NOISE STUDY REPORT

SR 674
PROJECT DEVELOPMENT AND ENVIRONMENT STUDY
from US 301 (SR 43) to south CR 579
Hillsborough County, Florida

Work Program Item Segment Number: 422762 1

Prepared for:
Florida Department of Transportation
District Seven
11201 North McKinley Drive
Tampa, Florida 33612-6456

April 2009

EXECUTIVE SUMMARY

A Project Development and Environment (PD&E) Study was prepared for proposed improvements to SR 674 from US 301 to County Road (CR) 579 in Hillsborough County, Florida. The improvements will add four through lanes (two through lanes in each direction of travel) to the existing two-lane roadway from US 301 to West Lake Drive and two through lanes (one through lane in each direction of travel) from West Lake Drive to CR 579.

The objectives of this Noise Study Report were to identify noise sensitive sites adjacent to the roadway, to evaluate future traffic noise levels with the proposed roadway improvements, and to evaluate the need for, and effectiveness of, noise abatement measures.

Noise Sensitive Sites
A total of 39 noise sensitive sites were evaluated (36 single-family residences and three churches).

Future Traffic Noise Levels
With the improvements to SR 674, 32 single-family residences are predicted to experience traffic noise levels that would approach, meet, or exceed the Federal Highway Administration's Noise Abatement Criteria (NAC). None of the residences are predicted to experience traffic noise levels that would increase substantially from existing levels.

Noise Abatement Measures
The noise abatement measures considered for the 32 affected residences were traffic management, alternative roadway alignment, property acquisition, and noise barriers. Based on the results of the analysis, a noise barrier is considered a potentially feasible and reasonable measure to reduce predicted future traffic noise levels for the affected residences of the Sun City Mobile Home Park. It does not appear that any of the measures would be considered both feasible and reasonable to reduce the predicted future traffic noise levels at any of the remaining affected residences within the project limits.

During the project's future design a detailed traffic noise analysis for the potential noise barrier at Sun City Mobile Home Park will be undertaken. If the analysis confirms that a noise barrier is a cost reasonable and feasible method of reducing predicted impacts, the noise barrier will be included as part of the SR 674 project contingent on the following:

- The owners of the Sun City Mobile Home Park indicate a positive desire for a barrier (including type, height, length, and location).

- All safety and engineering aspects of a barrier, as they related to the roadway user and to the adjacent property owners, have been reviewed and approved.

Construction Noise
Construction of the SR 674 improvements would result in a temporary noise increase within the project area. The noise would be generated primarily from the heavy equipment used to haul materials and construct the improvements.

Noise Contours

To reduce the potential for additional noise-sensitive sites to be located within an area incompatible with traffic noise, noise contours were developed to illustrate that a level of 66 decibels on the "A"-weighted scale (the NAC for residences) could, depending on the segment of the project, extend between approximately 55 to 150 feet from the edge of the near travel lane with the proposed improvements. Notably, local officials should not allow construction of any noise-sensitive sites (e.g., residences, parks, churches, etc.) within this area.

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Note: Electronic versions of the Traffic Noise Model (TNM) input/output are available for review at the District Seven office of the Florida Department of Transportation.

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1.0 INTRODUCTION

A Project Development and Environment (PD&E) Study was prepared for proposed improvements to SR 674 in Hillsborough County, Florida. The project limits for the improvements are from US 301 to CR 579 (**Figure 1**). The improvements will add four through lanes (two through lanes in each direction of travel) to the existing two-lane roadway from US 301 to West Lake Drive and two through lanes (one through lane in each direction of travel) from West Lake Drive to County Road (CR) 579.

The objectives of this Noise Study Report (NSR) were to:

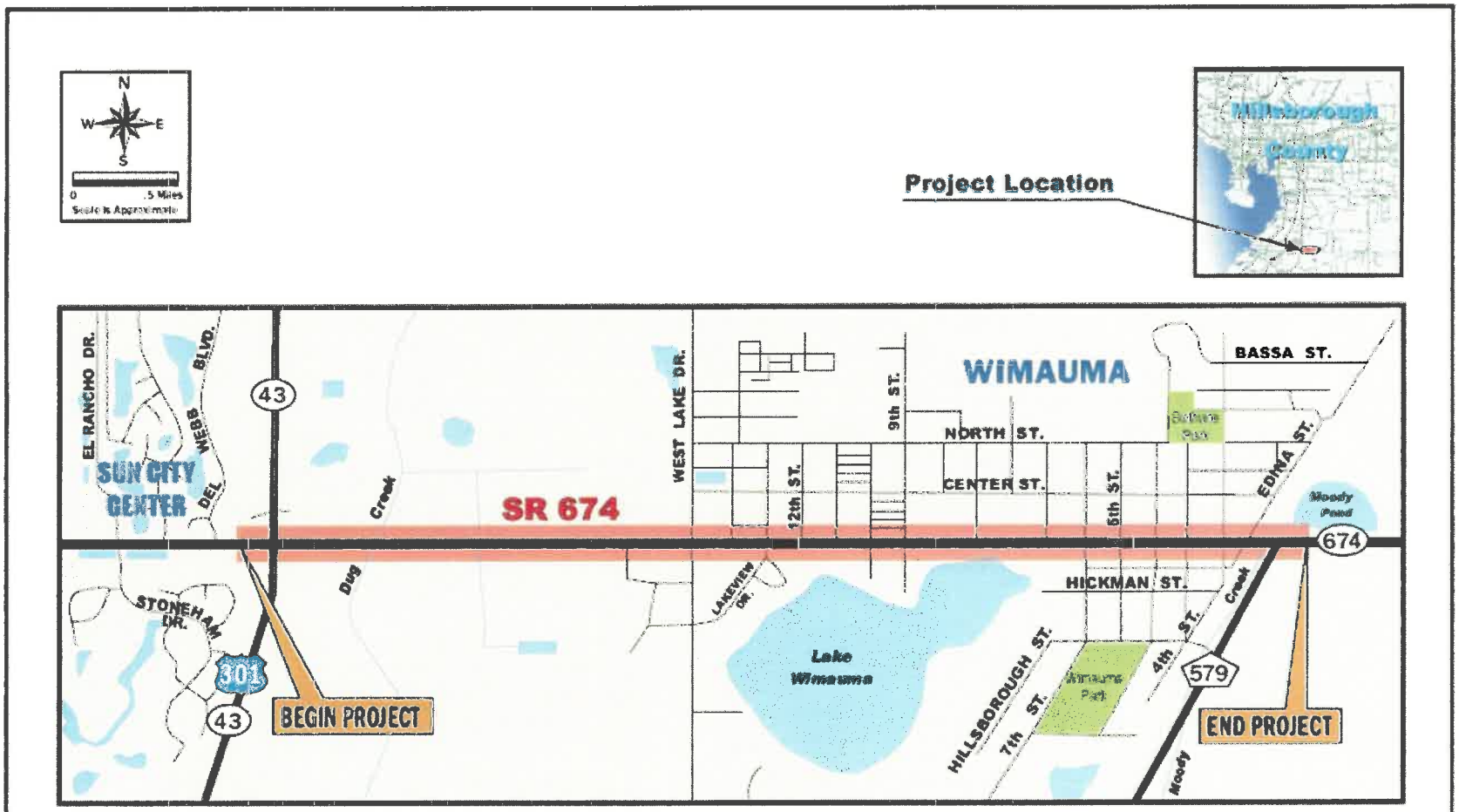
- Identify noise sensitive sites adjacent to SR 674,
- Evaluate future traffic noise levels at the noise sensitive sites with the improvements to the roadway, and
- Evaluate the need for and effectiveness of noise abatement measures.

