CORRIDOR CITIES TRANSITWAY – SUPPLEMENTAL NOISE AND VIBRATION TECHNICAL MEMORANDUM

November 2010

MTA Maryland

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FIGURES

A. INTRODUCTION

This technical memorandum documents the noise and vibration analysis of the alignment modifications and Operations and Maintenance (O&M) facility locations proposed in the Corridor Cities Transitway (CCT) *Supplemental Environmental Assessment* (SEA). The CCT SEA is a companion to the other NEPA documents that have been prepared for the I-270/US 15 Multi-Modal Corridor Study, located in Montgomery and Frederick counties in Maryland. These include the 2002 *I-270/US 15 Multi-Modal Corridor Study Draft Environmental Impact Statement and Section 4(f) Evaluation*, and the 2009 *I-270/US 15 Multi-Modal Corridor Study Alternatives Analysis/Environmental Assessment*, both of which can be found online, along with other technical reports, at www.I270multimodalstudy.com.

The CCT SEA addresses only the transit elements of the Multi-Modal Study, and therefore this technical memorandum only discusses noise and vibration in terms of Federal Transit Administration (FTA) requirements. Federal Highway Administration (FHWA) criteria are discussed in previous I-270/US 15 Multi-Modal Corridor Study documents that discuss highway improvements in the corridor, including the January 2008 *Noise and Vibration Technical Report*.

B. NOISE

This section explains FTA standards with respect to noise, and then provides a description of existing noise conditions in the study area. Estimated effects from the alignment modifications and O&M facilities proposed in the CCT SEA on the adjacent communities are then presented, along with possible mitigation measures.

1. Sound Descriptors

Sound is measured in a variety of ways to reflect how it is perceived by the human ear. A number of factors affect sound when it is perceived as noise. These factors include the actual level of sound (or noise), the frequencies involved, exposure time interval, and the changes or fluctuations in the noise levels during exposure. Noise levels are measured in units called decibels. Since the human ear does not respond equally to all frequencies (or pitches), measured sound levels (in decibel units at standard frequency bands) are often adjusted or weighted to correspond to the frequency response of human hearing and the human perception of loudness. The weighted sound level is expressed in units called A-weighted decibels (dBA) and is measured with a calibrated sound meter.

Road traffic and transit noise and other noises found in communities tend to fluctuate from moment to moment, depending on whether a truck, bus or train passes by, an airplane flies over, a horn blows, or children scream as they play in a nearby schoolyard. To measure this noise accurately, the noise energy (expressed in dBA) produced by different activities are averaged over a period of time in order to obtain a single number. This single number is called the equivalent noise level, or Leq. Another noise measure considers people's increased sensitivity to noise during sleeping hours. This measure is calculated by measuring noise levels over a 24-hour period to calculate what is called the day-night sound level, or Ldn. The Ldn level

is determined by calculating the average daytime (Lday) and average nighttime (Lnight) noise level. In determining the Lnight noise level, a 10-dBA addition to nighttime sound levels is applied between the hours of 10:00 PM and 7:00 AM to account to the greater human sensitivity to noise during the nighttime hours. At a given receptor site, the logarithmetic sum of the Lday and Lnight noise level establishes the Ldn level. The FTA criteria utilize both the Leq and the 24-hour Ldn noise descriptors for noise impact assessment. The selection of which one to apply is determined by the land use type being assessed for impact.

2. Human Perception to Changes in Noise Levels

The average individual's ability to perceive changes in noise levels is well documented. Generally, changes in noise levels less than three dBA will be barely perceived by most listeners, whereas a 10-dBA change normally is considered significant and is perceived as a doubling (or halving) of noise levels. Community noise levels in urban areas usually range between 45 dBA, the daytime level in a typical quiet living room, and 75 dBA, the approximate noise level near a sidewalk adjacent to heavy traffic. For reference and orientation to the decibel scale, representative environmental noises and their respective dBA levels are shown in **Figure 1**.

3. FTA Noise Criteria for Transit Projects

The FTA noise criteria are based on land use categories. Specifically, the FTA impact assessment guidelines groups sensitive areas into three specific land use categories and the noise descriptor used to complete the impact assessment is chosen based on that land use type. A summary of the description of each of the three land use categories is provided in **Table 1**. The Leq (h) dBA (one hour) descriptor is utilized for land uses with primarily daytime uses and the Ldn descriptor is applied when the land use involves properties where people sleep and sensitivity to noise at night is of utmost importance.

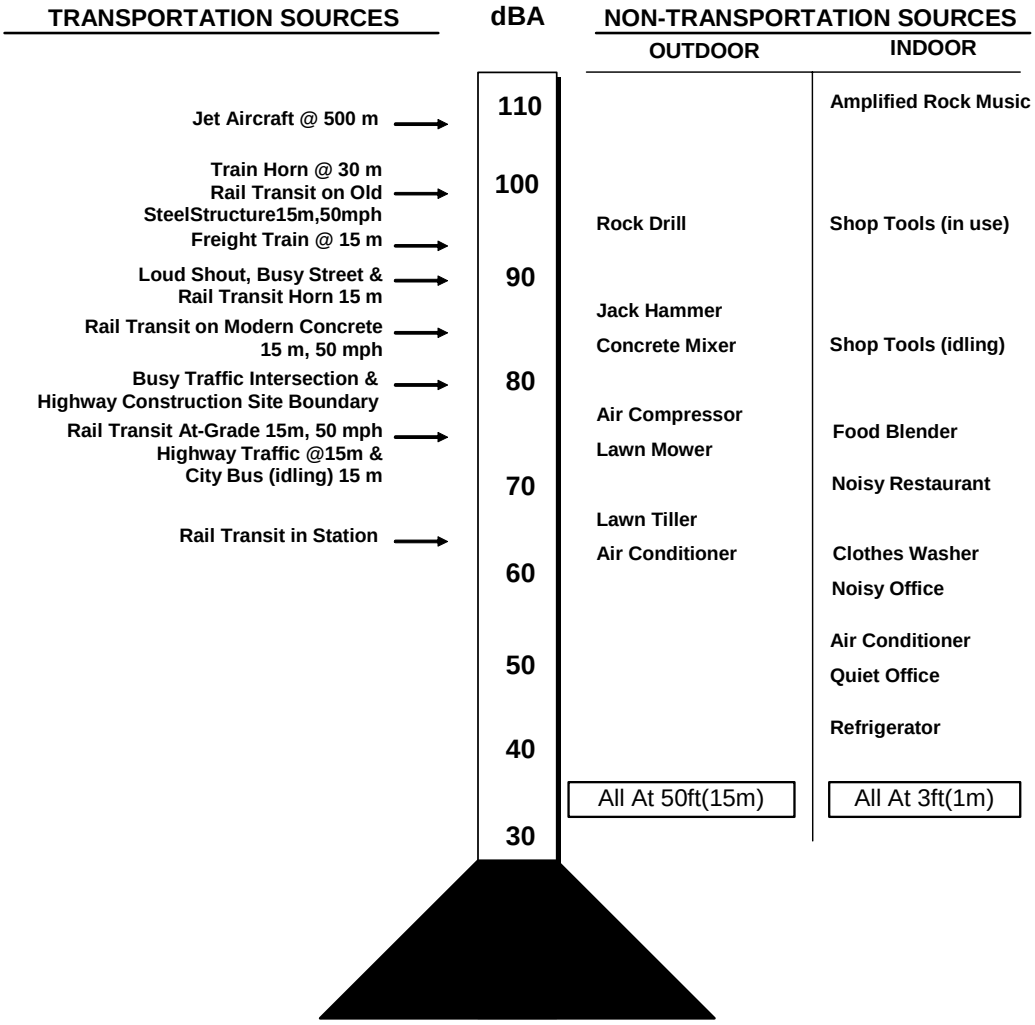
Table 1: FTA Guidelines Land Use Categories and Metrics for Transit Noise

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor Leq (h)*	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and land used as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor Leq (h)*	Institutional land uses with primarly daytime and evening use. This category includes schools, libraries, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material.

* Leq for the noisiest hour of transit-related activity during hours of noise sensitivity.

The noise impact assessment completed for this study primarily involved FTA Category 2 land uses, which consist of buildings where people normally sleep and the sensitivity to noise at night is of the utmost importance, such as residential buildings, hotels, and hospitals.

Figure 1:Common Indoor and Outdoor Instantaneous Noise Levels



Sources: FTA Report FTA-VA-90-1003-06. "Transit Noise and Vibration Impact Assessment" , May 2006

4. FTA Impact Assessment Based on Project Noise Exposure

Under FTA guidelines, noise impacts are determined by comparing the estimated future noise levels generated solely by the proposed LRT and BRT transit operations against the existing ambient noise levels without the project. The FTA noise impact criteria categorize project noise levels into three principal levels of impact defined as "No Impact", "Moderate Impact", or "Severe Impact". A summary of the impact criteria thresholds based on the existing noise exposure as defined and applied by the three land use categories is presented in **Table 2.**

Table 2: Noise Levels Defining Impact for Transit Projects

Existing Noise Exposure* Leq (h) or Ldn (dBA)	Project Noise Impact Exposure, * Leq (h) or Ldn (dBA)					
	Category 1 or 2 Sites			Category 3 Sites		
	No Impact	Moderate Impact	Severe Impact	No Impact	Moderate Impact	Severe Impact
51	<54	54-60	>60	<59	59-65	>65
52	<55	55-60	>60	<60	60-65	>65
53	<55	55-60	>60	<60	60-65	>65
54	<55	55-61	>61	<60	60-66	>66
55	<56	56-61	>61	<61	61-66	>66
56	<56	56-62	>62	<61	61-67	>67
57	<57	57-62	>62	<62	62-67	>67
58	<57	57-62	>62	<62	62-67	>67
59	<58	58-63	>63	<63	63-68	>68
60	<58	58-63	>63	<63	63-68	>68
61	<59	59-64	>64	<64	64-69	>69
62	<59	59-64	>64	<64	64-69	>69
63	<60	60-65	>65	<65	65-70	>70
64	<61	61-65	>65	<66	66-70	>70
65	<61	61-66	>66	<66	66-71	>71
66	<62	62-67	>67	<67	67-72	>72
67	<63	63-67	>67	<68	68-72	>72
68	<63	63-68	>68	<68	68-73	>73
69	<64	64-69	>69	<69	69-74	>74
70	<65	65-69	>69	<70	70-74	>74
71	<66	66-70	>70	<71	71-75	>75
72	<66	66-71	>71	<71	71-76	>76
73	<66	66-71	>71	<71	71-76	>76
74	<66	66-72	>72	<71	71-77	>77
75	<66	66-73	>73	<71	71-78	>78
76	<66	66-74	>74	<71	71-79	>79
77	<66	66-74	>74	<71	71-79	>79
>77	<66	66-75	>75	<71	71-80	>80

Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006

* Ldn is used for land uses where nighttime sensitivity is a factor; Leq during the hour of maximum transit noise exposure [Leq(h)] is used for land uses involving primarily daytime activities.*

5. Ambient Noise Measurement Survey

In accordance with FTA impact assessment requirements twenty-four hour day-night noise levels (Ldn dBA) were measured at 20 representative sites identified near each of the various proposed CCT alignment modification corridors. Noise measurements collected at ten of these

locations were recorded as part of work done for earlier environmental documents for the I-270/US 15 Multi-Modal Corridor Study.

The representative measurement sites were selected on the basis of several factors, the most important of which was the site's potential sensitivity and proximity to additional noise generated by transit operations. Each measurement site's noise readings serve as representative of ambient noise conditions at that location and other similar nearby properties.

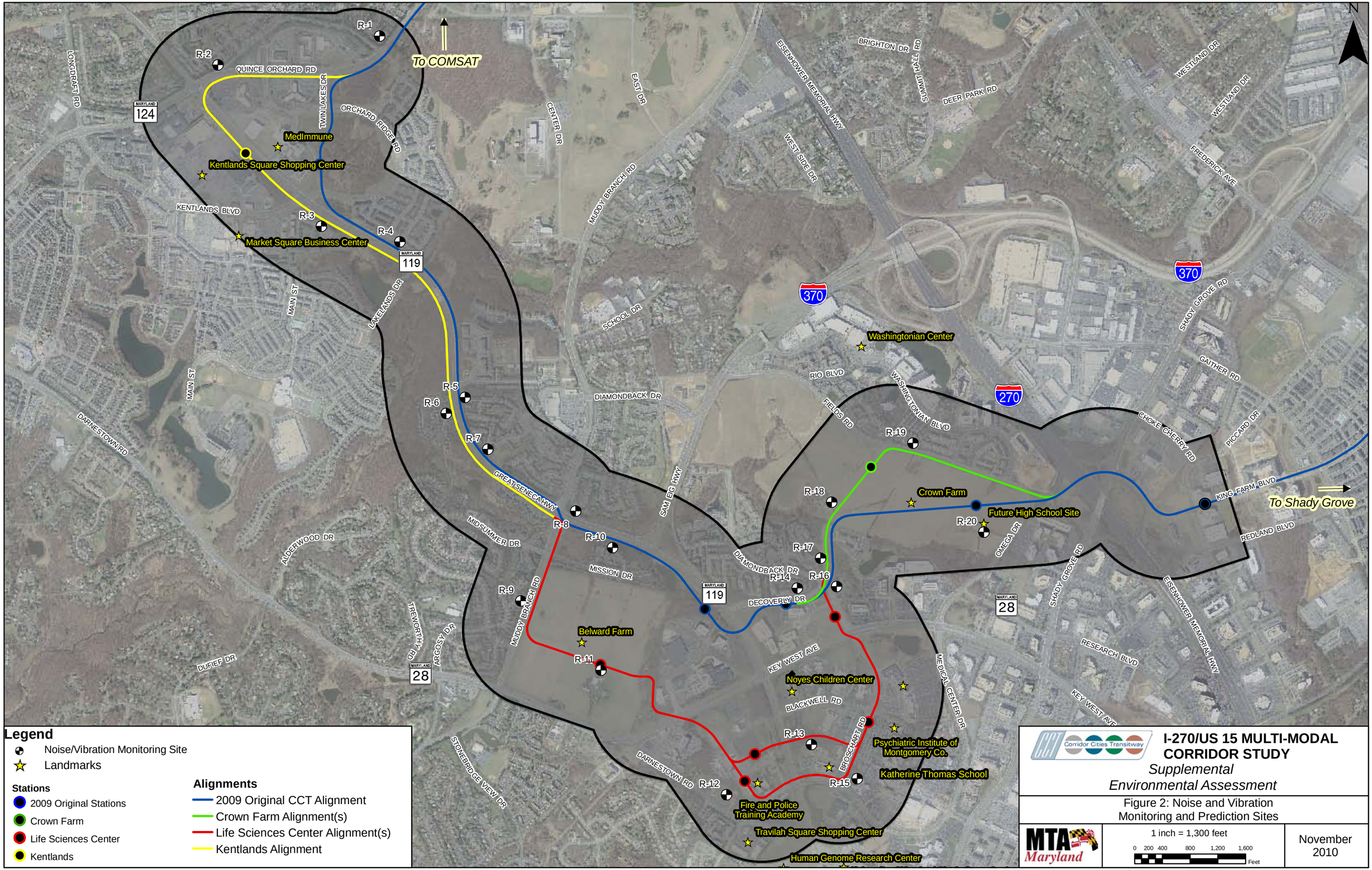
All field measurements were conducted according to procedures described in ***Sound Procedures for Measuring Highway Noise*** (Report Number FHWA-DP-45-1R May 1996). All measurements were collected during periods of dry weather with wind speeds of less than 15 mph. In accordance with the most vigorous FTA-recommended method for establishing baseline ambient day-night noise levels, monitoring at each site was conducted for a minimum duration of 24 continuous hours at each representative property. Five sets of certified Larson Davis LD 720 noise meters were used in the collecting the ambient noise readings outfitted with Larson Davis condenser microphones and windshields. Calibration before and after each 24-hour noise measurement was completed using a Larson Davis LD 250 calibrator.

Figure 2 depicts the locations of each of the noise monitoring sites along with the various alignment modifications discussed in the CCT SEA. Monitoring locations consisted primarily of residential properties, with one medical facility and one childcare facility. **Table 3** provides a brief description of each monitoring location along with its measured day-night noise level. Measured noise levels are typical of ambient conditions in suburban communities.

Two additional 24-hour noise measurement readings were collected adjacent to the two proposed O&M facilities discussed in the CCT SEA, and these locations are identified as Sites R-21 and R-22 as illustrated in **Figures 3** and **4** respectively.

In general, Ldn levels show less variability than short-term noise readings because the Ldn levels are time averaged over a 24-hour period. Within the proposed CCT corridor, several measurement sites are located in fairly isolated areas far removed from existing road traffic routes and other noise sources. Tranquil or low ambient noise conditions are considered to occur when measured day-night noise levels are 63 dBA or lower. Within the project study area measured day-night levels of 63 dBA or lower were recorded at 15 out of the 22 representative noise monitoring locations (R-2, R-4, R-6, R-8, R-9, R-10, R-11, R-12, R-14, R-15, R-16, R17, R-18, R-20 and R-21). Overall day-night levels ranged from 55 dBA at site R-11 (on Belwards Farm) to a maximum Ldn level of 74 dBA at Site R-22 (near the Motel Six located near the proposed Metropolitan Grove O&M facility). The high measured Ldn level recorded at Site R-22 is due primarily to its close proximity to an active railroad which overpasses the area near Quince Orchard Road. Lastly, peak hour (Leq (h) dBA) noise levels were reported at Site R-13 (Nanda Child Care Center) because this site is limited to daytime use.

The detailed hourly noise measurement survey findings collected at each site are contained in **Appendix A**.



Legend

- Noise/Vibration Monitoring Site
- Landmarks

Stations

- 2009 Original Stations
- Crown Farm
- Life Sciences Center
- Kentlands

Alignments

- 2009 Original CCT Alignment
- Crown Farm Alignment(s)
- Life Sciences Center Alignment(s)
- Kentlands Alignment

I-270/US 15 MULTI-MODAL CORRIDOR STUDY

Supplemental Environmental Assessment

Figure 2: Noise and Vibration Monitoring and Prediction Sites

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1 inch = 1,300 feet

0 200 400 800 1,200 1,600 Feet

November 2010

Table 3: Summary of Noise Measurements (L_{dn}) at Residential Land Uses (FTA "Category 2" Sites) Adjacent to Proposed CCT Corridor

Site # ID			Location	Land Use	Date	L_{dn}
2010 Study	2007 Study	2002 Study				
R-1	T-13	T-6	2 Purchase Street, Gaithersburg	Residential	5-15-06	68
R-2	NA	NA	Unit 12 Baybridge Court, Gaithersburg	Residential	5-4-10	61
R-3	NA	NA	130 Chevy Chase Street, Gaithersburg	Residential	5-4-10	71
R-4	T-12	T-N1	305 Swanton Lane, Gaithersburg	Residential	5-17-06	63
R-5	T-11	T-N4	300 High Gables Drive, Gaithersburg	Residential	5-31-06	65
R-6	T-10	T-5	427 Upshire Circle, Gaithersburg	Residential	5-15-06	61
R-7	T-9	T-4	309 Leafcap Road, Gaithersburg	Residential	5-16-06	66
R-8	T-8	T-3	67 Pontiac Way, Gaithersburg	Residential	5-4-10	61
R-9	NA	NA	314 Argosy Drive, Gaithersburg	Residential	5-4-10	58
R-10	T-7	T-2	141 Mission Drive, Gaithersburg	Residential	5-16-06	63
R-11	NA	NA	Belward Farm	Residential	5-4-10	55
R-12	NA	NA	10119 Darnestown Road, Gaithersburg	Residential	5-3-10	58
R-13	NA	NA	14910 Broschart Road, Rockville	Nanda Child Care	5-3-10	64[1]
R-14	T-6	T-1	9963 Foxborough Circle, Gaithersburg	Residential	5-17-06	63
R-15	NA	NA	9909 Medical Center Drive, Gaithersburg	Hospital	5-4-10	58
R-16	NA	NA	9700 Oakdale Drive, Gaithersburg	Residential	5-3-10	59
R-17	T-5	T-N10	15303 Gable Ridge Court Apt. J, Gaithersburg	Residential	6-13-06	59
R-18	T-4	T-N9	9800 Fields Road (English King Farm, near Crown Farm), Gaithersburg	Residential	6-13-06	61
R-19	T-3	T-N8	9601 Fields Road, Apt. 102, Gaithersburg	Residential	6-12-06	67
R-20	NA	NA	Crown Farm Property near Omega Drive	Residential	5-3-10	56
R-21	NA	NA	13041 Seneca Ayr Drive, Germantown	Residential	5-5-10	58
R-22	NA	NA	497 Quince Orchard Road, Gaithersburg	Motel Six	5-5-10	74

[1]Peak hour Leq (h) dBA is measured at this location because land use is primarily limited to daytime use.

6. Noise Prediction Methodology

The noise exposure calculations were completed following the procedures and methodologies described in the in the FTA Manual (*Transit Noise and Vibration Assessment Manual* [FTA report FTA-VA-90-1003-06, May 2006]).

The FTA Manual provides detailed calculation procedures to estimate vehicle noise emissions and quantifies the attenuation of sound as it travels from the transit vehicle (the train or bus) to noise-sensitive receptor locations along the right-of-way. In this study, residential properties (and other places where people sleep) along the ROW are the primary focus. However, land uses involving primarily daytime uses, such as the daycare center identified along the project study area limits, were also assessed for impact.

Every noise prediction must characterize three elements: the noise source, the sound propagation path, and the affected noise receptor. For a given type of vehicle, noise emissions depend upon the operating conditions. Noise generated by LRT and BRT line operations along the proposed CCT corridor were determined using pass-by frequency (headway) and vehicle travel speed data provided along each segment of the proposed transit corridor.

7. Future Transit Noise Exposure Methodology and Findings

This section describes the potential impacts associated from the line operations of the various proposed CCT LRT and BRT alignment modifications as illustrated on **Figure 2**. Future transit noise exposure levels estimated from all proposed LRT and BRT line operations were completed following the procedures and methodologies described in Chapter 6 of the FTA Manual.

To provide a conservative estimate of the future noise environment, a level ground terrain between the alignment modifications and the surrounding community was assumed, and shielding offered by intervening buildings between transit alignments and representative locations were ignored. Noise impacts were determined at each of the 20 representative noise monitoring locations which are identified in **Figure 2**. Nineteen of the 20 representative locations analyzed for impact assessment consist of properties where people normally sleep such as residences, hospitals, and hotels where nighttime sensitivity to noise is assumed to be of the utmost importance. These types of properties are described in **Table 1** as FTA Category 2 land uses. All 20 representative noise impact assessment locations represent properties that are within the closest proximity to the proposed alignment modifications and therefore provide a conservative estimate of “worst case” future projected noise exposure that can be expected adjacent to these communities.

In accordance with FTA impact assessment procedures, existing ambient Ldn levels measured at each monitoring location are compared with future noise levels computed from LRT and BRT transit line operations. Following the impact category thresholds in **Table 2,** the computed future noise exposure levels at each site were compared to the measured current Ldn levels at that particular location to establish if, at that existing noise exposure level, the project noise would exceed the FTA threshold of “moderate” or “severe” impact.

The noise analysis findings for the LRT option without horn blowing at road crossings are provided in **Table 4.** The noise analysis findings for the BRT option are summarized in **Table 5.** The transit line operation noise analysis findings indicate that under normal operating conditions (no horn blowing) there will be no severe impacts under any proposed LRT or BRT option, with moderate impacts identified as follows:

- Along the S3 alignment, moderate impacts are predicted at site R-6 (a residential property at 427 Upshire Circle) under both BRT and LRT
- Along the S1 alignment, moderate impacts are projected at site R-18 (9800 Fields Road) under the BRT alignment.

Table 6 provides a summary of the projected noise impacts that are likely to occur under LRT operations at properties near at-grade crossings if train horn sounding warnings were to be required. The FTA has no such requirement and looks to the states to rule on the matter of horn use at grade crossings.

The additional noise impact assessment due to possible horn blowing was completed at properties that were within 1,000 feet of proposed at-grade crossings where possible horn noise annoyance could be a noise contributing factor. The analysis findings indicate that moderate or severe noise impacts are projected to occur at Sites R-8, R-15, R-16 and R-17 under all proposed alignment options that pass by these areas. Where impacts from horn blowing are expected to be severe, it is anticipated that measures would be put in place to eliminate the need for horn-blowing.

Detailed hour-by-hour LRT and BRT noise calculations at each of the noise monitoring sites are contained in **Appendix B** and **Appendix C** respectively.

Table 4: Existing Noise Exposure, Projected Future LRT Noise Exposure and Impact Assessment Using FTA Criteria

Site No.	Existing Noise Level[1] Ldn (dBA)	Proposed CCT Alternatives[2]									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment
R1	68	56 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R2	61	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R3	71	60 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R4	63	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R5	65	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R6	61	60 MODERATE IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R7	66	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R8	61	44 NO IMPACT	NA	NA	NA	NA	43 NO IMPACT	54 NO IMPACT	53 NO IMPACT	55 NO IMPACT	54 NO IMPACT
R9	58	52 NO IMPACT	45 NO IMPACT	45 NO IMPACT	NA	NA	45 NO IMPACT	NA	NA	NA	NA
R10	63	NA	NA	NA	52 NO IMPACT	54 NOIMPACT	NA	47 NO IMPACT	52 NO IMPACT	52 NO IMPACT	47 NO IMPACT

1. Existing Ldn noise levels are derived from 24-hour measurements collected at each location. Except Site R-13, which is limited to primarily daytime use, and therefore peak-hour Leq is provided.

2. Headways of 10 minutes (5 AM to 5:30 AM , 9:30 AM to 4:30 PM & 7:30 PM to 9 PM), 7.5 minutes (5:30 AM to 9:30 AM & 4:30 PM to 7:30 PM) and 12 minutes (9 PM to 1 AM) were used for the impact assessment, with no service from 1 AM to 5 AM.

3. Peak hour Leq (h) dBA measured and predicted under future line operations at this location because land use is primarily limited to daytime use.

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

Table 4: Existing Noise Exposure, Projected Future LRT Noise Exposure and Impact Assessment Using FTA Criteria (Continued)

Site No.	Existing Noise Level[1] Ldn (dBA)	Proposed CCT Alternatives[2]									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment	Estimated L_{dn} Level FTA Impact Assessment
R11	55	48 NO IMPACT	NA	NA	NA	NA	47 NO IMPACT	NA	NA	40 NO IMPACT	41 NO IMPACT
R12	58	NA	NA	NA	43 NO IMPACT	41 NO IMPACT	48 NO IMPACT	49 NO IMPACT	49 NO IMPACT	40 NO IMPACT	48 NO IMPACT
R13[3]	64	55 NO IMPACT	NA	NA	55 NO IMPACT	55 NO IMPACT	NA	NA	NA	55 NO IMPACT	NA
R14	63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
R15	58	NA	NA	NA	NA	NA	47 NO IMPACT	47 NO IMPACT	47 NO IMPACT	NA	53 NO IMPACT
R16	59	45 NO IMPACT	39 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA
R17	59	53 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R18	61	56 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R19	67	55 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R20	56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1. Existing Ldn noise levels are derived from 24-hour measurements collected at each location. Except Site R-13, which is limited to primarily daytime use, and therefore peak-hour Leq is provided.

2. Headways of 10 minutes (5 AM to 5:30 AM , 9:30 AM to 4:30 PM & 7:30 PM to 9 PM), 7.5 minutes (5:30 AM to 9:30 AM & 4:30 PM to 7:30 PM) and 12 minutes (9 PM to 1 AM) were used for the impact assessment, with no service from 1 AM to 5 AM.

3. Peak hour Leq (h) dBA measured and predicted under future line operations at this location because land use is primarily limited to daytime use.

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

Table 5: Existing Noise Levels, Projected Future BRT Noise Exposure and Impact Assessment Using FTA Criteria

Site[1] No	Existing Noise Level[2] Ldn (dBA)	Proposed CCT Alternatives									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment
R1	68	58 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R2	61	55 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R3	71	63 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R4	63	55 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R5	65	55 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R6	61	**63 MODERATE IMPACT**	NA	NA	NA	NA	NA	NA	NA	NA	NA
R7	66	55 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R8	61	49 NO IMPACT	NA	NA	NA	NA	47 NO IMPACT	57 NO IMPACT	57 NO IMPACT	58 NO IMPACT	57 NO IMPACT
R9	58	55 NO IMPACT	NA	NA	NA	56 NO IMPACT	55 NO IMPACT	NA	NA	NA	NA
R10	63	NA	NA	NA	NA	56 NO IMPACT	NA	51 NO IMPACT	55 NO IMPACT	55 NO IMPACT	51 NO IMPACT

1. Existing Ldn noise levels are derived from 24-hour measurements collected at each location. Except Site R-13, which is limited to primarily daytime use, and therefore peak-hour Leq is provided.

2. Headways of 10 minutes (5 AM to 5:30 AM , 9:30 AM to 4:30 PM & 7:30 PM to 9 PM), 7.5 minutes (5:30 AM to 9:30 AM & 4:30 PM to 7:30 PM) and 12 minutes (9 PM to 1 AM) were used for the impact assessment, with no service from 1 AM to 5 AM.

3. Peak hour Leq (h) dBA measured and predicted under future line operations at this location because land use is primarily limited to daytime use.

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

Table 5 Existing Noise Levels, Projected Future BRT Noise Exposure and Impact Assessment Using FTA Criteria (Continued)

Site No.	Existing Noise Level[1] Ldn (dBA)	Proposed CCT Alternatives[2]									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment
R11	55	51 NO IMPACT	NA	NA	55 NO IMPACT	NA	50 NO IMPACT	NA	NA	44 NO IMPACT	45 NO IMPACT
R12	58	NA	NA	NA	48 NO IMPACT	45 NO IMPACT	52 NO IMPACT	52 NO IMPACT	52 NO IMPACT	44 NO IMPACT	52 NO IMPACT
R13[3]	64	59 NO IMPACT	NA	NA	59 NO IMPACT	59 NO IMPACT	NA	NA	NA	59 NO IMPACT	NA
R14	63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
R15	58	NA	NA	NA	NA	NA	52 NO IMPACT	52 NO IMPACT	52 NO IMPACT	NA	56 NO IMPACT
R16	59	49 NO IMPACT	45 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA
R17	59	57 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R18	61	**59 MODERATE IMPACT**	NA	NA	NA	NA	NA	NA	NA	NA	NA
R19	67	58 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R20	56	NA	45 NO IMPACT	45 NO IMPACT	NA	NA	NA	NA	NA	NA	NA

1. Existing Ldn noise levels are derived from 24-hour measurements collected at each location. Except Site R-13, which is limited to primarily daytime use, and therefore peak-hour Leq is provided.
2. Headways of 10 minutes (5 AM to 5:30 AM , 9:30 AM to 4:30 PM & 7:30 PM to 9 PM), 7.5 minutes (5:30 AM to 9:30 AM & 4:30 PM to 7:30 PM) and 12 minutes (9 PM to 1 AM) were used for the impact assessment, with no service from 1 AM to 5 AM.
3. Peak hour Leq (h) dBA measured and predicted under future line operations at this location because land use is primarily limited to daytime use.

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

Table 6: Existing Noise Levels, Projected Future LRT Noise Exposure and Impact Assessment Using FTA Criteria at Locations Where Horn Noise Soundings Are Potentially Required

Site No.	Existing Noise Level[1] Ldn (dBA)	Proposed CCT Alternatives[2]									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment	Estimated Ldn Level FTA Impact Assessment
R8	61	**65 SEVERE IMPACT**	NA	NA	NA	NA	**63 MODERATE IMPACT**	**63 MODERATE IMPACT**	**63 MODERATE IMPACT**	**63 MODERATE IMPACT**	**63 MODERATE IMPACT**
R15	58	NA	NA	NA	NA	NA	**69 SEVERE IMPACT**	**69 SEVERE IMPACT**	**69 SEVERE IMPACT**	NA	**66 SEVERE IMPACT**
R16	59	**61 MODERATE IMPACT**	NA	NA	NA	NA	NA	NA	NA	NA	NA
R17	59	**72 SEVERE IMPACT**	NA	NA	NA	NA	NA	NA	NA	NA	NA

1. Existing Ldn noise levels are derived from 24-hour measurements collected at each location.

2. Headways of 10 minutes (5 AM to 5:30 AM , 9:30 AM to 4:30 PM & 7:30 PM to 9 PM), 7.5 minutes (5:30 AM to 9:30 AM & 4:30 PM to 7:30 PM) and 12 minutes (9 PM to 1 AM) were used for the impact assessment, with no service from 1 AM to 5 AM.

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

10. Operations and Maintenance (O&M) Facilities

Noise generated from activities at transit O&M facilities (train yards and bus depots) were calculated based on the reference Sound Exposure Levels (SEL dBA), screening distances and calculation procedures provided in Chapters 4, 5, and 6 of the FTA Manual.

The principal sources of noise that are likely to generate annoyance in residences near transit system O&M facilities include moving transit cars with auxiliary equipment, trains negotiating tight curves (wheel squeal noise), car wash facilities, pings, clicks and bangs which occur as the wheels pass through switches and over frogs and joints in the special track work included in the yard, train car coupling impacts, maintenance and storage operations and the public address system. These sources produce randomly occurring noises that are of considerably different character than typical community background noise and therefore, if higher than the background noise level, they can be noticeable and intrusive. Most of the noises produced by the transit vehicles are controlled to a level that would avoid impact on adjacent areas unless the separation distance from the O&M facilities with the residential area is small.

Auxiliary equipment on modern transit cars are required to meet specified noise levels for individual equipment. With all of the equipment operating, the maximum noise level is generally found to be 60 dBA at 50 feet from the center of the vehicle. Train speeds in yards are generally limited to a maximum of 15 to 20 mph so that noise from the moving trains is generally 70 dBA at 50 feet, and usually is considerably less—in the range of 60 to 65 dBA at 50 feet. Because of the noise limit specifications on vehicle auxiliary and propulsion equipment and because of low train speeds in yards, the general rolling noise due to train operations on tangent tracks does not result in noise impact in adjacent communities and is comparable to and compatible with typical community background noise.

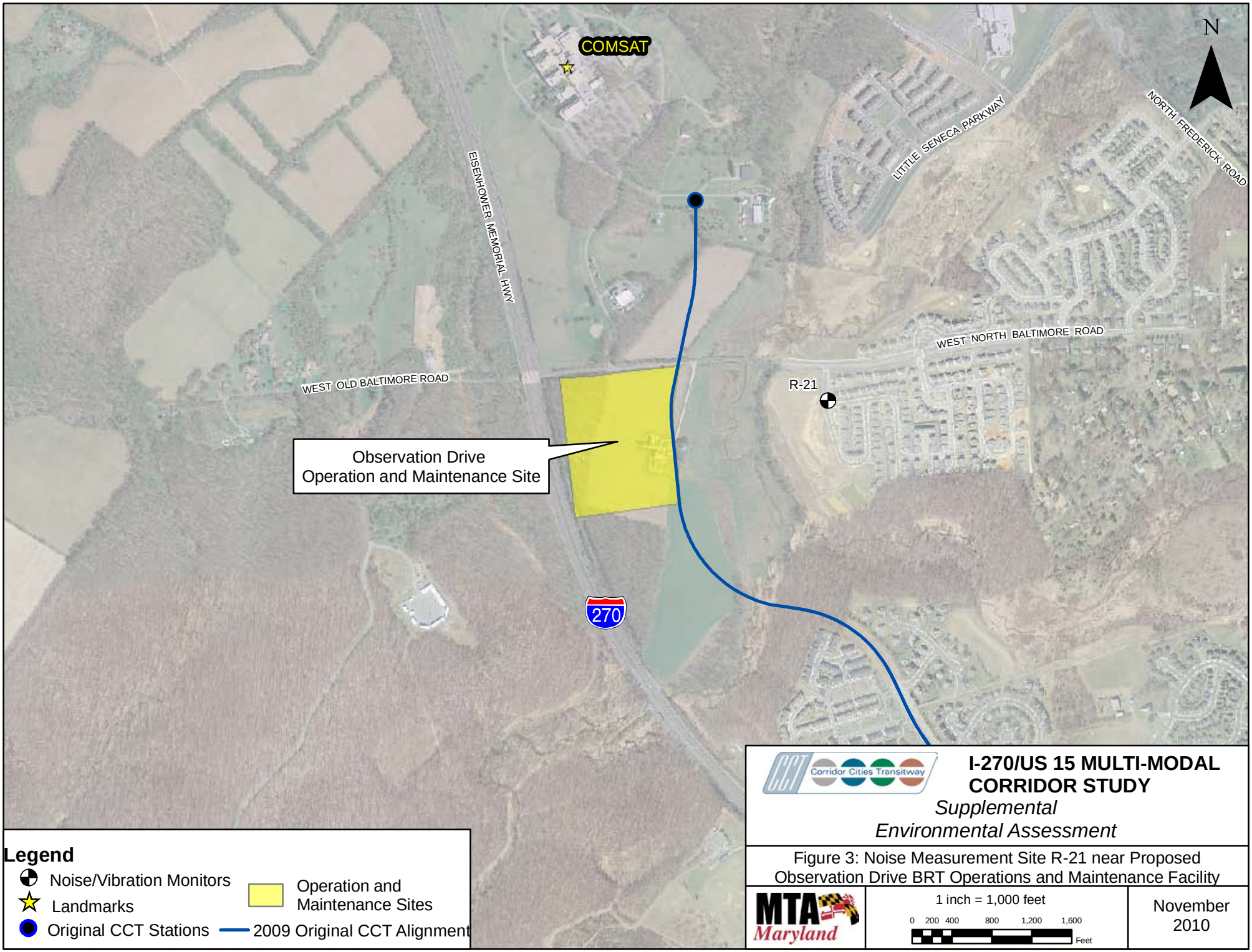
Maintenance activities will be performed inside enclosed buildings, and noise from the maintenance activities is not expected to result in impacts at the residential receptors. However, there are many other high-level intermittent noises and noise from wheel squeal associated with trains negotiating tight curves. These activities are expected to take place 24 hours a day. Total noise from all of the O&M activities was estimated after applying distance correction from the site boundary.

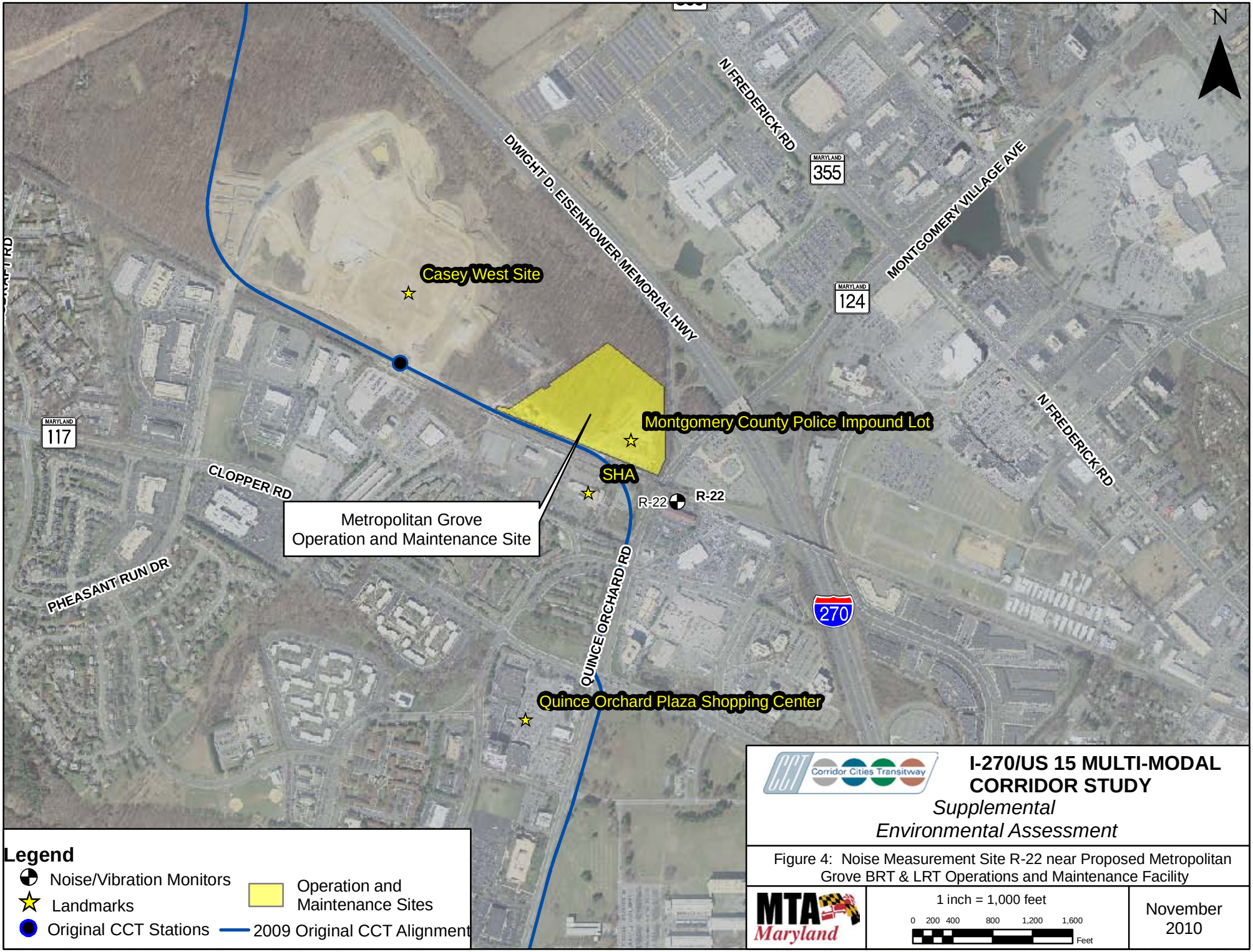
Two locations were identified for O&M facilities: one at Observation Drive shown in **Figure 3,** which could only serve as a BRT facility, and a second facility at Metropolitan Grove, depicted in **Figure 4**, which could serve either LRT or BRT maintenance operations. Existing 24-hour noise measurements were collected at the nearest noise-sensitive properties adjacent to each proposed facility. These measurement locations are identified as Site R-21 on **Figure 3** and Site R-22 on **Figure 4.**

A summary of the existing and future day-night noise level estimates due to noise generated from O&M activities is provided in **Table 7** for both of the representative receptor locations. The high existing Ldn level recorded at Site R-22 is due primarily to its close proximity to an active railroad overpass near Quince Orchard Road. The analysis findings indicate that noise generated from O&M activities is expected to be below the FTA impact threshold at the nearest noise sensitive properties adjacent to either proposed facility.

Table 7: Summary of Existing and Future Noise Level Estimates, and FTA Impact Assessment Due to Operations & Maintenance Activities

Receptor Site No.	Facility	Operation & Maintenance Use (Transit Mode)	Existing Day-Night Noise Level Ldn (dBA)	Projected Day-Night Noise Levels (Ldn dBA) Due to O & M FTA Impact Assessment
R-21	Observation Drive	BRT	58	38 NO IMPACT
R-22	Metropolitan Grove	BRT	74	47 NO IMPACT
R-22	Metropolitan Grove	LRT	74	65 NO IMPACT


COMSAT
N
EISENHOWER MEMORIAL HWY
LITTLE SENECA PARKWAY
NORTH FREDERICK ROAD
WEST NORTH BALTIMORE ROAD
WEST OLD BALTIMORE ROAD
R-21
Observation Drive
Operation and Maintenance Site
270
Legend
Noise/Vibration Monitors
Landmarks
Original CCT Stations
Operation and Maintenance Sites
2009 Original CCT Alignment
CCT Corridor Cities Transitway
I-270/US 15 MULTI-MODAL CORRIDOR STUDY
Supplemental Environmental Assessment
Figure 3: Noise Measurement Site R-21 near Proposed Observation Drive BRT Operations and Maintenance Facility
MTA Maryland
1 inch = 1,000 feet
0 200 400 800 1,200 1,600
Feet
November 2010


N
N FREDERICK RD
DWIGHT D. EISENHOWER MEMORIAL HWY
MARYLAND 355
MONTGOMERY VILLAGE AVE
MARYLAND 124
Casey West Site
Montgomery County Police Impound Lot
N FREDERICK RD
MARYLAND 117
CLOPPER RD
SHA
R-22
R-22
Metropolitan Grove
Operation and Maintenance Site
PHEASANT RUN DR
QUINCE ORCHARD RD
270
Quince Orchard Plaza Shopping Center
Legend
Noise/Vibration Monitors
Landmarks
Original CCT Stations
Operation and Maintenance Sites
2009 Original CCT Alignment
CCT Corridor Cities Transitway
I-270/US 15 MULTI-MODAL CORRIDOR STUDY
Supplemental Environmental Assessment
Figure 4: Noise Measurement Site R-22 near Proposed Metropolitan Grove BRT & LRT Operations and Maintenance Facility
MTA Maryland
1 inch = 1,000 feet
0 200 400 800 1,200 1,600
Feet
November 2010

11. Mitigation Measures

This section provides a brief overview of rail noise mitigation with appropriate reference to the CCT transit project. In conjunction with the FHWA, the FTA has issued a regulation implementing NEPA's general policy on environmental mitigation, which states that measures necessary to mitigate adverse impacts are to be incorporated into the project and that such measures are eligible for Federal funding, when FTA determines that "…the proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures." While NEPA provides broad direction, a more explicit statutory basis for mitigating adverse noise impacts is contained in the federal transit laws. Before approving a construction grant under Section 5309, FTA must make a finding that "…the preservation and enhancement of the environment, and the interest of the community in which a project is located, were considered; and no adverse environmental effect is likely to result from the project, or no feasible or prudent alternative to the effect exists and all reasonable steps have been taken to minimize the effect."

Mitigation of noise impacts from rail projects may involve treatments at three fundamental components of the noise problem:

- At the noise source
- Along the source-to-receiver propagation path
- At the receiver (Generally, the transit agency has the authority to treat the source and some elements of the propagation path, but may have little or no authority to modify anything at the receiver end.)

Practical noise mitigation measures that are employed in reducing noise from train operations are summarized in the FTA Manual and include the following:

- Select quieter system-wide components (e.g., continuous welded rail, tie and ballast track work, resilient wheels, skirts on the vehicle to reduce equipment noise, etc.)
- Add design features (e.g., noise barriers if adequate space is available, lubricate track at curves, track-bed isolation, moveable point switch frogs, etc.)
- Tailor operation plans to provide reduction in noise and vibration levels such as reducing vehicle speed, eliminating bells/horns at grade crossings, proper vehicle maintenance, etc.

The first measures would likely be included in the project design to reduce overall noise if the LRT mode is selected. The second and third types of improvements are usually site-specific and are only considered at sites where (1) noise impacts are expected and (2) where the number of "benefitted receivers" (e.g., the number of homes, hospitals etc., where project noise is noticeably reduced) justifies the cost of constructing the mitigation (e.g., a noise wall or crossing gates).

The noise analysis findings contained in this report indicate that under normal operating conditions (no horn blowing) there will be no severe impacts from either LRT or BRT operations.

Most considerations for noise abatement are generally limited to those areas which are projected to experience severe impacts; nevertheless projected noise levels in the moderate impact range may also require consideration and adoption of mitigation measures when it is considered reasonable. While impacts in this range are not of the same magnitude as severe impacts, there can be circumstances which would warrant abatement consideration such as a large cluster of residences adjacent to a proposed transit line, or when moderate impacts are approaching the severe impact threshold.

Moderate impacts from normal operations were projected at two sites, including Site R-6 under the LRT option (R-6 is near the S3 alignment) and at both R-6 and R-18 under the BRT option (R-18 is near the proposed S1 alignment).

Site R-18 is a single isolated property (9800 Fields Road) which would not satisfy Maryland State Highway Authority (MSHA) cost-effectiveness requirements, and therefore noise barrier abatement is not considered feasible at this property. Site R-6, which represents a residential cluster of single family homes just north of the Washingtonian Woods Park in Gaithersburg, could benefit from a four foot tall noise barrier positioned at the ROW line as illustrated in **Figure 5**, if one is desired. Noise impacts projected at Site R6 are in the middle range of impact values at an ambient Ldn noise level of 61 dBA. This proposed noise barrier would be approximately 900 feet long and would run from approximately track station 285+00 to 294+00. The four foot tall noise barrier would eliminate the moderate impacts projected at this area and satisfy MSHA feasibility and reasonableness criteria for noise barrier cost effectiveness. A summary of the cost and acoustic effectiveness of this barrier is provided in **Table 8**. Additional engineering work, as well as consultation with the community, are needed to determine if a noise wall is feasible near Site R-6.

Lastly, receptor sites near four at-grade crossings (R-8, R-15, R-16 and R17) are expected to experience moderate to severe impacts generated from horn noise soundings. The noise abatement strategies investigated to mitigate and reduce these impacts are discussed in greater detail in the next section.

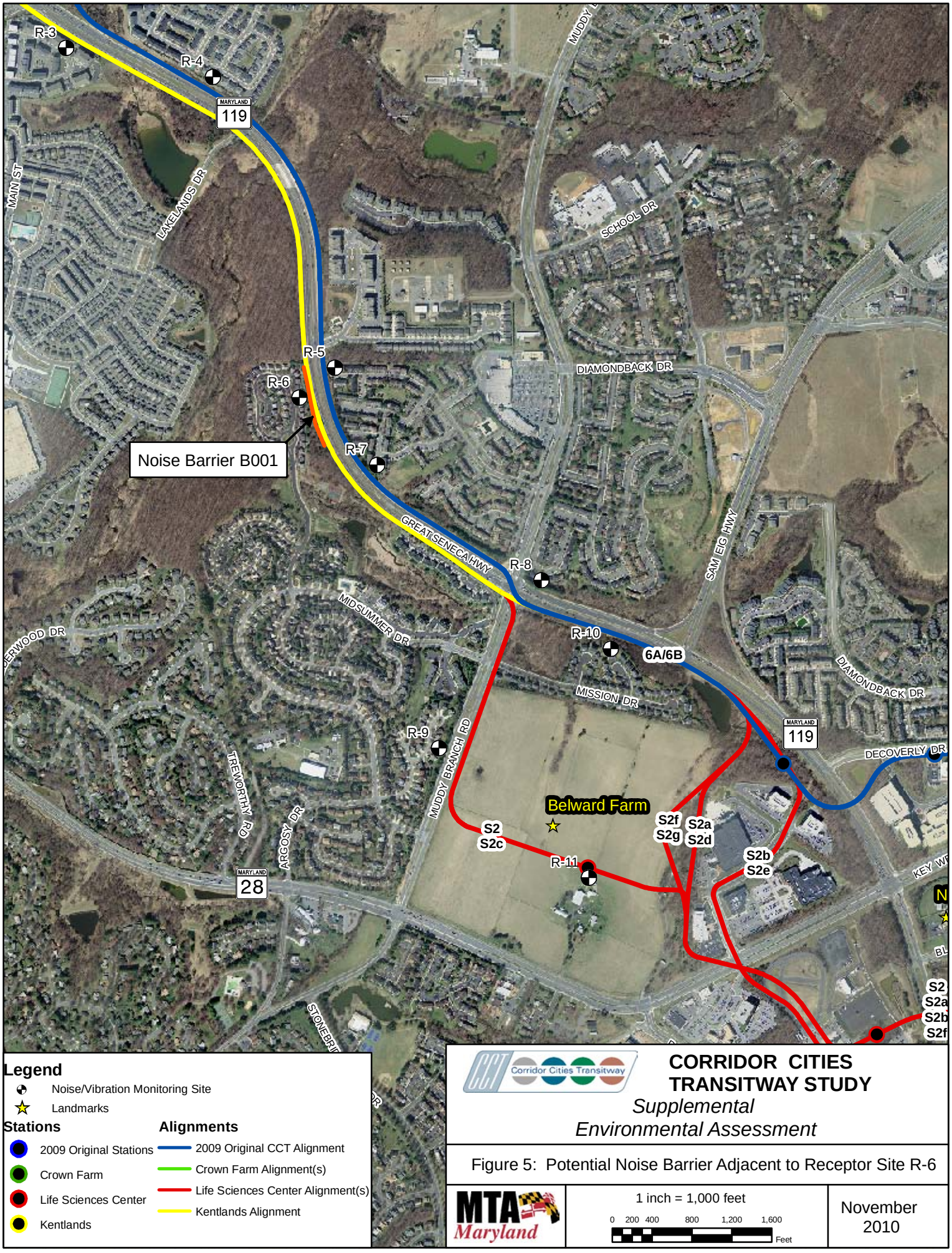

R-3
R-4
MARYLAND 119
MAIN ST
LAKELANDS DR
MUDDY
SCHOOL DR
R-5
R-6
DIAMONDBACK DR
Noise Barrier B001
R-7
GREAT SENECA HWY
SAM EIG HWY
R-8
MIDSUMMER DR
R-10
6A/6B
DIAMONDBACK DR
MISSION DR
R-9
MUDDY BRANCH RD
MARYLAND 119
DECOVERLY DR
TREWORTHY RD
ARGOSY DR
Belward Farm
S2
S2c
S2f
S2g
S2a
S2d
S2b
S2e
R-11
MARYLAND 28
KEY WE
S2
S2a
S2b
S2f
STONEBRI
Legend
Noise/Vibration Monitoring Site
Landmarks
Stations
2009 Original Stations
Crown Farm
Life Sciences Center
Kentlands
Alignments
2009 Original CCT Alignment
Crown Farm Alignment(s)
Life Sciences Center Alignment(s)
Kentlands Alignment
CCT Corridor Cities Transitway
CORRIDOR CITIES TRANSITWAY STUDY
Supplemental Environmental Assessment
Figure 5: Potential Noise Barrier Adjacent to Receptor Site R-6
MTA Maryland
1 inch = 1,000 feet
0 200 400 800 1,200 1,600
Feet
November 2010

Table 8: Summary of Noise Abatement Requirements Necessary to Eliminate Moderate Noise Impacts Identified in Tables 4 and 5

Barrier #	Nearest Monitoring Receptor Location	Achieved Noise Reduction (1) (dBA)	Barrier Length (Ft)	Alignment Station Numbers (2)	Barrier Height (Ft)	Estimated Barrier Cost (3) ($)	Number of Properties Protected	Estimated Cost Per Property Protected ($)	Barrier Effectiveness		SHA Criteria Satisfied (Yes/No)
									Acoustic (4) (Yes/No)	Cost (5) (Yes/No)	
B001	R-6	5	900	285 +00 to 294+00	4	136,800	10	13,600	Yes	Yes	Yes

Notes:

1. Insertion loss shown is maximum value at the most protected property.
2. Noise barriers to be located 10 to 15 feet from the centerline of the near track.
3. Estimated cost of the barriers is based on averaged cost of $38.00 per square foot, as recommended by SHA in 2006 dollars.
4. Acoustic effectiveness of a barrier was judged by satisfying the required insertion loss necessary to reduce future road traffic noise levels
5. Cost effectiveness was based on barrier cost of a maximum of $100,000 per benefiting property.

11. Train Horn Noise Mitigation Measures

Receptor sites near at-grade crossings where LRT vehicles might sound their horns (if the sounding of train horns is required) were found to experience noise levels which would exceed the FTA moderate and severe impact thresholds and would likely affect the quality of life for those residents living near these crossings unless some form of mitigation is implemented. These findings are summarized in **Table 6** and were found to occur at representative impact assessment Sites R-8, R-15, R-16 and R17. Where impacts are found to be severe, the second row of buildings from the alignment may potentially experience noise levels in the FTA moderate impact category. Beyond these second row properties, shielding provided by building rows should diminish noise levels sufficiently to below the FTA moderate impact threshold.

The most adversely affected properties are expected to be residences within 500 feet of the intersection of Muddy Branch Road and Great Seneca Highway (near Site R-8) and residences near the intersection of Diamondback and Decoverly Drives (near Site R-16). The affected residential areas and the path traversed by each of the proposed LRT alternatives as they pass through these intersections are illustrated in **Figure 2.**

Where impacts are predicted to be severe, measures can be put in place to eliminate the need for horn-blowing. A variety of approaches are available for reducing noise due to train horns near roadway/rail at-grade crossings. These include equipping crossings with flashing warning lights and automatic gates, as well as the use of median barriers, paired one-way streets, enforcement cameras similar to those used to ticket red-light runners, and wayside horns (where a warning horn installed at the crossing focuses an audible warning at the crossing itself instead of using the horns mounted on the trains).

Depending on actual design requirements, median barriers may be expensive to install at some locations. A four-quadrant gate system would generally be more expensive than a median barrier. As with noise walls, the cost-effectiveness of any abatement measure will depend on whether or not a substantial number of homes or other sensitive receptors would benefit from the elimination of horn noise soundings and if there would be other benefits, such as safety improvements, that need to be considered in the decision-making process.

C. VIBRATION ANALYSIS

This section presents the existing vibration conditions in the study area and describes applicable standards and criteria used to assess the potential for future environmental vibration effects on adjacent communities resulting from the proposed CCT transit alignments and the two O&M locations described in the CCT SEA.

1. Ground-Borne Vibration and Criteria

The analysis of ground-borne vibration requires a discussion of both ground-borne vibration levels and interior noise levels resulting from ground-borne vibration. Ground-borne noise refers to the noise effects that are caused by ground-borne vibration. For example, ground-borne vibration from a passing train can cause building floors and walls to vibrate and produce sound. The noise levels resulting from this effect depend on the amplitude and frequency of the vibration produced; the path of vibration propagation, and the acoustical characteristics of the structure and the receiving room. Additionally, the greater the acoustical absorption in the room, the lower the overall noise level.

Several factors can influence vibration levels at a receiver location. The important physical parameters associated with rail activity that can influence vibration levels fall into the following four categories:

- **Operational and vehicle factors**: speed, vehicle suspension, and flat or worn wheels;
- **Guide-way factors**: rail conditions, guide-way type, rail support system, and the mass and stiffness of the guide-way structure;
- **Geological factors**: stiffness and internal damping of the soil and the depth to bedrock; and
- **Receiver factors**: coupling of the building foundation to the soil and the propagation of vibration through the building.

Ground-borne vibration and ground-borne noise from light rail transit operations are governed by the criteria shown in **Table 9**. These criteria address maximum vibration levels associated with a single event, unlike noise levels, which are associated with cumulative exposure within a 24-hour period. To address the cumulative effects of multiple vibration events, the criteria are divided into “Frequent” and “Infrequent” event categories. The daily transit movements along the entire length of the proposed CCT corridor under both LRT and BRT line operations are projected to experience more than 70 vibration events per day (number of pass-bys per day)

and are therefore classified under the "Frequent Events" category which for FTA Category 2 land uses establishes a 72 VdB vibration impact threshold.

Table 9: FTA Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels		Ground-Borne Noise Impact Levels	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 V dB [3]	65 V dB [3]	NA [4]	NA [4]
Category 2: Residences and buildings where people normally sleep.	72 V dB	80 V dB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 V dB	83 V dB	40 dBA	48 dBA

Source: Transit Noise and Vibration Impact Assessment (FTA, May 2006)

Notes: Vibration levels expressed in V dB are 1 micro inch/sec and noise levels expressed in dBA.

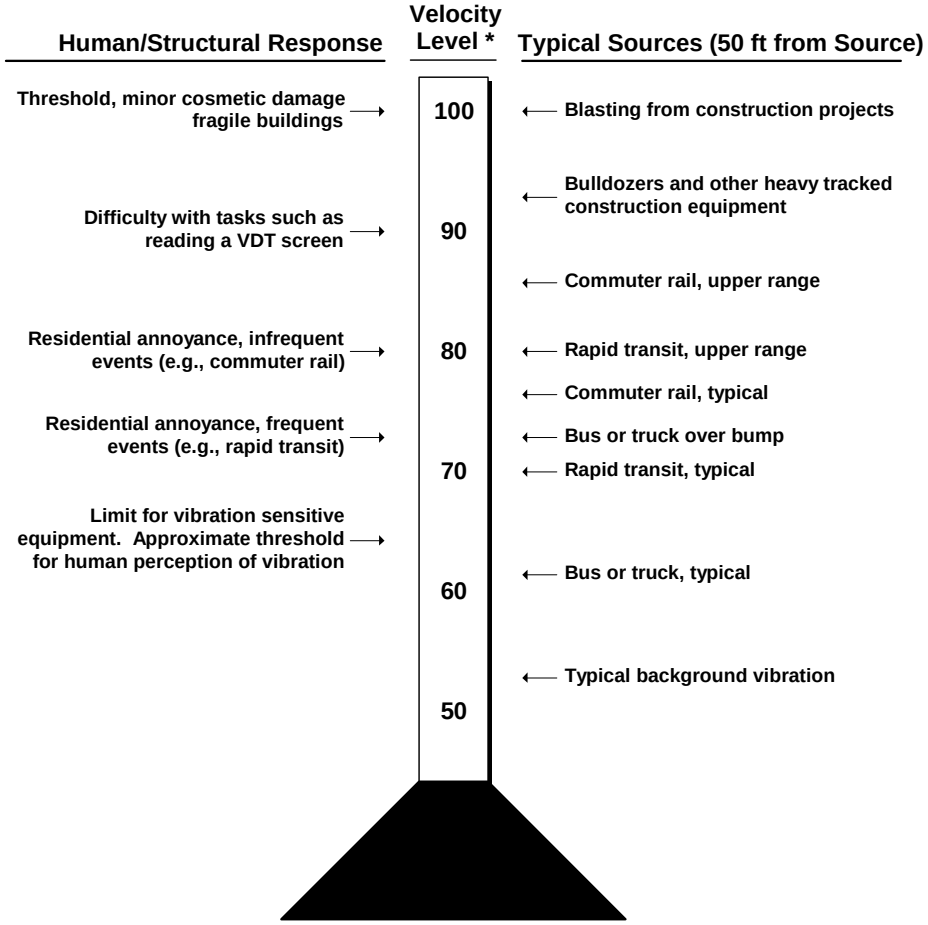
1. "Frequent Events" are defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Infrequent Events" are defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating/ventilation/air conditioning (HVAC) systems and stiffened floors.
4. Vibration-sensitive equipment is not sensitive to ground-borne noise.

2. Existing Vibration Levels and Vibration Prediction Methodology

The major sources of vibration in the corridor today include automobiles, trucks, and buses. Typical velocity levels generated by these types of vehicles range from 50 to 60 VdB and are generally considered below the threshold of perception. **Figure 6** lists some common sources of vibration and the velocity levels of the vibrations emanating from these sources.

FTA vibration criteria do not require measurement of existing vibration levels to assess potential impacts of the transit vibration impact. Estimated vibration levels were determined following procedures contained in Chapter 10 of the FTA Manual.

Figure 6: Common Vibration Sources and Levels



**** RMS Vibration Velocity Level in VdB relative to 10 inches/second***

3. Vibration Impact Assessment and Mitigation Measures

The estimated vibration noise levels for both the LRT and BRT line operations are presented in **Table 10** and **Table 11** respectively. At all 20 receptor sites evaluated along the proposed alignment modifications (mapped in **Figure 2**), velocity levels stay below the 72 VdB FTA Category 2 land use activity impact limit under both LRT and BRT proposed operations. Because transit operational levels are below the FTA impact threshold, vibration mitigation consideration is not necessary. The LRT and BRT vibration calculations for each of the proposed CCT alignment modification options are contained in **Appendix D** and **Appendix E** respectively.

Analysis is not needed for the two proposed O&M facility sites. The FTA Manual's recommended screening distance for completing ground-borne vibration impact assessment is 150 feet or less for residential areas and 450 feet or less for more sensitive concert halls/auditoriums and TV/recording studios. All existing vibration-sensitive properties near the two proposed CCT maintenance facilities are beyond these distances and therefore no vibration impact assessment is necessary.

Table 10: Estimated Vibration Levels from the LRT Operations

Site No	FTA Vibration Criteria (V dB)	Proposed CCT Alternatives									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment
R1	72	63 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R2	72	57 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R3	72	69 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R4	72	56 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R5	72	56 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R6	72	69 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R7	72	57 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R8	72	48 NO IMPACT	NA	NA	60 NO IMPACT	60 NO IMPACT	46 NO IMPACT	59 NO IMPACT	59 NO IMPACT	60 NO IMPACT	59 NO IMPACT
R9	72	57 NO IMPACT	NA	NA	NA	NA	57 NO IMPACT	NA	NA	NA	NA
R10	72	NA	NA	NA	56 NO IMPACT	58 NO IMPACT	NA	51 NO IMPACT	56 NO IMPACT	56 NO IMPACT	51 NO IMPACT
NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).											

Table 10 Estimated Vibration Levels from the LRT Operations (Continued)

Site No.	FTA Vibration Criteria (V dB)	Proposed CCT Alternatives									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment
R11	72	53 NO IMPACT	NA	NA	NA	NA	52 NO IMPACT	NA	NA	50 NO IMPACT	52 NO IMPACT
R12	72	NA	NA	NA	46 NO IMPACT	55 NO IMPACT	53 NO IMPACT	53 NO IMPACT	52 NO IMPACT	46 NO IMPACT	53 NO IMPACT
R13	72	67 NO IMPACT	NA	NA	67 NO IMPACT	67 NO IMPACT	NA	NA	NA	67 NO IMPACT	NA
R14	72	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
R15	72	NA	NA	NA	NA	NA	54 NO IMPACT	54 NO IMPACT	54 NO IMPACT	NA	60 NO IMPACT
R16	72	48 NO IMPACT	47 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA
R17	72	60 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R18	72	60 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R19	72	63 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R20	72	NA	40 NO IMPACT	40 NO IMPACT	NA	NA	NA	NA	NA	NA	NA

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

Table 11: Estimated Vibration Levels From BRT Operations

Site No.	FTA Vibration Criteria (V dB)	Proposed CCT Alternatives									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment
R1	72	56 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R2	72	51 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R3	72	62 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R4	72	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R5	72	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R6	72	62 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R7	72	52 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R8	72	44 NO IMPACT	NA	NA	55 NO IMPACT	55 NO IMPACT	44 NO IMPACT	53 NO IMPACT	53 NO IMPACT	55 NO IMPACT	53 NO IMPACT
R9	72	51 NO IMPACT	NA	NA	NA	NA	51 NO IMPACT	NA	NA	NA	NA
R10	72	NA	NA	NA	51 NO IMPACT	54 NO IMPACT	NA	46 NO IMPACT	51 NO IMPACT	51 NO IMPACT	46 NO IMPACT

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

Table 11: Estimated Vibration Levels From BRT Operations (Continued)

Site No.	FTA Vibration Criteria (V dB)	Proposed CCT Alternatives									
		S1+S2+S3 Alignment	S1A to Master Plan Alignment	S1A to S2 Alignment	S2A Alignment	S2B Alignment	S2C Alignment	S2D Alignment	S2E Alignment	S2F Alignment	S2G Alignment
		Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment	Estimated Vibration Level (V dB) FTA Impact Assessment
R11	72	53 NO IMPACT	NA	NA	NA	NA	50 NO IMPACT	NA	NA	48 NO IMPACT	50 NO IMPACT
R12	72	NA	NA	NA	44 NO IMPACT	54 NO IMPACT	51 NO IMPACT	51 NO IMPACT	50 NO IMPACT	44 NO IMPACT	51 NO IMPACT
R13	72	60 NO IMPACT	NA	NA	60 NO IMPACT	60 NO IMPACT	NA	NA	NA	60 NO IMPACT	NA
R14	72	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
R15	72	NA	NA	NA	NA	NA	47 NO IMPACT	47 NO IMPACT	47 NO IMPACT	NA	53 NO IMPACT
R16	72	46 NO IMPACT	40 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA
R17	72	54 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R18	72	67 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R19	72	55 NO IMPACT	NA	NA	NA	NA	NA	NA	NA	NA	NA
R20	72	NA	38 NO IMPACT	38 NO IMPACT	NA	NA	NA	NA	NA	NA	NA

NOTE: NA indicates where the alignment modification (column header) is not in proximity to the receptor site (row).

D. References

Acoustical Society of America (ASA). *Guide to the Evaluation of Human Exposure to Vibration in Buildings*. American National Standard ANSI S3.29, 1983.

Acoustical Society of America. *Part 4: Noise Assessment and Prediction of Long-Term Community Response.* American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, ANSI S12.9-2005/Part 4, 2005.

American Public Transit Association (APTA). "Section 2-7, Noise and Vibration," *1981 Guidelines for Design of Rail Transit Facilities*. January 1979.

Barry, T.M. and J.A. Reagan. *FHWA Highway Traffic Noise Prediction Model.* US Department of Transportation, Report No. FHWA-RD-77-108, December 1978.

Berendt, R.D., E.L.R. Corliss, and M.S. Ojalvo. *Quieting: A Practical Guide to Noise Control.* US National Bureau of Standards Handbook 119, 1976.

Federal Highway Administration (FHWA). Federal Highway Administration Procedures for Abatement of Highway Traffic Noise, 23 CFR 772. Last revised July 8, 1982.

Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*. US Department of Transportation Report No. FTA-VA-90-1003-06*,* May 2006.

Federal-Interagency Committee on Urban Noise (FICUN). *Guidelines for Considering Noise in Land-Use Planning and Control*. June 1980.

Menge, C.W., C.F. Rossano, G.S. Anderson, and C.J. Bajdek. *FHWA Traffic Noise Model, Version 1.0—Technical Manual.* US Department of Transportation Report No. FHWA-PD-96-010, February 1998.

Maryland Department of Transportation State Highway Administration (SHA). *Traffic Noise Impact Assessment and Sound Barrier Policy Guidelines.* Last amended May 1998.

Rudder, F.F., Jr. *Engineering Guidelines for the Analysis of Traffic-Induced Vibration.* US Department of Transportation Report FHWA-RD-78-166*.* February 1978.

Schultz, T.J. *Synthesis of Social Surveys on Noise Annoyance.* Journal Acoustical Society of America, Vol. 64, No.2. August 1978.

US Department of Housing and Urban Development (HUD). *Environmental Criteria and Standards, 24CFR51*. Last amended January 6, 1984.

US Environmental Protection Agency (EPA). Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. EPA Report 550/9-74-004, March 1974.

APPENDIX “A”

24 HOUR NOISE MONITORING SURVEY DATA

Table 1

24 Hour Noise Monitoring Data

Site R-1(T-13)…..2 Purchase Street, Gaithersburg

Date	Time	Leq
05/16/2006	12-1am	54.4
05/16/2006	1-2	51.1
05/16/2006	2-3	52.2
05/16/2006	3-4	51.0
05/16/2006	4-5	56.7
05/16/2006	5-6	62.2
05/16/2006	6-7	63.8
05/16/2006	7-8	66.7
05/16/2006	8-9	69.0
05/16/2006	9-10	65.9
05/16/2006	10-11	65.3
05/16/2006	11-12	69.3
05/16/2006	12-1pm	65.8
05/16/2006	1-2	67.1
05/16/2006	2-3	69.5
05/16/2006	3-4	65.8
05/16/2006	4-5	66.3
05/16/2006	5-6	66.8
05/16/2006	6-7	66.4
05/15/2006	7-8	65.5
05/15/2006	8-9	64.3
05/15/2006	9-10	62.5
05/15/2006	10-11	60.3
05/15/2006	11-12	57.0
Peak Leq		69.5
Day Leq *		66.8
Night Leq *		58.8
Ldn *		67.6

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 2

24 Hour Noise Monitoring Data

Site R-2(1)…..Unit 12 Baybridge Court, Gaithersburg

Date	Time	Leq
05/05/2010	12-1am	47.3
05/05/2010	1-2	44.6
05/05/2010	2-3	41.4
05/05/2010	3-4	42.9
05/05/2010	4-5	47.8
05/05/2010	5-6	54.0
05/05/2010	6-7	55.9
05/05/2010	7-8	56.1
05/05/2010	8-9	55.4
05/05/2010	9-10	54.8
05/05/2010	10-11	55.1
05/05/2010	11-12	57.1
05/05/2010	12-1pm	61.3
05/05/2010	1-2	62.4
05/05/2010	2-3	63.5
05/05/2010	3-4	64.5
05/05/2010	4-5	68.1
05/04/2010	5-6	59.8
05/04/2010	6-7	54.5
05/04/2010	7-8	57.1
05/04/2010	8-9	54.7
05/04/2010	9-10	51.8
05/04/2010	10-11	51.3
05/04/2010	11-12	53.8
Peak Leq		68.1
Day Leq *		61.0
Night Leq *		51.2
Ldn *		61.1

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 3

24 Hour Noise Monitoring Data

Site R-3(2)…..130 Chevy Chase Street, Gaithersburg

Date	Time	Leq
05/05/2010	12-1am	58.3
05/05/2010	1-2	55.7
05/05/2010	2-3	56.4
05/05/2010	3-4	59.9
05/05/2010	4-5	60.1
05/05/2010	5-6	64.6
05/05/2010	6-7	68.8
05/05/2010	7-8	70.7
05/05/2010	8-9	70.4
05/05/2010	9-10	69.2
05/05/2010	10-11	67.0
05/05/2010	11-12	67.5
05/05/2010	12-1pm	67.9
05/05/2010	1-2	68.8
05/05/2010	2-3	73.3
05/05/2010	3-4	72.1
05/05/2010	4-5	69.3
05/04/2010	5-6	68.6
05/04/2010	6-7	67.6
05/04/2010	7-8	68.5
05/04/2010	8-9	66.0
05/04/2010	9-10	65.1
05/04/2010	10-11	63.7
05/04/2010	11-12	61.1
Peak Leq		73.3
Day Leq *		69.3
Night Leq *		62.9
Ldn *		71.0

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 4

24 Hour Noise Monitoring Data

Site R-4(T-12)…..305 Swanton Lane, Gaithersburg

Date	Time	Leq
05/18/2006	12-1am	50.3
05/18/2006	1-2	45.9
05/18/2006	2-3	45.0
05/18/2006	3-4	46.0
05/18/2006	4-5	41.9
05/18/2006	5-6	52.0
05/18/2006	6-7	58.6
05/18/2006	7-8	62.1
05/18/2006	8-9	60.8
05/18/2006	9-10	61.8
05/18/2006	10-11	60.6
05/18/2006	11-12	61.2
05/18/2006	12-1pm	60.8
05/18/2006	1-2	59.4
05/18/2006	2-3	60.1
05/18/2006	3-4	58.8
05/18/2006	4-5	59.6
05/18/2006	5-6	58.8
05/18/2006	6-7	60.9
05/17/2006	7-8	61.1
05/17/2006	8-9	58.9
05/17/2006	9-10	61.6
05/17/2006	10-11	61.8
05/17/2006	11-12	53.2
Peak Leq		49.3
Day Leq *		60.6
Night Leq *		55.0
Ldn *		62.8

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 5

24 Hour Noise Monitoring Data

Site R-5(T-11)…..300 High Gables Drive, Gaithersburg

Date	Time	Leq
06/01/006	12-1am	54.4
06/01/006	1-2	52.4
06/01/006	2-3	49.9
06/01/006	3-4	49.8
06/01/006	4-5	52.6
06/01/006	5-6	58.5
06/01/006	6-7	62.8
06/01/006	7-8	64.0
06/01/006	8-9	64.4
06/01/006	9-10	63.7
06/01/006	10-11	62.0
06/01/006	11-12	61.7
06/01/006	12-1pm	62.6
06/01/006	1-2	62.3
06/01/006	2-3	62.6
06/01/006	3-4	63.2
05/31/2006	4-5	62.6
05/31/2006	5-6	63.2
05/31/2006	6-7	63.0
05/31/2006	7-8	62.9
05/31/2006	8-9	62.3
05/31/2006	9-10	60.9
05/31/2006	10-11	59.7
05/31/2006	11-12	56.9
Peak Leq		64.4
Day Leq *		62.8
Night Leq *		57.3
Ldn *		65.1

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 6

24 Hour Noise Monitoring Data

Site R-6(T-10)…..427 Upshire Circle, Gaithersburg

Date	Time	Leq
05/16/2006	12-1am	46.3
05/16/2006	1-2	40.4
05/16/2006	2-3	39.4
05/16/2006	3-4	42.0
05/16/2006	4-5	42.7
05/16/2006	5-6	53.1
05/16/2006	6-7	60.2
05/16/2006	7-8	62.4
05/16/2006	8-9	62.5
05/16/2006	9-10	60.9
05/16/2006	10-11	53.7
05/16/2006	11-12	59.7
05/16/2006	12-1pm	59.7
05/16/2006	1-2	58.9
05/16/2006	2-3	59.8
05/16/2006	3-4	60.6
05/16/2006	4-5	59.8
05/16/2006	5-6	60.9
05/15/2006	6-7	62.0
05/15/2006	7-8	60.5
05/15/2006	8-9	58.2
05/15/2006	9-10	56.1
05/15/2006	10-11	54.6
05/15/2006	11-12	51.4
Peak Leq		62.5
Day Leq *		60.2
Night Leq *		52.9
Ldn *		61.4

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 7

24 Hour Noise Monitoring Data

Site R-7(T-9)…..309 Leafcap Road, Gaithersburg

Date	Time	Leq
05/17/2006	12-1am	54.4
05/17/2006	1-2	51.8
05/17/2006	2-3	49.6
05/17/2006	3-4	49.3
05/17/2006	4-5	52.6
05/17/2006	5-6	60.6
05/17/2006	6-7	64.8
05/17/2006	7-8	65.3
05/17/2006	8-9	65.3
05/17/2006	9-10	64.1
05/17/2006	10-11	63.3
05/17/2006	11-12	63.8
05/17/2006	12-1pm	63.5
05/17/2006	1-2	63.3
05/17/2006	2-3	64.2
05/17/2006	3-4	63.9
05/17/2006	4-5	64.0
05/17/2006	5-6	64.5
05/17/2006	6-7	64.5
05/17/2006	7-8	65.2
05/16/2006	8-9	62.8
05/16/2006	9-10	61.7
05/16/2006	10-11	60.3
05/16/2006	11-12	57.4
Peak Leq		65.3
Day Leq *		64.1
Night Leq *		58.6
Ldn *		66.4

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 8

24 Hour Noise Monitoring Data

Site R-8(T-8)…..67 Pontiac Way, Gaithersburg

Date	Time	Leq
05/05/2010	12-1am	48.7
05/05/2010	1-2	45.7
05/05/2010	2-3	42.0
05/05/2010	3-4	44.1
05/05/2010	4-5	48.3
05/05/2010	5-6	56.2
05/05/2010	6-7	59.1
05/05/2010	7-8	61.1
05/05/2010	8-9	60.0
05/05/2010	9-10	59.3
05/05/2010	10-11	59.2
05/05/2010	11-12	58.8
05/04/2010	12-1pm	59.0
05/04/2010	1-2	58.9
05/04/2010	2-3	60.7
05/04/2010	3-4	59.2
05/04/2010	4-5	59.3
05/04/2010	5-6	59.3
05/04/2010	6-7	59.0
05/04/2010	7-8	58.3
05/04/2010	8-9	57.2
05/04/2010	9-10	56.0
05/04/2010	10-11	55.3
05/04/2010	11-12	52.0
Peak Leq		61.1
Day Leq *		59.2
Night Leq *		53.4
Ldn *		61.2

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 9

24 Hour Noise Monitoring Data

Site R-9(3)…..314 Argosy Drive, Gaithersburg

Date	Time	Leq
05/05/2010	12-1am	44.9
05/05/2010	1-2	43.9
05/05/2010	2-3	42.7
05/05/2010	3-4	43.2
05/05/2010	4-5	46.3
05/05/2010	5-6	53.5
05/05/2010	6-7	56.7
05/05/2010	7-8	56.7
05/05/2010	8-9	56.5
05/05/2010	9-10	55.1
05/05/2010	10-11	56.5
05/05/2010	11-12	56.3
05/05/2010	12-1pm	57.8
05/04/2010	1-2	56.8
05/04/2010	2-3	57.7
05/04/2010	3-4	58.0
05/04/2010	4-5	58.0
05/04/2010	5-6	56.5
05/04/2010	6-7	55.4
05/04/2010	7-8	54.9
05/04/2010	8-9	54.5
05/04/2010	9-10	53.0
05/04/2010	10-11	50.8
05/04/2010	11-12	48.0
Peak Leq		58.0
Day Leq *		56.5
Night Leq *		50.5
Ldn *		58.4