An additional objective was the development of noise contours (distances from the roadway that traffic noise levels would be predicted to approach, meet, or exceed the Federal Highway Administration's (FHWA's) Noise Abatement Criteria (NAC)). As shown in **Table 1**, the FHWA's NAC vary based on the activities that occur on a property.

Table 1
Federal Highway Administration Noise Abatement Criteria

Activity Category	Description	Noise Abatement Criteria (L_{Aeq1h})
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	57 (Exterior)
B	Picnic area, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (Exterior)
C	Developed lands, properties or activities not included in Categories A or B above.	72 (Exterior)
D	Undeveloped lands.	N/A
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.	52 (Interior)

Source: Code of Federal Regulations, Title 23, Part 772
L_{Aeq1h} - values that contain the same amount of acoustic energy as a time-varying A-weighted sound level over a period of one hour.



SR 674 from US 301 to CR 597	PROJECT LOCATION	FIGURE 1

2.0 PROPOSED IMPROVEMENTS

A typical section is an illustration of the roadway design for a project. The typical sections for the recommended alternative are illustrated on **Figure 2**. As shown, the ultimate improvement from US 301 to West Lake Drive (Segment 1 of the project) is a 6-lane roadway (three 12-foot through lanes in each direction). According to the traffic analyses, this segment should be ultimately widened to provide six travel lanes by the design year 2030. To minimize impacts, a six-lane urban typical section was developed for this segment that would provide three 12-foot-wide travel lanes in each direction, a 22-foot-wide median and bicycle lanes and sidewalks on both sides. This typical section would require 126 feet of right of way. To accommodate this typical section, an additional 26 feet of right of way would be needed along SR 674 from a point 2,600 feet east of US 301 (SR 43) – where the existing right of way narrows from 180 feet to 100 feet – to West Lake Drive.

Staged interim improvements are envisioned for this segment of SR 674 when warranted to accommodate the additional traffic demand that would be generated from planned developments that may be constructed in the near future. These improvements involve the widening of SR 674 to provide an initial four-lane urban typical section (an 11-foot-wide to 12-foot-wide inside travel lane and a 12-foot-wide outside travel lane in each direction), a 22-foot-wide median and bicycle lanes and sidewalks on both sides. This interim widening of SR 674 will take place within the existing right of way. Figure 2 also depicts the proposed typical section of SR 674 for these staged interim improvements.

Segments 2, 3 and 4 – from West Lake Drive to CR 579: A four lane urban typical section was developed for SR 674 from West Lake Drive to CR 579 (Segments 2, 3 and 4 of the project). This typical section contains 4-foot bike lanes, two 12-foot travel lanes in each direction, and 5-foot sidewalks. The existing right of way varies from 80 feet to 100 feet. The recommended four-lane typical section would require from 2 feet to 22 feet of additional right of way. The typical section for these improvements is also provided on Figure 2.

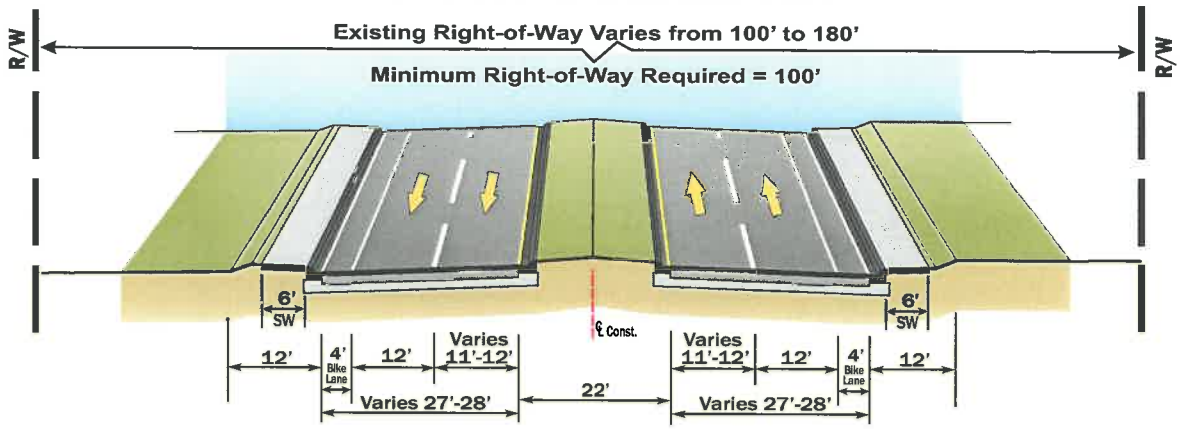
3.0 TRAFFIC NOISE ANALYSIS

3.1 Methodology

The traffic noise analysis was performed following Florida Department of Transportation (FDOT) procedures (Project Development and Environment (PD&E) Manual, Chapter 17-Noise, April 18, 2007). The FDOT's procedures comply with Part 772 of Title 23 of the Code of Federal Regulations (23 CFR 772)--Procedures for Abatement of Highway Traffic Noise and Construction Noise.