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 10

24 Hour Noise Monitoring Data

Site R-10(T-7)…..141 Mission Drive, Gaithersburg

Date	Time	Leq
05/17/2006	12-1am	42.5
05/17/2006	1-2	48.9
05/17/2006	2-3	47.8
05/17/2006	3-4	46.0
05/17/2006	4-5	47.3
05/17/2006	5-6	55.9
05/17/2006	6-7	60.8
05/17/2006	7-8	62.9
05/17/2006	8-9	63.0
05/17/2006	9-10	62.8
05/17/2006	10-11	60.8
05/17/2006	11-12	60.1
05/17/2006	12-1pm	60.1
05/17/2006	1-2	60.2
05/17/2006	2-3	61.7
05/17/2006	3-4	60.8
05/17/2006	4-5	60.6
05/17/2006	5-6	59.5
05/17/2006	6-7	59.5
05/16/2006	7-8	59.6
05/16/2006	8-9	58.4
05/16/2006	9-10	58.6
05/16/2006	10-11	56.6
05/16/2006	11-12	54.9
Peak Leq		63.0
Day Leq *		60.8
Night Leq *		54.6
Ldn *		62.6

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 11

24 Hour Noise Monitoring Data

Site R-11(4)…..Johns Hopkins Farm

Date	Time	Leq
05/05/2010	12-1am	40.7
05/05/2010	1-2	40.3
05/05/2010	2-3	40.3
05/05/2010	3-4	40.4
05/05/2010	4-5	43.3
05/05/2010	5-6	52.3
05/05/2010	6-7	54.0
05/05/2010	7-8	55.0
05/05/2010	8-9	52.0
05/05/2010	9-10	48.6
05/05/2010	10-11	46.7
05/05/2010	11-12	48.5
05/05/2010	12-1pm	46.6
05/05/2010	1-2	46.8
05/05/2010	2-3	52.0
05/05/2010	3-4	50.9
05/05/2010	4-5	57.9
05/04/2010	5-6	49.8
05/04/2010	6-7	50.5
05/04/2010	7-8	48.5
05/04/2010	8-9	46.8
05/04/2010	9-10	45.2
05/04/2010	10-11	44.2
05/04/2010	11-12	41.8
Peak Leq		57.9
Day Leq *		51.3
Night Leq *		47.7
Ldn *		54.8

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 12

24 Hour Noise Monitoring Data

Site R-12(5)…..10119 Darnstown Road, Gaithersburg

Date	Time	Leq
05/04/2010	12-1am	45.1
05/04/2010	1-2	44.5
05/04/2010	2-3	44.1
05/04/2010	3-4	46.0
05/04/2010	4-5	47.5
05/04/2010	5-6	52.8
05/04/2010	6-7	54.2
05/04/2010	7-8	53.9
05/04/2010	8-9	55.2
05/04/2010	9-10	55.5
05/04/2010	10-11	58.6
05/04/2010	11-12	56.9
05/04/2010	12-1pm	58.4
05/04/2010	1-2	63.6
05/04/2010	2-3	61.0
05/04/2010	3-4	60.6
05/03/2010	4-5	54.9
05/03/2010	5-6	53.4
05/03/2010	6-7	52.9
05/03/2010	7-8	54.2
05/03/2010	8-9	51.6
05/03/2010	9-10	52.1
05/03/2010	10-11	49.7
05/03/2010	11-12	45.9
Peak Leq		63.6
Day Leq *		57.7
Night Leq *		49.3
Ldn *		58.4

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 13

24 Hour Noise Monitoring Data

Site R-13(6)…..14910 Broscthart Road, Rockville

Date	Time	Leq
05/04/2010	12-1am	56.4
05/04/2010	1-2	56.4
05/04/2010	2-3	56.5
05/04/2010	3-4	56.1
05/04/2010	4-5	56.3
05/04/2010	5-6	57.0
05/04/2010	6-7	57.7
05/04/2010	7-8	58.6
05/04/2010	8-9	58.2
05/04/2010	9-10	58.6
05/04/2010	10-11	58.7
05/04/2010	11-12	60.0
05/04/2010	12-1pm	63.7
05/04/2010	1-2	60.7
05/04/2010	2-3	62.2
05/04/2010	3-4	61.9
05/03/2010	4-5	58.9
05/03/2010	5-6	57.2
05/03/2010	6-7	56.5
05/03/2010	7-8	56.6
05/03/2010	8-9	56.7
05/03/2010	9-10	56.6
05/03/2010	10-11	56.8
05/03/2010	11-12	56.5
Peak Leq		63.7
Day Leq *		59.6
Night Leq *		56.7
Ldn *		63.6

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 14

24 Hour Noise Monitoring Data

Site R-14(T-6)…..9963 Foxborough Circle, Gaithersburg

Date	Time	Leq
05/18/2006	12-1am	51.5
05/18/2006	1-2	50.5
05/18/2006	2-3	49.6
05/18/2006	3-4	47.0
05/18/2006	4-5	52.1
05/18/2006	5-6	56.9
05/18/2006	6-7	59.8
05/18/2006	7-8	61.6
05/18/2006	8-9	62.9
05/18/2006	9-10	61.7
05/18/2006	10-11	61.3
05/18/2006	11-12	61.8
05/18/2006	12-1pm	62.7
05/18/2006	1-2	61.1
05/18/2006	2-3	60.7
05/18/2006	3-4	60.8
05/18/2006	4-5	61.0
05/18/2006	5-6	61.5
05/18/2006	6-7	60.1
05/18/2006	7-8	60.0
05/17/2006	8-9	58.3
05/17/2006	9-10	56.7
05/17/2006	10-11	55.0
05/17/2006	11-12	53.1
Peak Leq		62.9
Day Leq *		61.0
Night Leq *		54.5
Ldn *		62.6

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 15

24 Hour Noise Monitoring Data

Site R-15(7)…..9909 Medical Center Drive, Gaithersburg

Date	Time	Leq
05/07/2010	12-1am	48.7
05/06/2010	1-2	48.2
05/06/2010	2-3	47.1
05/06/2010	3-4	47.9
05/06/2010	4-5	49.9
05/06/2010	5-6	52.3
05/06/2010	6-7	54.1
05/06/2010	7-8	53.8
05/06/2010	8-9	53.4
05/06/2010	9-10	53.4
05/06/2010	10-11	56.1
05/06/2010	11-12	55.8
05/06/2010	12-1pm	56.5
05/06/2010	1-2	60.0
05/06/2010	2-3	60.3
05/06/2010	3-4	60.7
05/06/2010	4-5	56.1
05/06/2010	5-6	55.5
05/06/2010	6-7	54.1
05/06/2010	7-8	52.7
05/06/2010	8-9	51.9
05/06/2010	9-10	51.9
05/06/2010	10-11	49.6
05/06/2010	11-12	49.5
Peak Leq		60.7
Day Leq *		56.5
Night Leq *		50.3
Ldn *		58.3

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 16

24 Hour Noise Monitoring Data

Site R-16(8b)…..9700 Oakdale Drive, Gaithersburg

Date	Time	Leq
05/04/2010	12-1am	43.4
05/04/2010	1-2	43.6
05/04/2010	2-3	42.7
05/04/2010	3-4	43.4
05/04/2010	4-5	59.7
05/04/2010	5-6	55.0
05/04/2010	6-7	50.0
05/04/2010	7-8	50.1
05/04/2010	8-9	49.8
05/04/2010	9-10	54.8
05/04/2010	10-11	51.9
05/04/2010	11-12	49.2
05/04/2010	12-1pm	56.3
05/04/2010	1-2	54.4
05/04/2010	2-3	58.3
05/03/2010	3-4	51.5
05/03/2010	4-5	49.5
05/03/2010	5-6	50.4
05/03/2010	6-7	49.9
05/03/2010	7-8	48.5
05/03/2010	8-9	47.6
05/03/2010	9-10	45.5
05/03/2010	10-11	44.8
05/03/2010	11-12	42.9
Peak Leq		59.7
Day Leq *		52.6
Night Leq *		52.2
Ldn *		58.6

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 17

24 Hour Noise Monitoring Data

Site R-17(T-5)…..15303 Gable Ridge Court, Apt. J, Gaithersburg

Date	Time	Leq
06/14/2006	12-1am	44.2
06/14/2006	1-2	44.3
06/14/2006	2-3	44.4
06/14/2006	3-4	44.6
06/14/2006	4-5	45.2
06/14/2006	5-6	51.3
06/14/2006	6-7	55.9
06/14/2006	7-8	57.5
06/14/2006	8-9	56.1
06/14/2006	9-10	57.0
06/14/2006	10-11	57.0
06/14/2006	11-12	55.9
06/14/2006	12-1pm	57.1
06/14/2006	1-2	61.9
06/14/2006	2-3	60.7
06/14/2006	3-4	59.3
06/13/2006	4-5	58.3
06/13/2006	5-6	53.4
06/13/2006	6-7	52.0
06/13/2006	7-8	49.7
06/13/2006	8-9	62.3
06/13/2006	9-10	49.3
06/13/2006	10-11	48.9
06/13/2006	11-12	46.3
Peak Leq		62.3
Day Leq *		58.0
Night Leq *		49.4
Ldn *		58.6

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 18

24 Hour Noise Monitoring Data

Site R-18(T-4)…..9800 Fields Road (Crown Farm), Gaithersburg

Date	Time	Leq
06/14/2006	12-1am	54.3
06/14/2006	1-2	54.5
06/14/2006	2-3	54.0
06/14/2006	3-4	53.4
06/14/2006	4-5	53.7
06/14/2006	5-6	54.8
06/14/2006	6-7	55.1
06/14/2006	7-8	54.1
06/14/2006	8-9	55.2
06/14/2006	9-10	56.1
06/14/2006	10-11	57.2
06/14/2006	11-12	55.0
06/14/2006	12-1pm	56.2
06/14/2006	1-2	55.8
06/14/2006	2-3	57.4
06/14/2006	3-4	60.6
06/14/2006	4-5	58.0
06/14/2006	5-6	54.3
06/14/2006	6-7	58.2
06/13/2006	7-8	59.0
06/13/2006	8-9	53.1
06/13/2006	9-10	54.0
06/13/2006	10-11	53.9
06/13/2006	11-12	54.3
Peak Leq		60.6
Day Leq *		56.8
Night Leq *		54.3
Ldn *		61.1

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 19

24 Hour Noise Monitoring Data

Site R-19(T-3)…..9601 Fields Road, Apt. 102, Gaithersburg

Date	Time	Leq
06/13/2006	12-1am	56.2
06/13/2006	1-2	53.9
06/13/2006	2-3	50.2
06/13/2006	3-4	50.6
06/13/2006	4-5	51.2
06/13/2006	5-6	56.7
06/13/2006	6-7	63.3
06/13/2006	7-8	65.9
06/13/2006	8-9	67.3
06/13/2006	9-10	65.2
06/13/2006	10-11	63.0
06/13/2006	11-12	65.1
06/13/2006	12-1pm	65.7
06/13/2006	1-2	65.3
06/13/2006	2-3	64.7
06/12/2006	3-4	66.2
06/12/2006	4-5	67.7
06/12/2006	5-6	69.1
06/12/2006	6-7	67.5
06/12/2006	7-8	64.5
06/12/2006	8-9	63.2
06/12/2006	9-10	61.8
06/12/2006	10-11	60.5
06/12/2006	11-12	63.7
Peak Leq		69.1
Day Leq *		65.9
Night Leq *		59.0
Ldn *		67.3

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 20

24 Hour Noise Monitoring Data

Site R-20(9)…..Crown Farm Property near Omega Drive

Date	Time	Leq
05/04/2010	12-1am	45.5
05/04/2010	1-2	45.1
05/04/2010	2-3	44.7
05/04/2010	3-4	47.7
05/04/2010	4-5	50.4
05/04/2010	5-6	52.4
05/04/2010	6-7	52.8
05/04/2010	7-8	54.8
05/04/2010	8-9	53.4
05/04/2010	9-10	54.3
05/04/2010	10-11	52.2
05/04/2010	11-12	49.8
05/04/2010	12-1pm	55.4
05/04/2010	1-2	56.8
05/03/2010	2-3	52.8
05/03/2010	3-4	51.8
05/03/2010	4-5	52.2
05/03/2010	5-6	53.8
05/03/2010	6-7	50.4
05/03/2010	7-8	45.1
05/03/2010	8-9	46.5
05/03/2010	9-10	45.4
05/03/2010	10-11	44.8
05/03/2010	11-12	44.1
Peak Leq		56.8
Day Leq *		52.8
Night Leq *		48.8
Ldn *		56.1

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 21

24 Hour Noise Monitoring Data

Site R-21(11a)…..13041 Seneca Ayr Drive, Germantown

Date	Time	Leq
05/06/2010	12-1am	44.1
05/06/2010	1-2	42.6
05/06/2010	2-3	44.7
05/06/2010	3-4	44.2
05/06/2010	4-5	48.0
05/06/2010	5-6	55.8
05/06/2010	6-7	51.1
05/06/2010	7-8	51.7
05/06/2010	8-9	50.7
05/06/2010	9-10	57.0
05/06/2010	10-11	60.4
05/06/2010	11-12	63.7
05/05/2010	12-1pm	53.3
05/05/2010	1-2	57.3
05/05/2010	2-3	56.1
05/05/2010	3-4	58.3
05/05/2010	4-5	59.6
05/05/2010	5-6	54.4
05/05/2010	6-7	53.6
05/05/2010	7-8	49.6
05/05/2010	8-9	47.7
05/05/2010	9-10	46.2
05/05/2010	10-11	44.3
05/05/2010	11-12	44.2
Peak Leq		63.7
Day Leq *		57.1
Night Leq *		49.1
Ldn *		57.9

* Day Leq, Night Leq and Ldn are Calculated Levels

Table 22

24 Hour Noise Monitoring Data

Site R-22(12a)…..497 Quince Orchard Road, Gaithersburg

Date	Time	Leq
05/06/2010	12-1am	73.1
05/06/2010	1-2	55.5
05/06/2010	2-3	64.5
05/06/2010	3-4	54.9
05/06/2010	4-5	65.9
05/06/2010	5-6	65.0
05/06/2010	6-7	68.9
05/06/2010	7-8	68.3
05/06/2010	8-9	66.5
05/06/2010	9-10	66.1
05/06/2010	10-11	71.2
05/06/2010	11-12	67.9
05/06/2010	12-1pm	69.6
05/05/2010	1-2	68.2
05/05/2010	2-3	66.5
05/05/2010	3-4	72.7
05/05/2010	4-5	69.6
05/05/2010	5-6	61.9
05/05/2010	6-7	68.7
05/05/2010	7-8	68.6
05/05/2010	8-9	70.8
05/05/2010	9-10	62.0
05/05/2010	10-11	66.6
05/05/2010	11-12	66.4
Peak Leq		73.1
Day Leq *		68.7
Night Leq *		67.2
Ldn *		73.9

* Day Leq, Night Leq and Ldn are Calculated Levels

APPENDIX “B”

LRT Noise Study

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
West Gaither Sta.							
			Sta. 120+40		**Rec.R-19(T-3)**	**Horn Not Blown**	
			Grade		**130**	**0**	
12-12:30am	5	12	2	35	50	101797.2528	
12:30-1	5	12	2	35	50	101797.2528	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	51	122156.7034	
5:30-6	8	7.5	2	35	52	162875.6046	
6-6:30	8	7.5	2	35	52	162875.6046	
6:30-7	8	7.5	2	35	52	162875.6046	
7-7:30	8	7.5	2	35	52	162875.6046	
7:30-8	8	7.5	2	35	52	162875.6046	
8-8:30	8	7.5	2	35	52	162875.6046	
8:30-9	8	7.5	2	35	52	162875.6046	
9-9:30	8	7.5	2	35	52	162875.6046	
9:30-10	6	10	2	35	51	122156.7034	
10-10:30	6	10	2	35	51	122156.7034	
10:30-11	6	10	2	35	51	122156.7034	
11-11:30	6	10	2	35	51	122156.7034	
11:30-12noon	6	10	2	35	51	122156.7034	
12noon-12:30pm	6	10	2	35	51	122156.7034	
12:30-1	6	10	2	35	51	122156.7034	
1-1:30	6	10	2	35	51	122156.7034	
1:30-2	6	10	2	35	51	122156.7034	
2-2:30	6	10	2	35	51	122156.7034	
2:30-3	6	10	2	35	51	122156.7034	
3-3:30	6	10	2	35	51	122156.7034	
3:30-4	6	10	2	35	51	122156.7034	
4-4:30	6	10	2	35	51	122156.7034	
4:30-5	8	7.5	2	35	52	162875.6046	
5-5:30	8	7.5	2	35	52	162875.6046	
5:30-6	8	7.5	2	35	52	162875.6046	
6-6:30	8	7.5	2	35	52	162875.6046	
6:30-7	8	7.5	2	35	52	162875.6046	
7-7:30	8	7.5	2	35	52	162875.6046	
7:30-8	6	10	2	35	51	122156.7034	
8-8:30	6	10	2	35	51	122156.7034	
8:30-9	6	10	2	35	51	122156.7034	

CCT LRT Ldn Receptor R-19(T-3) Alternatives S1, S2, and S3

9-9:30	5	12	2	35	50	101797.2528	
9:30-10	5	12	2	35	50	101797.2528	
10-10:30	5	12	2	35	50	101797.2528	
10:30-11	5	12	2	35	50	101797.2528	
11-11:30	5	12	2	35	50	101797.2528	
11:30-12midnight	5	12	2	35	50	101797.2528	
Peak Leq					52		
Day Leq						51	4071890
Night Leq						48	12215670
Ldn						**55**	
Crown Farm Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
Crown Farm Sta.							
			Sta. 144+00		**Rec.R-18(T-4)**	**Horn Not Blown**	
			Grade		**80**	**0**	
12-12:30am	5	12	2	25	50	107587.0587	
12:30-1	5	12	2	25	50	107587.0587	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	25	51	129104.4705	
5:30-6	8	7.5	2	25	52	172139.294	
6-6:30	8	7.5	2	25	52	172139.294	
6:30-7	8	7.5	2	25	52	172139.294	
7-7:30	8	7.5	2	25	52	172139.294	
7:30-8	8	7.5	2	25	52	172139.294	
8-8:30	8	7.5	2	25	52	172139.294	
8:30-9	8	7.5	2	25	52	172139.294	
9-9:30	8	7.5	2	25	52	172139.294	
9:30-10	6	10	2	25	51	129104.4705	
10-10:30	6	10	2	25	51	129104.4705	
10:30-11	6	10	2	25	51	129104.4705	
11-11:30	6	10	2	25	51	129104.4705	
11:30-12noon	6	10	2	25	51	129104.4705	
12noon-12:30pm	6	10	2	25	51	129104.4705	
12:30-1	6	10	2	25	51	129104.4705	
1-1:30	6	10	2	25	51	129104.4705	
1:30-2	6	10	2	25	51	129104.4705	
2-2:30	6	10	2	25	51	129104.4705	
2:30-3	6	10	2	25	51	129104.4705	
3-3:30	6	10	2	25	51	129104.4705	
3:30-4	6	10	2	25	51	129104.4705	
4-4:30	6	10	2	25	51	129104.4705	
4:30-5	8	7.5	2	25	52	172139.294	
5-5:30	8	7.5	2	25	52	172139.294	
5:30-6	8	7.5	2	25	52	172139.294	
6-6:30	8	7.5	2	25	52	172139.294	
6:30-7	8	7.5	2	25	52	172139.294	
7-7:30	8	7.5	2	25	52	172139.294	
7:30-8	6	10	2	25	51	129104.4705	
8-8:30	6	10	2	25	51	129104.4705	

8:30-9	6	10	2	25	51	129104.4705	
9-9:30	5	12	2	25	50	107587.0587	
9:30-10	5	12	2	25	50	107587.0587	
10-10:30	5	12	2	25	50	107587.0587	
10:30-11	5	12	2	25	50	107587.0587	
11-11:30	5	12	2	25	50	107587.0587	
11:30-12midnight	5	12	2	25	50	107587.0587	
Peak Leq					52		
Day Leq						52	4303482
Night Leq						49	12910447
Ldn						**56**	
Danac Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
Crown Farm Sta.													
			Sta. 153+00		**Rec.R-17(T-5)**	**Horn Blown**							
			Grade		**90**	**90**							
12-12:30am	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
12:30-1	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
5:30-6	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
6-6:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
6:30-7	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
7-7:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
7:30-8	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
8-8:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
8:30-9	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
9-9:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
9:30-10	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
10-10:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
10:30-11	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
11-11:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
11:30-12noon	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
12noon-12:30pm	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
12:30-1	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
1-1:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
1:30-2	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
2-2:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
2:30-3	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
3-3:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
3:30-4	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
4-4:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
4:30-5	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
5-5:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
5:30-6	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
6-6:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
6:30-7	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
7-7:30	8	7.5	2	20	50	92327.52797		68	6768383.9		68	6860711.5	
7:30-8	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
8-8:30	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
8:30-9	6	10	2	20	48	69245.64598		67	5076287.9		67	5145533.6	
9-9:30	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
9:30-10	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
10-10:30	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
10:30-11	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
11-11:30	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
11:30-12midnight	5	12	2	20	48	57704.70498		66	4230240		66	4287944.7	
Peak Leq					50			68			68		
Day Leq						49	2308188		68	169209598		68	171517786
Night Leq						46	6924565		65	507628795		65	514553359
Ldn						**53**			**71**			**72**	
Danac Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
Crown Farm Sta.													
			Sta. 155+00		**Rec.R-16(8B)**	**Horn Blown**							
			Grade		**310**	**310**							
12-12:30am	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
12:30-1	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
5:30-6	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
6-6:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
6:30-7	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
7-7:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
7:30-8	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
8-8:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
8:30-9	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
9-9:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
9:30-10	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
10-10:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
10:30-11	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
11-11:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
11:30-12noon	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
12noon-12:30pm	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
12:30-1	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
1-1:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
1:30-2	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
2-2:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
2:30-3	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
3-3:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
3:30-4	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
4-4:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
4:30-5	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
5-5:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
5:30-6	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
6-6:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
6:30-7	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
7-7:30	8	7.5	2	20	42	14442.83438		58	570488.14		58	584930.97	
7:30-8	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
8-8:30	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
8:30-9	6	10	2	20	40	10832.12578		56	427866.1		56	438698.23	
9-9:30	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
9:30-10	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
10-10:30	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
10:30-11	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
11-11:30	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
11:30-12midnight	5	12	2	20	40	9026.771487		56	356555.08		56	365581.86	
Peak Leq					42			58			58		
Day Leq						41	361071		57	14262203		57	14623274
Night Leq						38	1083213		54	42786610		54	43869823
Ldn						**45**			61			**61**	
Danac Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Central Sta.							
			Sta. 187+30		**Rec.R-13(6)**	**Horn Not Blown**	
			Grade		**70**	**0**	
12-12:30am	5	12	2	30	53	189282.493	
12:30-1	5	12	2	30	53	189282.493	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	30	54	227138.9916	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	8	7.5	2	30	55	302851.9887	
8-8:30	8	7.5	2	30	55	302851.9887	
8:30-9	8	7.5	2	30	55	302851.9887	
9-9:30	8	7.5	2	30	55	302851.9887	
9:30-10	6	10	2	30	54	227138.9916	
10-10:30	6	10	2	30	54	227138.9916	
10:30-11	6	10	2	30	54	227138.9916	
11-11:30	6	10	2	30	54	227138.9916	
11:30-12noon	6	10	2	30	54	227138.9916	
12noon-12:30pm	6	10	2	30	54	227138.9916	
12:30-1	6	10	2	30	54	227138.9916	
1-1:30	6	10	2	30	54	227138.9916	
1:30-2	6	10	2	30	54	227138.9916	
2-2:30	6	10	2	30	54	227138.9916	
2:30-3	6	10	2	30	54	227138.9916	
3-3:30	6	10	2	30	54	227138.9916	
3:30-4	6	10	2	30	54	227138.9916	
4-4:30	6	10	2	30	54	227138.9916	
4:30-5	8	7.5	2	30	55	302851.9887	
5-5:30	8	7.5	2	30	55	302851.9887	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	6	10	2	30	54	227138.9916	
8-8:30	6	10	2	30	54	227138.9916	
8:30-9	6	10	2	30	54	227138.9916	

CCT LRT Ldn Receptor R-13(6) Alternatives S1, S2, and S3

9-9:30	5	12	2	30	53	189282.493	
9:30-10	5	12	2	30	53	189282.493	
10-10:30	5	12	2	30	53	189282.493	
10:30-11	5	12	2	30	53	189282.493	
11-11:30	5	12	2	30	53	189282.493	
11:30-12midnight	5	12	2	30	53	189282.493	
Peak Leq					55		
Day Leq						54	7571300
Night Leq						51	22713899
Ldn						**58**	
LSC West Sta.							

CCT LRT Ldn Receptor R-11(4) Alternatives S1, S2, and S3

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC West Sta.							
			Sta. 233+20		**Rec.R-11(4)**	**Horn Not Blown**	
			Grade		**380**	**0**	
12-12:30am	5	12	2	35	43	20369.28063	
12:30-1	5	12	2	35	43	20369.28063	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	44	24443.13676	
5:30-6	8	7.5	2	35	45	32590.84901	
6-6:30	8	7.5	2	35	45	32590.84901	
6:30-7	8	7.5	2	35	45	32590.84901	
7-7:30	8	7.5	2	35	45	32590.84901	
7:30-8	8	7.5	2	35	45	32590.84901	
8-8:30	8	7.5	2	35	45	32590.84901	
8:30-9	8	7.5	2	35	45	32590.84901	
9-9:30	8	7.5	2	35	45	32590.84901	
9:30-10	6	10	2	35	44	24443.13676	
10-10:30	6	10	2	35	44	24443.13676	
10:30-11	6	10	2	35	44	24443.13676	
11-11:30	6	10	2	35	44	24443.13676	
11:30-12noon	6	10	2	35	44	24443.13676	
12noon-12:30pm	6	10	2	35	44	24443.13676	
12:30-1	6	10	2	35	44	24443.13676	
1-1:30	6	10	2	35	44	24443.13676	
1:30-2	6	10	2	35	44	24443.13676	
2-2:30	6	10	2	35	44	24443.13676	
2:30-3	6	10	2	35	44	24443.13676	
3-3:30	6	10	2	35	44	24443.13676	
3:30-4	6	10	2	35	44	24443.13676	
4-4:30	6	10	2	35	44	24443.13676	
4:30-5	8	7.5	2	35	45	32590.84901	
5-5:30	8	7.5	2	35	45	32590.84901	
5:30-6	8	7.5	2	35	45	32590.84901	
6-6:30	8	7.5	2	35	45	32590.84901	
6:30-7	8	7.5	2	35	45	32590.84901	
7-7:30	8	7.5	2	35	45	32590.84901	
7:30-8	6	10	2	35	44	24443.13676	
8-8:30	6	10	2	35	44	24443.13676	
8:30-9	6	10	2	35	44	24443.13676	

9-9:30	5	12	2	35	43	20369.28063	
9:30-10	5	12	2	35	43	20369.28063	
10-10:30	5	12	2	35	43	20369.28063	
10:30-11	5	12	2	35	43	20369.28063	
11-11:30	5	12	2	35	43	20369.28063	
11:30-12midnight	5	12	2	35	43	20369.28063	
Peak Leq					45		
Day Leq						44	814771
Night Leq						41	2444314
Ldn						**48**	
LSC Belward 2 Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward 2 Sta.							
			Sta. 248+10		**Rec.R-9(3)**	**Horn Not Blown**	
			Grade		**215**	**0**	
12-12:30am	5	12	2	35	47	47862.28149	
12:30-1	5	12	2	35	47	47862.28149	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	48	57434.73779	
5:30-6	8	7.5	2	35	49	76579.65039	
6-6:30	8	7.5	2	35	49	76579.65039	
6:30-7	8	7.5	2	35	49	76579.65039	
7-7:30	8	7.5	2	35	49	76579.65039	
7:30-8	8	7.5	2	35	49	76579.65039	
8-8:30	8	7.5	2	35	49	76579.65039	
8:30-9	8	7.5	2	35	49	76579.65039	
9-9:30	8	7.5	2	35	49	76579.65039	
9:30-10	6	10	2	35	48	57434.73779	
10-10:30	6	10	2	35	48	57434.73779	
10:30-11	6	10	2	35	48	57434.73779	
11-11:30	6	10	2	35	48	57434.73779	
11:30-12noon	6	10	2	35	48	57434.73779	
12noon-12:30pm	6	10	2	35	48	57434.73779	
12:30-1	6	10	2	35	48	57434.73779	
1-1:30	6	10	2	35	48	57434.73779	
1:30-2	6	10	2	35	48	57434.73779	
2-2:30	6	10	2	35	48	57434.73779	
2:30-3	6	10	2	35	48	57434.73779	
3-3:30	6	10	2	35	48	57434.73779	
3:30-4	6	10	2	35	48	57434.73779	
4-4:30	6	10	2	35	48	57434.73779	
4:30-5	8	7.5	2	35	49	76579.65039	
5-5:30	8	7.5	2	35	49	76579.65039	
5:30-6	8	7.5	2	35	49	76579.65039	
6-6:30	8	7.5	2	35	49	76579.65039	
6:30-7	8	7.5	2	35	49	76579.65039	
7-7:30	8	7.5	2	35	49	76579.65039	
7:30-8	6	10	2	35	48	57434.73779	
8-8:30	6	10	2	35	48	57434.73779	
8:30-9	6	10	2	35	48	57434.73779	

9-9:30	5	12	2	35	47	47862.28149	
9:30-10	5	12	2	35	47	47862.28149	
10-10:30	5	12	2	35	47	47862.28149	
10:30-11	5	12	2	35	47	47862.28149	
11-11:30	5	12	2	35	47	47862.28149	
11:30-12midnight	5	12	2	35	47	47862.28149	
Peak Leq					49		
Day Leq						48	1914491
Night Leq						45	5743474
Ldn						**52**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Belward 2 Sta.													
			Sta. 264+60		**R-8(T-8)(10)**	**Horn Blown**							
			Grade		**230**	**230**							
12-12:30am	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
12:30-1	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
5:30-6	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
6-6:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
6:30-7	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
7-7:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
7:30-8	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
8-8:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
8:30-9	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
9-9:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
9:30-10	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
10-10:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
10:30-11	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
11-11:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
11:30-12noon	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
12noon-12:30pm	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
12:30-1	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
1-1:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
1:30-2	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
2-2:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
2:30-3	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
3-3:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
3:30-4	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
4-4:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
4:30-5	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
5-5:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
5:30-6	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
6-6:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
6:30-7	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
7-7:30	8	7.5	2	15	41	12712.34716		61	1381825.1		61	1394537.4	
7:30-8	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
8-8:30	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
8:30-9	6	10	2	15	40	9534.260373		60	1036368.8		60	1045903.1	
9-9:30	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
9:30-10	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
10-10:30	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
10:30-11	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
11-11:30	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
11:30-12midnight	5	12	2	15	39	7945.216977		59	863640.67		59	871585.89	
Peak Leq					41			61			61		
Day Leq						40	317809		61	34545627		61	34863436
Night Leq						37	953426		58	103636881		58	104590307
Ldn						**44**			65			65	
Kentlands Sta.													

CCT LRT Ldn Receptor R-7(T-9) Alternatives S1, S2, and S3

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward 2 Sta.							
			Sta. 280+10		**Rec.R-7(T-9)**	**Horn Not Blown**	
			Grade		**255**	**0**	
12-12:30am	5	12	2	40	47	48397.69851	
12:30-1	5	12	2	40	47	48397.69851	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	40	48	58077.23821	
5:30-6	8	7.5	2	40	49	77436.31762	
6-6:30	8	7.5	2	40	49	77436.31762	
6:30-7	8	7.5	2	40	49	77436.31762	
7-7:30	8	7.5	2	40	49	77436.31762	
7:30-8	8	7.5	2	40	49	77436.31762	
8-8:30	8	7.5	2	40	49	77436.31762	
8:30-9	8	7.5	2	40	49	77436.31762	
9-9:30	8	7.5	2	40	49	77436.31762	
9:30-10	6	10	2	40	48	58077.23821	
10-10:30	6	10	2	40	48	58077.23821	
10:30-11	6	10	2	40	48	58077.23821	
11-11:30	6	10	2	40	48	58077.23821	
11:30-12noon	6	10	2	40	48	58077.23821	
12noon-12:30pm	6	10	2	40	48	58077.23821	
12:30-1	6	10	2	40	48	58077.23821	
1-1:30	6	10	2	40	48	58077.23821	
1:30-2	6	10	2	40	48	58077.23821	
2-2:30	6	10	2	40	48	58077.23821	
2:30-3	6	10	2	40	48	58077.23821	
3-3:30	6	10	2	40	48	58077.23821	
3:30-4	6	10	2	40	48	58077.23821	
4-4:30	6	10	2	40	48	58077.23821	
4:30-5	8	7.5	2	40	49	77436.31762	
5-5:30	8	7.5	2	40	49	77436.31762	
5:30-6	8	7.5	2	40	49	77436.31762	
6-6:30	8	7.5	2	40	49	77436.31762	
6:30-7	8	7.5	2	40	49	77436.31762	
7-7:30	8	7.5	2	40	49	77436.31762	
7:30-8	6	10	2	40	48	58077.23821	
8-8:30	6	10	2	40	48	58077.23821	
8:30-9	6	10	2	40	48	58077.23821	

9-9:30	5	12	2	40	47	48397.69851	
9:30-10	5	12	2	40	47	48397.69851	
10-10:30	5	12	2	40	47	48397.69851	
10:30-11	5	12	2	40	47	48397.69851	
11-11:30	5	12	2	40	47	48397.69851	
11:30-12midnight	5	12	2	40	47	48397.69851	
Peak Leq					49		
Day Leq						48	1935908
Night Leq						45	5807724
Ldn						**52**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward 2 Sta.							
			Sta. 291+35		**Rec.R-6(T-10)**	**Horn Not Blown**	
			Grade		**70**	**0**	
12-12:30am	5	12	2	40	55	336502.2097	
12:30-1	5	12	2	40	55	336502.2097	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	40	56	403802.6517	
5:30-6	8	7.5	2	40	57	538403.5356	
6-6:30	8	7.5	2	40	57	538403.5356	
6:30-7	8	7.5	2	40	57	538403.5356	
7-7:30	8	7.5	2	40	57	538403.5356	
7:30-8	8	7.5	2	40	57	538403.5356	
8-8:30	8	7.5	2	40	57	538403.5356	
8:30-9	8	7.5	2	40	57	538403.5356	
9-9:30	8	7.5	2	40	57	538403.5356	
9:30-10	6	10	2	40	56	403802.6517	
10-10:30	6	10	2	40	56	403802.6517	
10:30-11	6	10	2	40	56	403802.6517	
11-11:30	6	10	2	40	56	403802.6517	
11:30-12noon	6	10	2	40	56	403802.6517	
12noon-12:30pm	6	10	2	40	56	403802.6517	
12:30-1	6	10	2	40	56	403802.6517	
1-1:30	6	10	2	40	56	403802.6517	
1:30-2	6	10	2	40	56	403802.6517	
2-2:30	6	10	2	40	56	403802.6517	
2:30-3	6	10	2	40	56	403802.6517	
3-3:30	6	10	2	40	56	403802.6517	
3:30-4	6	10	2	40	56	403802.6517	
4-4:30	6	10	2	40	56	403802.6517	
4:30-5	8	7.5	2	40	57	538403.5356	
5-5:30	8	7.5	2	40	57	538403.5356	
5:30-6	8	7.5	2	40	57	538403.5356	
6-6:30	8	7.5	2	40	57	538403.5356	
6:30-7	8	7.5	2	40	57	538403.5356	
7-7:30	8	7.5	2	40	57	538403.5356	
7:30-8	6	10	2	40	56	403802.6517	
8-8:30	6	10	2	40	56	403802.6517	
8:30-9	6	10	2	40	56	403802.6517	

CCT LRT Ldn Receptor R-6(T-10) Alternatives S1, S2, and S3

9-9:30	5	12	2	40	55	336502.2097	
9:30-10	5	12	2	40	55	336502.2097	
10-10:30	5	12	2	40	55	336502.2097	
10:30-11	5	12	2	40	55	336502.2097	
11-11:30	5	12	2	40	55	336502.2097	
11:30-12midnight	5	12	2	40	55	336502.2097	
Peak Leq					57		
Day Leq						57	13460088
Night Leq						54	40380265
Ldn						**60**	
Kentlands Sta.							

CCT LRT Ldn Receptor R-5(T-11) Alternatives S1, S2, and S3

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward 2 Sta.							
			Sta. 299+70		**Rec.R-5(T-11)**	**Horn Not Blown**	
			Grade		**250**	**0**	
12-12:30am	5	12	2	40	47	49856.8651	
12:30-1	5	12	2	40	47	49856.8651	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	40	48	59828.23812	
5:30-6	8	7.5	2	40	49	79770.98416	
6-6:30	8	7.5	2	40	49	79770.98416	
6:30-7	8	7.5	2	40	49	79770.98416	
7-7:30	8	7.5	2	40	49	79770.98416	
7:30-8	8	7.5	2	40	49	79770.98416	
8-8:30	8	7.5	2	40	49	79770.98416	
8:30-9	8	7.5	2	40	49	79770.98416	
9-9:30	8	7.5	2	40	49	79770.98416	
9:30-10	6	10	2	40	48	59828.23812	
10-10:30	6	10	2	40	48	59828.23812	
10:30-11	6	10	2	40	48	59828.23812	
11-11:30	6	10	2	40	48	59828.23812	
11:30-12noon	6	10	2	40	48	59828.23812	
12noon-12:30pm	6	10	2	40	48	59828.23812	
12:30-1	6	10	2	40	48	59828.23812	
1-1:30	6	10	2	40	48	59828.23812	
1:30-2	6	10	2	40	48	59828.23812	
2-2:30	6	10	2	40	48	59828.23812	
2:30-3	6	10	2	40	48	59828.23812	
3-3:30	6	10	2	40	48	59828.23812	
3:30-4	6	10	2	40	48	59828.23812	
4-4:30	6	10	2	40	48	59828.23812	
4:30-5	8	7.5	2	40	49	79770.98416	
5-5:30	8	7.5	2	40	49	79770.98416	
5:30-6	8	7.5	2	40	49	79770.98416	
6-6:30	8	7.5	2	40	49	79770.98416	
6:30-7	8	7.5	2	40	49	79770.98416	
7-7:30	8	7.5	2	40	49	79770.98416	
7:30-8	6	10	2	40	48	59828.23812	
8-8:30	6	10	2	40	48	59828.23812	
8:30-9	6	10	2	40	48	59828.23812	

CCT LRT Ldn Receptor R-5(T-11) Alternatives S1, S2, and S3

9-9:30	5	12	2	40	47	49856.8651	
9:30-10	5	12	2	40	47	49856.8651	
10-10:30	5	12	2	40	47	49856.8651	
10:30-11	5	12	2	40	47	49856.8651	
11-11:30	5	12	2	40	47	49856.8651	
11:30-12midnight	5	12	2	40	47	49856.8651	
Peak Leq					49		
Day Leq						48	1994275
Night Leq						45	5982824
Ldn						**52**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward 2 Sta.							
			Sta. 316+70		**Rec.R-4(T-12)**	**Horn Not Blown**	
			Grade		**260**	**0**	
12-12:30am	5	12	2	40	47	47008.34468	
12:30-1	5	12	2	40	47	47008.34468	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	40	48	56410.01362	
5:30-6	8	7.5	2	40	49	75213.35149	
6-6:30	8	7.5	2	40	49	75213.35149	
6:30-7	8	7.5	2	40	49	75213.35149	
7-7:30	8	7.5	2	40	49	75213.35149	
7:30-8	8	7.5	2	40	49	75213.35149	
8-8:30	8	7.5	2	40	49	75213.35149	
8:30-9	8	7.5	2	40	49	75213.35149	
9-9:30	8	7.5	2	40	49	75213.35149	
9:30-10	6	10	2	40	48	56410.01362	
10-10:30	6	10	2	40	48	56410.01362	
10:30-11	6	10	2	40	48	56410.01362	
11-11:30	6	10	2	40	48	56410.01362	
11:30-12noon	6	10	2	40	48	56410.01362	
12noon-12:30pm	6	10	2	40	48	56410.01362	
12:30-1	6	10	2	40	48	56410.01362	
1-1:30	6	10	2	40	48	56410.01362	
1:30-2	6	10	2	40	48	56410.01362	
2-2:30	6	10	2	40	48	56410.01362	
2:30-3	6	10	2	40	48	56410.01362	
3-3:30	6	10	2	40	48	56410.01362	
3:30-4	6	10	2	40	48	56410.01362	
4-4:30	6	10	2	40	48	56410.01362	
4:30-5	8	7.5	2	40	49	75213.35149	
5-5:30	8	7.5	2	40	49	75213.35149	
5:30-6	8	7.5	2	40	49	75213.35149	
6-6:30	8	7.5	2	40	49	75213.35149	
6:30-7	8	7.5	2	40	49	75213.35149	
7-7:30	8	7.5	2	40	49	75213.35149	
7:30-8	6	10	2	40	48	56410.01362	
8-8:30	6	10	2	40	48	56410.01362	
8:30-9	6	10	2	40	48	56410.01362	

CCT LRT Ldn Receptor R-4(T-12) Alternatives S1, S2, and S3

9-9:30	5	12	2	40	47	47008.34468	
9:30-10	5	12	2	40	47	47008.34468	
10-10:30	5	12	2	40	47	47008.34468	
10:30-11	5	12	2	40	47	47008.34468	
11-11:30	5	12	2	40	47	47008.34468	
11:30-12midnight	5	12	2	40	47	47008.34468	
Peak Leq					49		
Day Leq						48	1880334
Night Leq						45	5641001
Ldn						**52**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward 2 Sta.							
			Sta. 332+50		**Rec.R-3(2)**	**Horn Not Blown**	
			Grade		**70**	**0**	
12-12:30am	5	12	2	40	55	336502.2097	
12:30-1	5	12	2	40	55	336502.2097	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	40	56	403802.6517	
5:30-6	8	7.5	2	40	57	538403.5356	
6-6:30	8	7.5	2	40	57	538403.5356	
6:30-7	8	7.5	2	40	57	538403.5356	
7-7:30	8	7.5	2	40	57	538403.5356	
7:30-8	8	7.5	2	40	57	538403.5356	
8-8:30	8	7.5	2	40	57	538403.5356	
8:30-9	8	7.5	2	40	57	538403.5356	
9-9:30	8	7.5	2	40	57	538403.5356	
9:30-10	6	10	2	40	56	403802.6517	
10-10:30	6	10	2	40	56	403802.6517	
10:30-11	6	10	2	40	56	403802.6517	
11-11:30	6	10	2	40	56	403802.6517	
11:30-12noon	6	10	2	40	56	403802.6517	
12noon-12:30pm	6	10	2	40	56	403802.6517	
12:30-1	6	10	2	40	56	403802.6517	
1-1:30	6	10	2	40	56	403802.6517	
1:30-2	6	10	2	40	56	403802.6517	
2-2:30	6	10	2	40	56	403802.6517	
2:30-3	6	10	2	40	56	403802.6517	
3-3:30	6	10	2	40	56	403802.6517	
3:30-4	6	10	2	40	56	403802.6517	
4-4:30	6	10	2	40	56	403802.6517	
4:30-5	8	7.5	2	40	57	538403.5356	
5-5:30	8	7.5	2	40	57	538403.5356	
5:30-6	8	7.5	2	40	57	538403.5356	
6-6:30	8	7.5	2	40	57	538403.5356	
6:30-7	8	7.5	2	40	57	538403.5356	
7-7:30	8	7.5	2	40	57	538403.5356	
7:30-8	6	10	2	40	56	403802.6517	
8-8:30	6	10	2	40	56	403802.6517	
8:30-9	6	10	2	40	56	403802.6517	

9-9:30	5	12	2	40	55	336502.2097	
9:30-10	5	12	2	40	55	336502.2097	
10-10:30	5	12	2	40	55	336502.2097	
10:30-11	5	12	2	40	55	336502.2097	
11-11:30	5	12	2	40	55	336502.2097	
11:30-12midnight	5	12	2	40	55	336502.2097	
Peak Leq					57		
Day Leq						57	13460088
Night Leq						54	40380265
Ldn						**60**	
Kentlands Sta.							

CCT LRT Ldn Receptor R-2(1) Alternatives S1, S2, and S3

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
Kentlands Sta.							
			Sta. 358+70		**Rec.R-2(1)**	**Horn Not Blown**	
			Grade		**210**	**0**	
12-12:30am	5	12	2	35	47	49581.78347	
12:30-1	5	12	2	35	47	49581.78347	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	48	59498.14017	
5:30-6	8	7.5	2	35	49	79330.85356	
6-6:30	8	7.5	2	35	49	79330.85356	
6:30-7	8	7.5	2	35	49	79330.85356	
7-7:30	8	7.5	2	35	49	79330.85356	
7:30-8	8	7.5	2	35	49	79330.85356	
8-8:30	8	7.5	2	35	49	79330.85356	
8:30-9	8	7.5	2	35	49	79330.85356	
9-9:30	8	7.5	2	35	49	79330.85356	
9:30-10	6	10	2	35	48	59498.14017	
10-10:30	6	10	2	35	48	59498.14017	
10:30-11	6	10	2	35	48	59498.14017	
11-11:30	6	10	2	35	48	59498.14017	
11:30-12noon	6	10	2	35	48	59498.14017	
12noon-12:30pm	6	10	2	35	48	59498.14017	
12:30-1	6	10	2	35	48	59498.14017	
1-1:30	6	10	2	35	48	59498.14017	
1:30-2	6	10	2	35	48	59498.14017	
2-2:30	6	10	2	35	48	59498.14017	
2:30-3	6	10	2	35	48	59498.14017	
3-3:30	6	10	2	35	48	59498.14017	
3:30-4	6	10	2	35	48	59498.14017	
4-4:30	6	10	2	35	48	59498.14017	
4:30-5	8	7.5	2	35	49	79330.85356	
5-5:30	8	7.5	2	35	49	79330.85356	
5:30-6	8	7.5	2	35	49	79330.85356	
6-6:30	8	7.5	2	35	49	79330.85356	
6:30-7	8	7.5	2	35	49	79330.85356	
7-7:30	8	7.5	2	35	49	79330.85356	
7:30-8	6	10	2	35	48	59498.14017	
8-8:30	6	10	2	35	48	59498.14017	
8:30-9	6	10	2	35	48	59498.14017	

9-9:30	5	12	2	35	47	49581.78347	
9:30-10	5	12	2	35	47	49581.78347	
10-10:30	5	12	2	35	47	49581.78347	
10:30-11	5	12	2	35	47	49581.78347	
11-11:30	5	12	2	35	47	49581.78347	
11:30-12midnight	5	12	2	35	47	49581.78347	
Peak Leq					49		
Day Leq						48	1983271
Night Leq						45	5949814
Ldn						**52**	
N.I.S.T. Sta.							

CCT LRT Ldn Receptor R-1(T-13) Alternatives S1, S2, and S3

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
Kentlands Sta.							
			Sta. 393+80		**Rec.R-1(T-13)**	**Horn Not Blown**	
			Grade		**135**	**0**	
12-12:30am	5	12	2	40	51	125641.8515	
12:30-1	5	12	2	40	51	125641.8515	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	40	52	150770.2218	
5:30-6	8	7.5	2	40	53	201026.9624	
6-6:30	8	7.5	2	40	53	201026.9624	
6:30-7	8	7.5	2	40	53	201026.9624	
7-7:30	8	7.5	2	40	53	201026.9624	
7:30-8	8	7.5	2	40	53	201026.9624	
8-8:30	8	7.5	2	40	53	201026.9624	
8:30-9	8	7.5	2	40	53	201026.9624	
9-9:30	8	7.5	2	40	53	201026.9624	
9:30-10	6	10	2	40	52	150770.2218	
10-10:30	6	10	2	40	52	150770.2218	
10:30-11	6	10	2	40	52	150770.2218	
11-11:30	6	10	2	40	52	150770.2218	
11:30-12noon	6	10	2	40	52	150770.2218	
12noon-12:30pm	6	10	2	40	52	150770.2218	
12:30-1	6	10	2	40	52	150770.2218	
1-1:30	6	10	2	40	52	150770.2218	
1:30-2	6	10	2	40	52	150770.2218	
2-2:30	6	10	2	40	52	150770.2218	
2:30-3	6	10	2	40	52	150770.2218	
3-3:30	6	10	2	40	52	150770.2218	
3:30-4	6	10	2	40	52	150770.2218	
4-4:30	6	10	2	40	52	150770.2218	
4:30-5	8	7.5	2	40	53	201026.9624	
5-5:30	8	7.5	2	40	53	201026.9624	
5:30-6	8	7.5	2	40	53	201026.9624	
6-6:30	8	7.5	2	40	53	201026.9624	
6:30-7	8	7.5	2	40	53	201026.9624	
7-7:30	8	7.5	2	40	53	201026.9624	
7:30-8	6	10	2	40	52	150770.2218	
8-8:30	6	10	2	40	52	150770.2218	
8:30-9	6	10	2	40	52	150770.2218	

CCT LRT Ldn Receptor R-1(T-13) Alternatives S1, S2, and S3

9-9:30	5	12	2	40	51	125641.8515	
9:30-10	5	12	2	40	51	125641.8515	
10-10:30	5	12	2	40	51	125641.8515	
10:30-11	5	12	2	40	51	125641.8515	
11-11:30	5	12	2	40	51	125641.8515	
11:30-12midnight	5	12	2	40	51	125641.8515	
Peak Leq					53		
Day Leq						52	5025674
Night Leq						49	15077022
Ldn						**56**	
N.I.S.T. Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
Belward 2 Sta.							
			Sta. 116+80		**Rec.R-20(9)**	**Horn Not Blown**	
			Aerial		**725**	**0**	
12-12:30am	5	12	2	25	40	9905.764648	
12:30-1	5	12	2	25	40	9905.764648	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	25	41	11886.91758	
5:30-6	8	7.5	2	25	42	15849.22344	
6-6:30	8	7.5	2	25	42	15849.22344	
6:30-7	8	7.5	2	25	42	15849.22344	
7-7:30	8	7.5	2	25	42	15849.22344	
7:30-8	8	7.5	2	25	42	15849.22344	
8-8:30	8	7.5	2	25	42	15849.22344	
8:30-9	8	7.5	2	25	42	15849.22344	
9-9:30	8	7.5	2	25	42	15849.22344	
9:30-10	6	10	2	25	41	11886.91758	
10-10:30	6	10	2	25	41	11886.91758	
10:30-11	6	10	2	25	41	11886.91758	
11-11:30	6	10	2	25	41	11886.91758	
11:30-12noon	6	10	2	25	41	11886.91758	
12noon-12:30pm	6	10	2	25	41	11886.91758	
12:30-1	6	10	2	25	41	11886.91758	
1-1:30	6	10	2	25	41	11886.91758	
1:30-2	6	10	2	25	41	11886.91758	
2-2:30	6	10	2	25	41	11886.91758	
2:30-3	6	10	2	25	41	11886.91758	
3-3:30	6	10	2	25	41	11886.91758	
3:30-4	6	10	2	25	41	11886.91758	
4-4:30	6	10	2	25	41	11886.91758	
4:30-5	8	7.5	2	25	42	15849.22344	
5-5:30	8	7.5	2	25	42	15849.22344	
5:30-6	8	7.5	2	25	42	15849.22344	
6-6:30	8	7.5	2	25	42	15849.22344	
6:30-7	8	7.5	2	25	42	15849.22344	
7-7:30	8	7.5	2	25	42	15849.22344	
7:30-8	6	10	2	25	41	11886.91758	
8-8:30	6	10	2	25	41	11886.91758	

8:30-9	6	10	2	25	41	11886.91758	
9-9:30	5	12	2	25	40	9905.764648	
9:30-10	5	12	2	25	40	9905.764648	
10-10:30	5	12	2	25	40	9905.764648	
10:30-11	5	12	2	25	40	9905.764648	
11-11:30	5	12	2	25	40	9905.764648	
11:30-12midnight	5	12	2	25	40	9905.764648	
Peak Leq					42		
Day Leq						41	396231
Night Leq						38	1188692
Ldn						**45**	
Kentlands Sta.							

CCT LRT Ldn Receptors R-16(8b) Alternative S1A to Master Plan

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
West Gaither Sta.							
			Sta. N-120+40 Grade		**Rec.R-16(8b 280**	**Horn Not Blown 0**	
12-12:30am	5	12	2	10	34	2628.924	
12:30-1	5	12	2	10	34	2628.924	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	10	35	3154.708	
5:30-6	8	7.5	2	10	36	4206.278	
6-6:30	8	7.5	2	10	36	4206.278	
6:30-7	8	7.5	2	10	36	4206.278	
7-7:30	8	7.5	2	10	36	4206.278	
7:30-8	8	7.5	2	10	36	4206.278	
8-8:30	8	7.5	2	10	36	4206.278	
8:30-9	8	7.5	2	10	36	4206.278	
9-9:30	8	7.5	2	10	36	4206.278	
9:30-10	6	10	2	10	35	3154.708	
10-10:30	6	10	2	10	35	3154.708	
10:30-11	6	10	2	10	35	3154.708	
11-11:30	6	10	2	10	35	3154.708	
11:30-12noon	6	10	2	10	35	3154.708	
12noon-12:30pm	6	10	2	10	35	3154.708	
12:30-1	6	10	2	10	35	3154.708	
1-1:30	6	10	2	10	35	3154.708	
1:30-2	6	10	2	10	35	3154.708	
2-2:30	6	10	2	10	35	3154.708	
2:30-3	6	10	2	10	35	3154.708	
3-3:30	6	10	2	10	35	3154.708	
3:30-4	6	10	2	10	35	3154.708	
4-4:30	6	10	2	10	35	3154.708	
4:30-5	8	7.5	2	10	36	4206.278	
5-5:30	8	7.5	2	10	36	4206.278	
5:30-6	8	7.5	2	10	36	4206.278	
6-6:30	8	7.5	2	10	36	4206.278	
6:30-7	8	7.5	2	10	36	4206.278	

CCT LRT Ldn Receptors R-16(8b) Alternative S1A to Master Plan

7-7:30	8	7.5	2	10	36	4206.278	
7:30-8	6	10	2	10	35	3154.708	
8-8:30	6	10	2	10	35	3154.708	
8:30-9	6	10	2	10	35	3154.708	
9-9:30	5	12	2	10	34	2628.924	
9:30-10	5	12	2	10	34	2628.924	
10-10:30	5	12	2	10	34	2628.924	
10:30-11	5	12	2	10	34	2628.924	
11-11:30	5	12	2	10	34	2628.924	
11:30-12midnight	5	12	2	10	34	2628.924	
Peak Leq					36		
Day Leq						35	105157
Night Leq						32	315471
Ldn						**39**	
Decoverly Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
West Gaither Sta.							
			Sta. 116+80		**Rec.R-20(9))**	**Horn Not Blown**	
			Aerial		**725**	**0**	
12-12:30am	5	12	2	25	40	9905.764648	
12:30-1	5	12	2	25	40	9905.764648	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	25	41	11886.91758	
5:30-6	8	7.5	2	25	42	15849.22344	
6-6:30	8	7.5	2	25	42	15849.22344	
6:30-7	8	7.5	2	25	42	15849.22344	
7-7:30	8	7.5	2	25	42	15849.22344	
7:30-8	8	7.5	2	25	42	15849.22344	
8-8:30	8	7.5	2	25	42	15849.22344	
8:30-9	8	7.5	2	25	42	15849.22344	
9-9:30	8	7.5	2	25	42	15849.22344	
9:30-10	6	10	2	25	41	11886.91758	
10-10:30	6	10	2	25	41	11886.91758	
10:30-11	6	10	2	25	41	11886.91758	
11-11:30	6	10	2	25	41	11886.91758	
11:30-12noon	6	10	2	25	41	11886.91758	
12noon-12:30pm	6	10	2	25	41	11886.91758	
12:30-1	6	10	2	25	41	11886.91758	
1-1:30	6	10	2	25	41	11886.91758	
1:30-2	6	10	2	25	41	11886.91758	
2-2:30	6	10	2	25	41	11886.91758	
2:30-3	6	10	2	25	41	11886.91758	
3-3:30	6	10	2	25	41	11886.91758	
3:30-4	6	10	2	25	41	11886.91758	
4-4:30	6	10	2	25	41	11886.91758	
4:30-5	8	7.5	2	25	42	15849.22344	
5-5:30	8	7.5	2	25	42	15849.22344	
5:30-6	8	7.5	2	25	42	15849.22344	
6-6:30	8	7.5	2	25	42	15849.22344	
6:30-7	8	7.5	2	25	42	15849.22344	
7-7:30	8	7.5	2	25	42	15849.22344	
7:30-8	6	10	2	25	41	11886.91758	
8-8:30	6	10	2	25	41	11886.91758	

8:30-9	6	10	2	25	41	11886.91758	
9-9:30	5	12	2	25	40	9905.764648	
9:30-10	5	12	2	25	40	9905.764648	
10-10:30	5	12	2	25	40	9905.764648	
10:30-11	5	12	2	25	40	9905.764648	
11-11:30	5	12	2	25	40	9905.764648	
11:30-12midnight	5	12	2	25	40	9905.764648	
Peak Leq					42		
Day Leq						41	396231
Night Leq						38	1188692
Ldn						**45**	
LSC Central Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Central Sta.							
			Sta. 187+30		**Rec.R-13(6)**	**Horn Not Blown**	
			Grade		**70**	**0**	
12-12:30am	5	12	2	30	53	189282.493	
12:30-1	5	12	2	30	53	189282.493	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	30	54	227138.9916	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	8	7.5	2	30	55	302851.9887	
8-8:30	8	7.5	2	30	55	302851.9887	
8:30-9	8	7.5	2	30	55	302851.9887	
9-9:30	8	7.5	2	30	55	302851.9887	
9:30-10	6	10	2	30	54	227138.9916	
10-10:30	6	10	2	30	54	227138.9916	
10:30-11	6	10	2	30	54	227138.9916	
11-11:30	6	10	2	30	54	227138.9916	
11:30-12noon	6	10	2	30	54	227138.9916	
12noon-12:30pm	6	10	2	30	54	227138.9916	
12:30-1	6	10	2	30	54	227138.9916	
1-1:30	6	10	2	30	54	227138.9916	
1:30-2	6	10	2	30	54	227138.9916	
2-2:30	6	10	2	30	54	227138.9916	
2:30-3	6	10	2	30	54	227138.9916	
3-3:30	6	10	2	30	54	227138.9916	
3:30-4	6	10	2	30	54	227138.9916	
4-4:30	6	10	2	30	54	227138.9916	
4:30-5	8	7.5	2	30	55	302851.9887	
5-5:30	8	7.5	2	30	55	302851.9887	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	6	10	2	30	54	227138.9916	
8-8:30	6	10	2	30	54	227138.9916	
8:30-9	6	10	2	30	54	227138.9916	

CCT LRT Ldn Receptor R-13(6) Alternative S2A

9-9:30	5	12	2	30	53	189282.493	
9:30-10	5	12	2	30	53	189282.493	
10-10:30	5	12	2	30	53	189282.493	
10:30-11	5	12	2	30	53	189282.493	
11-11:30	5	12	2	30	53	189282.493	
11:30-12midnight	5	12	2	30	53	189282.493	
Peak Leq					55		
Day Leq						54	7571300
Night Leq						51	22713899
Ldn						**58**	
LSC West Sta.							

CCT LRT Ldn Receptor R-12(5) Alternative S2A

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC West Sta.							
			Sta. 204+80		**Rec.R-12(5)**	**Horn Not Blown**	
			Grade		**290**	**0**	
12-12:30am	5	12	2	15	37	5611.778477	
12:30-1	5	12	2	15	37	5611.778477	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	15	38	6734.134173	
5:30-6	8	7.5	2	15	40	8978.845564	
6-6:30	8	7.5	2	15	40	8978.845564	
6:30-7	8	7.5	2	15	40	8978.845564	
7-7:30	8	7.5	2	15	40	8978.845564	
7:30-8	8	7.5	2	15	40	8978.845564	
8-8:30	8	7.5	2	15	40	8978.845564	
8:30-9	8	7.5	2	15	40	8978.845564	
9-9:30	8	7.5	2	15	40	8978.845564	
9:30-10	6	10	2	15	38	6734.134173	
10-10:30	6	10	2	15	38	6734.134173	
10:30-11	6	10	2	15	38	6734.134173	
11-11:30	6	10	2	15	38	6734.134173	
11:30-12noon	6	10	2	15	38	6734.134173	
12noon-12:30pm	6	10	2	15	38	6734.134173	
12:30-1	6	10	2	15	38	6734.134173	
1-1:30	6	10	2	15	38	6734.134173	
1:30-2	6	10	2	15	38	6734.134173	
2-2:30	6	10	2	15	38	6734.134173	
2:30-3	6	10	2	15	38	6734.134173	
3-3:30	6	10	2	15	38	6734.134173	
3:30-4	6	10	2	15	38	6734.134173	
4-4:30	6	10	2	15	38	6734.134173	
4:30-5	8	7.5	2	15	40	8978.845564	
5-5:30	8	7.5	2	15	40	8978.845564	
5:30-6	8	7.5	2	15	40	8978.845564	
6-6:30	8	7.5	2	15	40	8978.845564	
6:30-7	8	7.5	2	15	40	8978.845564	
7-7:30	8	7.5	2	15	40	8978.845564	
7:30-8	6	10	2	15	38	6734.134173	
8-8:30	6	10	2	15	38	6734.134173	
8:30-9	6	10	2	15	38	6734.134173	

CCT LRT Ldn Receptor R-12(5) Alternative S2A

9-9:30	5	12	2	15	37	5611.778477	
9:30-10	5	12	2	15	37	5611.778477	
10-10:30	5	12	2	15	37	5611.778477	
10:30-11	5	12	2	15	37	5611.778477	
11-11:30	5	12	2	15	37	5611.778477	
11:30-12midnight	5	12	2	15	37	5611.778477	
Peak Leq					40		
Day Leq						39	224471
Night Leq						36	673413
Ldn						**43**	
LSC Belward Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward Sta.							
			Sta. 247+50		**Rec.R-10(T-7)**	**Horn Not Blown**	
			Grade		**230**	**0**	
12-12:30am	5	12	2	35	46	43257.29243	
12:30-1	5	12	2	35	46	43257.29243	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	47	51908.75092	
5:30-6	8	7.5	2	35	48	69211.66789	
6-6:30	8	7.5	2	35	48	69211.66789	
6:30-7	8	7.5	2	35	48	69211.66789	
7-7:30	8	7.5	2	35	48	69211.66789	
7:30-8	8	7.5	2	35	48	69211.66789	
8-8:30	8	7.5	2	35	48	69211.66789	
8:30-9	8	7.5	2	35	48	69211.66789	
9-9:30	8	7.5	2	35	48	69211.66789	
9:30-10	6	10	2	35	47	51908.75092	
10-10:30	6	10	2	35	47	51908.75092	
10:30-11	6	10	2	35	47	51908.75092	
11-11:30	6	10	2	35	47	51908.75092	
11:30-12noon	6	10	2	35	47	51908.75092	
12noon-12:30pm	6	10	2	35	47	51908.75092	
12:30-1	6	10	2	35	47	51908.75092	
1-1:30	6	10	2	35	47	51908.75092	
1:30-2	6	10	2	35	47	51908.75092	
2-2:30	6	10	2	35	47	51908.75092	
2:30-3	6	10	2	35	47	51908.75092	
3-3:30	6	10	2	35	47	51908.75092	
3:30-4	6	10	2	35	47	51908.75092	
4-4:30	6	10	2	35	47	51908.75092	
4:30-5	8	7.5	2	35	48	69211.66789	
5-5:30	8	7.5	2	35	48	69211.66789	
5:30-6	8	7.5	2	35	48	69211.66789	
6-6:30	8	7.5	2	35	48	69211.66789	
6:30-7	8	7.5	2	35	48	69211.66789	
7-7:30	8	7.5	2	35	48	69211.66789	
7:30-8	6	10	2	35	47	51908.75092	
8-8:30	6	10	2	35	47	51908.75092	

8:30-9	6	10	2	35	47	51908.75092	
9-9:30	5	12	2	35	46	43257.29243	
9:30-10	5	12	2	35	46	43257.29243	
10-10:30	5	12	2	35	46	43257.29243	
10:30-11	5	12	2	35	46	43257.29243	
11-11:30	5	12	2	35	46	43257.29243	
11:30-12midnight	5	12	2	35	46	43257.29243	
Peak Leq					48		
Day Leq						48	1730292
Night Leq						45	5190875
Ldn						**52**	
Kentlands							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Central Sta.							
			Sta. 187+30		**Rec.R-13(6)**	**Horn Not Blown**	
			Grade		**70**	**0**	
12-12:30am	5	12	2	30	53	189282.493	
12:30-1	5	12	2	30	53	189282.493	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	30	54	227138.9916	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	8	7.5	2	30	55	302851.9887	
8-8:30	8	7.5	2	30	55	302851.9887	
8:30-9	8	7.5	2	30	55	302851.9887	
9-9:30	8	7.5	2	30	55	302851.9887	
9:30-10	6	10	2	30	54	227138.9916	
10-10:30	6	10	2	30	54	227138.9916	
10:30-11	6	10	2	30	54	227138.9916	
11-11:30	6	10	2	30	54	227138.9916	
11:30-12noon	6	10	2	30	54	227138.9916	
12noon-12:30pm	6	10	2	30	54	227138.9916	
12:30-1	6	10	2	30	54	227138.9916	
1-1:30	6	10	2	30	54	227138.9916	
1:30-2	6	10	2	30	54	227138.9916	
2-2:30	6	10	2	30	54	227138.9916	
2:30-3	6	10	2	30	54	227138.9916	
3-3:30	6	10	2	30	54	227138.9916	
3:30-4	6	10	2	30	54	227138.9916	
4-4:30	6	10	2	30	54	227138.9916	
4:30-5	8	7.5	2	30	55	302851.9887	
5-5:30	8	7.5	2	30	55	302851.9887	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	6	10	2	30	54	227138.9916	
8-8:30	6	10	2	30	54	227138.9916	
8:30-9	6	10	2	30	54	227138.9916	

CCt LRT Ldn Receptor R-13(6) Alternative S2B

9-9:30	5	12	2	30	53	189282.493	
9:30-10	5	12	2	30	53	189282.493	
10-10:30	5	12	2	30	53	189282.493	
10:30-11	5	12	2	30	53	189282.493	
11-11:30	5	12	2	30	53	189282.493	
11:30-12midnight	5	12	2	30	53	189282.493	
Peak Leq					55		
Day Leq						54	7571300
Night Leq						51	22713899
Ldn						**58**	
LSC West Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC West Sta.							
			Sta. 205+00		**Rec.R-12(5)**	**Horn Not Blown**	
			Grade		**400**	**0**	
12-12:30am	5	12	2	15	35	3464.236466	
12:30-1	5	12	2	15	35	3464.236466	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	15	36	4157.083759	
5:30-6	8	7.5	2	15	37	5542.778346	
6-6:30	8	7.5	2	15	37	5542.778346	
6:30-7	8	7.5	2	15	37	5542.778346	
7-7:30	8	7.5	2	15	37	5542.778346	
7:30-8	8	7.5	2	15	37	5542.778346	
8-8:30	8	7.5	2	15	37	5542.778346	
8:30-9	8	7.5	2	15	37	5542.778346	
9-9:30	8	7.5	2	15	37	5542.778346	
9:30-10	6	10	2	15	36	4157.083759	
10-10:30	6	10	2	15	36	4157.083759	
10:30-11	6	10	2	15	36	4157.083759	
11-11:30	6	10	2	15	36	4157.083759	
11:30-12noon	6	10	2	15	36	4157.083759	
12noon-12:30pm	6	10	2	15	36	4157.083759	
12:30-1	6	10	2	15	36	4157.083759	
1-1:30	6	10	2	15	36	4157.083759	
1:30-2	6	10	2	15	36	4157.083759	
2-2:30	6	10	2	15	36	4157.083759	
2:30-3	6	10	2	15	36	4157.083759	
3-3:30	6	10	2	15	36	4157.083759	
3:30-4	6	10	2	15	36	4157.083759	
4-4:30	6	10	2	15	36	4157.083759	
4:30-5	8	7.5	2	15	37	5542.778346	
5-5:30	8	7.5	2	15	37	5542.778346	
5:30-6	8	7.5	2	15	37	5542.778346	
6-6:30	8	7.5	2	15	37	5542.778346	
6:30-7	8	7.5	2	15	37	5542.778346	
7-7:30	8	7.5	2	15	37	5542.778346	
7:30-8	6	10	2	15	36	4157.083759	
8-8:30	6	10	2	15	36	4157.083759	
8:30-9	6	10	2	15	36	4157.083759	

CCt LRT Ldn Receptor R-12(5) Alternative S2B

9-9:30	5	12	2	15	35	3464.236466	
9:30-10	5	12	2	15	35	3464.236466	
10-10:30	5	12	2	15	35	3464.236466	
10:30-11	5	12	2	15	35	3464.236466	
11-11:30	5	12	2	15	35	3464.236466	
11:30-12midnight	5	12	2	15	35	3464.236466	
Peak Leq					37		
Day Leq						37	138569
Night Leq						34	415708
Ldn						**41**	
LSC Belward 3 Sta.							

	Trains (two-way)	Headway (minutes)	# of Cars	Maximum Speed	Leq (dB)	Energy Power	
					Vehicle Leq		
LSC Belward 3 Sta.							
			Sta. 247+50 Grade		**Rec.R-10(T-7) 230**	**Horn Not Blown 0**	
12-12:30am	5	12	2	45	49	71506.95279	
12:30-1	5	12	2	45	49	71506.95279	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	45	49	85808.34335	
5:30-6	8	7.5	2	45	51	114411.1245	
6-6:30	8	7.5	2	45	51	114411.1245	
6:30-7	8	7.5	2	45	51	114411.1245	
7-7:30	8	7.5	2	45	51	114411.1245	
7:30-8	8	7.5	2	45	51	114411.1245	
8-8:30	8	7.5	2	45	51	114411.1245	
8:30-9	8	7.5	2	45	51	114411.1245	
9-9:30	8	7.5	2	45	51	114411.1245	
9:30-10	6	10	2	45	49	85808.34335	
10-10:30	6	10	2	45	49	85808.34335	
10:30-11	6	10	2	45	49	85808.34335	
11-11:30	6	10	2	45	49	85808.34335	
11:30-12noon	6	10	2	45	49	85808.34335	
12noon-12:30pm	6	10	2	45	49	85808.34335	
12:30-1	6	10	2	45	49	85808.34335	
1-1:30	6	10	2	45	49	85808.34335	
1:30-2	6	10	2	45	49	85808.34335	
2-2:30	6	10	2	45	49	85808.34335	
2:30-3	6	10	2	45	49	85808.34335	
3-3:30	6	10	2	45	49	85808.34335	
3:30-4	6	10	2	45	49	85808.34335	
4-4:30	6	10	2	45	49	85808.34335	
4:30-5	8	7.5	2	45	51	114411.1245	
5-5:30	8	7.5	2	45	51	114411.1245	
5:30-6	8	7.5	2	45	51	114411.1245	
6-6:30	8	7.5	2	45	51	114411.1245	
6:30-7	8	7.5	2	45	51	114411.1245	
7-7:30	8	7.5	2	45	51	114411.1245	
7:30-8	6	10	2	45	49	85808.34335	
8-8:30	6	10	2	45	49	85808.34335	

8:30-9	6	10	2	45	49	85808.34335	
9-9:30	5	12	2	45	49	71506.95279	
9:30-10	5	12	2	45	49	71506.95279	
10-10:30	5	12	2	45	49	71506.95279	
10:30-11	5	12	2	45	49	71506.95279	
11-11:30	5	12	2	45	49	71506.95279	
11:30-12midnight	5	12	2	45	49	71506.95279	
Peak Leq					51		
Day Leq						50	2860278
Night Leq						47	8580834
Ldn						**54**	
Kentlands							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Central Sta.													
			Sta. 189+36		**Rec.R-15(7)**	**Horn Blown**							
			Grade		**140**	**140**							
12-12:30am	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
12:30-1	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
5:30-6	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6-6:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6:30-7	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7-7:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7:30-8	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
8-8:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
8:30-9	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
9-9:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
9:30-10	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
10-10:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
10:30-11	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
11-11:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
11:30-12noon	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
12noon-12:30pm	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
12:30-1	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
1-1:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
1:30-2	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
2-2:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
2:30-3	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
3-3:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
3:30-4	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
4-4:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
4:30-5	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
5-5:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
5:30-6	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6-6:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6:30-7	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7-7:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7:30-8	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
8-8:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
8:30-9	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
9-9:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
9:30-10	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
10-10:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
10:30-11	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
11-11:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
11:30-12midnight	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
Peak Leq					44			66			66		
Day Leq						43	669215		65	93237942		65	93907157
Night Leq						40	2007644		62	279713826		62	281721470
Ldn						**47**			**69**			**69**	
LSC West 3 Sta.													

CCT LRT Ldn Receptor R-12(5) Alternative S2C

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Central Sta.							
			Sta. 208+40		**Rec.R-12(5)**	**Horn Not Blown**	
			Grade		**370**	**0**	
12-12:30am	5	12	2	35	43	21200.617	
12:30-1	5	12	2	35	43	21200.617	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	44	25440.7404	
5:30-6	8	7.5	2	35	45	33920.98721	
6-6:30	8	7.5	2	35	45	33920.98721	
6:30-7	8	7.5	2	35	45	33920.98721	
7-7:30	8	7.5	2	35	45	33920.98721	
7:30-8	8	7.5	2	35	45	33920.98721	
8-8:30	8	7.5	2	35	45	33920.98721	
8:30-9	8	7.5	2	35	45	33920.98721	
9-9:30	8	7.5	2	35	45	33920.98721	
9:30-10	6	10	2	35	44	25440.7404	
10-10:30	6	10	2	35	44	25440.7404	
10:30-11	6	10	2	35	44	25440.7404	
11-11:30	6	10	2	35	44	25440.7404	
11:30-12noon	6	10	2	35	44	25440.7404	
12noon-12:30pm	6	10	2	35	44	25440.7404	
12:30-1	6	10	2	35	44	25440.7404	
1-1:30	6	10	2	35	44	25440.7404	
1:30-2	6	10	2	35	44	25440.7404	
2-2:30	6	10	2	35	44	25440.7404	
2:30-3	6	10	2	35	44	25440.7404	
3-3:30	6	10	2	35	44	25440.7404	
3:30-4	6	10	2	35	44	25440.7404	
4-4:30	6	10	2	35	44	25440.7404	
4:30-5	8	7.5	2	35	45	33920.98721	
5-5:30	8	7.5	2	35	45	33920.98721	
5:30-6	8	7.5	2	35	45	33920.98721	
6-6:30	8	7.5	2	35	45	33920.98721	
6:30-7	8	7.5	2	35	45	33920.98721	
7-7:30	8	7.5	2	35	45	33920.98721	
7:30-8	6	10	2	35	44	25440.7404	
8-8:30	6	10	2	35	44	25440.7404	
8:30-9	6	10	2	35	44	25440.7404	

CCT LRT Ldn Receptor R-12(5) Alternative S2C

9-9:30	5	12	2	35	43	21200.617	
9:30-10	5	12	2	35	43	21200.617	
10-10:30	5	12	2	35	43	21200.617	
10:30-11	5	12	2	35	43	21200.617	
11-11:30	5	12	2	35	43	21200.617	
11:30-12midnight	5	12	2	35	43	21200.617	
Peak Leq					45		
Day Leq						45	848025
Night Leq						42	2544074
Ldn						**48**	
LSC West 3 Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC West 3 Sta.							
			Sta. 239+40 Grade		**Rec.R-10(4) 380**	**Horn Not Blown 0**	
12-12:30am	5	12	2	30	42	14965.18577	
12:30-1	5	12	2	30	42	14965.18577	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	30	43	17958.22293	
5:30-6	8	7.5	2	30	44	23944.29723	
6-6:30	8	7.5	2	30	44	23944.29723	
6:30-7	8	7.5	2	30	44	23944.29723	
7-7:30	8	7.5	2	30	44	23944.29723	
7:30-8	8	7.5	2	30	44	23944.29723	
8-8:30	8	7.5	2	30	44	23944.29723	
8:30-9	8	7.5	2	30	44	23944.29723	
9-9:30	8	7.5	2	30	44	23944.29723	
9:30-10	6	10	2	30	43	17958.22293	
10-10:30	6	10	2	30	43	17958.22293	
10:30-11	6	10	2	30	43	17958.22293	
11-11:30	6	10	2	30	43	17958.22293	
11:30-12noon	6	10	2	30	43	17958.22293	
12noon-12:30pm	6	10	2	30	43	17958.22293	
12:30-1	6	10	2	30	43	17958.22293	
1-1:30	6	10	2	30	43	17958.22293	
1:30-2	6	10	2	30	43	17958.22293	
2-2:30	6	10	2	30	43	17958.22293	
2:30-3	6	10	2	30	43	17958.22293	
3-3:30	6	10	2	30	43	17958.22293	
3:30-4	6	10	2	30	43	17958.22293	
4-4:30	6	10	2	30	43	17958.22293	
4:30-5	8	7.5	2	30	44	23944.29723	
5-5:30	8	7.5	2	30	44	23944.29723	
5:30-6	8	7.5	2	30	44	23944.29723	
6-6:30	8	7.5	2	30	44	23944.29723	
6:30-7	8	7.5	2	30	44	23944.29723	
7-7:30	8	7.5	2	30	44	23944.29723	
7:30-8	6	10	2	30	43	17958.22293	
8-8:30	6	10	2	30	43	17958.22293	

8:30-9	6	10	2	30	43	17958.22293	
9-9:30	5	12	2	30	42	14965.18577	
9:30-10	5	12	2	30	42	14965.18577	
10-10:30	5	12	2	30	42	14965.18577	
10:30-11	5	12	2	30	42	14965.18577	
11-11:30	5	12	2	30	42	14965.18577	
11:30-12midnight	5	12	2	30	42	14965.18577	
Peak Leq					44		
Day Leq						43	598607
Night Leq						40	1795822
Ldn						**47**	
LSC Belward 2 Sta.							