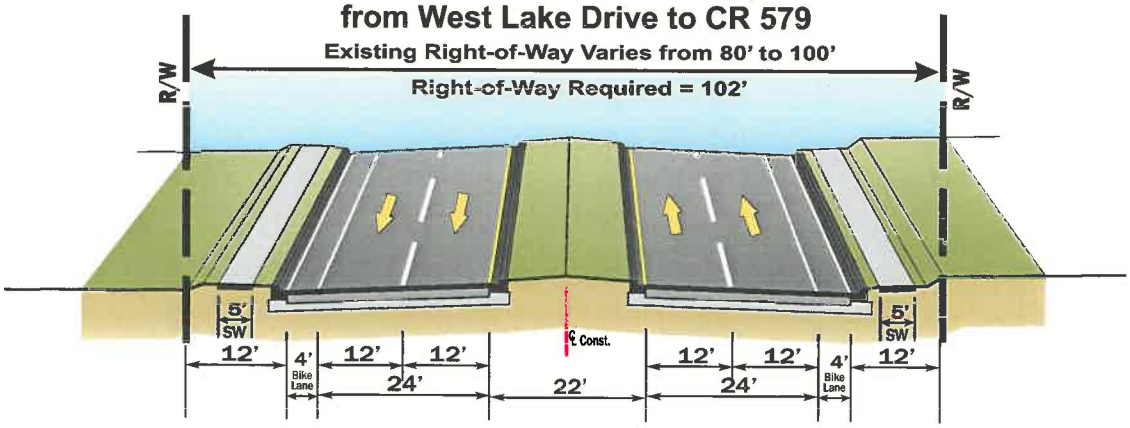
The traffic noise levels in this NSR were predicted using the FHWA's computer model for the prediction and analysis of highway traffic noise--the Traffic Noise Model (TNM - Version 2.5). The TNM propagates sound energy, in one-third octave bands, between highways and nearby receivers taking the intervening ground's acoustical characteristic and topography, and intervening structures (i.e., buildings) into consideration.

Segment 1 - Interim 4-Lane Urban Typical Section from US 301 to West Lake Drive



Segment 1 - Ultimate 6-Lane Urban Typical Section from US 301 to West Lake Drive

Segments 2, 3 & 4 - 4-Lane Urban Typical Section from West Lake Drive to CR 579



SR 674 PD&E Study
From US 301 (SR 43) to CR 579
Hillsborough County
WPI Segment No. 422762 1

Proposed Typical Sections

Figure 2

The noise levels discussed in this NSR are also expressed in decibels (dB) on the A-weighted scale (dBA). The A-weighted scale is widely used in environmental studies because this scale closely resembles the non-linearity of human hearing and correlates well with human perceptions regarding the annoying aspects of noise. All sound and traffic noise levels are reported as one hour equivalent levels (L_{Aeq1h}), values which theoretically contain the same amount of acoustic energy as an actual time-varying A-weighted sound level over a period of one hour.

The existing and forecast future traffic data used in the TNM to predict noise levels within the project limits are presented in **Table 2** (and Appendix A of this report). Because traffic noise levels are low when traffic volumes are low (level-of-service (LOS) "A" or "B") or when traffic is so congested that movement is slow (LOS "D", "E", or "F"), the maximum hourly noise level occurs between these two conditions—when the traffic service volume is at the maximum LOS "C" volume.

Table 2
Traffic Data Used for Noise Analysis

Segment	Scenario	No. of Lanes	K Factor (%)	D Factor (%)	LOS C/Demand Hourly Traffic Data				Posted Speed (mph)[a]
					Direction	Cars	MT	HT	
Segment 1a- US 301 to Westlake Village	Existing	2	9.6	57	Peak	628	13	27	45
					Off-Peak	473	10	20	
	No-Build	2	9.6	57	Peak	710	15	30	
					Off-Peak	535	11	23	
	Build (Ultimate)	6	9.6	57	Peak	2,145	46	91	
					Off-Peak	1,618	34	69	
Segment 1b - Westlake Village to West Lake Drive	Existing	2	9.6	57	Peak	514	11	22	45
					Off-Peak	388	8	17	
	No-Build	2	9.6	57	Peak	710	15	30	
					Off-Peak	535	11	23	
	Build (Ultimate)	6	9.6	57	Peak	1,533	33	65	
					Off-Peak	1,156	25	49	
Segments 2 and 3 - West Lake Drive to CR 579	Existing	2	9.6	57	Peak	442	9	19	45
					Off-Peak	334	7	14	
	No-Build	2	9.6	57	Peak	710	15	30	
					Off-Peak	535	11	23	
	Build	4	9.6	57	Peak	916	19	39	
					Off-Peak	691	15	29	
Segment 4 - East of CR 579	Existing	2	9.6	57	Peak	309	7	13	45
					Off-Peak	233	5	10	
	No-Build	2	9.6	57	Peak	566	12	24	
					Off-Peak	427	9	18	
	Build	4	9.6	57	Peak	566	12	24	
					Off-Peak	427	9	18	

K Factor = peak hour factor D Factor = directional factor MT = medium trucks HT = heavy trucks
MC = Motorcycle
[a] Motor vehicle speeds less than the posted speed would result in lower predicted traffic noise levels.
Source: H.W. Lochner, Inc.

The traffic data used in the PD&E traffic noise analysis was either the level-of-service (LOS) "C" traffic volume or the forecast demand volume (if forecast demand levels meet the LOS "A" or "B" criteria), whichever was less.

3.2 Noise Sensitive Sites

Noise-sensitive sites are defined as properties where frequent human use occurs and where a lowered noise level would be of benefit. When predicted traffic noise levels approach, meet or exceed the NAC or, when predicted noise levels increase substantially when compared to existing levels, the FHWA requires that noise abatement measures be considered. The FDOT defines "approach" to be within 1 dBA of the NAC and considers an increase to be substantial if predicted future levels with roadway improvements increase 15 dBA or more when compared to existing levels. Notably, increases of 15 dBA are not typically predicted to occur for roadway projects that involve widening an existing roadway.

Within the project corridor, there are 39 noise sensitive sites that have the potential to be impacted by traffic noise with the proposed improvements to SR 679. These sites include 36 single-family residences (11 within the Sun City Mobile Home Park, 16 are cottages related to the Church of God, and the remaining residences are scattered along the corridor) and three churches. The locations of the noise sensitive sites are depicted on **Figure 3**.