CCT LRT Ldn Receptor R-9(3) Alternative S2C

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
				Vehicle Leq			
LSC Belward 2 Sta.							
			Sta. 254+40		**Rec.R-9(3)**	**Horn Not Blown**	
			Grade		**215**	**0**	
12-12:30am	5	12	2	15	39	8791.031	
12:30-1	5	12	2	15	39	8791.031	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	15	40	10549.24	
5:30-6	8	7.5	2	15	41	14065.65	
6-6:30	8	7.5	2	15	41	14065.65	
6:30-7	8	7.5	2	15	41	14065.65	
7-7:30	8	7.5	2	15	41	14065.65	
7:30-8	8	7.5	2	15	41	14065.65	
8-8:30	8	7.5	2	15	41	14065.65	
8:30-9	8	7.5	2	15	41	14065.65	
9-9:30	8	7.5	2	15	41	14065.65	
9:30-10	6	10	2	15	40	10549.24	
10-10:30	6	10	2	15	40	10549.24	
10:30-11	6	10	2	15	40	10549.24	
11-11:30	6	10	2	15	40	10549.24	
11:30-12noon	6	10	2	15	40	10549.24	
12noon-12:30pm	6	10	2	15	40	10549.24	
12:30-1	6	10	2	15	40	10549.24	
1-1:30	6	10	2	15	40	10549.24	
1:30-2	6	10	2	15	40	10549.24	
2-2:30	6	10	2	15	40	10549.24	
2:30-3	6	10	2	15	40	10549.24	
3-3:30	6	10	2	15	40	10549.24	
3:30-4	6	10	2	15	40	10549.24	
4-4:30	6	10	2	15	40	10549.24	
4:30-5	8	7.5	2	15	41	14065.65	
5-5:30	8	7.5	2	15	41	14065.65	
5:30-6	8	7.5	2	15	41	14065.65	
6-6:30	8	7.5	2	15	41	14065.65	
6:30-7	8	7.5	2	15	41	14065.65	
7-7:30	8	7.5	2	15	41	14065.65	
7:30-8	6	10	2	15	40	10549.24	
8-8:30	6	10	2	15	40	10549.24	
8:30-9	6	10	2	15	40	10549.24	

CCT LRT Ldn Receptor R-9(3) Alternative S2C

9-9:30	5	12	2	15	39	8791.031	
9:30-10	5	12	2	15	39	8791.031	
10-10:30	5	12	2	15	39	8791.031	
10:30-11	5	12	2	15	39	8791.031	
11-11:30	5	12	2	15	39	8791.031	
11:30-12midnight	5	12	2	15	39	8791.031	
Peak Leq					41		
Day Leq						41	351641
Night Leq						38	1054924
Ldn						**45**	
Kentlands							

	Trains (two-way)	Headway (minutes)	# of Cars	Maximum Speed	Leq (dB)	Energy Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Belward 2 Sta.													
			Sta. 270+80 Grade		**Rec.R-8(T-8)(290**	**Horn Blown 290**							
12-12:30am	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
12:30-1	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
5:30-6	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
6-6:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
6:30-7	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
7-7:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
7:30-8	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
8-8:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
8:30-9	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
9-9:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
9:30-10	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
10-10:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
10:30-11	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
11-11:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
11:30-12noon	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
12noon-12:30pm	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
12:30-1	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
1-1:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
1:30-2	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
2-2:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
2:30-3	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
3-3:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
3:30-4	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
4-4:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
4:30-5	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
5-5:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
5:30-6	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
6-6:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
6:30-7	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
7-7:30	8	7.5	2	15	40	8978.846		59	869186		59	878164.89	
7:30-8	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
8-8:30	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
8:30-9	6	10	2	15	38	6734.134		58	651889.5		58	658623.67	
9-9:30	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
9:30-10	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
10-10:30	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
10:30-11	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
11-11:30	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
11:30-12midnight	5	12	2	15	37	5611.778		57	543241.3		57	548853.06	
Peak Leq					40			59			59		
Day Leq						39	224471		59	21729651		59	21954122
Night Leq						36	673413		56	65188953		56	65862367
Ldn						**43**			**63**			**63**	
Kentlands													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Central Sta.													
			Sta. 189+60 Grade		**Rec.R-15(7) 140**	**Horn Blown 140**							
12-12:30am	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
12:30-1	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
5:30-6	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6-6:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6:30-7	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7-7:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7:30-8	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
8-8:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
8:30-9	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
9-9:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
9:30-10	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
10-10:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
10:30-11	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
11-11:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
11:30-12noon	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
12noon-12:30pm	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
12:30-1	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
1-1:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
1:30-2	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
2-2:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
2:30-3	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
3-3:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
3:30-4	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
4-4:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
4:30-5	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
5-5:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
5:30-6	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6-6:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6:30-7	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7-7:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7:30-8	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
8-8:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
8:30-9	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
9-9:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
9:30-10	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
10-10:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
10:30-11	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
11-11:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
11:30-12midnight	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
Peak Leq					44			66			66		
Day Leq						43	669215		65	93237942		65	93907157
Night Leq						40	2007644		62	279713826		62	281721470
Ldn						**47**			**69**			**69**	
LSC West 3 Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Central Sta.													
			Sta. 208+50 Grade		**Rec.R-12(5) 370**	**Horn Not Blown 0**							
12-12:30am	5	12	2	35	43	21200.617			1		43	21201.617	
12:30-1	5	12	2	35	43	21200.617			1		43	21201.617	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	35	44	25440.7404			1		44	25441.74	
5:30-6	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6-6:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6:30-7	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7-7:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7:30-8	8	7.5	2	35	45	33920.98721			1		45	33921.987	
8-8:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
8:30-9	8	7.5	2	35	45	33920.98721			1		45	33921.987	
9-9:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
9:30-10	6	10	2	35	44	25440.7404			1		44	25441.74	
10-10:30	6	10	2	35	44	25440.7404			1		44	25441.74	
10:30-11	6	10	2	35	44	25440.7404			1		44	25441.74	
11-11:30	6	10	2	35	44	25440.7404			1		44	25441.74	
11:30-12noon	6	10	2	35	44	25440.7404			1		44	25441.74	
12noon-12:30pm	6	10	2	35	44	25440.7404			1		44	25441.74	
12:30-1	6	10	2	35	44	25440.7404			1		44	25441.74	
1-1:30	6	10	2	35	44	25440.7404			1		44	25441.74	
1:30-2	6	10	2	35	44	25440.7404			1		44	25441.74	
2-2:30	6	10	2	35	44	25440.7404			1		44	25441.74	
2:30-3	6	10	2	35	44	25440.7404			1		44	25441.74	
3-3:30	6	10	2	35	44	25440.7404			1		44	25441.74	
3:30-4	6	10	2	35	44	25440.7404			1		44	25441.74	
4-4:30	6	10	2	35	44	25440.7404			1		44	25441.74	
4:30-5	8	7.5	2	35	45	33920.98721			1		45	33921.987	
5-5:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
5:30-6	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6-6:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6:30-7	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7-7:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7:30-8	6	10	2	35	44	25440.7404			1		44	25441.74	
8-8:30	6	10	2	35	44	25440.7404			1		44	25441.74	
8:30-9	6	10	2	35	44	25440.7404			1		44	25441.74	
9-9:30	5	12	2	35	43	21200.617			1		43	21201.617	
9:30-10	5	12	2	35	43	21200.617			1		43	21201.617	
10-10:30	5	12	2	35	43	21200.617			1		43	21201.617	
10:30-11	5	12	2	35	43	21200.617			1		43	21201.617	
11-11:30	5	12	2	35	43	21200.617			1		43	21201.617	
11:30-12midnight	5	12	2	35	43	21200.617			1		43	21201.617	
Peak Leq					45						45		
Day Leq						45	848025		0	30		45	848055
Night Leq						42	2544074		-3	100		42	2544174
Ldn						**48**			**4**			**48**	
LSC West 3 Sta.													

	Trains (two-way)	Headway (minutes)	# of Cars	Maximum Speed	Leq (dB)	Energy Power
					Vehicle Leq	
LSC Belward Sta.						
			Sta. 247+50 Grade		**Rec.R-10(T-7) 230**	**Horn Not Blown 0**
12-12:30am	5	12	2	20	41	14124.83018
12:30-1	5	12	2	20	41	14124.83018
1-1:30						
1:30-2						
2-2:30						
2:30-3						
3-3:30						
3:30-4						
4-4:30						
4:30-5						
5-5:30	6	10	2	20	42	16949.79622
5:30-6	8	7.5	2	20	44	22599.72829
6-6:30	8	7.5	2	20	44	22599.72829
6:30-7	8	7.5	2	20	44	22599.72829
7-7:30	8	7.5	2	20	44	22599.72829
7:30-8	8	7.5	2	20	44	22599.72829
8-8:30	8	7.5	2	20	44	22599.72829
8:30-9	8	7.5	2	20	44	22599.72829
9-9:30	8	7.5	2	20	44	22599.72829
9:30-10	6	10	2	20	42	16949.79622
10-10:30	6	10	2	20	42	16949.79622
10:30-11	6	10	2	20	42	16949.79622
11-11:30	6	10	2	20	42	16949.79622
11:30-12noon	6	10	2	20	42	16949.79622
12noon-12:30pm	6	10	2	20	42	16949.79622
12:30-1	6	10	2	20	42	16949.79622
1-1:30	6	10	2	20	42	16949.79622
1:30-2	6	10	2	20	42	16949.79622
2-2:30	6	10	2	20	42	16949.79622
2:30-3	6	10	2	20	42	16949.79622
3-3:30	6	10	2	20	42	16949.79622
3:30-4	6	10	2	20	42	16949.79622
4-4:30	6	10	2	20	42	16949.79622
4:30-5	8	7.5	2	20	44	22599.72829
5-5:30	8	7.5	2	20	44	22599.72829
5:30-6	8	7.5	2	20	44	22599.72829
6-6:30	8	7.5	2	20	44	22599.72829
6:30-7	8	7.5	2	20	44	22599.72829
7-7:30	8	7.5	2	20	44	22599.72829
7:30-8	6	10	2	20	42	16949.79622
8-8:30	6	10	2	20	42	16949.79622
8:30-9	6	10	2	20	42	16949.79622
9-9:30	5	12	2	20	41	14124.83018
9:30-10	5	12	2	20	41	14124.83018
10-10:30	5	12	2	20	41	14124.83018

10:30-11	5	12	2	20	41	14124.83018	
11-11:30	5	12	2	20	41	14124.83018	
11:30-12midnight	5	12	2	20	41	14124.83018	
Peak Leq					44		
Day Leq						43	564993
Night Leq						40	1694980
Ldn						**47**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Belward Sta.													
			Sta. 262+80		**R-8(T-8)(10)**	**Horn Blown**							
			Grade		**180**	**180**							
12-12:30am	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
12:30-1	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
5:30-6	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6-6:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6:30-7	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7-7:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7:30-8	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
8-8:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
8:30-9	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
9-9:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
9:30-10	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
10-10:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
10:30-11	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
11-11:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
11:30-12noon	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
12noon-12:30pm	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
12:30-1	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
1-1:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
1:30-2	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
2-2:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
2:30-3	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
3-3:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
3:30-4	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
4-4:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
4:30-5	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
5-5:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
5:30-6	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6-6:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6:30-7	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7-7:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7:30-8	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
8-8:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
8:30-9	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
9-9:30	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
9:30-10	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
10-10:30	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
10:30-11	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
11-11:30	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
11:30-12midnight	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
Peak Leq					51			59			60		
Day Leq						50	3264271		58	21151200		59	24415471
Night Leq						47	9792813		55	63453599		56	73246412
Ldn						**54**			**62**			**63**	
Kentlands Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Central Sta.													
			Sta. 189+60 Grade		**Rec.R-15(7) 140**	**Horn Blown 140**							
12-12:30am	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
12:30-1	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
5:30-6	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6-6:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6:30-7	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7-7:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7:30-8	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
8-8:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
8:30-9	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
9-9:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
9:30-10	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
10-10:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
10:30-11	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
11-11:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
11:30-12noon	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
12noon-12:30pm	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
12:30-1	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
1-1:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
1:30-2	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
2-2:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
2:30-3	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
3-3:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
3:30-4	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
4-4:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
4:30-5	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
5-5:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
5:30-6	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6-6:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
6:30-7	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7-7:30	8	7.5	2	15	44	26768.58687		66	3729517.7		66	3756286.3	
7:30-8	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
8-8:30	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
8:30-9	6	10	2	15	43	20076.44015		64	2797138.3		64	2817214.7	
9-9:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
9:30-10	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
10-10:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
10:30-11	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
11-11:30	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
11:30-12midnight	5	12	2	15	42	16730.36679		64	2330948.5		64	2347678.9	
Peak Leq					44			66			66		
Day Leq						43	669215		65	93237942		65	93907157
Night Leq						40	2007644		62	279713826		62	281721470
Ldn						**47**			**69**			**69**	
LSC West 2 Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Central Sta.													
			Sta. 209+30 Grade		**Rec.R-12(5) 290**	**Horn Not Blown 0**							
12-12:30am	5	12	2	30	44	22447.11391			1		44	22448.114	
12:30-1	5	12	2	30	44	22447.11391			1		44	22448.114	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	30	44	26936.53669			1		44	26937.537	
5:30-6	8	7.5	2	30	46	35915.38225			1		46	35916.382	
6-6:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
6:30-7	8	7.5	2	30	46	35915.38225			1		46	35916.382	
7-7:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
7:30-8	8	7.5	2	30	46	35915.38225			1		46	35916.382	
8-8:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
8:30-9	8	7.5	2	30	46	35915.38225			1		46	35916.382	
9-9:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
9:30-10	6	10	2	30	44	26936.53669			1		44	26937.537	
10-10:30	6	10	2	30	44	26936.53669			1		44	26937.537	
10:30-11	6	10	2	30	44	26936.53669			1		44	26937.537	
11-11:30	6	10	2	30	44	26936.53669			1		44	26937.537	
11:30-12noon	6	10	2	30	44	26936.53669			1		44	26937.537	
12noon-12:30pm	6	10	2	30	44	26936.53669			1		44	26937.537	
12:30-1	6	10	2	30	44	26936.53669			1		44	26937.537	
1-1:30	6	10	2	30	44	26936.53669			1		44	26937.537	
1:30-2	6	10	2	30	44	26936.53669			1		44	26937.537	
2-2:30	6	10	2	30	44	26936.53669			1		44	26937.537	
2:30-3	6	10	2	30	44	26936.53669			1		44	26937.537	
3-3:30	6	10	2	30	44	26936.53669			1		44	26937.537	
3:30-4	6	10	2	30	44	26936.53669			1		44	26937.537	
4-4:30	6	10	2	30	44	26936.53669			1		44	26937.537	
4:30-5	8	7.5	2	30	46	35915.38225			1		46	35916.382	
5-5:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
5:30-6	8	7.5	2	30	46	35915.38225			1		46	35916.382	
6-6:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
6:30-7	8	7.5	2	30	46	35915.38225			1		46	35916.382	
7-7:30	8	7.5	2	30	46	35915.38225			1		46	35916.382	
7:30-8	6	10	2	30	44	26936.53669			1		44	26937.537	
8-8:30	6	10	2	30	44	26936.53669			1		44	26937.537	
8:30-9	6	10	2	30	44	26936.53669			1		44	26937.537	
9-9:30	5	12	2	30	44	22447.11391			1		44	22448.114	
9:30-10	5	12	2	30	44	22447.11391			1		44	22448.114	
10-10:30	5	12	2	30	44	22447.11391			1		44	22448.114	
10:30-11	5	12	2	30	44	22447.11391			1		44	22448.114	
11-11:30	5	12	2	30	44	22447.11391			1		44	22448.114	
11:30-12midnight	5	12	2	30	44	22447.11391			1		44	22448.114	
Peak Leq					46						46		
Day Leq						45	897885		0	30		45	897915
Night Leq						42	2693654		-3	100		42	2693754
Ldn						**49**			**4**			**49**	
LSC West 2 Sta.													

	Trains (two-way)	Headway (minutes)	# of Cars	Maximum Speed	Leq (dB)	Energy Power
					Vehicle Leq	
LSC Belward 3 Sta.						
			Sta. 247+50 Grade		**Rec.R-10(T-7) 230**	**Horn Not Blown 0**
12-12:30am	5	12	2	35	46	43257.29243
12:30-1	5	12	2	35	46	43257.29243
1-1:30						
1:30-2						
2-2:30						
2:30-3						
3-3:30						
3:30-4						
4-4:30						
4:30-5						
5-5:30	6	10	2	35	47	51908.75092
5:30-6	8	7.5	2	35	48	69211.66789
6-6:30	8	7.5	2	35	48	69211.66789
6:30-7	8	7.5	2	35	48	69211.66789
7-7:30	8	7.5	2	35	48	69211.66789
7:30-8	8	7.5	2	35	48	69211.66789
8-8:30	8	7.5	2	35	48	69211.66789
8:30-9	8	7.5	2	35	48	69211.66789
9-9:30	8	7.5	2	35	48	69211.66789
9:30-10	6	10	2	35	47	51908.75092
10-10:30	6	10	2	35	47	51908.75092
10:30-11	6	10	2	35	47	51908.75092
11-11:30	6	10	2	35	47	51908.75092
11:30-12noon	6	10	2	35	47	51908.75092
12noon-12:30pm	6	10	2	35	47	51908.75092
12:30-1	6	10	2	35	47	51908.75092
1-1:30	6	10	2	35	47	51908.75092
1:30-2	6	10	2	35	47	51908.75092
2-2:30	6	10	2	35	47	51908.75092
2:30-3	6	10	2	35	47	51908.75092
3-3:30	6	10	2	35	47	51908.75092
3:30-4	6	10	2	35	47	51908.75092
4-4:30	6	10	2	35	47	51908.75092
4:30-5	8	7.5	2	35	48	69211.66789
5-5:30	8	7.5	2	35	48	69211.66789
5:30-6	8	7.5	2	35	48	69211.66789
6-6:30	8	7.5	2	35	48	69211.66789
6:30-7	8	7.5	2	35	48	69211.66789
7-7:30	8	7.5	2	35	48	69211.66789
7:30-8	6	10	2	35	47	51908.75092
8-8:30	6	10	2	35	47	51908.75092
8:30-9	6	10	2	35	47	51908.75092
9-9:30	5	12	2	35	46	43257.29243
9:30-10	5	12	2	35	46	43257.29243
10-10:30	5	12	2	35	46	43257.29243

10:30-11	5	12	2	35	46	43257.29243	
11-11:30	5	12	2	35	46	43257.29243	
11:30-12midnight	5	12	2	35	46	43257.29243	
Peak Leq					48		
Day Leq						48	1730292
Night Leq						45	5190875
Ldn						**52**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Belward 3 Sta.													
			Sta. 262+80 Grade		**R-8(T-8)(10) 180**	**Horn Blown 180**							
12-12:30am	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
12:30-1	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
5:30-6	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
6-6:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
6:30-7	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
7-7:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
7:30-8	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
8-8:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
8:30-9	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
9-9:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
9:30-10	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
10-10:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
10:30-11	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
11-11:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
11:30-12noon	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
12noon-12:30pm	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
12:30-1	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
1-1:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
1:30-2	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
2-2:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
2:30-3	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
3-3:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
3:30-4	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
4-4:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
4:30-5	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
5-5:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
5:30-6	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
6-6:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
6:30-7	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
7-7:30	8	7.5	2	35	50	99968.30108		60	966911.99		60	1066880.3	
7:30-8	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
8-8:30	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
8:30-9	6	10	2	35	49	74976.22581		59	725183.99		59	800160.22	
9-9:30	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
9:30-10	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
10-10:30	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
10:30-11	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
11-11:30	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
11:30-12midnight	5	12	2	35	48	62480.18818		58	604319.99		58	666800.18	
Peak Leq					50			60			60		
Day Leq						49	2499208		59	24172800		59	26672007
Night Leq						46	7497623		56	72518399		56	80016022
Ldn						**53**			**63**			**63**	
Kentlands Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Central Sta.							
			Sta. 187+30		**Rec.R-13(6)**	**Horn Not Blown**	
			Grade		**70**	**0**	
12-12:30am	5	12	2	30	53	189282.493	
12:30-1	5	12	2	30	53	189282.493	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	30	54	227138.9916	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	8	7.5	2	30	55	302851.9887	
8-8:30	8	7.5	2	30	55	302851.9887	
8:30-9	8	7.5	2	30	55	302851.9887	
9-9:30	8	7.5	2	30	55	302851.9887	
9:30-10	6	10	2	30	54	227138.9916	
10-10:30	6	10	2	30	54	227138.9916	
10:30-11	6	10	2	30	54	227138.9916	
11-11:30	6	10	2	30	54	227138.9916	
11:30-12noon	6	10	2	30	54	227138.9916	
12noon-12:30pm	6	10	2	30	54	227138.9916	
12:30-1	6	10	2	30	54	227138.9916	
1-1:30	6	10	2	30	54	227138.9916	
1:30-2	6	10	2	30	54	227138.9916	
2-2:30	6	10	2	30	54	227138.9916	
2:30-3	6	10	2	30	54	227138.9916	
3-3:30	6	10	2	30	54	227138.9916	
3:30-4	6	10	2	30	54	227138.9916	
4-4:30	6	10	2	30	54	227138.9916	
4:30-5	8	7.5	2	30	55	302851.9887	
5-5:30	8	7.5	2	30	55	302851.9887	
5:30-6	8	7.5	2	30	55	302851.9887	
6-6:30	8	7.5	2	30	55	302851.9887	
6:30-7	8	7.5	2	30	55	302851.9887	
7-7:30	8	7.5	2	30	55	302851.9887	
7:30-8	6	10	2	30	54	227138.9916	
8-8:30	6	10	2	30	54	227138.9916	
8:30-9	6	10	2	30	54	227138.9916	
9-9:30	5	12	2	30	53	189282.493	
9:30-10	5	12	2	30	53	189282.493	
10-10:30	5	12	2	30	53	189282.493	

10:30-11	5	12	2	30	53	189282.493	
11-11:30	5	12	2	30	53	189282.493	
11:30-12midnight	5	12	2	30	53	189282.493	
Peak Leq					55		
Day Leq						54	7571300
Night Leq						51	22713899
Ldn						**58**	
LSC West Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC West Sta.													
			Sta. 204+50		**Rec.R-12(5)**	**Horn Not Blown**							
			Grade		**475**	**0**							
12-12:30am	5	12	2	15	34	2677.053814			1		34	2678.0538	
12:30-1	5	12	2	15	34	2677.053814			1		34	2678.0538	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
5:30-6	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
6-6:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
6:30-7	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
7-7:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
7:30-8	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
8-8:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
8:30-9	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
9-9:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
9:30-10	6	10	2	15	35	3212.464577			1		35	3213.4646	
10-10:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
10:30-11	6	10	2	15	35	3212.464577			1		35	3213.4646	
11-11:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
11:30-12noon	6	10	2	15	35	3212.464577			1		35	3213.4646	
12noon-12:30pm	6	10	2	15	35	3212.464577			1		35	3213.4646	
12:30-1	6	10	2	15	35	3212.464577			1		35	3213.4646	
1-1:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
1:30-2	6	10	2	15	35	3212.464577			1		35	3213.4646	
2-2:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
2:30-3	6	10	2	15	35	3212.464577			1		35	3213.4646	
3-3:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
3:30-4	6	10	2	15	35	3212.464577			1		35	3213.4646	
4-4:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
4:30-5	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
5-5:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
5:30-6	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
6-6:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
6:30-7	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
7-7:30	8	7.5	2	15	36	4283.286103			1		36	4284.2861	
7:30-8	6	10	2	15	35	3212.464577			1		35	3213.4646	
8-8:30	6	10	2	15	35	3212.464577			1		35	3213.4646	
8:30-9	6	10	2	15	35	3212.464577			1		35	3213.4646	
9-9:30	5	12	2	15	34	2677.053814			1		34	2678.0538	
9:30-10	5	12	2	15	34	2677.053814			1		34	2678.0538	
10-10:30	5	12	2	15	34	2677.053814			1		34	2678.0538	
10:30-11	5	12	2	15	34	2677.053814			1		34	2678.0538	
11-11:30	5	12	2	15	34	2677.053814			1		34	2678.0538	
11:30-12midnight	5	12	2	15	34	2677.053814			1		34	2678.0538	
Peak Leq					36						36		
Day Leq						36	107082		0	30		36	107112
Night Leq						33	321246		-3	100		33	321346
Ldn						**40**			**4**			**40**	
LSC Belward Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC West Sta.													
			Sta. 223+25		**Rec.R-11(4**	**Horn Not Blown**							
			Grade		**900**	**0**							
12-12:30am	5	12	2	25	35	2851.223			1		35	2852.223	
12:30-1	5	12	2	25	35	2851.223			1		35	2852.223	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	25	35	3421.468			1		35	3422.468	
5:30-6	8	7.5	2	25	37	4561.957			1		37	4562.957	
6-6:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
6:30-7	8	7.5	2	25	37	4561.957			1		37	4562.957	
7-7:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
7:30-8	8	7.5	2	25	37	4561.957			1		37	4562.957	
8-8:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
8:30-9	8	7.5	2	25	37	4561.957			1		37	4562.957	
9-9:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
9:30-10	6	10	2	25	35	3421.468			1		35	3422.468	
10-10:30	6	10	2	25	35	3421.468			1		35	3422.468	
10:30-11	6	10	2	25	35	3421.468			1		35	3422.468	
11-11:30	6	10	2	25	35	3421.468			1		35	3422.468	
11:30-12noon	6	10	2	25	35	3421.468			1		35	3422.468	
12noon-12:30pm	6	10	2	25	35	3421.468			1		35	3422.468	
12:30-1	6	10	2	25	35	3421.468			1		35	3422.468	
1-1:30	6	10	2	25	35	3421.468			1		35	3422.468	
1:30-2	6	10	2	25	35	3421.468			1		35	3422.468	
2-2:30	6	10	2	25	35	3421.468			1		35	3422.468	
2:30-3	6	10	2	25	35	3421.468			1		35	3422.468	
3-3:30	6	10	2	25	35	3421.468			1		35	3422.468	
3:30-4	6	10	2	25	35	3421.468			1		35	3422.468	
4-4:30	6	10	2	25	35	3421.468			1		35	3422.468	
4:30-5	8	7.5	2	25	37	4561.957			1		37	4562.957	
5-5:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
5:30-6	8	7.5	2	25	37	4561.957			1		37	4562.957	
6-6:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
6:30-7	8	7.5	2	25	37	4561.957			1		37	4562.957	
7-7:30	8	7.5	2	25	37	4561.957			1		37	4562.957	
7:30-8	6	10	2	25	35	3421.468			1		35	3422.468	
8-8:30	6	10	2	25	35	3421.468			1		35	3422.468	
8:30-9	6	10	2	25	35	3421.468			1		35	3422.468	
9-9:30	5	12	2	25	35	2851.223			1		35	2852.223	
9:30-10	5	12	2	25	35	2851.223			1		35	2852.223	
10-10:30	5	12	2	25	35	2851.223			1		35	2852.223	
10:30-11	5	12	2	25	35	2851.223			1		35	2852.223	
11-11:30	5	12	2	25	35	2851.223			1		35	2852.223	
11:30-12midnight	5	12	2	25	35	2851.223			1		35	2852.223	
Peak Leq					37						37		
Day Leq						36	114049		0	30		36	114079
Night Leq						33	342147		-3	100		33	342247
Ldn						**40**			**4**			**40**	
LSC Belward Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy	
	(two-way)	(minutes)	Cars	Speed		Power	
					Vehicle Leq		
LSC Belward Sta.							
			Sta. 247+50		**Rec.R-10(T-7)**	**Horn Not Blown**	
			Grade		**230**	**0**	
12-12:30am	5	12	2	35	46	43257.29243	
12:30-1	5	12	2	35	46	43257.29243	
1-1:30							
1:30-2							
2-2:30							
2:30-3							
3-3:30							
3:30-4							
4-4:30							
4:30-5							
5-5:30	6	10	2	35	47	51908.75092	
5:30-6	8	7.5	2	35	48	69211.66789	
6-6:30	8	7.5	2	35	48	69211.66789	
6:30-7	8	7.5	2	35	48	69211.66789	
7-7:30	8	7.5	2	35	48	69211.66789	
7:30-8	8	7.5	2	35	48	69211.66789	
8-8:30	8	7.5	2	35	48	69211.66789	
8:30-9	8	7.5	2	35	48	69211.66789	
9-9:30	8	7.5	2	35	48	69211.66789	
9:30-10	6	10	2	35	47	51908.75092	
10-10:30	6	10	2	35	47	51908.75092	
10:30-11	6	10	2	35	47	51908.75092	
11-11:30	6	10	2	35	47	51908.75092	
11:30-12noon	6	10	2	35	47	51908.75092	
12noon-12:30pm	6	10	2	35	47	51908.75092	
12:30-1	6	10	2	35	47	51908.75092	
1-1:30	6	10	2	35	47	51908.75092	
1:30-2	6	10	2	35	47	51908.75092	
2-2:30	6	10	2	35	47	51908.75092	
2:30-3	6	10	2	35	47	51908.75092	
3-3:30	6	10	2	35	47	51908.75092	
3:30-4	6	10	2	35	47	51908.75092	
4-4:30	6	10	2	35	47	51908.75092	
4:30-5	8	7.5	2	35	48	69211.66789	
5-5:30	8	7.5	2	35	48	69211.66789	
5:30-6	8	7.5	2	35	48	69211.66789	
6-6:30	8	7.5	2	35	48	69211.66789	
6:30-7	8	7.5	2	35	48	69211.66789	
7-7:30	8	7.5	2	35	48	69211.66789	
7:30-8	6	10	2	35	47	51908.75092	
8-8:30	6	10	2	35	47	51908.75092	
8:30-9	6	10	2	35	47	51908.75092	
9-9:30	5	12	2	35	46	43257.29243	
9:30-10	5	12	2	35	46	43257.29243	
10-10:30	5	12	2	35	46	43257.29243	

10:30-11	5	12	2	35	46	43257.29243	
11-11:30	5	12	2	35	46	43257.29243	
11:30-12midnight	5	12	2	35	46	43257.29243	
Peak Leq					48		
Day Leq						48	1730292
Night Leq						45	5190875
Ldn						**52**	
Kentlands	**Sta.**						

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Belward Sta.													
			Sta. 262+80 Grade		**R-8(T-8)(10) 180**	**Horn Blown 180**							
12-12:30am	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
12:30-1	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
5:30-6	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
6-6:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
6:30-7	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
7-7:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
7:30-8	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
8-8:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
8:30-9	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
9-9:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
9:30-10	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
10-10:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
10:30-11	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
11-11:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
11:30-12noon	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
12noon-12:30pm	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
12:30-1	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
1-1:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
1:30-2	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
2-2:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
2:30-3	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
3-3:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
3:30-4	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
4-4:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
4:30-5	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
5-5:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
5:30-6	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
6-6:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
6:30-7	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
7-7:30	8	7.5	2	45	52	165253.7222		59	752042.66		60	917296.38	
7:30-8	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
8-8:30	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
8:30-9	6	10	2	45	51	123940.2917		58	564031.99		58	687972.29	
9-9:30	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
9:30-10	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
10-10:30	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
10:30-11	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
11-11:30	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
11:30-12midnight	5	12	2	45	50	103283.5764		57	470026.66		58	573310.24	
Peak Leq					52			59			60		
Day Leq						51	4131343		58	18801066		59	22932410
Night Leq						48	12394029		55	56403199		56	68797229
Ldn						**55**			**62**			**63**	
Kentlands Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Central Sta.													
			Sta. 189+60		**Rec.R-15(7)**	**Horn Blown**							
			Grade		**140**	**140**							
12-12:30am	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
12:30-1	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
5:30-6	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
6-6:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
6:30-7	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
7-7:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
7:30-8	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
8-8:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
8:30-9	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
9-9:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
9:30-10	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
10-10:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
10:30-11	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
11-11:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
11:30-12noon	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
12noon-12:30pm	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
12:30-1	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
1-1:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
1:30-2	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
2-2:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
2:30-3	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
3-3:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
3:30-4	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
4-4:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
4:30-5	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
5-5:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
5:30-6	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
6-6:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
6:30-7	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
7-7:30	8	7.5	2	30	50	107074.3475		63	1864758.8		63	1971833.2	
7:30-8	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
8-8:30	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
8:30-9	6	10	2	30	49	80305.7606		61	1398569.1		62	1478874.9	
9-9:30	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
9:30-10	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
10-10:30	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
10:30-11	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
11-11:30	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
11:30-12midnight	5	12	2	30	48	66921.46717		61	1165474.3		61	1232395.7	
Peak Leq					50			63			63		
Day Leq						50	2676859		62	46618971		62	49295830
Night Leq						46	8030576		59	139856913		59	147887489
Ldn						**53**			**66**			**66**	
LSC West 3 Sta.													

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC West 3 Sta.													
			Sta. 208+50		**Rec.R-12(5)**	**Horn Not Blown**							
			Grade		**370**	**0**							
12-12:30am	5	12	2	35	43	21200.617			1		43	21201.617	
12:30-1	5	12	2	35	43	21200.617			1		43	21201.617	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	35	44	25440.7404			1		44	25441.74	
5:30-6	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6-6:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6:30-7	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7-7:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7:30-8	8	7.5	2	35	45	33920.98721			1		45	33921.987	
8-8:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
8:30-9	8	7.5	2	35	45	33920.98721			1		45	33921.987	
9-9:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
9:30-10	6	10	2	35	44	25440.7404			1		44	25441.74	
10-10:30	6	10	2	35	44	25440.7404			1		44	25441.74	
10:30-11	6	10	2	35	44	25440.7404			1		44	25441.74	
11-11:30	6	10	2	35	44	25440.7404			1		44	25441.74	
11:30-12noon	6	10	2	35	44	25440.7404			1		44	25441.74	
12noon-12:30pm	6	10	2	35	44	25440.7404			1		44	25441.74	
12:30-1	6	10	2	35	44	25440.7404			1		44	25441.74	
1-1:30	6	10	2	35	44	25440.7404			1		44	25441.74	
1:30-2	6	10	2	35	44	25440.7404			1		44	25441.74	
2-2:30	6	10	2	35	44	25440.7404			1		44	25441.74	
2:30-3	6	10	2	35	44	25440.7404			1		44	25441.74	
3-3:30	6	10	2	35	44	25440.7404			1		44	25441.74	
3:30-4	6	10	2	35	44	25440.7404			1		44	25441.74	
4-4:30	6	10	2	35	44	25440.7404			1		44	25441.74	
4:30-5	8	7.5	2	35	45	33920.98721			1		45	33921.987	
5-5:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
5:30-6	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6-6:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
6:30-7	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7-7:30	8	7.5	2	35	45	33920.98721			1		45	33921.987	
7:30-8	6	10	2	35	44	25440.7404			1		44	25441.74	
8-8:30	6	10	2	35	44	25440.7404			1		44	25441.74	
8:30-9	6	10	2	35	44	25440.7404			1		44	25441.74	
9-9:30	5	12	2	35	43	21200.617			1		43	21201.617	
9:30-10	5	12	2	35	43	21200.617			1		43	21201.617	
10-10:30	5	12	2	35	43	21200.617			1		43	21201.617	
10:30-11	5	12	2	35	43	21200.617			1		43	21201.617	
11-11:30	5	12	2	35	43	21200.617			1		43	21201.617	
11:30-12midnight	5	12	2	35	43	21200.617			1		43	21201.617	
Peak Leq					45						45		
Day Leq						45	848025		0	30		45	848055
Night Leq						42	2544074		-3	100		42	2544174
Ldn						**48**			**4**			**48**	
LSC Belward Sta.													

	Trains (two-way)	Headway (minutes)	# of Cars	Maximum Speed	Leq (dB)	Energy Power							
					Vehicle Leq			**Horn Leq**				**Combined Leq**	
LSC West 3 Sta.													
			Sta. 223+25 Grade		**Rec.R-11(4 900**	**Horn Not Blown 0**							
12-12:30am	5	12	2	30	36	4105.762			1		36	4106.762	
12:30-1	5	12	2	30	36	4105.762			1		36	4106.762	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	30	37	4926.914			1		37	4927.914	
5:30-6	8	7.5	2	30	38	6569.219			1		38	6570.219	
6-6:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
6:30-7	8	7.5	2	30	38	6569.219			1		38	6570.219	
7-7:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
7:30-8	8	7.5	2	30	38	6569.219			1		38	6570.219	
8-8:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
8:30-9	8	7.5	2	30	38	6569.219			1		38	6570.219	
9-9:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
9:30-10	6	10	2	30	37	4926.914			1		37	4927.914	
10-10:30	6	10	2	30	37	4926.914			1		37	4927.914	
10:30-11	6	10	2	30	37	4926.914			1		37	4927.914	
11-11:30	6	10	2	30	37	4926.914			1		37	4927.914	
11:30-12noon	6	10	2	30	37	4926.914			1		37	4927.914	
12noon-12:30pm	6	10	2	30	37	4926.914			1		37	4927.914	
12:30-1	6	10	2	30	37	4926.914			1		37	4927.914	
1-1:30	6	10	2	30	37	4926.914			1		37	4927.914	
1:30-2	6	10	2	30	37	4926.914			1		37	4927.914	
2-2:30	6	10	2	30	37	4926.914			1		37	4927.914	
2:30-3	6	10	2	30	37	4926.914			1		37	4927.914	
3-3:30	6	10	2	30	37	4926.914			1		37	4927.914	
3:30-4	6	10	2	30	37	4926.914			1		37	4927.914	
4-4:30	6	10	2	30	37	4926.914			1		37	4927.914	
4:30-5	8	7.5	2	30	38	6569.219			1		38	6570.219	
5-5:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
5:30-6	8	7.5	2	30	38	6569.219			1		38	6570.219	
6-6:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
6:30-7	8	7.5	2	30	38	6569.219			1		38	6570.219	
7-7:30	8	7.5	2	30	38	6569.219			1		38	6570.219	
7:30-8	6	10	2	30	37	4926.914			1		37	4927.914	
8-8:30	6	10	2	30	37	4926.914			1		37	4927.914	
8:30-9	6	10	2	30	37	4926.914			1		37	4927.914	
9-9:30	5	12	2	30	36	4105.762			1		36	4106.762	
9:30-10	5	12	2	30	36	4105.762			1		36	4106.762	
10-10:30	5	12	2	30	36	4105.762			1		36	4106.762	
10:30-11	5	12	2	30	36	4105.762			1		36	4106.762	
11-11:30	5	12	2	30	36	4105.762			1		36	4106.762	
11:30-12midnight	5	12	2	30	36	4105.762			1		36	4106.762	
Peak Leq					38						38		
Day Leq						37	164230		0	30		37	164260
Night Leq						34	492691		-3	100		34	492791
Ldn						**41**			**4**			**41**	
LSC Belward Sta.													

	Trains (two-way)	Headway (minutes)	# of Cars	Maximum Speed	Leq (dB)	Energy Power
					Vehicle Leq	
LSC Belward Sta.						
			Sta. 247+50 Grade		**Rec.R-10(T-7) 230**	**Horn Not Blown 0**
12-12:30am	5	12	2	20	41	14124.83018
12:30-1	5	12	2	20	41	14124.83018
1-1:30						
1:30-2						
2-2:30						
2:30-3						
3-3:30						
3:30-4						
4-4:30						
4:30-5						
5-5:30	6	10	2	20	42	16949.79622
5:30-6	8	7.5	2	20	44	22599.72829
6-6:30	8	7.5	2	20	44	22599.72829
6:30-7	8	7.5	2	20	44	22599.72829
7-7:30	8	7.5	2	20	44	22599.72829
7:30-8	8	7.5	2	20	44	22599.72829
8-8:30	8	7.5	2	20	44	22599.72829
8:30-9	8	7.5	2	20	44	22599.72829
9-9:30	8	7.5	2	20	44	22599.72829
9:30-10	6	10	2	20	42	16949.79622
10-10:30	6	10	2	20	42	16949.79622
10:30-11	6	10	2	20	42	16949.79622
11-11:30	6	10	2	20	42	16949.79622
11:30-12noon	6	10	2	20	42	16949.79622
12noon-12:30pm	6	10	2	20	42	16949.79622
12:30-1	6	10	2	20	42	16949.79622
1-1:30	6	10	2	20	42	16949.79622
1:30-2	6	10	2	20	42	16949.79622
2-2:30	6	10	2	20	42	16949.79622
2:30-3	6	10	2	20	42	16949.79622
3-3:30	6	10	2	20	42	16949.79622
3:30-4	6	10	2	20	42	16949.79622
4-4:30	6	10	2	20	42	16949.79622
4:30-5	8	7.5	2	20	44	22599.72829
5-5:30	8	7.5	2	20	44	22599.72829
5:30-6	8	7.5	2	20	44	22599.72829
6-6:30	8	7.5	2	20	44	22599.72829
6:30-7	8	7.5	2	20	44	22599.72829
7-7:30	8	7.5	2	20	44	22599.72829
7:30-8	6	10	2	20	42	16949.79622
8-8:30	6	10	2	20	42	16949.79622
8:30-9	6	10	2	20	42	16949.79622
9-9:30	5	12	2	20	41	14124.83018
9:30-10	5	12	2	20	41	14124.83018
10-10:30	5	12	2	20	41	14124.83018

10:30-11	5	12	2	20	41	14124.83018	
11-11:30	5	12	2	20	41	14124.83018	
11:30-12midnight	5	12	2	20	41	14124.83018	
Peak Leq					44		
Day Leq						43	564993
Night Leq						40	1694980
Ldn						**47**	
Kentlands Sta.							

	Trains	Headway	# of	Maximum	Leq (dB)	Energy							
	(two-way)	(minutes)	Cars	Speed		Power							
					Vehicle Leq			**Horn Leq**			**Combined Leq**		
LSC Belward Sta.													
			Sta. 262+80		**R-8(T-8)(10)**	**Horn Blown**							
			Grade		**180**	**180**							
12-12:30am	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
12:30-1	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
5:30-6	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6-6:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6:30-7	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7-7:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7:30-8	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
8-8:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
8:30-9	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
9-9:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
9:30-10	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
10-10:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
10:30-11	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
11-11:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
11:30-12noon	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
12noon-12:30pm	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
12:30-1	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
1-1:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
1:30-2	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
2-2:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
2:30-3	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
3-3:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
3:30-4	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
4-4:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
4:30-5	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
5-5:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
5:30-6	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6-6:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
6:30-7	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7-7:30	8	7.5	2	40	51	130570.8422		59	846047.99		60	976618.83	
7:30-8	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
8-8:30	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
8:30-9	6	10	2	40	50	97928.13167		58	634535.99		59	732464.12	
9-9:30	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
9:30-10	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
10-10:30	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
10:30-11	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
11-11:30	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
11:30-12midnight	5	12	2	40	49	81606.7764		57	528779.99		58	610386.77	
Peak Leq					51			59			60		
Day Leq						50	3264271		58	21151200		59	24415471
Night Leq						47	9792813		55	63453599		56	73246412
Ldn						**54**			**62**			**63**	
Kentlands Sta.													

APPENDIX “C”

BRT Noise Study

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-19(T-3)

BRT LDN at Receptor R-19(T-3)						Feeder Bus LDN at Receptor R-19(T-3)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-19(T-3) Distance= 130		Sta.120+40			Receptor R-19(T-3) Distance= 130		Sta.120+40			
	BRT (vp1/2h)	Speed mph	Leq at 130' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 130' dBA	Energy Power				
12-12:30am	4	35	47.9	61270		6	35	48.6	73003		51	134272.473	
12:30-1	6	35	49.6	91905		6	35	48.6	73003		52	164907.413	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	50.9	122540		6	35	48.6	73003		53	195542.353	
5:30-6	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
6-6:30	12	35	52.6	183810		14	35	52.3	170339		55	354149.024	
6:30-7	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
7-7:30	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
7:30-8	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
8-8:30	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
8:30-9	12	35	52.6	183810		14	35	52.3	170339		55	354149.024	
9-9:30	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
9:30-10	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
10-10:30	6	35	49.6	91905		14	35	52.3	170339		54	262244.204	
10:30-11	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
11-11:30	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
11:30-12noon	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
2noon-12:30pn	6	35	49.6	91905		14	35	52.3	170339		54	262244.204	
12:30-1	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
1-1:30	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
1:30-2	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
2-2:30	6	35	49.6	91905		14	35	52.3	170339		54	262244.204	
2:30-3	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
3-3:30	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
3:30-4	10	35	51.9	153175		14	35	52.3	170339		55	323514.084	
4-4:30	12	35	52.6	183810		14	35	52.3	170339		55	354149.024	
4:30-5	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
5-5:30	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
5:30-6	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
6-6:30	12	35	52.6	183810		21	35	54.1	255509		56	439318.717	
6:30-7	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
7-7:30	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
7:30-8	8	35	50.9	122540		14	35	52.3	170339		55	292879.144	
8-8:30	6	35	49.6	91905		6	35	48.6	73003		52	164907.413	
8:30-9	6	35	49.6	91905		6	35	48.6	73003		52	164907.413	
9-9:30	4	35	47.9	61270		6	35	48.6	73003		51	134272.473	
9:30-10	6	35	49.6	91905		6	35	48.6	73003		52	164907.413	
10-10:30	4	35	47.9	61270		6	35	48.6	73003		51	134272.473	
10:30-11	6	35	49.6	91905		6	35	48.6	73003		52	164907.413	
11-11:30	4	35	47.9	61270		6	35	48.6	73003		51	134272.473	
1:30-12midnigh	6	35	49.6	91905		6	35	48.6	73003		52	164907.413	
Peak Leq			**52.6**					**54.1**			56		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-19(T-3)

Day Leq				**51.3**	**4013177.1**				**52.5**	**5317022.2**		55	9330199
Night Leq				**47.8**	**10722229.0**				**47.9**	**11072060.0**		51	20451564
Ldn				**54.9**					**55.3**			**58**	

Vehicle	**Speed**	**Ce**	
Autos	35	-6.2	
Commuter Bus	35	1.6	
Buses	35	-3.9	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-18(T-4)

BRT LDN at Receptor R-18(T-4)						Feeder Bus LDN at Receptor R-18(T-4)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-18(T-4) Distance= 80		Sta.144+00			Receptor R-18(T-4) Distance= 80		Sta.144+00			
	BRT (vp1/2h)	Speed	Leq at 80'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 80'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	25	48.8	76619		6	25	49.6	91291		52	167909.39	
12:30-1	6	25	50.6	114928		6	25	49.6	91291		53	206218.761	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	25	51.9	153237		6	25	49.6	91291		54	244528.133	
5:30-6	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
6-6:30	12	25	53.6	229856		14	25	53.3	213012		56	442867.738	
6:30-7	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
7-7:30	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
7:30-8	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
8-8:30	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
8:30-9	12	25	53.6	229856		14	25	53.3	213012		56	442867.738	
9-9:30	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
9:30-10	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
10-10:30	6	25	50.6	114928		14	25	53.3	213012		55	327939.623	
10:30-11	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
11-11:30	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
11:30-12noon	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
2noon-12:30pn	6	25	50.6	114928		14	25	53.3	213012		55	327939.623	
12:30-1	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
1-1:30	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
1:30-2	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
2-2:30	6	25	50.6	114928		14	25	53.3	213012		55	327939.623	
2:30-3	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
3-3:30	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
3:30-4	10	25	52.8	191547		14	25	53.3	213012		56	404558.367	
4-4:30	12	25	53.6	229856		14	25	53.3	213012		56	442867.738	
4:30-5	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
5-5:30	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
5:30-6	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
6-6:30	12	25	53.6	229856		21	25	55.0	319517		57	549373.493	
6:30-7	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
7-7:30	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
7:30-8	8	25	51.9	153237		14	25	53.3	213012		56	366248.995	
8-8:30	6	25	50.6	114928		6	25	49.6	91291		53	206218.761	
8:30-9	6	25	50.6	114928		6	25	49.6	91291		53	206218.761	
9-9:30	4	25	48.8	76619		6	25	49.6	91291		52	167909.39	
9:30-10	6	25	50.6	114928		6	25	49.6	91291		53	206218.761	
10-10:30	4	25	48.8	76619		6	25	49.6	91291		52	167909.39	
10:30-11	6	25	50.6	114928		6	25	49.6	91291		53	206218.761	
11-11:30	4	25	48.8	76619		6	25	49.6	91291		52	167909.39	
1:30-12midnigh	6	25	50.6	114928		6	25	49.6	91291		53	206218.761	
Peak Leq			**53.6**					**55.0**			57		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-18(T-4)

Day Leq				**52.2**	**5018527.7**				**53.5**	**6649002.1**		56	11667530
Night Leq				**48.7**	**13408280.1**				**48.9**	**13845748.1**		52	25574934
Ldn				**55.8**					**56.3**			**59**	

Vehicle	**Speed**	**Ce**	
Autos	25	-12.0	
Commuter Bus	25	1.6	
Buses	25	-7.5	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-17(T-5)

BRT LDN at Receptor R-17(T-5)						Feeder Bus LDN at Receptor R-17(T-5)					Combined Ldn (BRT+Diesel Buses)		
			ReceptorR-17(T-5) Distance= 90		Sta.153+00			ReceptorR-17(T-5) Distance= 90		Sta.153+00			
	BRT (vp1/2h)	Speed mph	Leq at 90' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 90' dBA	Energy Power				
12-12:30am	4	20	46.6	45945		6	20	47.4	54743		50	100688.803	
12:30-1	6	20	48.4	68918		6	20	47.4	54743		51	123661.46	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	20	49.6	91891		6	20	47.4	54743		52	146634.117	
5:30-6	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
6-6:30	12	20	51.4	137836		14	20	51.1	127735		54	265570.751	
6:30-7	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
7-7:30	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
7:30-8	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
8-8:30	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
8:30-9	12	20	51.4	137836		14	20	51.1	127735		54	265570.751	
9-9:30	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
9:30-10	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
10-10:30	6	20	48.4	68918		14	20	51.1	127735		53	196652.78	
10:30-11	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
11-11:30	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
11:30-12noon	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
2noon-12:30pn	6	20	48.4	68918		14	20	51.1	127735		53	196652.78	
12:30-1	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
1-1:30	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
1:30-2	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
2-2:30	6	20	48.4	68918		14	20	51.1	127735		53	196652.78	
2:30-3	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
3-3:30	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
3:30-4	10	20	50.6	114863		14	20	51.1	127735		54	242598.094	
4-4:30	12	20	51.4	137836		14	20	51.1	127735		54	265570.751	
4:30-5	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
5-5:30	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
5:30-6	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
6-6:30	12	20	51.4	137836		21	20	52.8	191602		55	329438.155	
6:30-7	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
7-7:30	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
7:30-8	8	20	49.6	91891		14	20	51.1	127735		53	219625.437	
8-8:30	6	20	48.4	68918		6	20	47.4	54743		51	123661.46	
8:30-9	6	20	48.4	68918		6	20	47.4	54743		51	123661.46	
9-9:30	4	20	46.6	45945		6	20	47.4	54743		50	100688.803	
9:30-10	6	20	48.4	68918		6	20	47.4	54743		51	123661.46	
10-10:30	4	20	46.6	45945		6	20	47.4	54743		50	100688.803	
10:30-11	6	20	48.4	68918		6	20	47.4	54743		51	123661.46	
11-11:30	4	20	46.6	45945		6	20	47.4	54743		50	100688.803	
1:30-12midnigh	6	20	48.4	68918		6	20	47.4	54743		51	123661.46	
Peak Leq			**51.4**					**52.8**			55		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-17(T-5)

Day Leq				**50.0**	**3009418.0**				**51.2**	**3987150.8**		54	6996569
Night Leq				**46.5**	**8040429.9**				**46.6**	**8302762.6**		49	15336304
Ldn				**53.6**					**54.1**			**57**	

Vehicle	Speed	Ce	
Autos	20	-15.9	
Commuter Bus	20	1.6	
Buses	20	-9.9	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-16(8b)

BRT LDN at Receptor R-16(8b)						Feeder Bus LDN at Receptor R-16(8b)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-16(8b) Distance= 310		Sta.155+00			Receptor R-16(8b) Distance= 310		Sta.155+00			
	BRT (vp1/2h)	Speed	Leq at 310'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 310'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	20	38.6	7187		6	20	39.3	8564		42	15750.7923	
12:30-1	6	20	40.3	10781		6	20	39.3	8564		43	19344.4147	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	20	41.6	14374		6	20	39.3	8564		44	22938.0372	
5:30-6	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
6-6:30	12	20	43.3	21562		14	20	43.0	19982		46	41543.3452	
6:30-7	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
7-7:30	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
7:30-8	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
8-8:30	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
8:30-9	12	20	43.3	21562		14	20	43.0	19982		46	41543.3452	
9-9:30	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
9:30-10	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
10-10:30	6	20	40.3	10781		14	20	43.0	19982		45	30762.4778	
10:30-11	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
11-11:30	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
11:30-12noon	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
2noon-12:30pn	6	20	40.3	10781		14	20	43.0	19982		45	30762.4778	
12:30-1	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
1-1:30	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
1:30-2	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
2-2:30	6	20	40.3	10781		14	20	43.0	19982		45	30762.4778	
2:30-3	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
3-3:30	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
3:30-4	10	20	42.5	17968		14	20	43.0	19982		46	37949.7228	
4-4:30	12	20	43.3	21562		14	20	43.0	19982		46	41543.3452	
4:30-5	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
5-5:30	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
5:30-6	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
6-6:30	12	20	43.3	21562		21	20	44.8	29972		47	51534.1504	
6:30-7	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
7-7:30	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
7:30-8	8	20	41.6	14374		14	20	43.0	19982		45	34356.1003	
8-8:30	6	20	40.3	10781		6	20	39.3	8564		43	19344.4147	
8:30-9	6	20	40.3	10781		6	20	39.3	8564		43	19344.4147	
9-9:30	4	20	38.6	7187		6	20	39.3	8564		42	15750.7923	
9:30-10	6	20	40.3	10781		6	20	39.3	8564		43	19344.4147	
10-10:30	4	20	38.6	7187		6	20	39.3	8564		42	15750.7923	
10:30-11	6	20	40.3	10781		6	20	39.3	8564		43	19344.4147	
11-11:30	4	20	38.6	7187		6	20	39.3	8564		42	15750.7923	
1:30-12midnigh	6	20	40.3	10781		6	20	39.3	8564		43	19344.4147	
Peak Leq			**43.3**					**44.8**			47		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-16(8b)

Day Leq				**42.0**	**470764.5**				**43.2**	**623711.7**		46	1094476
Night Leq				**38.4**	**1257767.9**				**38.6**	**1298804.7**		41	2399065
Ldn				**45.6**					**46.0**			**49**	

Vehicle	Speed	Ce	
Autos	20	-15.9	
Commuter Bus	20	1.6	
Buses	20	-9.9	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-13(6)

BRT LDN at Receptor R-13(6)						Feeder Bus LDN at Receptor R-13(6)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-13(6) Distance= 70		Sta.187+30			Receptor R-13(6) Distance= 70		Sta.187+30			
	BRT (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power				
12-12:30am	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
12:30-1	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	53.9	246107		6	30	51.7	146618		56	392725.066	
5:30-6	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
6-6:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
6:30-7	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7-7:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7:30-8	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8-8:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8:30-9	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
9-9:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
9:30-10	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
10-10:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
10:30-11	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11-11:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11:30-12noon	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2noon-12:30pn	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
12:30-1	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1-1:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1:30-2	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2-2:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
2:30-3	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3-3:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3:30-4	10	30	54.9	307634		14	30	55.3	342108		58	649742.054	
4-4:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
4:30-5	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5-5:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5:30-6	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6-6:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6:30-7	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7-7:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7:30-8	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
8-8:30	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
8:30-9	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
9-9:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
9:30-10	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
10-10:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
10:30-11	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
11-11:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
1:30-12midnigh	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
Peak Leq			**55.7**					**57.1**			**59**		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-13(6)

Day Leq				**54.3**	**8060019.9**				**55.5**	**10678647.7**		58	18738668
Night Leq				**50.8**	**21534404.3**				**50.9**	**22237000.9**		54	41074692
Ldn				**57.9**					**58.4**			**61**	

Vehicle	Speed	Ce	
Autos	30	-8.9	
Commuter Bus	30	1.6	
Buses	30	-5.5	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-11(4)

BRT LDN at Receptor R-11(4)						Feeder Bus LDN at Receptor R-11(4)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-11(4) Distance= 380		Sta.233+20			Receptor R-11(4) Distance= 380		Sta.233+20			
	BRT (vp1/2h)	Speed	Leq at 380'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 380'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	35	40.9	12260		8	35	42.9	19477		45	31736.6501	
12:30-1	6	35	42.6	18390		8	35	42.9	19477		46	37866.5964	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	43.9	24520		8	35	42.9	19477		46	43996.5426	
5:30-6	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
6-6:30	12	35	45.7	36780		15	35	45.6	36519		49	73298.598	
6:30-7	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
7-7:30	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
7:30-8	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
8-8:30	12	35	45.7	36780		15	35	45.6	36519		49	73298.598	
8:30-9	12	35	45.7	36780		15	35	45.6	36519		49	73298.598	
9-9:30	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
9:30-10	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
10-10:30	6	35	42.6	18390		15	35	45.6	36519		47	54908.7592	
10:30-11	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
11-11:30	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
11:30-12noon	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
2noon-12:30pn	6	35	42.6	18390		15	35	45.6	36519		47	54908.7592	
12:30-1	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
1-1:30	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
1:30-2	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
2-2:30	6	35	42.6	18390		15	35	45.6	36519		47	54908.7592	
2:30-3	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
3-3:30	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
3:30-4	10	35	44.9	30650		15	35	45.6	36519		48	67168.6518	
4-4:30	12	35	45.7	36780		15	35	45.6	36519		49	73298.598	
4:30-5	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
5-5:30	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
5:30-6	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
6-6:30	12	35	45.7	36780		22	35	47.3	53561		50	90340.7609	
6:30-7	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
7-7:30	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
7:30-8	8	35	43.9	24520		15	35	45.6	36519		48	61038.7055	
8-8:30	6	35	42.6	18390		8	35	42.9	19477		46	37866.5964	
8:30-9	6	35	42.6	18390		8	35	42.9	19477		46	37866.5964	
9-9:30	4	35	40.9	12260		8	35	42.9	19477		45	31736.6501	
9:30-10	6	35	42.6	18390		8	35	42.9	19477		46	37866.5964	
10-10:30	4	35	40.9	12260		8	35	42.9	19477		45	31736.6501	
10:30-11	6	35	42.6	18390		8	35	42.9	19477		46	37866.5964	
11-11:30	4	35	40.9	12260		8	35	42.9	19477		45	31736.6501	
1:30-12midnigh	6	35	42.6	18390		8	35	42.9	19477		46	37866.5964	
Peak Leq			**45.7**					**47.3**			50		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-11(4)

Day Leq				**44.3**	**803023.0**				**45.8**	**1129651.9**		48	1932675
Night Leq				**40.8**	**2145481.2**				**41.6**	**2629362.3**		44	4457477
Ldn				**47.9**					**48.9**			**51**	

Vehicle	Speed	Ce	
Autos	35	-6.2	
Commuter Bus	35	1.6	
Buses	35	-3.9	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-9(3)

BRT LDN at Receptor R-9(3)						Feeder Bus LDN at Receptor R-9(3)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-9(3) Distance= 215		Sta.248+10			Receptor R-9(3) Distance= 215		Sta.248+10			
	BRT (vp1/2h)	Speed mph	Leq at 215' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 215' dBA	Energy Power				
12-12:30am	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
12:30-1	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	47.6	57615		8	35	46.6	45765		50	103379.935	
5:30-6	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
6-6:30	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
6:30-7	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
7-7:30	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
7:30-8	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
8-8:30	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
8:30-9	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
9-9:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
9:30-10	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
10-10:30	6	35	46.4	43211		15	35	49.3	85810		51	129020.683	
10:30-11	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
11-11:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
11:30-12noon	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
2noon-12:30pn	6	35	46.4	43211		15	35	49.3	85810		51	129020.683	
12:30-1	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
1-1:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
1:30-2	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
2-2:30	6	35	46.4	43211		15	35	49.3	85810		51	129020.683	
2:30-3	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
3-3:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
3:30-4	10	35	48.6	72019		15	35	49.3	85810		52	157828.103	
4-4:30	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
4:30-5	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
5-5:30	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
5:30-6	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
6-6:30	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
6:30-7	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
7-7:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
7:30-8	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
8-8:30	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
8:30-9	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
9-9:30	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
9:30-10	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
10-10:30	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
10:30-11	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
11-11:30	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
1:30-12midnigh	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
Peak Leq			**49.4**					**51.0**			53		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-9(3)

Day Leq				**48.0**	**1886886.0**				**49.5**	**2654375.5**		52	4541262
Night Leq				**44.5**	**5041298.5**				**45.4**	**6178287.8**		48	10473861
Ldn				**51.6**					**52.6**			**55**	

Vehicle	**Speed**	**Ce**	
Autos	35	-6.2	
Commuter Bus	35	1.6	
Buses	35	-3.9	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 230		Sta.264+60			Receptor R-8(T-8)(10) Distance= 230		Sta.264+60			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	15	38.6	7305		8	15	40.6	11605		43	18909.4783	
12:30-1	6	15	40.4	10957		8	15	40.6	11605		44	22561.8513	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	41.6	14609		8	15	40.6	11605		44	26214.2244	
5:30-6	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
6-6:30	12	15	43.4	21914		15	15	43.4	21759		46	43673.1111	
6:30-7	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
7-7:30	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
7:30-8	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
8-8:30	12	15	43.4	21914		15	15	43.4	21759		46	43673.1111	
8:30-9	12	15	43.4	21914		15	15	43.4	21759		46	43673.1111	
9-9:30	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
9:30-10	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
10-10:30	6	15	40.4	10957		15	15	43.4	21759		45	32715.992	
10:30-11	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
11-11:30	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
11:30-12noon	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
2noon-12:30pn	6	15	40.4	10957		15	15	43.4	21759		45	32715.992	
12:30-1	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
1-1:30	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
1:30-2	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
2-2:30	6	15	40.4	10957		15	15	43.4	21759		45	32715.992	
2:30-3	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
3-3:30	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
3:30-4	10	15	42.6	18262		15	15	43.4	21759		46	40020.7381	
4-4:30	12	15	43.4	21914		15	15	43.4	21759		46	43673.1111	
4:30-5	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
5-5:30	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
5:30-6	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
6-6:30	12	15	43.4	21914		22	15	45.0	31913		47	53827.2518	
6:30-7	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
7-7:30	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
7:30-8	8	15	41.6	14609		15	15	43.4	21759		46	36368.365	
8-8:30	6	15	40.4	10957		8	15	40.6	11605		44	22561.8513	
8:30-9	6	15	40.4	10957		8	15	40.6	11605		44	22561.8513	
9-9:30	4	15	38.6	7305		8	15	40.6	11605		43	18909.4783	
9:30-10	6	15	40.4	10957		8	15	40.6	11605		44	22561.8513	
10-10:30	4	15	38.6	7305		8	15	40.6	11605		43	18909.4783	
10:30-11	6	15	40.4	10957		8	15	40.6	11605		44	22561.8513	
11-11:30	4	15	38.6	7305		8	15	40.6	11605		43	18909.4783	
1:30-12midnigh	6	15	40.4	10957		8	15	40.6	11605		44	22561.8513	
Peak Leq			**43.4**					**45.0**			47		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-8(T-8)(10)

Day Leq				**42.0**	**478460.9**				**43.5**	**673074.5**		46	1151535
Night Leq				**38.5**	**1278330.6**				**39.4**	**1566638.8**		42	2655875
Ldn				**45.6**					**46.7**			**49**	

Vehicle	Speed	Ce	
Autos	15	-20.9	
Commuter Bus	15	1.6	
Buses	15	-13.1	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-7(T-9)

BRT LDN at Receptor R-7(T-9)						Feeder Bus LDN at Receptor R-7(T-9)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-7(T-9) Distance= 255		Sta.280+10			Receptor R-7(T-9) Distance= 255		Sta.280+10			
	BRT (vp1/2h)	Speed mph	Leq at 255' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 255' dBA	Energy Power				
12-12:30am	4	40	44.4	27248		8	40	46.4	43288		48	70536.5361	
12:30-1	6	40	46.1	40872		8	40	46.4	43288		49	84160.6953	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	47.4	54497		8	40	46.4	43288		50	97784.8546	
5:30-6	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
6-6:30	12	40	49.1	81745		15	40	49.1	81165		52	162910.363	
6:30-7	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
7-7:30	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
7:30-8	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
8-8:30	12	40	49.1	81745		15	40	49.1	81165		52	162910.363	
8:30-9	12	40	49.1	81745		15	40	49.1	81165		52	162910.363	
9-9:30	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
9:30-10	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
10-10:30	6	40	46.1	40872		15	40	49.1	81165		51	122037.886	
10:30-11	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
11-11:30	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
11:30-12noon	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
2noon-12:30pn	6	40	46.1	40872		15	40	49.1	81165		51	122037.886	
12:30-1	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
1-1:30	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
1:30-2	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
2-2:30	6	40	46.1	40872		15	40	49.1	81165		51	122037.886	
2:30-3	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
3-3:30	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
3:30-4	10	40	48.3	68121		15	40	49.1	81165		52	149286.204	
4-4:30	12	40	49.1	81745		15	40	49.1	81165		52	162910.363	
4:30-5	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
5-5:30	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
5:30-6	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
6-6:30	12	40	49.1	81745		22	40	50.8	119043		53	200787.554	
6:30-7	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
7-7:30	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
7:30-8	8	40	47.4	54497		15	40	49.1	81165		51	135662.045	
8-8:30	6	40	46.1	40872		8	40	46.4	43288		49	84160.6953	
8:30-9	6	40	46.1	40872		8	40	46.4	43288		49	84160.6953	
9-9:30	4	40	44.4	27248		8	40	46.4	43288		48	70536.5361	
9:30-10	6	40	46.1	40872		8	40	46.4	43288		49	84160.6953	
10-10:30	4	40	44.4	27248		8	40	46.4	43288		48	70536.5361	
10:30-11	6	40	46.1	40872		8	40	46.4	43288		49	84160.6953	
11-11:30	4	40	44.4	27248		8	40	46.4	43288		48	70536.5361	
1:30-12midnigh	6	40	46.1	40872		8	40	46.4	43288		49	84160.6953	
Peak Leq			**49.1**					**50.8**			53		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-7(T-9)

Day Leq				**47.7**	**1784764.9**				**49.2**	**2510716.6**		52	4295481
Night Leq				**44.2**	**4768455.7**				**45.1**	**5843909.4**		47	9907000
Ldn				**51.4**					**52.4**			**55**	

Vehicle	Speed	Ce	
Autos	40	-3.9	
Commuter Bus	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-6(T-10)

BRT LDN at Receptor R-6(T-10)						Feeder Bus LDN at Receptor R-6(T-10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-6(T-10) Distance= 70		Sta.291+35			Receptor R-6(T-10) Distance= 70		Sta.291+35			
	BRT (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power				
12-12:30am	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
12:30-1	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	55.8	378907		8	40	54.8	300977		58	679883.975	
5:30-6	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
6-6:30	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
6:30-7	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
7-7:30	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
7:30-8	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
8-8:30	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
8:30-9	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
9-9:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
9:30-10	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
10-10:30	6	40	54.5	284180		15	40	57.5	564331		59	848511.798	
10:30-11	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
11-11:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
11:30-12noon	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
2noon-12:30pn	6	40	54.5	284180		15	40	57.5	564331		59	848511.798	
12:30-1	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
1-1:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
1:30-2	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
2-2:30	6	40	54.5	284180		15	40	57.5	564331		59	848511.798	
2:30-3	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
3-3:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
3:30-4	10	40	56.8	473634		15	40	57.5	564331		60	1037965.42	
4-4:30	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
4:30-5	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
5-5:30	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
5:30-6	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
6-6:30	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
6:30-7	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
7-7:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
7:30-8	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
8-8:30	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
8:30-9	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
9-9:30	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
9:30-10	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
10-10:30	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
10:30-11	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
11-11:30	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
1:30-12midnigh	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
Peak Leq			**57.5**					**59.2**			61		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-6(T-10)

Day Leq				**56.2**	**12409212.4**				**57.6**	**17456650.1**		60	29865863
Night Leq				**52.7**	**33154384.3**				**53.5**	**40631858.0**		56	68881939
Ldn				**59.8**					**60.8**			**63**	

Vehicle	Speed	Ce	
Autos	40	-3.9	
Commuter Bus	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-5(T-11)

BRT LDN at Receptor R-5(T-11)						Feeder Bus LDN at Receptor R-5(T-11)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-5(T-11) Distance= 250		Sta.299+70			Receptor R-5(T-11) Distance= 250		Sta.299+70			
	BRT (vp1/2h)	Speed	Leq at 250'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 250'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	40	44.5	28070		8	40	46.5	44593		49	72663.1776	
12:30-1	6	40	46.2	42105		8	40	46.5	44593		49	86698.0985	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	47.5	56140		8	40	46.5	44593		50	100733.019	
5:30-6	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
6-6:30	12	40	49.3	84210		15	40	49.2	83613		52	167822.03	
6:30-7	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
7-7:30	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
7:30-8	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
8-8:30	12	40	49.3	84210		15	40	49.2	83613		52	167822.03	
8:30-9	12	40	49.3	84210		15	40	49.2	83613		52	167822.03	
9-9:30	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
9:30-10	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
10-10:30	6	40	46.2	42105		15	40	49.2	83613		51	125717.267	
10:30-11	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
11-11:30	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
11:30-12noon	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
2noon-12:30pn	6	40	46.2	42105		15	40	49.2	83613		51	125717.267	
12:30-1	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
1-1:30	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
1:30-2	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
2-2:30	6	40	46.2	42105		15	40	49.2	83613		51	125717.267	
2:30-3	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
3-3:30	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
3:30-4	10	40	48.5	70175		15	40	49.2	83613		52	153787.109	
4-4:30	12	40	49.3	84210		15	40	49.2	83613		52	167822.03	
4:30-5	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
5-5:30	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
5:30-6	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
6-6:30	12	40	49.3	84210		22	40	50.9	122632		53	206841.199	
6:30-7	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
7-7:30	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
7:30-8	8	40	47.5	56140		15	40	49.2	83613		51	139752.188	
8-8:30	6	40	46.2	42105		8	40	46.5	44593		49	86698.0985	
8:30-9	6	40	46.2	42105		8	40	46.5	44593		49	86698.0985	
9-9:30	4	40	44.5	28070		8	40	46.5	44593		49	72663.1776	
9:30-10	6	40	46.2	42105		8	40	46.5	44593		49	86698.0985	
10-10:30	4	40	44.5	28070		8	40	46.5	44593		49	72663.1776	
10:30-11	6	40	46.2	42105		8	40	46.5	44593		49	86698.0985	
11-11:30	4	40	44.5	28070		8	40	46.5	44593		49	72663.1776	
1:30-12midnigh	6	40	46.2	42105		8	40	46.5	44593		49	86698.0985	
Peak Leq			**49.3**					**50.9**			53		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-5(T-11)

Day Leq				**47.9**	**1838574.6**				**49.4**	**2586413.5**		52	4424988
Night Leq				**44.4**	**4912222.3**				**45.2**	**6020100.3**		48	10205691
Ldn				**51.5**					**52.5**			**55**	

Vehicle	**Speed**	**Ce**	
Autos	40	-3.9	
Commuter Bus	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-4(T-12)

BRT LDN at Receptor R-4(T-12)						Feeder Bus LDN at Receptor R-4(T-12)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-4(T-12) Distance= 260		Sta.316+70			Receptor R-4(T-12) Distance= 260		Sta.316+70			
	BRT (vp1/2h)	Speed mph	Leq at 260' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 260' dBA	Energy Power				
12-12:30am	4	40	44.2	26466		8	40	46.2	42046		48	68511.6421	
12:30-1	6	40	46.0	39699		8	40	46.2	42046		49	81744.6924	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	47.2	52932		8	40	46.2	42046		50	94977.7426	
5:30-6	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
6-6:30	12	40	49.0	79398		15	40	49.0	78835		52	158233.692	
6:30-7	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
7-7:30	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
7:30-8	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
8-8:30	12	40	49.0	79398		15	40	49.0	78835		52	158233.692	
8:30-9	12	40	49.0	79398		15	40	49.0	78835		52	158233.692	
9-9:30	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
9:30-10	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
10-10:30	6	40	46.0	39699		15	40	49.0	78835		51	118534.541	
10:30-11	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
11-11:30	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
11:30-12noon	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
2noon-12:30pn	6	40	46.0	39699		15	40	49.0	78835		51	118534.541	
12:30-1	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
1-1:30	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
1:30-2	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
2-2:30	6	40	46.0	39699		15	40	49.0	78835		51	118534.541	
2:30-3	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
3-3:30	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
3:30-4	10	40	48.2	66165		15	40	49.0	78835		52	145000.642	
4-4:30	12	40	49.0	79398		15	40	49.0	78835		52	158233.692	
4:30-5	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
5-5:30	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
5:30-6	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
6-6:30	12	40	49.0	79398		22	40	50.6	115625		53	195023.541	
6:30-7	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
7-7:30	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
7:30-8	8	40	47.2	52932		15	40	49.0	78835		51	131767.592	
8-8:30	6	40	46.0	39699		8	40	46.2	42046		49	81744.6924	
8:30-9	6	40	46.0	39699		8	40	46.2	42046		49	81744.6924	
9-9:30	4	40	44.2	26466		8	40	46.2	42046		48	68511.6421	
9:30-10	6	40	46.0	39699		8	40	46.2	42046		49	81744.6924	
10-10:30	4	40	44.2	26466		8	40	46.2	42046		48	68511.6421	
10:30-11	6	40	46.0	39699		8	40	46.2	42046		49	81744.6924	
11-11:30	4	40	44.2	26466		8	40	46.2	42046		48	68511.6421	
1:30-12midnigh	6	40	46.0	39699		8	40	46.2	42046		49	81744.6924	
Peak Leq			**49.0**					**50.6**			53		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-4(T-12)

Day Leq				**47.6**	**1733529.6**				**49.1**	**2438641.4**		51	4172171
Night Leq				**44.1**	**4631567.6**				**45.0**	**5676148.1**		47	9622599
Ldn				**51.2**					**52.3**			**55**	

Vehicle	Speed	Ce	
Autos	40	-3.9	
Commuter Bus	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-3(2)

BRT LDN at Receptor R-3(2)						Feeder Bus LDN at Receptor R-3(2)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-3(2) Distance= 70		Sta.332+50		Receptor R-3(	Receptor 2 Distance= 70		Sta.332+50			
	BRT (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power				
12-12:30am	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
12:30-1	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	55.8	378907		8	40	54.8	300977		58	679883.975	
5:30-6	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
6-6:30	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
6:30-7	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
7-7:30	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
7:30-8	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
8-8:30	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
8:30-9	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
9-9:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
9:30-10	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
10-10:30	6	40	54.5	284180		15	40	57.5	564331		59	848511.798	
10:30-11	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
11-11:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
11:30-12noon	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
2noon-12:30pn	6	40	54.5	284180		15	40	57.5	564331		59	848511.798	
12:30-1	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
1-1:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
1:30-2	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
2-2:30	6	40	54.5	284180		15	40	57.5	564331		59	848511.798	
2:30-3	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
3-3:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
3:30-4	10	40	56.8	473634		15	40	57.5	564331		60	1037965.42	
4-4:30	12	40	57.5	568361		15	40	57.5	564331		61	1132692.24	
4:30-5	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
5-5:30	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
5:30-6	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
6-6:30	12	40	57.5	568361		22	40	59.2	827686		61	1396046.87	
6:30-7	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
7-7:30	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
7:30-8	8	40	55.8	378907		15	40	57.5	564331		60	943238.611	
8-8:30	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
8:30-9	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
9-9:30	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
9:30-10	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
10-10:30	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
10:30-11	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
11-11:30	4	40	52.8	189454		8	40	54.8	300977		57	490430.351	
1:30-12midnigh	6	40	54.5	284180		8	40	54.8	300977		58	585157.163	
Peak Leq			**57.5**					**59.2**			61		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-3(2)

Day Leq				**56.2**	**12409212.4**				**57.6**	**17456650.1**		60	29865863
Night Leq				**52.7**	**33154384.3**				**53.5**	**40631858.0**		56	68881939
Ldn				**59.8**					**60.8**			**63**	

Vehicle	Speed	Ce	
Autos	40	-3.9	
Commuter Bus	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-2(1)

BRT LDN at Receptor R-2(1)						Feeder Bus LDN at Receptor R-2(1)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-2(1) Distance= 210		Sta.358+70			Receptor R-2(1) Distance= 210		Sta.358+70			
	BRT (vp1/2h)	Speed	Leq at 210'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 210'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	35	44.7	29842		6	35	45.5	35557		48	65399.2963	
12:30-1	6	35	46.5	44764		6	35	45.5	35557		49	80320.4746	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	47.8	59685		6	35	45.5	35557		50	95241.6529	
5:30-6	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
6-6:30	12	35	49.5	89527		13	35	48.9	77040		52	166567.106	
6:30-7	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
7-7:30	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
7:30-8	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
8-8:30	12	35	49.5	89527		13	35	48.9	77040		52	166567.106	
8:30-9	12	35	49.5	89527		13	35	48.9	77040		52	166567.106	
9-9:30	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
9:30-10	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
10-10:30	6	35	46.5	44764		13	35	48.9	77040		51	121803.571	
10:30-11	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
11-11:30	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
11:30-12noon	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
2noon-12:30pn	6	35	46.5	44764		13	35	48.9	77040		51	121803.571	
12:30-1	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
1-1:30	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
1:30-2	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
2-2:30	6	35	46.5	44764		13	35	48.9	77040		51	121803.571	
2:30-3	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
3-3:30	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
3:30-4	10	35	48.7	74606		13	35	48.9	77040		52	151645.927	
4-4:30	12	35	49.5	89527		13	35	48.9	77040		52	166567.106	
4:30-5	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
5-5:30	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
5:30-6	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
6-6:30	12	35	49.5	89527		19	35	50.5	112597		53	202124.045	
6:30-7	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
7-7:30	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
7:30-8	8	35	47.8	59685		13	35	48.9	77040		51	136724.749	
8-8:30	6	35	46.5	44764		6	35	45.5	35557		49	80320.4746	
8:30-9	6	35	46.5	44764		6	35	45.5	35557		49	80320.4746	
9-9:30	4	35	44.7	29842		6	35	45.5	35557		48	65399.2963	
9:30-10	6	35	46.5	44764		6	35	45.5	35557		49	80320.4746	
10-10:30	4	35	44.7	29842		6	35	45.5	35557		48	65399.2963	
10:30-11	6	35	46.5	44764		6	35	45.5	35557		49	80320.4746	
11-11:30	4	35	44.7	29842		6	35	45.5	35557		48	65399.2963	
1:30-12midnigh	6	35	46.5	44764		6	35	45.5	35557		49	80320.4746	
Peak Leq			**49.5**					**50.5**			53		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-2(1)

Day Leq				**48.1**	**1954674.4**				**49.0**	**2358610.3**		52	4313285
Night Leq				**44.6**	**5222412.4**				**44.6**	**5155756.3**		47	9724176
Ldn				**51.7**					**51.9**			**55**	

Vehicle	Speed	Ce
Autos	35	-6.2
Commuter Bus	35	1.6
Buses	35	-3.9

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-1(T-13)

BRT LDN at Receptor R-1(T-13)						Feeder Bus LDN at Receptor R-1(T-13)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-1(T-13) Distance= 135		Sta.393+80			Receptor R-1(T-13) Distance= 135		Sta.393+80			
	BRT (vp1/2h)	Speed mph	Leq at 135' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 135' dBA	Energy Power				
12-12:30am	4	40	48.5	70737		6	40	49.3	84283		52	155020.554	
12:30-1	6	40	50.3	106106		6	40	49.3	84283		53	190389.273	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	51.5	141475		6	40	49.3	84283		54	225757.992	
5:30-6	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
6-6:30	12	40	53.3	212212		13	40	52.6	182613		56	394825.732	
6:30-7	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
7-7:30	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
7:30-8	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
8-8:30	12	40	53.3	212212		13	40	52.6	182613		56	394825.732	
8:30-9	12	40	53.3	212212		13	40	52.6	182613		56	394825.732	
9-9:30	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
9:30-10	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
10-10:30	6	40	50.3	106106		13	40	52.6	182613		55	288719.575	
10:30-11	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
11-11:30	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
11:30-12noon	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
2noon-12:30pn	6	40	50.3	106106		13	40	52.6	182613		55	288719.575	
12:30-1	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
1-1:30	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
1:30-2	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
2-2:30	6	40	50.3	106106		13	40	52.6	182613		55	288719.575	
2:30-3	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
3-3:30	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
3:30-4	10	40	52.5	176844		13	40	52.6	182613		56	359457.013	
4-4:30	12	40	53.3	212212		13	40	52.6	182613		56	394825.732	
4:30-5	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
5-5:30	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
5:30-6	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
6-6:30	12	40	53.3	212212		19	40	54.3	266897		57	479108.848	
6:30-7	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
7-7:30	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
7:30-8	8	40	51.5	141475		13	40	52.6	182613		55	324088.294	
8-8:30	6	40	50.3	106106		6	40	49.3	84283		53	190389.273	
8:30-9	6	40	50.3	106106		6	40	49.3	84283		53	190389.273	
9-9:30	4	40	48.5	70737		6	40	49.3	84283		52	155020.554	
9:30-10	6	40	50.3	106106		6	40	49.3	84283		53	190389.273	
10-10:30	4	40	48.5	70737		6	40	49.3	84283		52	155020.554	
10:30-11	6	40	50.3	106106		6	40	49.3	84283		53	190389.273	
11-11:30	4	40	48.5	70737		6	40	49.3	84283		52	155020.554	
1:30-12midnigh	6	40	50.3	106106		6	40	49.3	84283		53	190389.273	
Peak Leq			**53.3**					**54.3**			57		

Alternative S1, S2, and S3 BRT Ldn Calculations
Receptor R-1(T-13)

Day Leq				**51.9**	**4633302.2**				**52.7**	**5590780.0**		55	10224082
Night Leq				**48.4**	**12379051.6**				**48.3**	**12221051.9**		51	23049898
Ldn				**55.5**					**55.7**			**58**	

Vehicle	Speed	Ce	
Autos	40	-3.9	
Commuter Bus	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1a to Master Plan BRT Ldn Calculations
Receptor R-20(9)

BRT LDN at Receptor R-20(9)						Feeder Bus LDN at Receptor R-20(9)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-20(9) Distance= 725		Sta.116+80			Receptor R-20(9) Distance= 725		Sta.116+80			
	BRT (vp1/2h)	Speed	Leq at 725'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 725'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
12:30-1	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	25	37.5	5617		6	25	35.2	3346		40	8963.0703	
5:30-6	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
6-6:30	12	25	39.3	8425		14	25	38.9	7808		42	16233.1206	
6:30-7	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
7-7:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
7:30-8	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
8-8:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
8:30-9	12	25	39.3	8425		14	25	38.9	7808		42	16233.1206	
9-9:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
9:30-10	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
10-10:30	6	25	36.2	4213		14	25	38.9	7808		41	12020.4815	
10:30-11	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
11-11:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
11:30-12noon	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
2noon-12:30pn	6	25	36.2	4213		14	25	38.9	7808		41	12020.4815	
12:30-1	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
1-1:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
1:30-2	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
2-2:30	6	25	36.2	4213		14	25	38.9	7808		41	12020.4815	
2:30-3	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
3-3:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
3:30-4	10	25	38.5	7021		14	25	38.9	7808		42	14828.9076	
4-4:30	12	25	39.3	8425		14	25	38.9	7808		42	16233.1206	
4:30-5	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
5-5:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
5:30-6	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
6-6:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
6:30-7	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
7-7:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
7:30-8	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
8-8:30	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
8:30-9	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
9-9:30	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
9:30-10	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
10-10:30	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
10:30-11	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
11-11:30	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
1:30-12midnigh	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
Peak Leq			**39.3**					**40.7**			43		