All of the single-family residences were evaluated as Activity Category "B" (see **Table 1**). Traffic noise levels were determined to affect the residences if predicted exterior traffic noise levels were 66 dBA or more (within 1 dBA of the FHWA NAC for an Activity Category "B" land use), or if traffic noise levels were predicted to increase 15 dBA or more from existing levels. Since areas of frequent exterior use were not identified at the churches, these sites were evaluated as Activity Category "E" of the NAC (which considers interior traffic noise levels). Consistent with guidance found in the FHWA publication "Highway Traffic Noise Analysis and Abatement: Policies and Guidance", for buildings of masonry construction with single glazed windows a reduction factor of 25 dBA was applied to the predicted exterior noise level to derive the predicted interior level. Traffic noise levels were determined to affect the churches if predicted interior traffic noise levels were 51 dBA or more (within 1 dBA of the FHWA NAC for an Activity Category "E" land use), or if traffic noise levels were predicted to increase 15 dBA or more from existing levels.

3.3 Measured Noise Levels

To provide an indication of the accuracy of the TNM to be used in predicting traffic noise levels for this project, the computer model was validated using measured sound levels. The measured levels were obtained using a calibrated Rion NL-31 sound level meter. During each measurement period, traffic volumes, vehicle mix, vehicle speeds, and meteorological conditions were recorded. Following procedures in the FDOT Project Development and Environment (PD&E) Manual, if the TNM-predicted and field measured levels are within 3 dBA of one another, the TNM can be considered to have an acceptable level of accuracy.

As shown in **Table 3**, the measured versus modeled values are within the acceptable range. Additional details related to the field measurements are provided in the Appendix B.

SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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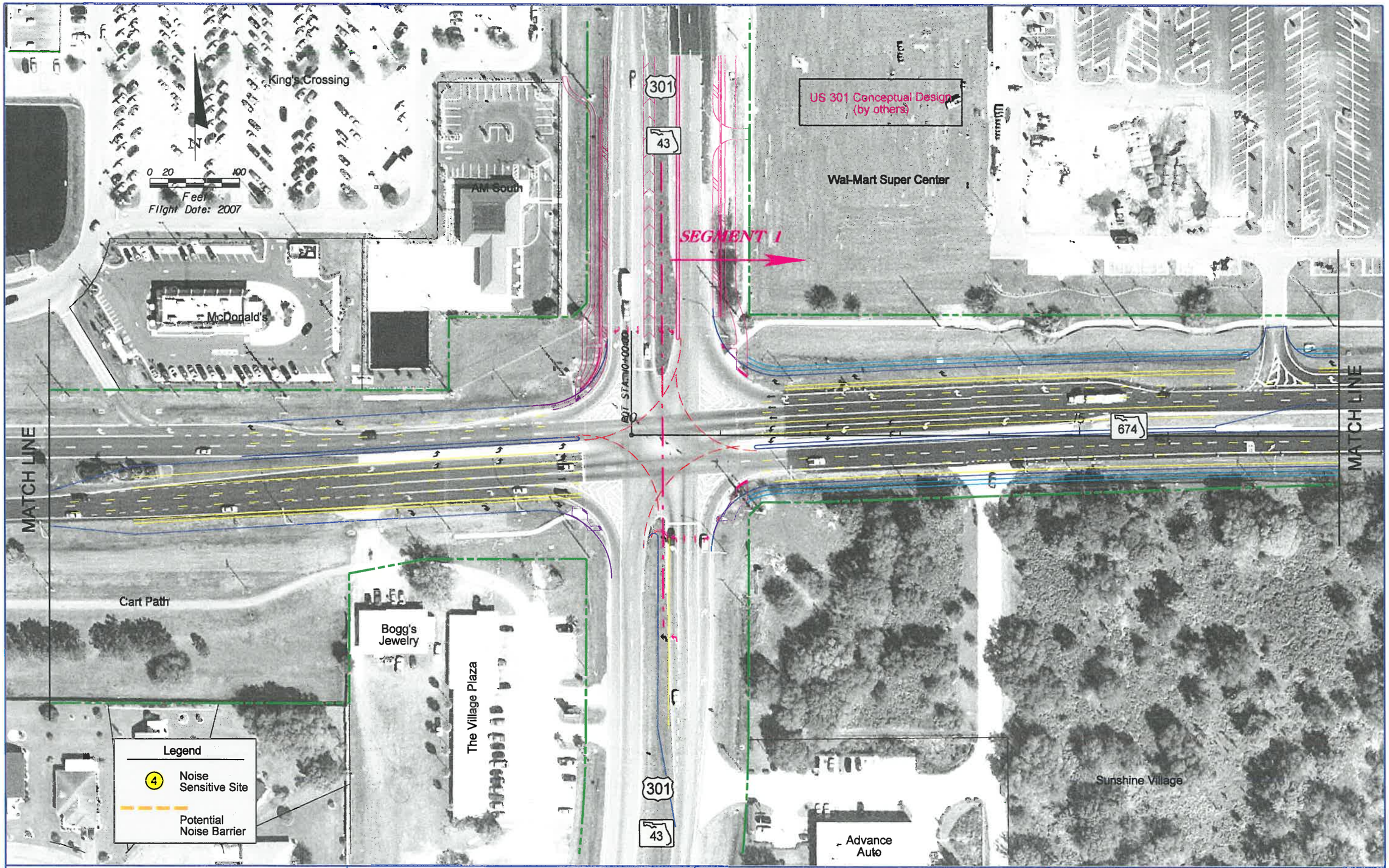

SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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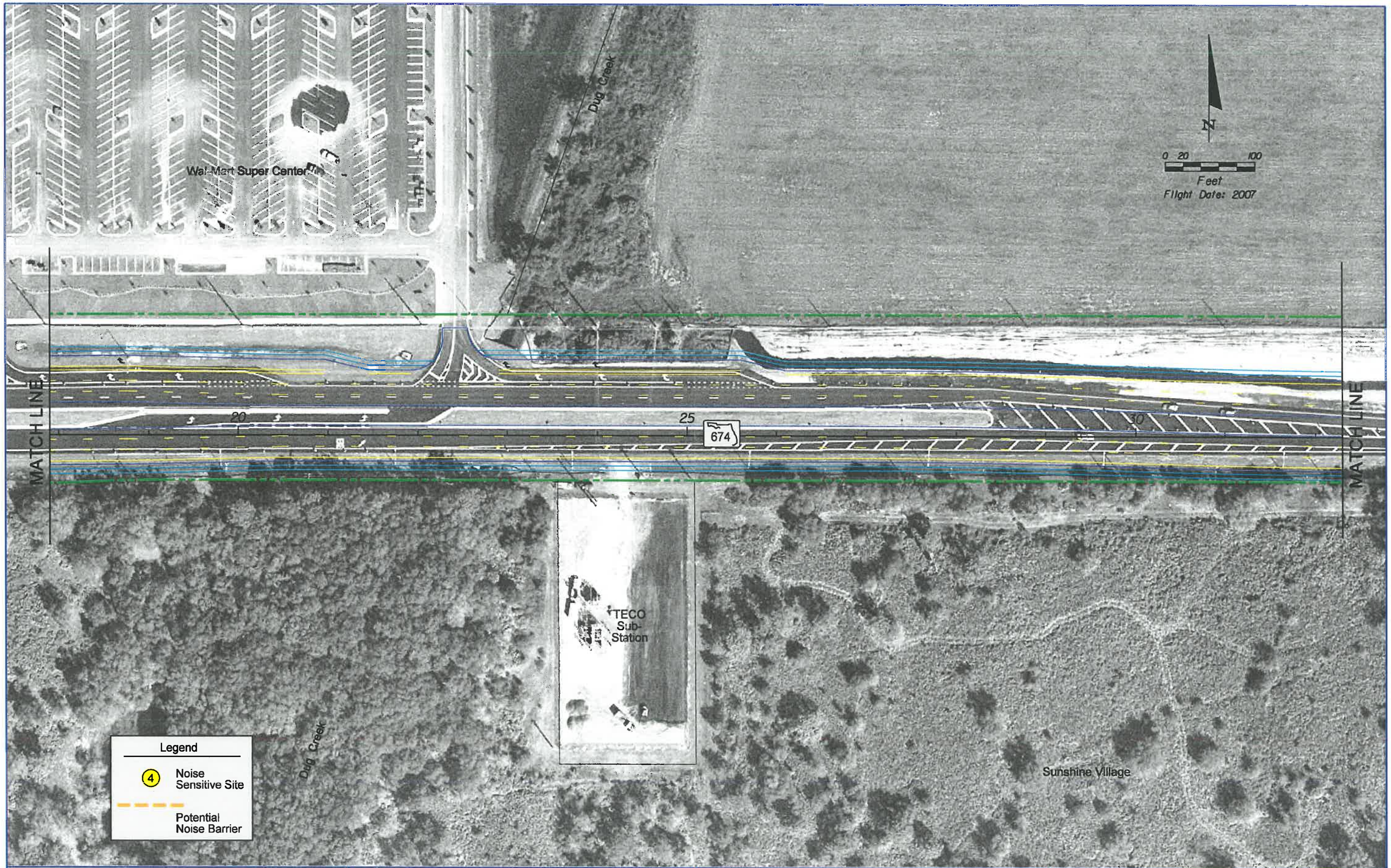

SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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Sun City Mobile Home RV Park
11
5
6
7
8
9
10
EZ Storage
Rachel's Country Kitchen
Reedy Plumbing Inc.
Hearne Produce Co.
N
Feet
Flight Date: 2007
MATCH LINE
50
55
60
674
Wimauma Auto Sales (closed)
Sun City Auto & Collision
Rudy's Golf Carts
Kenilworth Ave.
Neman Plaza Shopping Center
Circle K Gas Station
Jose's Fruits & V
Westlake Village
MATCH LINE
Legend
4 Noise Sensitive Site
Potential Noise Barrier

SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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Hearne Produce Co.

N

0 20 100

Feet

Flight Date: 2001

West Lake Dr.

14th St.

13th St.

SEGMENT 1

SEGMENT 2

Revels

Revels

Church of God

Church of God

Church of God

Church of God

RV Camp

Future Westlake Plaza

Vacant

The Sandbar Cafe

Little Log Cabin

Residential

12

13

14

15

674

70

75

65

MATCH LINE

MATCH LINE

PC STA. 62+74.75

PT STA. 64+53.92

L = N 87° 00' 38" E

PT STA. 65+22.15

PT STA. 67+72.40

Vacant Building

Jose's Fruits & V

Turf Keepers Inc.

Tax Land

Los Amigos

Quest Ecology

Church of God State Office

West Lake Dr.

Lakeview Dr.

Legend

4 Noise Sensitive Site

Potential Noise Barrier

SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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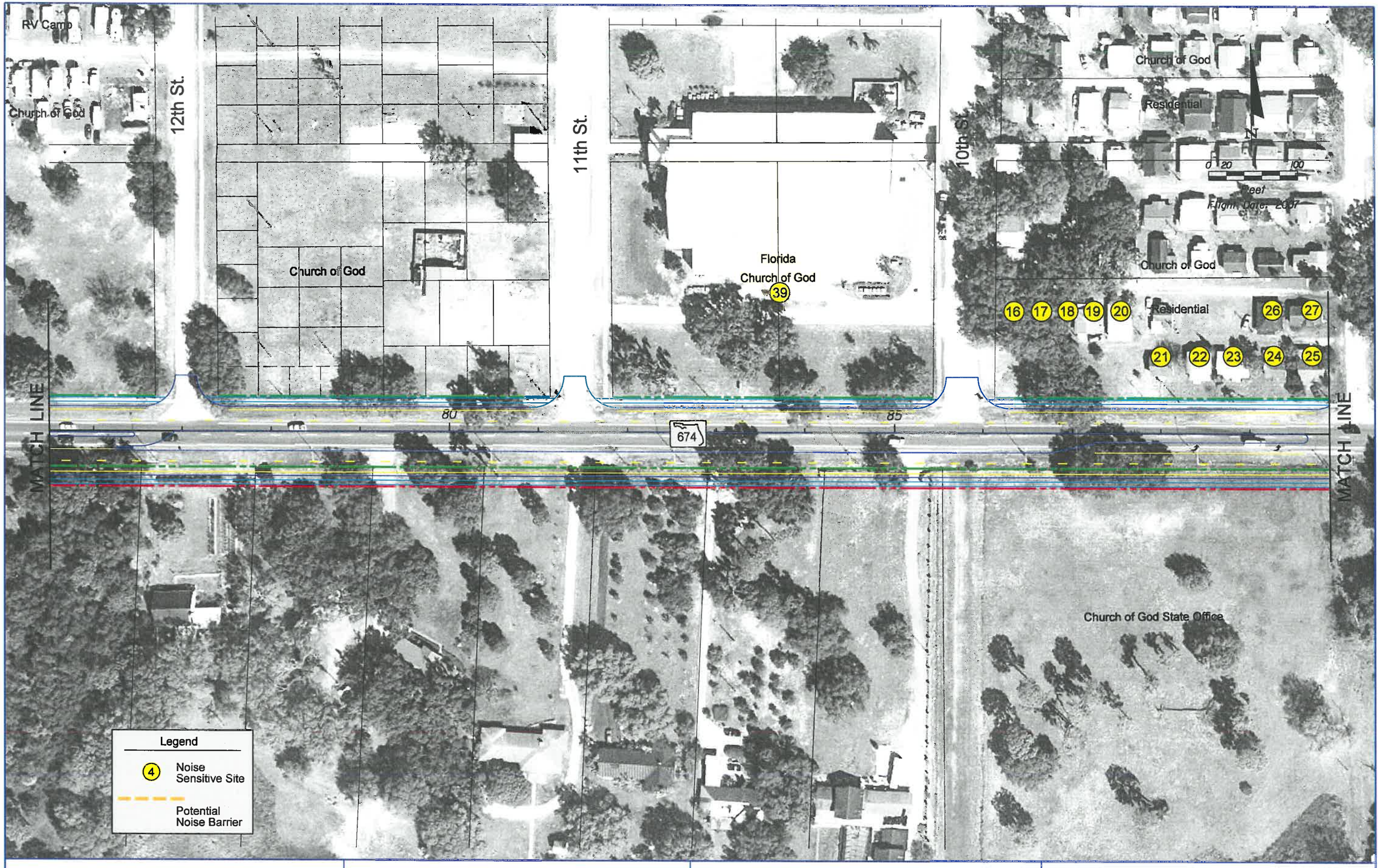

SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3
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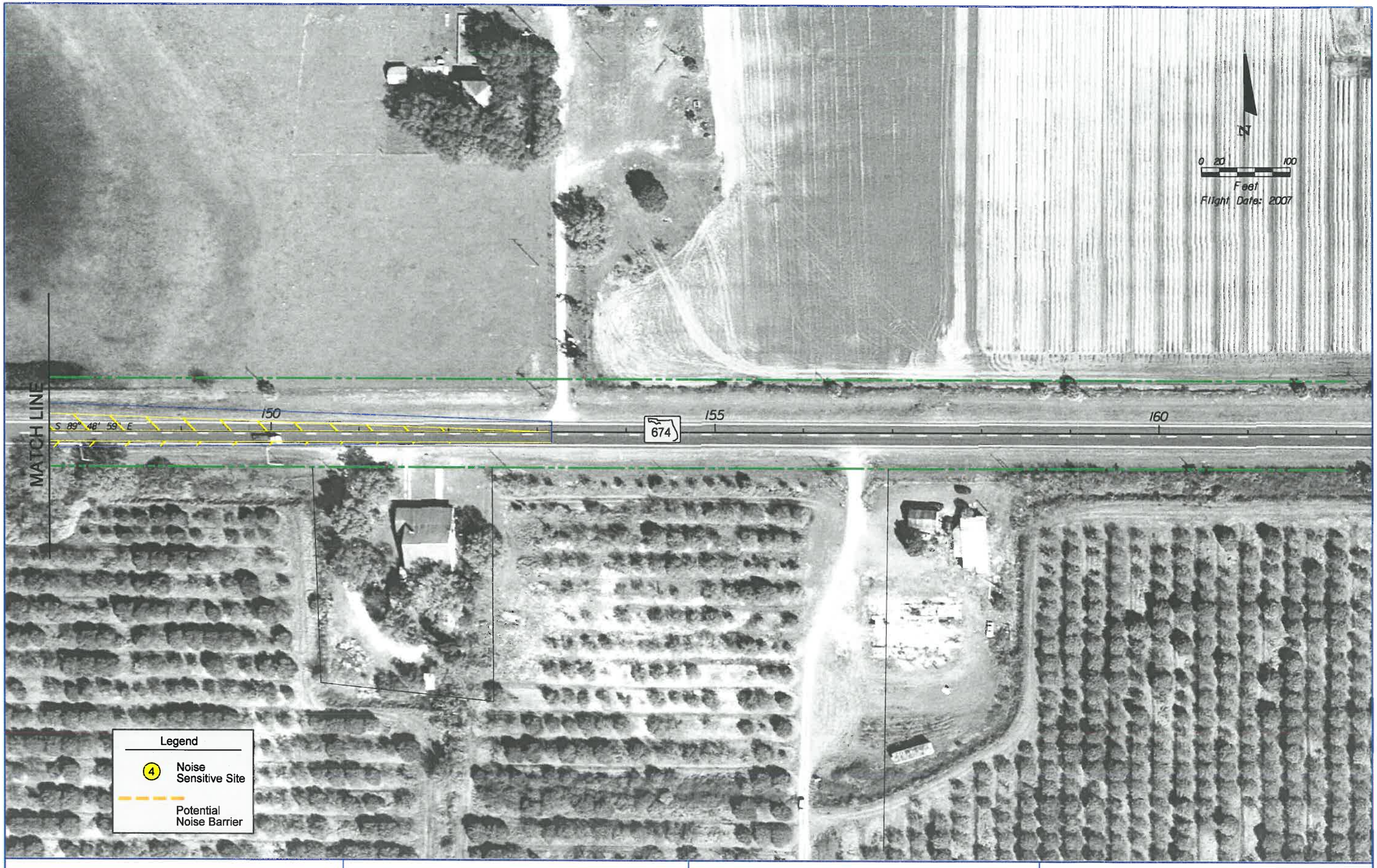
SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3



SR 674
From US 301 to CR 579

EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPERTY LINE
PAVEMENT MARKINGS
SIDEWALK

NOISE SENSITIVE SITES

FIGURE 3

Table 3 TNM Validation Results					
Location	Test Period	Noise Level (dBA)			Validates?
		Measured	Modeled	Difference (Measured –Modeled)	
North side of SR 674 between 12th and 13th Street	1	61.8	62.4	-0.6	Yes
	2	62.4	63.4	-1.0	Yes
	3	62.4	63.8	-1.4	Yes
Southwest corner of SR 674 and Kenilworth Avenue	1	61.9	63.6	-1.7	Yes
	2	62.9	63.9	-1.0	Yes
	3	62.5	62.1	0.4	Yes

3.4 Outdoor Sound Propagation

There are numerous factors that affect the propagation of sound in the outdoors from a source (roadway) to a receiver (listener). These factors include meteorological conditions, the amount and type of vegetation between the source and the receiver, the existence of intervening structures, the elevation of the source and/or the receiver, the surrounding topography and the type of ground surface between the source and the receiver. The attenuation (reduction) of sound levels due to intervening structures occurs when a receiver's view (line-of-sight) is obstructed or partially obstructed by dense objects (i.e., rows of buildings, residences, and barriers). The attenuation provided by a row of buildings depends on the number of buildings, the length and height of the buildings, and the amount of space between the buildings.