Alternative S1a to Master Plan BRT Ldn Calculations
Receptor R-20(9)

Day Leq				**37.9**	**183951.9**				**39.1**	**243716.2**		42	427668
Night Leq				**34.4**	**491474.6**				**34.5**	**507509.8**		37	937438
Ldn				**41.5**					**41.9**			**45**	

Vehicle	Speed	Ce
Autos	25	-12.0
Commuter Bus	25	1.6
Buses	25	-7.5

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S1a to Master Plan BRT Ldn Calculations
Receptor R-16(8b)

BRT LDN at Receptor R-16(8b)						Feeder Bus LDN at Receptor R-16(8b)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-16(8b) Distance= 280		Sta.149+80			Receptor R-16(8b) Distance= 280		Sta.149+80			
	BRT	Speed	Leq at 280'	Energy Power		Diesel Feeder Bus	Speed	Leq at 280'	Energy Power				
	(vp1/2h)	mph	dBA			(vp1/2h)	mph	dBA					
12-12:30am	4	10	34.7	2960		6	10	35.5	3527		38	6487.28389	
12:30-1	6	10	36.5	4440		6	10	35.5	3527		39	7967.39033	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	10	37.7	5920		6	10	35.5	3527		40	9447.49678	
5:30-6	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
6-6:30	12	10	39.5	8881		14	10	39.2	8230		42	17110.471	
6:30-7	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
7-7:30	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
7:30-8	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
8-8:30	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
8:30-9	12	10	39.5	8881		14	10	39.2	8230		42	17110.471	
9-9:30	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
9:30-10	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
10-10:30	6	10	36.5	4440		14	10	39.2	8230		41	12670.1517	
10:30-11	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
11-11:30	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
11:30-12noon	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
2noon-12:30p	6	10	36.5	4440		14	10	39.2	8230		41	12670.1517	
12:30-1	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
1-1:30	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
1:30-2	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
2-2:30	6	10	36.5	4440		14	10	39.2	8230		41	12670.1517	
2:30-3	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
3-3:30	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
3:30-4	10	10	38.7	7401		14	10	39.2	8230		42	15630.3646	
4-4:30	12	10	39.5	8881		14	10	39.2	8230		42	17110.471	
4:30-5	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
5-5:30	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
5:30-6	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
6-6:30	12	10	39.5	8881		21	10	40.9	12345		43	21225.3872	
6:30-7	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
7-7:30	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
7:30-8	8	10	37.7	5920		14	10	39.2	8230		42	14150.2581	
8-8:30	6	10	36.5	4440		6	10	35.5	3527		39	7967.39033	
8:30-9	6	10	36.5	4440		6	10	35.5	3527		39	7967.39033	
9-9:30	4	10	34.7	2960		6	10	35.5	3527		38	6487.28389	
9:30-10	6	10	36.5	4440		6	10	35.5	3527		39	7967.39033	
10-10:30	4	10	34.7	2960		6	10	35.5	3527		38	6487.28389	
10:30-11	6	10	36.5	4440		6	10	35.5	3527		39	7967.39033	
11-11:30	4	10	34.7	2960		6	10	35.5	3527		38	6487.28389	
1:30-12midnig	6	10	36.5	4440		6	10	35.5	3527		39	7967.39033	

Alternative S1a to Master Plan BRT Ldn Calculations
Receptor R-16(8b)

Peak Leq			**39.5**					**40.9**			43		
Day Leq				**38.1**	**193893.9**				**39.3**	**256888.3**		42	450782
Night Leq				**34.6**	**518037.3**				**34.7**	**534939.1**		37	988104
Ldn				**41.7**					**42.2**			**45**	

Vehicle	**Speed**	**Ce**	
Autos	10	-28.0	
Commuter Bu	10	1.6	
Buses	10	-17.5	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S1a to S2 BRT Ldn Calculations
Receptor R-20(9)

BRT LDN at Receptor R-20(9)						Feeder Bus LDN at Receptor R-20(9)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-20(9) Distance= 725		Sta.116+80			Receptor R-20(9) Distance= 725		Sta.116+80			
	BRT (vp1/2h)	Speed	Leq at 725'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 725'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
12:30-1	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	25	37.5	5617		6	25	35.2	3346		40	8963.0703	
5:30-6	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
6-6:30	12	25	39.3	8425		14	25	38.9	7808		42	16233.1206	
6:30-7	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
7-7:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
7:30-8	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
8-8:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
8:30-9	12	25	39.3	8425		14	25	38.9	7808		42	16233.1206	
9-9:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
9:30-10	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
10-10:30	6	25	36.2	4213		14	25	38.9	7808		41	12020.4815	
10:30-11	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
11-11:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
11:30-12noon	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
2noon-12:30pn	6	25	36.2	4213		14	25	38.9	7808		41	12020.4815	
12:30-1	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
1-1:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
1:30-2	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
2-2:30	6	25	36.2	4213		14	25	38.9	7808		41	12020.4815	
2:30-3	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
3-3:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
3:30-4	10	25	38.5	7021		14	25	38.9	7808		42	14828.9076	
4-4:30	12	25	39.3	8425		14	25	38.9	7808		42	16233.1206	
4:30-5	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
5-5:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
5:30-6	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
6-6:30	12	25	39.3	8425		21	25	40.7	11712		43	20137.0418	
6:30-7	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
7-7:30	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
7:30-8	8	25	37.5	5617		14	25	38.9	7808		41	13424.6945	
8-8:30	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
8:30-9	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
9-9:30	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
9:30-10	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
10-10:30	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
10:30-11	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
11-11:30	4	25	34.5	2808		6	25	35.2	3346		38	6154.64423	
1:30-12midnigh	6	25	36.2	4213		6	25	35.2	3346		39	7558.85727	
Peak Leq			**39.3**					**40.7**			43		

Alternative S1a to S2 BRT Ldn Calculations
Receptor R-20(9)

Day Leq				**37.9**	**183951.9**				**39.1**	**243716.2**		42	427668
Night Leq				**34.4**	**491474.6**				**34.5**	**507509.8**		37	937438
Ldn				**41.5**					**41.9**			**45**	

Vehicle	Speed	Ce	
Autos	25	-12.0	
Commuter Bus	25	1.6	
Buses	25	-7.5	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S2a BRT Ldn Calculations
Receptor R-13(6)

BRT LDN at Receptor R-13(6)						Feeder Bus LDN at Receptor R-13(6)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-13(6) Distance= 70		Sta.187+30			Receptor R-13(6) Distance= 70		Sta.187+30			
	BRT (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power				
12-12:30am	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
12:30-1	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	53.9	246107		6	30	51.7	146618		56	392725.066	
5:30-6	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
6-6:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
6:30-7	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7-7:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7:30-8	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8-8:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8:30-9	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
9-9:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
9:30-10	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
10-10:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
10:30-11	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11-11:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11:30-12noon	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2noon-12:30pn	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
12:30-1	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1-1:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1:30-2	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2-2:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
2:30-3	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3-3:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3:30-4	10	30	54.9	307634		14	30	55.3	342108		58	649742.054	
4-4:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
4:30-5	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5-5:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5:30-6	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6-6:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6:30-7	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7-7:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7:30-8	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
8-8:30	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
8:30-9	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
9-9:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
9:30-10	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
10-10:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
10:30-11	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
11-11:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
1:30-12midnigh	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
Peak Leq			**55.7**					**57.1**			**59**		

Alternative S2a BRT Ldn Calculations
Receptor R-13(6)

Day Leq				**54.3**	**8060019.9**				**55.5**	**10678647.7**		58	18738668
Night Leq				**50.8**	**21534404.3**				**50.9**	**22237000.9**		54	41074692
Ldn				**57.9**					**58.4**			**61**	

Vehicle	Speed	Ce	
Autos	30	-8.9	
Commuter Bus	30	1.6	
Buses	30	-5.5	**BRT**

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2a BRT Ldn Calculations
Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 290		Sta.204+80			Receptor R-12(5) Distance= 290		Sta.204+80			
	BRT	Speed	Leq at 290'	Energy Power		Diesel Feeder Bus	Speed	Leq at 290'	Energy Power				
	(vp1/2h)	mph	dBA			(vp1/2h)	mph	dBA					
12-12:30am	4	15	37.1	5159		8	15	39.1	8197		41	13355.9352	
12:30-1	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	40.1	10319		7	15	38.6	7172		42	17490.7775	
5:30-6	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
6-6:30	12	15	41.9	15478		17	15	42.4	17418		45	32895.8444	
6:30-7	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
7-7:30	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
7:30-8	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
8-8:30	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
8:30-9	12	15	41.9	15478		17	15	42.4	17418		45	32895.8444	
9-9:30	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
9:30-10	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
10-10:30	6	15	38.9	7739		17	15	42.4	17418		44	25156.7323	
10:30-11	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
11-11:30	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
11:30-12noon	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
2noon-12:30p	6	15	38.9	7739		17	15	42.4	17418		44	25156.7323	
12:30-1	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
1-1:30	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
1:30-2	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
2-2:30	6	15	38.9	7739		17	15	42.4	17418		44	25156.7323	
2:30-3	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
3-3:30	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
3:30-4	10	15	41.1	12899		17	15	42.4	17418		45	30316.1404	
4-4:30	12	15	41.9	15478		17	15	42.4	17418		45	32895.8444	
4:30-5	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
5-5:30	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
5:30-6	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
6-6:30	12	15	41.9	15478		25	15	44.1	25614		46	41092.3715	
6:30-7	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
7-7:30	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
7:30-8	8	15	40.1	10319		17	15	42.4	17418		44	27736.4363	
8-8:30	6	15	38.9	7739		6	15	37.9	6147		41	13886.5075	
8:30-9	6	15	38.9	7739		6	15	37.9	6147		41	13886.5075	
9-9:30	4	15	37.1	5159		6	15	37.9	6147		41	11306.8034	
9:30-10	6	15	38.9	7739		6	15	37.9	6147		41	13886.5075	
10-10:30	4	15	37.1	5159		6	15	37.9	6147		41	11306.8034	
10:30-11	6	15	38.9	7739		6	15	37.9	6147		41	13886.5075	
11-11:30	4	15	37.1	5159		6	15	37.9	6147		41	11306.8034	
1:30-12midnig	6	15	38.9	7739		6	15	37.9	6147		41	13886.5075	

Alternative S2a BRT Ldn Calculations
Receptor R-12(5)

Peak Leq			**41.9**					**44.1**			46		
Day Leq				**40.5**	**337941.2**				**42.5**	**534823.4**		45	872765
Night Leq				**37.0**	**902896.4**				**37.8**	**1086039.8**		40	1875868
Ldn				**44.1**					**45.3**			**48**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2a BRT Ldn Calculations
Receptor R-10(T-7)

BRT LDN at Receptor R-10(T-7)						Feeder Bus LDN at Receptor R-10(T-7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-10(7) Distance= 230		Sta.247+50			Receptor R-10(7) Distance= 230		Sta.247+50			
	BRT (vp1/2h)	Speed	Leq at 230'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 230'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
12:30-1	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	47.2	52072		8	35	46.2	41362		50	93433.4081	
5:30-6	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
6-6:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
6:30-7	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
7-7:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
7:30-8	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
8-8:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
8:30-9	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
9-9:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
9:30-10	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
10-10:30	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
10:30-11	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
11-11:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
11:30-12noon	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
2noon-12:30pn	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
12:30-1	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
1-1:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
1:30-2	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
2-2:30	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
2:30-3	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
3-3:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
3:30-4	10	35	48.1	65089		15	35	48.9	77554		52	142642.937	
4-4:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
4:30-5	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
5-5:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
5:30-6	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
6-6:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
6:30-7	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
7-7:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
7:30-8	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
8-8:30	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
8:30-9	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
9-9:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
9:30-10	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
10-10:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
10:30-11	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
11-11:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
1:30-12midnigh	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
Peak Leq			**48.9**					**50.6**			53		

Alternative S2a BRT Ldn Calculations
Receptor R-10(T-7)

Day Leq				**47.5**	**1705342.5**				**49.0**	**2398989.2**		51	4104332
Night Leq				**44.0**	**4556258.5**				**44.9**	**5583854.2**		47	9466136
Ldn				**51.2**					**52.2**			**55**	

Vehicle	Speed	Ce
Autos	35	-6.2
Commuter Bus	35	1.6
Buses	35	-3.9

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2b BRT Ldn Calculations
Receptor R-13(6)

BRT LDN at Receptor R-13(6)						Feeder Bus LDN at Receptor R-13(6)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-13(6) Distance= 70		Sta.187+30			Receptor R-13(6) Distance= 70		Sta.187+30			
	BRT (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power				
12-12:30am	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
12:30-1	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	53.9	246107		6	30	51.7	146618		56	392725.066	
5:30-6	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
6-6:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
6:30-7	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7-7:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7:30-8	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8-8:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
8:30-9	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
9-9:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
9:30-10	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
10-10:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
10:30-11	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11-11:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11:30-12noon	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2noon-12:30pi	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
12:30-1	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1-1:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1:30-2	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2-2:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
2:30-3	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3-3:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3:30-4	10	30	54.9	307634		14	30	55.3	342108		58	649742.054	
4-4:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
4:30-5	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5-5:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5:30-6	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6-6:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6:30-7	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7-7:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7:30-8	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
8-8:30	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
8:30-9	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
9-9:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
9:30-10	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
10-10:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
10:30-11	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
11-11:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
1:30-12midnig	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
Peak Leq			**55.7**					**57.1**			**59**		

Alternative S2b BRT Ldn Calculations
Receptor R-13(6)

Day Leq				**54.3**	**8060019.9**				**55.4**	**10507593.8**		58	18567614
Night Leq				**50.8**	**21534404.3**				**50.9**	**22237000.9**		54	41074692
Ldn				**57.9**					**58.3**			**61**	

Vehicle	**Speed**	**Ce**	
Autos	30	-8.9	
Commuter Bu	30	1.6	
Buses	30	-5.5	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2b BRT Ldn Calculations

Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 400		Sta.205+00			Receptor R-12(5) Distance= 400		Sta.205+00			
	BRT (vp1/2h)	Speed mph	Leq at 400' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 400' dBA	Energy Power				
12-12:30am	4	15	35.0	3185		6	15	35.8	3795		38	6979.86226	
12:30-1	6	15	36.8	4777		6	15	35.8	3795		39	8572.35293	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	38.0	6370		6	15	35.8	3795		40	10164.8436	
5:30-6	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
6-6:30	12	15	39.8	9555		14	15	39.5	8855		43	18409.6662	
6:30-7	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
7-7:30	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
7:30-8	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
8-8:30	12	15	39.8	9555		14	15	39.5	8855		43	18409.6662	
8:30-9	12	15	39.8	9555		14	15	39.5	8855		43	18409.6662	
9-9:30	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
9:30-10	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
10-10:30	6	15	36.8	4777		14	15	39.5	8855		41	13632.1941	
10:30-11	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
11-11:30	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
11:30-12noon	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
2noon-12:30p	6	15	36.8	4777		14	15	39.5	8855		41	13632.1941	
12:30-1	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
1-1:30	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
1:30-2	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
2-2:30	6	15	36.8	4777		14	15	39.5	8855		41	13632.1941	
2:30-3	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
3-3:30	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
3:30-4	10	15	39.0	7962		14	15	39.5	8855		42	16817.1755	
4-4:30	12	15	39.8	9555		14	15	39.5	8855		43	18409.6662	
4:30-5	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
5-5:30	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
5:30-6	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
6-6:30	12	15	39.8	9555		21	15	41.2	13282		44	22837.0272	
6:30-7	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
7-7:30	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
7:30-8	8	15	38.0	6370		14	15	39.5	8855		42	15224.6848	
8-8:30	6	15	36.8	4777		6	15	35.8	3795		39	8572.35293	
8:30-9	6	15	36.8	4777		6	15	35.8	3795		39	8572.35293	
9-9:30	4	15	35.0	3185		6	15	35.8	3795		38	6979.86226	
9:30-10	6	15	36.8	4777		6	15	35.8	3795		39	8572.35293	
10-10:30	4	15	35.0	3185		6	15	35.8	3795		38	6979.86226	
10:30-11	6	15	36.8	4777		6	15	35.8	3795		39	8572.35293	
11-11:30	4	15	35.0	3185		6	15	35.8	3795		38	6979.86226	
1:30-12midnig	6	15	36.8	4777		6	15	35.8	3795		39	8572.35293	

Alternative S2b BRT Ldn Calculations
Receptor R-12(5)

Peak Leq			**39.8**					**41.2**			44		
Day Leq				**38.4**	**208616.3**				**39.6**	**271966.5**		42	480583
Night Leq				**34.9**	**557371.7**				**35.0**	**575556.9**		38	1063130
Ldn				**42.0**					**42.5**			**45**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2b BRT Ldn Calculations

Receptor R-10(T-7)

BRT LDN at Receptor R-10(T-7)						Feeder Bus LDN at Receptor r-10(T-7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-10(T-7) Distance= 230		Sta.247+50			Receptor R-10(T-7) Distance= 230		Sta.247+50			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
12:30-1	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	45	48.8	75913		8	45	47.8	60300		51	136213.106	
5:30-6	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
6-6:30	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
6:30-7	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
7-7:30	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
7:30-8	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
8-8:30	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
8:30-9	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
9-9:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
9:30-10	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
10-10:30	6	45	47.6	56935		15	45	50.5	113062		52	169997.281	
10:30-11	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
11-11:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
11:30-12noon	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
2noon-12:30p	6	45	47.6	56935		15	45	50.5	113062		52	169997.281	
12:30-1	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
1-1:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
1:30-2	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
2-2:30	6	45	47.6	56935		15	45	50.5	113062		52	169997.281	
2:30-3	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
3-3:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
3:30-4	10	45	49.8	94891		15	45	50.5	113062		53	207953.855	
4-4:30	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
4:30-5	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
5-5:30	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
5:30-6	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
6-6:30	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
6:30-7	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
7-7:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
7:30-8	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
8-8:30	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
8:30-9	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
9-9:30	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
9:30-10	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
10-10:30	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
10:30-11	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
11-11:30	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
1:30-12midnig	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	

Alternative S2b BRT Ldn Calculations
Receptor R-10(T-7)

Peak Leq			**50.6**					**52.2**			54		
Day Leq				**49.2**	**2486155.6**				**50.7**	**3497397.5**		53	5983553
Night Leq				**45.7**	**6642400.5**				**46.6**	**8140494.2**		49	13800329
Ldn				**52.8**					**53.8**			**56**	

Vehicle	Speed	Ce
Autos	45	-1.8
Commuter Bu	45	1.6
Buses	45	-1.1

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2b BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R-8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 230		Sta.268+70			Receptor R-8(T-8)(10) Distance= 230		Sta.268+70			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
12:30-1	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	45	48.8	75913		8	45	47.8	60300		51	136213.106	
5:30-6	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
6-6:30	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
6:30-7	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
7-7:30	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
7:30-8	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
8-8:30	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
8:30-9	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
9-9:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
9:30-10	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
10-10:30	6	45	47.6	56935		15	45	50.5	113062		52	169997.281	
10:30-11	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
11-11:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
11:30-12noon	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
2noon-12:30p	6	45	47.6	56935		15	45	50.5	113062		52	169997.281	
12:30-1	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
1-1:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
1:30-2	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
2-2:30	6	45	47.6	56935		15	45	50.5	113062		52	169997.281	
2:30-3	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
3-3:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
3:30-4	10	45	49.8	94891		15	45	50.5	113062		53	207953.855	
4-4:30	12	45	50.6	113870		15	45	50.5	113062		54	226932.142	
4:30-5	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
5-5:30	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
5:30-6	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
6-6:30	12	45	50.6	113870		22	45	52.2	165825		54	279694.605	
6:30-7	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
7-7:30	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
7:30-8	8	45	48.8	75913		15	45	50.5	113062		53	188975.568	
8-8:30	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
8:30-9	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
9-9:30	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
9:30-10	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
10-10:30	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
10:30-11	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	
11-11:30	4	45	45.8	37957		8	45	47.8	60300		50	98256.5314	
1:30-12midnig	6	45	47.6	56935		8	45	47.8	60300		51	117234.818	

Alternative S2b BRT Ldn Calculations
Receptor R-8(T-8)(10)

Peak Leq			**50.6**					**52.2**			**54**		
Day Leq				**49.2**	**2486155.6**				**50.7**	**3497397.5**		53	5983553
Night Leq				**45.7**	**6642400.5**				**46.6**	**8140494.2**		49	13800329
Ldn				**52.8**					**53.8**			**56**	

Vehicle	**Speed**	**Ce**	
Autos	45	-1.8	
Commuter Bu	45	1.6	
Buses	45	-1.1	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2c BRT Ldn Calculations

Receptor R-15(7)

BRT LDN at Receptor R-15(7)						Feeder Bus LDN at Receptor R-15(7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-15(7) Distance= 140		Sta.189+60			Receptor R-15(7) Distance= 140		Sta.189+60			
	BRT (vp1/2h)	Speed mph	Leq at 140' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 140' dBA	Energy Power				
12-12:30am	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
12:30-1	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	44.9	30763		6	15	42.6	18327		47	49090.6333	
5:30-6	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
6-6:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
6:30-7	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
7-7:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
7:30-8	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
8-8:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
8:30-9	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
9-9:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
9:30-10	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
10-10:30	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
10:30-11	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
11-11:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
11:30-12noon	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
2noon-12:30p	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
12:30-1	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
1-1:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
1:30-2	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
2-2:30	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
2:30-3	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
3-3:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
3:30-4	10	15	45.8	38454		14	15	46.3	42763		49	81217.7567	
4-4:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
4:30-5	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
5-5:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
5:30-6	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
6-6:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
6:30-7	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
7-7:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
7:30-8	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
8-8:30	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
8:30-9	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
9-9:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
9:30-10	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
10-10:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
10:30-11	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
11-11:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
1:30-12midnig	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	

Alternative S2c BRT Ldn Calculations
Receptor R-15(7)

Peak Leq			**46.6**					**48.1**			50		
Day Leq				**45.3**	**1007502.5**				**46.4**	**1313449.2**		49	2320952
Night Leq				**41.7**	**2691800.5**				**41.9**	**2779625.1**		45	5134336
Ldn				**48.9**					**49.3**			**52**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2c BRT Ldn Calculations

Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 370		Sta.208+40			Receptor R-12(5) Distance= 370		Sta.208+40			
	BRT (vp1/2h)	Speed mph	Leq at 370' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 370' dBA	Energy Power				
12-12:30am	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
12:30-1	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	44.1	25521		8	35	43.1	20272		47	45792.1841	
5:30-6	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
6-6:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
6:30-7	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
7-7:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
7:30-8	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
8-8:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
8:30-9	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
9-9:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
9:30-10	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
10-10:30	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
10:30-11	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
11-11:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
11:30-12noon	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
2noon-12:30p	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
12:30-1	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
1-1:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
1:30-2	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
2-2:30	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
2:30-3	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
3-3:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
3:30-4	10	35	45.0	31901		17	35	46.3	43077		49	74977.939	
4-4:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
4:30-5	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
5-5:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
5:30-6	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
6-6:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
6:30-7	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
7-7:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
7:30-8	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
8-8:30	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
8:30-9	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
9-9:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
9:30-10	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
10-10:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
10:30-11	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
11-11:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
1:30-12midnig	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	

Alternative S2c BRT Ldn Calculations
Receptor R-12(5)

Peak Leq			**45.8**					**48.0**			50		
Day Leq				**44.4**	**835796.9**				**46.4**	**1322726.3**		49	2158523
Night Leq				**40.9**	**2233045.2**				**42.1**	**2914052.2**		44	4816778
Ldn				**48.1**					**49.5**			**52**	

Vehicle	**Speed**	**Ce**	
Autos	35	-6.2	
Commuter Bu	35	1.6	
Buses	35	-3.9	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2c BRT Ldn Calculations

Receptor R-11(4)

BRT LDN at Receptor R-11(4)						Feeder Bus LDN at Receptor R-11(4)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-11(4) Distance= 380		Sta.239+40			Receptor R-11(4) Distance= 380		Sta.239+40			
	BRT (vp1/2h)	Speed mph	Leq at 380' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 380' dBA	Energy Power				
12-12:30am	4	30	39.9	9729		8	30	41.9	15456		44	25184.9388	
12:30-1	6	30	41.6	14593		8	30	41.9	15456		45	30049.4194	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	42.9	19458		8	30	41.9	15456		45	34913.9001	
5:30-6	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
6-6:30	12	30	44.7	29187		15	30	44.6	28980		48	58166.8417	
6:30-7	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
7-7:30	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
7:30-8	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
8-8:30	12	30	44.7	29187		15	30	44.6	28980		48	58166.8417	
8:30-9	12	30	44.7	29187		15	30	44.6	28980		48	58166.8417	
9-9:30	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
9:30-10	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
10-10:30	6	30	41.6	14593		15	30	44.6	28980		46	43573.3997	
10:30-11	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
11-11:30	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
11:30-12noon	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
2noon-12:30p	6	30	41.6	14593		15	30	44.6	28980		46	43573.3997	
12:30-1	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
1-1:30	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
1:30-2	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
2-2:30	6	30	41.6	14593		15	30	44.6	28980		46	43573.3997	
2:30-3	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
3-3:30	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
3:30-4	10	30	43.9	24322		15	30	44.6	28980		47	53302.361	
4-4:30	12	30	44.7	29187		15	30	44.6	28980		48	58166.8417	
4:30-5	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
5-5:30	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
5:30-6	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
6-6:30	12	30	44.7	29187		22	30	46.3	42504		49	71690.8219	
6:30-7	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
7-7:30	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
7:30-8	8	30	42.9	19458		15	30	44.6	28980		47	48437.8803	
8-8:30	6	30	41.6	14593		8	30	41.9	15456		45	30049.4194	
8:30-9	6	30	41.6	14593		8	30	41.9	15456		45	30049.4194	
9-9:30	4	30	39.9	9729		8	30	41.9	15456		44	25184.9388	
9:30-10	6	30	41.6	14593		8	30	41.9	15456		45	30049.4194	
10-10:30	4	30	39.9	9729		8	30	41.9	15456		44	25184.9388	
10:30-11	6	30	41.6	14593		8	30	41.9	15456		45	30049.4194	
11-11:30	4	30	39.9	9729		8	30	41.9	15456		44	25184.9388	
1:30-12midnig	6	30	41.6	14593		8	30	41.9	15456		45	30049.4194	

Alternative S2c BRT Ldn Calculations
Receptor R-11(4)

Peak Leq			**44.7**					**46.3**			49		
Day Leq				**43.3**	**637247.0**				**44.8**	**896446.7**		47	1533694
Night Leq				**39.8**	**1702568.2**				**40.6**	**2086556.9**		43	3537276
Ldn				**46.9**					**47.9**			**50**	

Vehicle	**Speed**	**Ce**	
Autos	30	-8.9	
Commuter Bu	30	1.6	
Buses	30	-5.5	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2c BRT Ldn Calculations
Receptor R-9(3)

BRT LDN at Receptor R-9(3)						Feeder Bus LDN at Receptor R-9(3)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-9(3) Distance= 215		Sta.254+40			Receptor R-9(3) Distance= 215		Sta.254+40			
	BRT (vp1/2h)	Speed mph	Leq at 215' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 215' dBA	Energy Power				
12-12:30am	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
12:30-1	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	47.6	57615		8	35	46.6	45765		50	103379.935	
5:30-6	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
6-6:30	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
6:30-7	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
7-7:30	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
7:30-8	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
8-8:30	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
8:30-9	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
9-9:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
9:30-10	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
10-10:30	6	35	46.4	43211		15	35	49.3	85810		51	129020.683	
10:30-11	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
11-11:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
11:30-12noon	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
2noon-12:30p	6	35	46.4	43211		15	35	49.3	85810		51	129020.683	
12:30-1	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
1-1:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
1:30-2	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
2-2:30	6	35	46.4	43211		15	35	49.3	85810		51	129020.683	
2:30-3	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
3-3:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
3:30-4	10	35	48.6	72019		15	35	49.3	85810		52	157828.103	
4-4:30	12	35	49.4	86422		15	35	49.3	85810		52	172231.813	
4:30-5	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
5-5:30	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
5:30-6	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
6-6:30	12	35	49.4	86422		22	35	51.0	125854		53	212276.271	
6:30-7	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
7-7:30	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
7:30-8	8	35	47.6	57615		15	35	49.3	85810		52	143424.393	
8-8:30	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
8:30-9	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
9-9:30	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
9:30-10	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
10-10:30	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
10:30-11	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	
11-11:30	4	35	44.6	28807		8	35	46.6	45765		49	74572.5147	
1:30-12midnig	6	35	46.4	43211		8	35	46.6	45765		49	88976.2249	

Alternative S2c BRT Ldn Calculations
Receptor R-9(3)

Peak Leq			**49.4**					**51.0**			53		
Day Leq				**48.0**	**1886886.0**				**49.5**	**2654375.5**		52	4541262
Night Leq				**44.5**	**5041298.5**				**45.4**	**6178287.8**		48	10473861
Ldn				**51.6**					**52.6**			**55**	

Vehicle	Speed	Ce
Autos	35	-6.2
Commuter Bu	35	1.6
Buses	35	-3.9

BRT

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Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2c BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R-8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 290		Sta.270+80			Receptor R-8(T-8)(10) Distance= 290		Sta.270+80			
	BRT (vp1/2h)	Speed mph	Leq at 290' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 290' dBA	Energy Power				
12-12:30am	4	15	37.1	5159		8	15	39.1	8197		41	13355.9352	
12:30-1	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	40.1	10319		8	15	39.1	8197		43	18515.3433	
5:30-6	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
6-6:30	12	15	41.9	15478		15	15	41.9	15368		45	30846.7127	
6:30-7	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
7-7:30	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
7:30-8	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
8-8:30	12	15	41.9	15478		15	15	41.9	15368		45	30846.7127	
8:30-9	12	15	41.9	15478		15	15	41.9	15368		45	30846.7127	
9-9:30	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
9:30-10	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
10-10:30	6	15	38.9	7739		15	15	41.9	15368		44	23107.6005	
10:30-11	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
11-11:30	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
11:30-12noon	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
2noon-12:30p	6	15	38.9	7739		15	15	41.9	15368		44	23107.6005	
12:30-1	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
1-1:30	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
1:30-2	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
2-2:30	6	15	38.9	7739		15	15	41.9	15368		44	23107.6005	
2:30-3	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
3-3:30	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
3:30-4	10	15	41.1	12899		15	15	41.9	15368		45	28267.0086	
4-4:30	12	15	41.9	15478		15	15	41.9	15368		45	30846.7127	
4:30-5	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
5-5:30	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
5:30-6	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
6-6:30	12	15	41.9	15478		22	15	43.5	22540		46	38018.6739	
6:30-7	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
7-7:30	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
7:30-8	8	15	40.1	10319		15	15	41.9	15368		44	25687.3045	
8-8:30	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	
8:30-9	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	
9-9:30	4	15	37.1	5159		8	15	39.1	8197		41	13355.9352	
9:30-10	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	
10-10:30	4	15	37.1	5159		8	15	39.1	8197		41	13355.9352	
10:30-11	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	
11-11:30	4	15	37.1	5159		8	15	39.1	8197		41	13355.9352	
1:30-12midnig	6	15	38.9	7739		8	15	39.1	8197		42	15935.6393	

Alternative S2c BRT Ldn Calculations
Receptor R-8(T-8)(10)

Peak Leq			**41.9**					**43.5**			46		
Day Leq				**40.5**	**337941.2**				**42.0**	**475398.6**		44	813340
Night Leq				**37.0**	**902896.4**				**37.9**	**1106531.2**		40	1875868
Ldn				**44.1**					**45.2**			**47**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2d BRT Ldn Calculations
Receptor R-15(7)

BRT LDN at Receptor R-15(7)						Feeder Bus LDN at Receptor R-15(7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-15(76) Distance= 140		Sta.189+60			Receptor R-15(76) Distance= 140		Sta.189+60			
	BRT (vp1/2h)	Speed	Leq at 140'	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed	Leq at 140'	Energy Power				
		mph	dBA				mph	dBA					
12-12:30am	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
12:30-1	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	44.9	30763		6	15	42.6	18327		47	49090.6333	
5:30-6	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
6-6:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
6:30-7	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
7-7:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
7:30-8	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
8-8:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
8:30-9	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
9-9:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
9:30-10	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
10-10:30	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
10:30-11	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
11-11:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
11:30-12noon	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
2noon-12:30p	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
12:30-1	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
1-1:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
1:30-2	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
2-2:30	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
2:30-3	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
3-3:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
3:30-4	10	15	45.8	38454		14	15	46.3	42763		49	81217.7567	
4-4:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
4:30-5	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
5-5:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
5:30-6	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
6-6:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
6:30-7	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
7-7:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
7:30-8	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
8-8:30	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
8:30-9	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
9-9:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
9:30-10	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
10-10:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
10:30-11	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
11-11:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
11:30-12midnig	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
Peak Leq			**46.6**					**48.1**			50		

Alternative S2d BRT Ldn Calculations
Receptor R-15(7)

Day Leq				**45.3**	**1007502.5**				**46.4**	**1313449.2**		49	2320952
Night Leq				**41.7**	**2691800.5**				**41.9**	**2779625.1**		45	5134336
Ldn				**48.9**					**49.3**			**52**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2d BRT Ldn Calculations

Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 370		Sta.208+50			Receptor R-12(5) Distance= 370		Sta.208+50			
	BRT (vp1/2h)	Speed mph	Leq at 370' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 370' dBA	Energy Power				
12-12:30am	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
12:30-1	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	44.1	25521		8	35	43.1	20272		47	45792.1841	
5:30-6	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
6-6:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
6:30-7	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
7-7:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
7:30-8	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
8-8:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
8:30-9	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
9-9:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
9:30-10	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
10-10:30	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
10:30-11	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
11-11:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
11:30-12noon	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
2noon-12:30p	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
12:30-1	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
1-1:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
1:30-2	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
2-2:30	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
2:30-3	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
3-3:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
3:30-4	10	35	45.0	31901		17	35	46.3	43077		49	74977.939	
4-4:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
4:30-5	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
5-5:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
5:30-6	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
6-6:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
6:30-7	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
7-7:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
7:30-8	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
8-8:30	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
8:30-9	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
9-9:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
9:30-10	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
10-10:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
10:30-11	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
11-11:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
1:30-12midnig	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	

Alternative S2d BRT Ldn Calculations
Receptor R-12(5)

Peak Leq			**45.8**					**48.0**			50		
Day Leq				**44.4**	**835796.9**				**46.4**	**1322726.3**		49	2158523
Night Leq				**40.9**	**2233045.2**				**42.1**	**2914052.2**		44	4816778
Ldn				**48.1**					**49.5**			**52**	

Vehicle	**Speed**	**Ce**	
Autos	35	-6.2	
Commuter Bu	35	1.6	
Buses	35	-3.9	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2d BRT Ldn Calculations

Receptor R-10(T-7)

BRT LDN at Receptor R-10(T-7)						Feeder Bus LDN at Receptor r-10(T-7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-10(T-7) Distance= 230		Sta.247+50			Receptor R-10(T-7) Distance= 230		Sta.247+50			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
12:30-1	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	20	43.5	22493		8	20	42.5	17867		46	40359.4387	
5:30-6	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
6-6:30	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
6:30-7	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
7-7:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
7:30-8	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
8-8:30	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
8:30-9	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
9-9:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
9:30-10	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
10-10:30	6	20	42.3	16870		15	20	45.3	33500		47	50369.5647	
10:30-11	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
11-11:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
11:30-12noon	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
2noon-12:30p	6	20	42.3	16870		15	20	45.3	33500		47	50369.5647	
12:30-1	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
1-1:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
1:30-2	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
2-2:30	6	20	42.3	16870		15	20	45.3	33500		47	50369.5647	
2:30-3	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
3-3:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
3:30-4	10	20	44.5	28116		15	20	45.3	33500		48	61615.9571	
4-4:30	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
4:30-5	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
5-5:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
5:30-6	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
6-6:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
6:30-7	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
7-7:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
7:30-8	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
8-8:30	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
8:30-9	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
9-9:30	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
9:30-10	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
10-10:30	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
10:30-11	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
11-11:30	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
1:30-12midnig	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	

Alternative S2d BRT Ldn Calculations

Receptor R-10(T-7)

Peak Leq			**45.3**					**46.9**			49		
Day Leq				**43.9**	**736638.7**				**45.4**	**1036265.9**		48	1772905
Night Leq				**40.4**	**1968118.7**				**41.3**	**2411998.3**		44	4088986
Ldn				**47.5**					**48.6**			**51**	

Vehicle	**Speed**	**Ce**
Autos	20	-15.9
Commuter Bu	20	1.6
Buses	20	-9.9

BRT

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2d BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R-8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			
	BRT (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power				
12-12:30am	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
12:30-1	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	49.6	91891		8	40	48.6	72991		52	164881.947	
5:30-6	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
6-6:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
6:30-7	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
7-7:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
7:30-8	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
8-8:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
8:30-9	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
9-9:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
9:30-10	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
10-10:30	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
10:30-11	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
11-11:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
11:30-12noon	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
2noon-12:30p	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
12:30-1	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
1-1:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
1:30-2	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
2-2:30	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
2:30-3	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
3-3:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
3:30-4	10	40	50.6	114863		15	40	51.4	136859		54	251722.009	
4-4:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
4:30-5	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
5-5:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
5:30-6	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
6-6:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
6:30-7	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
7-7:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
7:30-8	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
8-8:30	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
8:30-9	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
9-9:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
9:30-10	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
10-10:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
10:30-11	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
11-11:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
1:30-12midnig	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	

Alternative S2d BRT Ldn Calculations

Receptor R-8(T-8)(10)

Peak Leq			**51.4**					**53.0**			55		
Day Leq				**50.0**	**3009418.0**				**51.5**	**4233496.5**		54	7242915
Night Leq				**46.5**	**8040429.9**				**47.4**	**9853828.2**		50	16704892
Ldn				**53.6**					**54.7**			**57**	

Vehicle	**Speed**	**Ce**
Autos	40	-3.9
Commuter Bu	40	1.6
Buses	40	-2.4

BRT

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S2e BRT Ldn Calculations

Receptor R-15(7)

BRT LDN at Receptor R-15(7)						Feeder Bus LDN at Receptor R-15(7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-15(76) Distance= 140		Sta.189+60			Receptor R-15(76) Distance= 140		Sta.189+60			
	BRT (vp1/2h)	Speed mph	Leq at 140' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 140' dBA	Energy Power				
12-12:30am	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
12:30-1	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	44.9	30763		6	15	42.6	18327		47	49090.6333	
5:30-6	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
6-6:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
6:30-7	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
7-7:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
7:30-8	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
8-8:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
8:30-9	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
9-9:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
9:30-10	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
10-10:30	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
10:30-11	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
11-11:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
11:30-12noon	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
2noon-12:30p	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
12:30-1	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
1-1:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
1:30-2	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
2-2:30	6	15	43.6	23073		14	15	46.3	42763		48	65836.0394	
2:30-3	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
3-3:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
3:30-4	10	15	45.8	38454		14	15	46.3	42763		49	81217.7567	
4-4:30	12	15	46.6	46145		14	15	46.3	42763		49	88908.6154	
4:30-5	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
5-5:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
5:30-6	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
6-6:30	12	15	46.6	46145		21	15	48.1	64145		50	110290.347	
6:30-7	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
7-7:30	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
7:30-8	8	15	44.9	30763		14	15	46.3	42763		49	73526.898	
8-8:30	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
8:30-9	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
9-9:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
9:30-10	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
10-10:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
10:30-11	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
11-11:30	4	15	41.9	15382		6	15	42.6	18327		45	33708.9159	
11:30-12midnig	6	15	43.6	23073		6	15	42.6	18327		46	41399.7746	
Peak Leq			**46.6**					**48.1**			50		

Alternative S2e BRT Ldn Calculations
Receptor R-15(7)

Day Leq				**45.3**	**1007502.5**				**46.5**	**1334831.0**		49	2342333
Night Leq				**41.7**	**2691800.5**				**41.9**	**2779625.1**		45	5134336
Ldn				**48.9**					**49.3**			**52**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2e BRT Ldn Calculations

Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 290		Sta.209+30			Receptor R-12(5) Distance= 290		Sta.209+30			
	BRT (vp1/2h)	Speed mph	Leq at 290' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 290' dBA	Energy Power				
12-12:30am	4	30	41.6	14593		8	30	43.7	23183		46	37776.2894	
12:30-1	6	30	43.4	21890		8	30	43.7	23183		47	45072.7944	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	44.7	29186		8	30	43.7	23183		47	52369.2993	
5:30-6	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
6-6:30	12	30	46.4	43779		17	30	46.9	49264		50	93043.4987	
6:30-7	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
7-7:30	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
7:30-8	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
8-8:30	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
8:30-9	12	30	46.4	43779		17	30	46.9	49264		50	93043.4987	
9-9:30	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
9:30-10	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
10-10:30	6	30	43.4	21890		17	30	46.9	49264		49	71153.9839	
10:30-11	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
11-11:30	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
11:30-12noon	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
2noon-12:30p	6	30	43.4	21890		17	30	46.9	49264		49	71153.9839	
12:30-1	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
1-1:30	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
1:30-2	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
2-2:30	6	30	43.4	21890		17	30	46.9	49264		49	71153.9839	
2:30-3	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
3-3:30	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
3:30-4	10	30	45.6	36483		17	30	46.9	49264		49	85746.9938	
4-4:30	12	30	46.4	43779		17	30	46.9	49264		50	93043.4987	
4:30-5	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
5-5:30	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
5:30-6	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
6-6:30	12	30	46.4	43779		25	30	48.6	72448		51	116226.778	
6:30-7	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
7-7:30	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
7:30-8	8	30	44.7	29186		17	30	46.9	49264		49	78450.4888	
8-8:30	6	30	43.4	21890		8	30	43.7	23183		47	45072.7944	
8:30-9	6	30	43.4	21890		8	30	43.7	23183		47	45072.7944	
9-9:30	4	30	41.6	14593		8	30	43.7	23183		46	37776.2894	
9:30-10	6	30	43.4	21890		8	30	43.7	23183		47	45072.7944	
10-10:30	4	30	41.6	14593		8	30	43.7	23183		46	37776.2894	
10:30-11	6	30	43.4	21890		8	30	43.7	23183		47	45072.7944	
11-11:30	4	30	41.6	14593		8	30	43.7	23183		46	37776.2894	
1:30-12midnig	6	30	43.4	21890		8	30	43.7	23183		47	45072.7944	

Alternative S2e BRT Ldn Calculations
Receptor R-12(5)

Peak Leq			**46.4**					**48.6**			51		
Day Leq				**45.0**	**955842.1**				**47.1**	**1535892.3**		49	2491734
Night Leq				**41.5**	**2553776.7**				**42.7**	**3332596.4**		45	5508610
Ldn				**48.6**					**50.1**			**52**	

Vehicle	Speed	Ce
Autos	30	-8.9
Commuter Bu	30	1.6
Buses	30	-5.5

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S2e BRT Ldn Calculations

Receptor R-10(T-7)

BRT LDN at Receptor R-10(T-7)						Feeder Bus LDN at Receptor r-10(T-7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-10(T-7) Distance= 230		Sta.247+50			Receptor R-10(T-7) Distance= 230		Sta.247+50			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
12:30-1	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	47.2	52072		8	35	46.2	41362		50	93433.4081	
5:30-6	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
6-6:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
6:30-7	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
7-7:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
7:30-8	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
8-8:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
8:30-9	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
9-9:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
9:30-10	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
10-10:30	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
10:30-11	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
11-11:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
11:30-12noon	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
2noon-12:30p	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
12:30-1	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
1-1:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
1:30-2	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
2-2:30	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
2:30-3	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
3-3:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
3:30-4	10	35	48.1	65089		15	35	48.9	77554		52	142642.937	
4-4:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
4:30-5	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
5-5:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
5:30-6	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
6-6:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
6:30-7	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
7-7:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
7:30-8	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
8-8:30	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
8:30-9	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
9-9:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
9:30-10	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
10-10:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
10:30-11	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
11-11:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
1:30-12midnig	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	

Alternative S2e BRT Ldn Calculations
Receptor R-10(T-7)

Peak Leq			**48.9**					**50.6**			53		
Day Leq				**47.5**	**1705342.5**				**49.1**	**2435180.8**		51	4140523
Night Leq				**44.0**	**4556258.5**				**44.9**	**5583854.2**		47	9466136
Ldn				**51.2**					**52.2**			**55**	

Vehicle	Speed	Ce
Autos	35	-6.2
Commuter Bu	35	1.6
Buses	35	-3.9

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2e BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R-8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			
	BRT (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power				
12-12:30am	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
12:30-1	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	49.6	91891		8	40	48.6	72991		52	164881.947	
5:30-6	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
6-6:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
6:30-7	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
7-7:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
7:30-8	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
8-8:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
8:30-9	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
9-9:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
9:30-10	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
10-10:30	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
10:30-11	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
11-11:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
11:30-12noon	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
2noon-12:30p	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
12:30-1	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
1-1:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
1:30-2	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
2-2:30	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
2:30-3	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
3-3:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
3:30-4	10	40	50.6	114863		15	40	51.4	136859		54	251722.009	
4-4:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
4:30-5	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
5-5:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
5:30-6	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
6-6:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
6:30-7	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
7-7:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
7:30-8	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
8-8:30	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
8:30-9	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
9-9:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
9:30-10	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
10-10:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
10:30-11	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
11-11:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
1:30-12midnig	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	

Alternative S2e BRT Ldn Calculations
Receptor R-8(T-8)(10)

Peak Leq			**51.4**					**53.0**			55		
Day Leq				**50.0**	**3009418.0**				**51.6**	**4297364.0**		54	7306782
Night Leq				**46.5**	**8040429.9**				**47.4**	**9853828.2**		50	16704892
Ldn				**53.6**					**54.7**			**57**	

Vehicle	Speed	Ce
Autos	40	-3.9
Commuter Bu	40	1.6
Buses	40	-2.4

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

6-14

Alternative S2f BRT Ldn Calculations
Receptor R-13(6)

BRT LDN at Receptor R-13(6)						Feeder Bus LDN at Receptor R-13(6)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-13(6) Distance= 70		Sta.187+30			Receptor R-13(6) Distance= 70		Sta.187+30			
	BRT (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 70' dBA	Energy Power				
12-12:30am	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
12:30-1	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	53.9	246107		6	30	51.7	146618		56	392725.066	
5:30-6	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
6-6:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
6:30-7	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7-7:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
7:30-8	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8-8:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
8:30-9	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
9-9:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
9:30-10	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
10-10:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
10:30-11	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11-11:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
11:30-12noon	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2noon-12:30p	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
12:30-1	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1-1:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
1:30-2	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
2-2:30	6	30	52.7	184581		14	30	55.3	342108		57	526688.315	
2:30-3	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3-3:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
3:30-4	10	30	54.9	307634		14	30	55.3	342108		58	649742.054	
4-4:30	12	30	55.7	369161		14	30	55.3	342108		59	711268.923	
4:30-5	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5-5:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
5:30-6	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6-6:30	12	30	55.7	369161		21	30	57.1	513162		59	882322.776	
6:30-7	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7-7:30	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
7:30-8	8	30	53.9	246107		14	30	55.3	342108		58	588215.184	
8-8:30	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
8:30-9	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
9-9:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
9:30-10	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
10-10:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
10:30-11	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
11-11:30	4	30	50.9	123054		6	30	51.7	146618		54	269671.327	
1:30-12midnig	6	30	52.7	184581		6	30	51.7	146618		55	331198.197	
Peak Leq			**55.7**					**57.1**			**59**		

Alternative S2f BRT Ldn Calculations

Receptor R-13(6)

Day Leq				**54.3**	**8060019.9**				**55.5**	**10678647.7**		58	18738668
Night Leq				**50.8**	**21534404.3**				**50.9**	**22237000.9**		54	41074692
Ldn				**57.9**					**58.4**			**61**	

Vehicle	**Speed**	**Ce**	
Autos	30	-8.9	
Commuter Bu	30	1.6	
Buses	30	-5.5	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2f BRT Ldn Calculations

Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 475		Sta.204+50			Receptor R-12(5) Distance= 475		Sta.204+50			
	BRT (vp1/2h)	Speed mph	Leq at 475' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 475' dBA	Energy Power				
12-12:30am	4	15	33.9	2461		8	15	35.9	3910		38	6371.34154	
12:30-1	6	15	35.7	3692		8	15	35.9	3910		39	7601.96862	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	15	36.9	4923		8	15	35.9	3910		39	8832.59571	
5:30-6	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
6-6:30	12	15	38.7	7384		17	15	39.2	8309		42	15692.6982	
6:30-7	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
7-7:30	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
7:30-8	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
8-8:30	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
8:30-9	12	15	38.7	7384		17	15	39.2	8309		42	15692.6982	
9-9:30	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
9:30-10	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
10-10:30	6	15	35.7	3692		17	15	39.2	8309		41	12000.8169	
10:30-11	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
11-11:30	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
11:30-12noon	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
2noon-12:30p	6	15	35.7	3692		17	15	39.2	8309		41	12000.8169	
12:30-1	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
1-1:30	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
1:30-2	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
2-2:30	6	15	35.7	3692		17	15	39.2	8309		41	12000.8169	
2:30-3	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
3-3:30	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
3:30-4	10	15	37.9	6153		17	15	39.2	8309		42	14462.0711	
4-4:30	12	15	38.7	7384		17	15	39.2	8309		42	15692.6982	
4:30-5	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
5-5:30	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
5:30-6	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
6-6:30	12	15	38.7	7384		25	15	40.9	12219		43	19602.7855	
6:30-7	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
7-7:30	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
7:30-8	8	15	36.9	4923		17	15	39.2	8309		41	13231.444	
8-8:30	6	15	35.7	3692		8	15	35.9	3910		39	7601.96862	
8:30-9	6	15	35.7	3692		8	15	35.9	3910		39	7601.96862	
9-9:30	4	15	33.9	2461		8	15	35.9	3910		38	6371.34154	
9:30-10	6	15	35.7	3692		8	15	35.9	3910		39	7601.96862	
10-10:30	4	15	33.9	2461		8	15	35.9	3910		38	6371.34154	
10:30-11	6	15	35.7	3692		8	15	35.9	3910		39	7601.96862	
11-11:30	4	15	33.9	2461		8	15	35.9	3910		38	6371.34154	
1:30-12midnig	6	15	35.7	3692		8	15	35.9	3910		39	7601.96862	

Alternative S2f BRT Ldn Calculations

Receptor R-12(5)

Peak Leq			**38.7**					**40.9**			43		
Day Leq				**37.3**	**161212.1**				**39.4**	**259043.3**		41	420255
Night Leq				**33.8**	**430719.5**				**34.9**	**562075.1**		37	929081
Ldn				**40.9**					**42.3**			**44**	

Vehicle	**Speed**	**Ce**	
Autos	15	-20.9	
Commuter Bu	15	1.6	
Buses	15	-13.1	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2f BRT Ldn Calculations

Receptor R-11(4)

BRT LDN at Receptor R-11(4)						Feeder Bus LDN at Receptor R-11(4)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-11(4) Distance= 900		Sta.223+25			Receptor R-11(4) Distance= 900		Sta.223+25			
	BRT (vp1/2h)	Speed mph	Leq at 900' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 900' dBA	Energy Power				
12-12:30am	4	25	33.1	2031		8	25	35.1	3226		37	5256.30625	
12:30-1	6	25	34.8	3046		8	25	35.1	3226		38	6271.56384	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	25	36.1	4061		8	25	35.1	3226		39	7286.82143	
5:30-6	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
6-6:30	12	25	37.8	6092		17	25	38.4	6855		41	12946.3516	
6:30-7	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
7-7:30	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
7:30-8	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
8-8:30	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
8:30-9	12	25	37.8	6092		17	25	38.4	6855		41	12946.3516	
9-9:30	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
9:30-10	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
10-10:30	6	25	34.8	3046		17	25	38.4	6855		40	9900.5788	
10:30-11	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
11-11:30	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
11:30-12noon	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
2noon-12:30p	6	25	34.8	3046		17	25	38.4	6855		40	9900.5788	
12:30-1	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
1-1:30	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
1:30-2	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
2-2:30	6	25	34.8	3046		17	25	38.4	6855		40	9900.5788	
2:30-3	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
3-3:30	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
3:30-4	10	25	37.1	5076		17	25	38.4	6855		41	11931.094	
4-4:30	12	25	37.8	6092		17	25	38.4	6855		41	12946.3516	
4:30-5	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
5-5:30	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
5:30-6	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
6-6:30	12	25	37.8	6092		25	25	40.0	10081		42	16172.1426	
6:30-7	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
7-7:30	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
7:30-8	8	25	36.1	4061		17	25	38.4	6855		40	10915.8364	
8-8:30	6	25	34.8	3046		8	25	35.1	3226		38	6271.56384	
8:30-9	6	25	34.8	3046		8	25	35.1	3226		38	6271.56384	
9-9:30	4	25	33.1	2031		8	25	35.1	3226		37	5256.30625	
9:30-10	6	25	34.8	3046		8	25	35.1	3226		38	6271.56384	
10-10:30	4	25	33.1	2031		8	25	35.1	3226		37	5256.30625	
10:30-11	6	25	34.8	3046		8	25	35.1	3226		38	6271.56384	
11-11:30	4	25	33.1	2031		8	25	35.1	3226		37	5256.30625	
1:30-12midnig	6	25	34.8	3046		8	25	35.1	3226		38	6271.56384	

Alternative S2f BRT Ldn Calculations
Receptor R-11(4)

Peak Leq			**37.8**					**40.0**			42		
Day Leq				**36.5**	**132998.7**				**38.5**	**213708.7**		41	346707
Night Leq				**33.0**	**355340.2**				**34.1**	**463707.5**		36	766485
Ldn				**40.1**					**41.5**			**44**	

Vehicle	**Speed**	**Ce**	
Autos	25	-12.0	
Commuter Bu	25	1.6	
Buses	25	-7.5	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2f BRT Ldn Calculations

Receptor R-10(T-7)

BRT LDN at Receptor R-10(T-7)						Feeder Bus LDN at Receptor r-10(T-7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-10(T-7) Distance= 230		Sta.247+50			Receptor R-10(T-7) Distance= 230		Sta.247+50			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
12:30-1	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	47.2	52072		8	35	46.2	41362		50	93433.4081	
5:30-6	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
6-6:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
6:30-7	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
7-7:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
7:30-8	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
8-8:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
8:30-9	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
9-9:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
9:30-10	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
10-10:30	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
10:30-11	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
11-11:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
11:30-12noon	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
2noon-12:30p	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
12:30-1	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
1-1:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
1:30-2	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
2-2:30	6	35	45.9	39054		15	35	48.9	77554		51	116607.174	
2:30-3	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
3-3:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
3:30-4	10	35	48.1	65089		15	35	48.9	77554		52	142642.937	
4-4:30	12	35	48.9	78107		15	35	48.9	77554		52	155660.818	
4:30-5	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
5-5:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
5:30-6	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
6-6:30	12	35	48.9	78107		22	35	50.6	113745		53	191852.466	
6:30-7	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
7-7:30	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
7:30-8	8	35	47.2	52072		15	35	48.9	77554		51	129625.056	
8-8:30	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
8:30-9	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
9-9:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
9:30-10	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
10-10:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
10:30-11	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	
11-11:30	4	35	44.2	26036		8	35	46.2	41362		48	67397.6454	
1:30-12midnig	6	35	45.9	39054		8	35	46.2	41362		49	80415.5268	

Alternative S2f BRT Ldn Calculations
Receptor R-10(T-7)

Peak Leq			**48.9**					**50.6**			53		
Day Leq				**47.5**	**1705342.5**				**49.1**	**2435180.8**		51	4140523
Night Leq				**44.0**	**4556258.5**				**44.9**	**5583854.2**		47	9466136
Ldn				**51.2**					**52.2**			**55**	

Vehicle	Speed	Ce
Autos	35	-6.2
Commuter Bu	35	1.6
Buses	35	-3.9

BRT

6-16

Source	Reference SEL (dBA)
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2f BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R-8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			
	BRT (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power				
12-12:30am	4	45	47.4	54824		8	45	49.4	87096		52	141920.269	
12:30-1	6	45	49.2	82236		8	45	49.4	87096		52	169332.224	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	45	50.4	109648		8	45	49.4	87096		53	196744.179	
5:30-6	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
6-6:30	12	45	52.2	164472		15	45	52.1	163306		55	327777.403	
6:30-7	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
7-7:30	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
7:30-8	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
8-8:30	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
8:30-9	12	45	52.2	164472		15	45	52.1	163306		55	327777.403	
9-9:30	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
9:30-10	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
10-10:30	6	45	49.2	82236		15	45	52.1	163306		54	245541.538	
10:30-11	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
11-11:30	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
11:30-12noon	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
2noon-12:30p	6	45	49.2	82236		15	45	52.1	163306		54	245541.538	
12:30-1	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
1-1:30	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
1:30-2	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
2-2:30	6	45	49.2	82236		15	45	52.1	163306		54	245541.538	
2:30-3	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
3-3:30	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
3:30-4	10	45	51.4	137060		15	45	52.1	163306		55	300365.448	
4-4:30	12	45	52.2	164472		15	45	52.1	163306		55	327777.403	
4:30-5	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
5-5:30	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
5:30-6	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
6-6:30	12	45	52.2	164472		22	45	53.8	239515		56	403986.717	
6:30-7	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
7-7:30	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
7:30-8	8	45	50.4	109648		15	45	52.1	163306		54	272953.493	
8-8:30	6	45	49.2	82236		8	45	49.4	87096		52	169332.224	
8:30-9	6	45	49.2	82236		8	45	49.4	87096		52	169332.224	
9-9:30	4	45	47.4	54824		8	45	49.4	87096		52	141920.269	
9:30-10	6	45	49.2	82236		8	45	49.4	87096		52	169332.224	
10-10:30	4	45	47.4	54824		8	45	49.4	87096		52	141920.269	
10:30-11	6	45	49.2	82236		8	45	49.4	87096		52	169332.224	
11-11:30	4	45	47.4	54824		8	45	49.4	87096		52	141920.269	
1:30-12midnig	6	45	49.2	82236		8	45	49.4	87096		52	169332.224	

Alternative S2f BRT Ldn Calculations

Receptor R-8(T-8)(10)

Peak Leq			**52.2**					**53.8**			56		
Day Leq				**50.8**	**3590966.1**				**52.3**	**5127798.1**		55	8718764
Night Leq				**47.3**	**9594184.2**				**48.2**	**11758008.5**		50	19932990
Ldn				**54.4**					**55.5**			**58**	

Vehicle	**Speed**	**Ce**	
Autos	45	-1.8	
Commuter Bu	45	1.6	
Buses	45	-1.1	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2g BRT Ldn Calculations
Receptor R-15(7)

BRT LDN at Receptor R-15(7)						Feeder Bus LDN at Receptor R-15(7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-15(7) Distance= 140		Sta.189+60			Receptor R-15(7) Distance= 140		Sta.189+60			
	BRT (vp1/2h)	Speed mph	Leq at 140' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 140' dBA	Energy Power				
12-12:30am	4	30	46.4	43506		6	30	47.1	51837		50	95343.2121	
12:30-1	6	30	48.1	65259		6	30	47.1	51837		51	117096.245	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	49.4	87012		6	30	47.1	51837		51	138849.279	
5:30-6	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
6-6:30	12	30	51.2	130518		14	30	50.8	120953		54	251471.539	
6:30-7	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
7-7:30	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
7:30-8	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
8-8:30	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
8:30-9	12	30	51.2	130518		14	30	50.8	120953		54	251471.539	
9-9:30	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
9:30-10	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
10-10:30	6	30	48.1	65259		14	30	50.8	120953		53	186212.439	
10:30-11	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
11-11:30	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
11:30-12noon	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
2noon-12:30pi	6	30	48.1	65259		14	30	50.8	120953		53	186212.439	
12:30-1	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
1-1:30	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
1:30-2	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
2-2:30	6	30	48.1	65259		14	30	50.8	120953		53	186212.439	
2:30-3	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
3-3:30	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
3:30-4	10	30	50.4	108765		14	30	50.8	120953		54	229718.506	
4-4:30	12	30	51.2	130518		14	30	50.8	120953		54	251471.539	
4:30-5	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
5-5:30	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
5:30-6	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
6-6:30	12	30	51.2	130518		21	30	52.6	181430		55	311948.209	
6:30-7	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
7-7:30	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
7:30-8	8	30	49.4	87012		14	30	50.8	120953		53	207965.473	
8-8:30	6	30	48.1	65259		6	30	47.1	51837		51	117096.245	
8:30-9	6	30	48.1	65259		6	30	47.1	51837		51	117096.245	
9-9:30	4	30	46.4	43506		6	30	47.1	51837		50	95343.2121	
9:30-10	6	30	48.1	65259		6	30	47.1	51837		51	117096.245	
10-10:30	4	30	46.4	43506		6	30	47.1	51837		50	95343.2121	
10:30-11	6	30	48.1	65259		6	30	47.1	51837		51	117096.245	
11-11:30	4	30	46.4	43506		6	30	47.1	51837		50	95343.2121	
1:30-12midnig	6	30	48.1	65259		6	30	47.1	51837		51	117096.245	
Peak Leq			**51.2**					**52.6**			55		

Alternative S2g BRT Ldn Calculations
Receptor R-15(7)

Day Leq				**49.8**	**2849647.4**				**51.0**	**3775472.1**		53	6625119
Night Leq				**46.3**	**7613561.6**				**46.4**	**7861967.1**		49	14522097
Ldn				**53.4**					**53.8**			**56**	

Vehicle	**Speed**	**Ce**	
Autos	30	-8.9	
Commuter Bu	30	1.6	
Buses	30	-5.5	**BRT**

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Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2g BRT Ldn Calculations
Receptor R-12(5)

BRT LDN at Receptor R-12(5)						Feeder Bus LDN at Receptor R-12(5)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-12(5) Distance= 370		Sta.208+50			Receptor R-12(5) Distance= 370		Sta.208+50			
	BRT (vp1/2h)	Speed mph	Leq at 370' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 370' dBA	Energy Power				
12-12:30am	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
12:30-1	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	35	44.1	25521		8	35	43.1	20272		47	45792.1841	
5:30-6	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
6-6:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
6:30-7	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
7-7:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
7:30-8	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
8-8:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
8:30-9	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
9-9:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
9:30-10	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
10-10:30	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
10:30-11	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
11-11:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
11:30-12noon	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
2noon-12:30p	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
12:30-1	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
1-1:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
1:30-2	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
2-2:30	6	35	42.8	19140		17	35	46.3	43077		48	62217.6805	
2:30-3	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
3-3:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
3:30-4	10	35	45.0	31901		17	35	46.3	43077		49	74977.939	
4-4:30	12	35	45.8	38281		17	35	46.3	43077		49	81358.0682	
4:30-5	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
5-5:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
5:30-6	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
6-6:30	12	35	45.8	38281		25	35	48.0	63349		50	101629.735	
6:30-7	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
7-7:30	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
7:30-8	8	35	44.1	25521		17	35	46.3	43077		48	68597.8097	
8-8:30	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
8:30-9	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
9-9:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
9:30-10	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
10-10:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
10:30-11	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	
11-11:30	4	35	41.1	12760		8	35	43.1	20272		45	33031.9257	
1:30-12midnig	6	35	42.8	19140		8	35	43.1	20272		46	39412.0549	

Alternative S2g BRT Ldn Calculations
Receptor R-12(5)

Peak Leq			**45.8**					**48.0**			50		
Day Leq				**44.4**	**835796.9**				**46.5**	**1342998.0**		49	2178795
Night Leq				**40.9**	**2233045.2**				**42.1**	**2914052.2**		44	4816778
Ldn				**48.1**					**49.5**			**52**	

Vehicle	**Speed**	**Ce**
Autos	35	-6.2
Commuter Bu	35	1.6
Buses	35	-3.9

BRT

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2g BRT Ldn Calculations
Receptor R-11(4)

BRT LDN at Receptor R-11(4)						Feeder Bus LDN at Receptor R-11(4)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-11(4) Distance= 900		Sta.223+25			Receptor R-11(4) Distance= 900		Sta.223+25			
	BRT (vp1/2h)	Speed mph	Leq at 900' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 900' dBA	Energy Power				
12-12:30am	4	30	34.3	2669		8	30	36.3	4240		38	6909.59401	
12:30-1	6	30	36.0	4004		8	30	36.3	4240		39	8244.18477	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	30	37.3	5338		8	30	36.3	4240		40	9578.77553	
5:30-6	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
6-6:30	12	30	39.0	8008		17	30	39.5	9011		42	17018.4211	
6:30-7	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
7-7:30	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
7:30-8	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
8-8:30	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
8:30-9	12	30	39.0	8008		17	30	39.5	9011		42	17018.4211	
9-9:30	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
9:30-10	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
10-10:30	6	30	36.0	4004		17	30	39.5	9011		41	13014.6488	
10:30-11	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
11-11:30	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
11:30-12noon	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
2noon-12:30p	6	30	36.0	4004		17	30	39.5	9011		41	13014.6488	
12:30-1	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
1-1:30	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
1:30-2	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
2-2:30	6	30	36.0	4004		17	30	39.5	9011		41	13014.6488	
2:30-3	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
3-3:30	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
3:30-4	10	30	38.2	6673		17	30	39.5	9011		42	15683.8303	
4-4:30	12	30	39.0	8008		17	30	39.5	9011		42	17018.4211	
4:30-5	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
5-5:30	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
5:30-6	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
6-6:30	12	30	39.0	8008		25	30	41.2	13251		43	21258.8336	
6:30-7	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
7-7:30	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
7:30-8	8	30	37.3	5338		17	30	39.5	9011		42	14349.2396	
8-8:30	6	30	36.0	4004		8	30	36.3	4240		39	8244.18477	
8:30-9	6	30	36.0	4004		8	30	36.3	4240		39	8244.18477	
9-9:30	4	30	34.3	2669		8	30	36.3	4240		38	6909.59401	
9:30-10	6	30	36.0	4004		8	30	36.3	4240		39	8244.18477	
10-10:30	4	30	34.3	2669		8	30	36.3	4240		38	6909.59401	
10:30-11	6	30	36.0	4004		8	30	36.3	4240		39	8244.18477	
11-11:30	4	30	34.3	2669		8	30	36.3	4240		38	6909.59401	
1:30-12midnig	6	30	36.0	4004		8	30	36.3	4240		39	8244.18477	

Alternative S2g BRT Ldn Calculations
Receptor R-11(4)

Peak Leq			**39.0**					**41.2**			43		
Day Leq				**37.7**	**174831.4**				**39.7**	**280927.3**		42	455759
Night Leq				**34.1**	**467106.8**				**35.3**	**609559.3**		37	1007570
Ldn				**41.3**					**42.7**			**45**	

Vehicle	**Speed**	**Ce**
Autos	30	-8.9
Commuter Bu	30	1.6
Buses	30	-5.5

BRT

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2g BRT Ldn Calculations
Receptor R-10(T-7)

BRT LDN at Receptor R-10(T-7)						Feeder Bus LDN at Receptor r-10(T-7)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-10(T-7) Distance= 230		Sta.247+50			Receptor R-10(T-7) Distance= 230		Sta.247+50			
	BRT (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 230' dBA	Energy Power				
12-12:30am	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
12:30-1	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	20	43.5	22493		8	20	42.5	17867		46	40359.4387	
5:30-6	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
6-6:30	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
6:30-7	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
7-7:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
7:30-8	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
8-8:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
8:30-9	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
9-9:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
9:30-10	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
10-10:30	6	20	42.3	16870		15	20	45.3	33500		47	50369.5647	
10:30-11	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
11-11:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
11:30-12noon	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
2noon-12:30p	6	20	42.3	16870		15	20	45.3	33500		47	50369.5647	
12:30-1	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
1-1:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
1:30-2	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
2-2:30	6	20	42.3	16870		15	20	45.3	33500		47	50369.5647	
2:30-3	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
3-3:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
3:30-4	10	20	44.5	28116		15	20	45.3	33500		48	61615.9571	
4-4:30	12	20	45.3	33739		15	20	45.3	33500		48	67239.1533	
4:30-5	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
5-5:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
5:30-6	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
6-6:30	12	20	45.3	33739		22	20	46.9	49133		49	82872.4755	
6:30-7	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
7-7:30	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
7:30-8	8	20	43.5	22493		15	20	45.3	33500		47	55992.7609	
8-8:30	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
8:30-9	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
9-9:30	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
9:30-10	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
10-10:30	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
10:30-11	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	
11-11:30	4	20	40.5	11246		8	20	42.5	17867		45	29113.0463	
1:30-12midnig	6	20	42.3	16870		8	20	42.5	17867		45	34736.2425	

Alternative S2g BRT Ldn Calculations
Receptor R-10(T-7)

Peak Leq			**45.3**					**46.9**			49		
Day Leq				**43.9**	**736638.7**				**45.4**	**1051899.3**		48	1788538
Night Leq				**40.4**	**1968118.7**				**41.3**	**2411998.3**		44	4088986
Ldn				**47.5**					**48.6**			**51**	

Vehicle	**Speed**	**Ce**
Autos	20	-15.9
Commuter Bu	20	1.6
Buses	20	-9.9

BRT

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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Alternative S2g BRT Ldn Calculations
Receptor R-8(T-8)(10)

BRT LDN at Receptor R-8(T-8)(10)						Feeder Bus LDN at Receptor R-8(T-8)(10)					Combined Ldn (BRT+Diesel Buses)		
			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			Receptor R-8(T-8)(10) Distance= 180		Sta.262+80			
	BRT (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power		Diesel Feeder Bus (vp1/2h)	Speed mph	Leq at 180' dBA	Energy Power				
12-12:30am	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
12:30-1	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
1-1:30													
1:30-2													
2-2:30													
2:30-3													
3-3:30													
3:30-4													
4-4:30													
4:30-5													
5-5:30	8	40	49.6	91891		8	40	48.6	72991		52	164881.947	
5:30-6	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
6-6:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
6:30-7	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
7-7:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
7:30-8	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
8-8:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
8:30-9	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
9-9:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
9:30-10	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
10-10:30	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
10:30-11	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
11-11:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
11:30-12noon	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
2noon-12:30p	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
12:30-1	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
1-1:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
1:30-2	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
2-2:30	6	40	48.4	68918		15	40	51.4	136859		53	205776.695	
2:30-3	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
3-3:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
3:30-4	10	40	50.6	114863		15	40	51.4	136859		54	251722.009	
4-4:30	12	40	51.4	137836		15	40	51.4	136859		54	274694.666	
4:30-5	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
5-5:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
5:30-6	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
6-6:30	12	40	51.4	137836		22	40	53.0	200726		55	338562.07	
6:30-7	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
7-7:30	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
7:30-8	8	40	49.6	91891		15	40	51.4	136859		54	228749.352	
8-8:30	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
8:30-9	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
9-9:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
9:30-10	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
10-10:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
10:30-11	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	
11-11:30	4	40	46.6	45945		8	40	48.6	72991		51	118936.633	
1:30-12midnig	6	40	48.4	68918		8	40	48.6	72991		52	141909.29	

Alternative S2g BRT Ldn Calculations
Receptor R-8(T-8)(10)

Peak Leq			**51.4**					**53.0**			55		
Day Leq				**50.0**	**3009418.0**				**51.6**	**4297364.0**		54	7306782
Night Leq				**46.5**	**8040429.9**				**47.4**	**9853828.2**		50	16704892
Ldn				**53.6**					**54.7**			**57**	

Vehicle	**Speed**	**Ce**	
Autos	40	-3.9	
Commuter Bu	40	1.6	
Buses	40	-2.4	**BRT**

6-16

Source	**Reference SEL (dBA)**
Autos	74
Bus(diesel)	82
Bus (Elec.)	80
Bus (hybrid)	83

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APPENDIX “D”

LRT Vibration Study

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternatives S1, S2, and S3

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-19(T-3)	130	35	Grade	65	-3.10	0	62	**No**
R-18(T-4)	80	25	Grade	69	-6.02	0	63	**No**
R-17(T-5)	90	20	Grade	68	-7.96	0	60	**No**
R-16(8b)	310	20	Grade	56	-7.96	0	48	**No**
R-13(6)	70	30	Grade	71	-4.44	0	67	**No**
R-11(4)	380	35	Grade	56	-3.10	0	53	**No**
R-9(3)	215	35	Grade	60	-3.10	0	57	**No**
R-8(T-8)(10)	230	15	Grade	58	-10.46	0	48	**No**
R-7(T-9)	255	40	Grade	57.5	-1.94	0	56	**No**
R-6(T-10)	70	40	Grade	71	-1.94	0	69	**No**
R-5(T-11)	250	40	Grade	58	-1.94	0	56	**No**
R-4(T-12)	260	40	Grade	57.5	-1.94	0	56	**No**
R-3(2)	70	40	Grade	71	-1.94	0	69	**No**
R-2(1)	210	35	Grade	60	-3.10	0	57	**No**
R-1(T-13)	135	40	Grade	65	-1.94	0	63	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternatives S1a to Master Plan

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-20(9)	725	25	Aerial	56	-6.02	-10	40	**No**
R-16(8b)	280	10	Grade	56.5	-3.52	0	47	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternatives S1a to S2

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-20(9)	725	25	Aerial	56	-6.02	-10	40	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternative S2a

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-13(6)	70	30	Grade	71	-4.44	0	67	**No**
R-12(5)	290	15	Grade	56.5	-10.46	0	46	**No**
R-10(T-7)	230	35	Grade	59	-3.10	0	54	**No**
R-8(T-8)(10)	180	45	Grade	61	-0.92	0	54	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternative S2b

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-13(6)	70	30	Grade	71	-4.44	0	67	**No**
R-12(5)	400	45	Grade	56	-0.92	0	55	**No**
R-10(T-7)	225	45	Grade	59	-0.92	0	58	**No**
R-8(T-8)(10)	180	45	Grade	61	-0.92	0	60	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternative S2c

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	15	Grade	64.5	-10.46	0	54	**No**
R-12(5)	370	35	Grade	56	-3.10	0	53	**No**
R-11(4)	380	30	Grade	56	-4.44	0	52	**No**
R-9(3)	215	35	Grade	60.5	-3.10	0	57	**No**
R-8(T-8)(10))	290	15	Grade	56	-10.46	0	46	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternative S2d

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	15	Grade	64.5	-10.46	0	54	**No**
R-12(5)	370	35	Grade	56	-3.10	0	53	**No**
R-10(T-7)	230	20	Grade	59	-7.96	0	51	**No**
R-8(T-8)(10)	180	40	Grade	61	-1.94	0	59	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRt Vibration Calculations Alternative S2e

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	15	Grade	64.5	-10.46	0	54	**No**
R-12(5)	290	30	Grade	56	-4.44	0	52	**No**
R-10(T-7)	230	35	Grade	59	-3.10	0	56	**No**
R-8(T-8)(10)	180	40	Grade	61	-1.94	0	59	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternative S2f

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-13(6)	70	30	Grade	71	-4.44	0	67	**No**
R-12(5)	475	15	Grade	56	-10.46	0	46	**No**
R-11(4)	900	25	Grade	56	-6.02	0	50	**No**
R-10(T-7)	230	35	Grade	59	-3.10	0	56	**No**
R-8(T-8)(10)	180	45	Grade	61	-0.92	0	60	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
LRT Vibration Calculations Alternative S2g

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 50 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	30	Grade	64.5	-4.44	0	60	**No**
R-12(5)	370	35	Grade	56	-3.10	0	53	**No**
R-11(4)	900	30	Grade	56	-4.44	0	52	**No**
R-10(T-7)	230	20	Grade	59	-7.96	0	51	**No**
R-8(T-8)(10)	180	40	Grade	61	-1.94	0	59	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

APPENDIX “E”

BRT Vibration Study

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternatives S1, S2, and S3

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-19(T-3)	130	35	Grade	54	1.34	0	55	**No**
R-18(T-4)	80	25	Grade	59	-1.58	0	57	**No**
R-17(T-5)	90	20	Grade	57.5	-3.52	0	54	**No**
R-16(8b)	310	20	Grade	50	-3.52	0	46	**No**
R-13(6)	70	30	Grade	60	0.00	0	60	**No**
R-11(4)	380	35	Grade	50	1.34	0	51	**No**
R-9(3)	215	35	Grade	50	1.34	0	51	**No**
R-8(T-8)(10)	230	15	Grade	50	-6.02	0	44	**No**
R-7(T-9)	255	40	Grade	50	2.50	0	52	**No**
R-6(T-10)	70	40	Grade	60	2.50	0	62	**No**
R-5(T-11)	250	40	Grade	50	2.50	0	52	**No**
R-4(T-12)	260	40	Grade	50	2.50	0	52	**No**
R-3(2)	70	40	Grade	60	2.50	0	62	**No**
R-2(1)	210	35	Grade	50	1.34	0	51	**No**
R-1(T-13)	135	40	Grade	54	2.50	0	56	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternatives S1a to Master Plan

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-20(9)	725	25	Aerial	50	-1.58	-10	38	**No**
R-16(8b)	280	10	Grade	50	-9.54	0	40	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternatives S1a to S2

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-20(9)	725	25	Aerial	50	-1.58	-10	38	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2a

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-13(6)	70	30	Grade	60	0.00	0	60	**No**
R-12(5)	290	15	Grade	50	-6.02	0	44	**No**
R-10(T-7)	230	35	Grade	50	1.34	0	51	**No**
R-8(T-8)(10)	180	45	Grade	51	3.52	0	55	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2b

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-13(6)	70	30	Grade	60	0.00	0	60	**No**
R-12(5)	400	45	Grade	50	3.52	0	54	**No**
R-10(T-7)	225	45	Grade	50	3.52	0	54	**No**
R-8(T-8)(10)	180	45	Grade	51	3.52	0	55	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2c

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	15	Grade	53	-6.02	0	47	**No**
R-12(5)	370	35	Grade	50	1.34	0	51	**No**
R-11(4)	380	30	Grade	50	0.00	0	50	**No**
R-9(3)	215	35	Grade	50	1.34	0	51	**No**
R-8(T-8)(10))	290	15	Grade	50	-6.02	0	44	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2d

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	15	Grade	53	-6.02	0	47	**No**
R-12(5)	370	35	Grade	50	1.34	0	51	**No**
R-10(T-7)	230	20	Grade	50	-3.52	0	46	**No**
R-8(T-8)(10)	180	40	Grade	51	2.50	0	53	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2e

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	15	Grade	53	-6.02	0	47	**No**
R-12(5)	290	30	Grade	50	0.00	0	50	**No**
R-10(T-7)	230	35	Grade	50	1.34	0	51	**No**
R-8(T-8)(10)	180	40	Grade	51	2.50	0	53	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2f

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-13(6)	70	30	Grade	60	0.00	0	60	**No**
R-12(5)	475	15	Grade	50	-6.02	0	44	**No**
R-11(4)	900	25	Grade	50	-1.58	0	48	**No**
R-10(T-7)	230	35	Grade	50	1.34	0	51	**No**
R-8(T-8)(10)	180	45	Grade	51	3.52	0	55	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.

I-270 CCT (LRT) Vibration Calculations @ Monitored Receptors
BRT Vibration Calculations Alternative S2g

Receptor	Distance to Track	Speed	Elevation	VdB	Adjustments (VdB)		VdB	Impact(>/=72 VdB)
	(Feet)	(mph)	Grade/Aerial	(at 30 mph)	Speed	Aerial	(in/sec)	Yes/No
R-15(7)	140	30	Grade	53	0.00	0	53	**No**
R-12(5)	370	35	Grade	50	1.34	0	51	**No**
R-11(4)	900	30	Grade	50	0.00	0	50	**No**
R-10(T-7)	230	20	Grade	50	-3.52	0	46	**No**
R-8(T-8)(10)	180	40	Grade	51	2.50	0	53	**No**

Category 2 (residences and buildings where people normally sleep) noise criteria = 72 VdB for frequent events..

Frequent events are defined as more than 70 vibration events per day.