Because there are no topographical features between SR 674 and the evaluated sites that would affect predicted traffic noise levels (e.g., ponds, heavily forested areas, etc.), no such features were considered in the analysis.

3.5 Results of the Analysis

Table 4 presents the predicted traffic noise levels. As shown, with the existing roadway, exterior traffic noise levels are predicted to range from 55.5 to 66.7 dBA with levels exceeding the NAC at 4 of the evaluated sites (Sites 22 - 25). As also shown, interior traffic noise levels at the churches are predicted to range from 31.8 to 39.8 dBA, which are below the NAC.

With the future no-build alternative , exterior traffic noise levels are predicted to range from 56.9 to 68.7 dBA at the evaluated sites with levels exceeding the NAC at 9 of the evaluated residences (Sites 13, 21 - 25, 32, 35, and 36). Interior traffic noise levels are predicted to range from 33.8 to 41.8 dBA, levels below the NAC.

With the proposed improvements and assuming the ultimate improvement for Segment 1 of the project (US 301 to West Lake Drive), exterior traffic noise levels are predicted to range from 64.7 to 71.2 dBA—increases from existing levels that range from 4.0 dBA (perceptible) to 9.9 dBA (twice as loud). Additionally, traffic noise levels are predicted to approach or exceed the NAC at 32 residences. Nine of the 32 residences are located within the Sun City Mobile Home Park, 15 are cottages related to the Church of God, and eight are isolated residences between 4th and 9th Street. Interior traffic noise levels at the churches are predicted to range from 37.2 to 45.3 dBA—levels below the NAC and increases that are not considered substantial.

Table 4
Predicted Traffic Noise Levels

Site ID	Location	No. of Dwelling Units	Existing	No-Build	Build (Ultimate-Seg 1)	Increase from Existing	Build (Interim - Seg 1)	Increase from Existing	Approaches, Meets, or Exceeds NAC?
1	SF Residences (Sun City Mobile Home Park)	1	56.1	57.3	65.8	9.7	63.6	7.5	
2		1	57.7	59.0	67.6	9.9	65.8	8.1	Yes
3		1	58.8	60.2	68.6	9.8	67.5	8.7	Yes
4		1	61.5	62.8	70.6	9.1	70.1	8.6	Yes
5		1	61.3	62.6	70.3	9.0	69.9	8.6	Yes
6		1	61.6	62.9	70.5	8.9	70.2	8.6	Yes
7		1	61.8	63.1	70.7	8.9	70.3	8.5	Yes
8		1	61.6	63.0	70.5	8.9	70.2	8.6	Yes
9		1	62.1	63.5	70.9	8.8	70.6	8.5	Yes
10		1	60.8	62.2	69.9	9.1	69.6	8.8	Yes
11		1	55.5	56.9	64.7	9.2	62.9	7.4	
12	SF Residences (Church of God cottages)	1	63.9	65.9	69.3	5.4	-	-	Yes
13		1	64.6	66.6	69.7	5.1	-	-	Yes
14		1	63.3	65.3	68.8	5.5	-	-	Yes
15		1	63.9	65.9	69.2	5.3	-	-	Yes
16		1	60.9	63.0	66.9	6.0	-	-	Yes
17		1	60.9	63.0	66.9	6.0	-	-	Yes
18		1	60.7	62.8	66.8	6.1	-	-	Yes
19		1	60.5	62.5	66.6	6.1	-	-	Yes
20		1	60.1	62.1	66.3	6.2	-	-	Yes
21		1	65.6	67.6	70.1	4.5	-	-	Yes
22		1	66.4	68.5	70.6	4.2	-	-	Yes
23		1	66.4	68.4	70.6	4.2	-	-	Yes
24		1	66.4	68.4	70.5	4.1	-	-	Yes
25		1	66.7	68.7	70.7	4.0	-	-	Yes
26		1	60.3	62.4	66.4	6.1	-	-	Yes
27		1	59.7	61.7	65.8	6.1	-	-	
28	Church	N/A	39.8	41.8	44.5	4.7	-	-	
29	SF Residences (between 4th and 9th Street)	1	60.9	63.0	67.5	6.6	-	-	Yes
30		1	62.5	64.5	68.0	5.5	-	-	Yes
31		1	63.1	65.2	68.4	5.3	-	-	Yes
32		1	64.6	66.7	69.4	4.8	-	-	Yes
33		1	62.9	64.9	68.2	5.3	-	-	Yes
34		1	63.1	65.2	69.4	6.3	-	-	Yes
35		1	64.7	66.7	71.2	6.5	-	-	Yes
36		1	64.4	66.4	68.7	4.3	-	-	Yes
37		1	60.2	62.2	65.8	5.6	-	-	
38	Church	N/A	38.7	40.7	45.3	6.6	-	-	
39	Church	N/A	31.8	33.8	37.2	5.4	-	-	

- = Not applicable

Source: KB Environmental Sciences, Inc. 2009

The only noise sensitive sites located within Segment 1 are the residences I the Sun City Mobile Home Park. With the interim improvement in this area of the project exterior traffic noise levels are predicted to range from 62.9 to 70.3 dBA—increases from existing levels that range from 7.4 to 8.8 dBA (perceptible). Additionally, traffic noise levels are predicted to approach or exceed the NAC at 9 of the residences (the same residences that would be impacted with the ultimate improvement.

4.0 NOISE ABATEMENT MEASURES

As previously stated, noise abatement measures are considered when predicted traffic noise levels approach or exceed the NAC. The measures considered for SR 674 were traffic management, alternative roadway alignment, property acquisition, and noise barriers. The following discusses the feasibility (acoustics and engineering considerations) and reasonableness (number of noise-sensitive sites benefited, absolute noise levels, cost, etc.) of the measures.

4.1 Traffic Management

Traffic management measures that limit motor vehicle speeds and reduce volumes can be effective noise mitigation measures. However, these measures also negate a project's ability to accommodate forecast traffic volumes. As such, reducing the speed limit and restricting certain vehicles from the roadway would negate the project's ability to handle forecast traffic volumes.

4.2 Alternative Roadway Alignment

The residences affected by traffic noise with the proposed improvements are located in close proximity to SR 674 and are on both the north and south side of the roadway. As such, significant shifts, that would greatly increase the cost of the improvements to SR 674, would be required to affect a substantial change in the level of predicted noise.

4.3 Property Acquisition

Property acquisition is not considered to be a reasonable method of abating traffic noise.

4.4 Noise Barriers

Noise barriers reduce sound levels by blocking the path of the sound between the source (roadway) and the receiver (listener). In order to effectively reduce traffic noise, a noise barrier must be relatively long, continuous (without intermittent openings), and of sufficient height to break the line-of-sight between the source and the receiver. Following procedures outlined in FDOT's PD&E Manual, the minimum requirements for a noise barrier to be considered feasible and economically reasonable are:

- The barrier must provide at least a 5 dBA reduction in traffic noise with a design goal of 10 dBA or more desired.

- The barrier should cost no more than $42,000 per benefited noise sensitive site. For a receiver to be considered benefited, the barrier must provide at least a 5 dBA reduction in noise. The current estimated cost to construct a noise barrier (materials and labor) is $30.00 per square foot ($ft^2$).

Additional factors to be considered when evaluating noise barriers as a potential noise abatement measure include the feasibility of constructing a barrier at the desired location, driver/pedestrian sight distance (safety), ingress and egress requirements to and from affected properties, right-of-way requirements including access rights/easements for construction and/or maintenance, drainage, land use stability (are the noise sensitive sites likely to remain for an indefinite period of time), antiquity (the amount of development that occurred before the date of public knowledge for a project), the desires of the affected property owners to have a barrier adjacent to their property, and aesthetics.

The TNM accounts for the shielding effect of a noise barrier, the diffraction of sound over a noise barrier, and the effects of the ground between a barrier and a receiver (i.e., sound absorption). The net effect of the barrier shielding is referred to as "insertion loss". Insertion loss is the difference in the sound level before and after installation of a barrier. The following presents the results of a noise barrier analysis that was performed to determine if noise barriers would provide the minimum required insertion loss or more at a cost within the cost reasonable guideline for those sites predicted to be affected by traffic noise with the proposed improvements.

4.4.1 Sites 2 - 10 (Sun City Mobile Home Park)

Table 5 presents the results of the noise barrier analysis for the nine affected single-family residences located within the Sun City Mobile Home Park with the interim improvement to Segment 1 of the project (US 301 to West Lake Drive). To provide a noise barrier at this location, the barrier would have to be constructed in two segments to accommodate the entrance to the mobile home park. As shown, at heights of 8 to 20 feet, a barrier would reduce predicted traffic noise levels at least 5 dBA at six to nine of the affected residences. At these heights, the cost per benefited noise sensitive site (ranging from $21,200 to $36,480 per benefited site) would be less than the FDOT's cost reasonable guideline ($42,000 per benefited site).

Table 6 presents the results of the noise barrier analysis for the nine affected single-family residences located within the Sun City Mobile Home Park with the ultimate improvement to Segment 1. As shown, at heights of 12 to 16 feet, a barrier would reduce predicted traffic noise levels by at least 5 dBA at seven of the nine affected residences. At these heights, the cost per benefited noise sensitive site (ranging from $32,297 to $41,691 per benefited site) would be less than the FDOT's cost reasonable guideline ($42,000 per benefited site).

Because a barrier is predicted to provide some of the affected residences with a reduction in traffic noise of at least 5 dBA and the cost of the barrier would be below the cost reasonable guideline (with the interim and ultimate improvements), the barrier was evaluated further. The results of the evaluation are provided in **Table 7**.

Table 5
Noise Barrier Results – Interim Improvement Sites 2 - 10 (Sun City Mobile Home Park)

Barrier Height (ft)	Noise Sensitive Sites With Insertion Loss (IL) of (dBA)						Avg IL of Impacted/ Benefited	Number of Benefited Noise Sensitive Sites			Total Estimated Barrier Cost	Cost Per Benefited Noise Sensitive Site	Cost Reasonable[b] (Yes/No)
	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 or >		Impacted	Other[a]	Total			
8	0	5	1	0	0	0	7.2	6	0	6	$127,200	$21,200	Yes
10	1	0	0	2	4	0	8.5	7	0	7	$176,400	$25,200	Yes
12	2	0	0	0	2	4	8.8	8	0	8	$226,080	$28,260	Yes
14	1	1	0	0	1	5	9.3	8	0	8	$255,360	$31,920	Yes
16	1	1	0	0	1	5	9.8	8	0	8	$291,840	$36,480	Yes
18	2	1	0	0	0	6	10.1	8	1	9	$317,520	$35,280	Yes
20	1	2	0	0	0	6	10.4	8	1	9	$352,800	$29,200	Yes
22	1	2	0	0	0	6	10.6	8	1	9	$388,080	$43,120	No

[a] Other = Receivers not impacted by the project (traffic noise levels less than 66 dBA) but benefited by a noise barrier.
[b] Barriers are considered cost reasonable if the cost per benefited receiver is less than $42,000.

Table 6
Noise Barrier Results – Ultimate Improvement Sites 2 - 10 (Sun City Mobile Home Park)

Barrier Height (ft)	Noise Sensitive Sites With Insertion Loss (IL) of (dBA)						Avg IL of Impacted/ Benefited	Number of Benefited Noise Sensitive Sites			Total Estimated Barrier Cost	Cost Per Benefited Noise Sensitive Site	Cost Reasonable[b] (Yes/No)
	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 or >		Impacted	Other[a]	Total			
8	3	1	0	0	0	0	5.3	4	0	4	$127,200	$31,800	Yes
10	2	2	1	0	0	0	6.3	5	0	5	$176,400	$35,280	Yes
12	3	0	3	1	0	0	6.7	7	0	7	$226,080	$32,297	Yes
14	3	0	3	1	0	0	6.9	7	0	7	$255,360	$36,480	Yes
16	3	0	2	1	1	0	7.1	7	0	7	$291,840	$41,691	Yes
18	3	0	1	2	1	0	7.1	7	0	7	$317,520	$45,360	No
20	3	0	0	3	1	0	7.2	7	0	7	$352,800	$50,400	No
22	3	0	0	3	1	0	7.3	7	0	7	$388,080	$55,440	No

[a] Other = Receivers not impacted by the project (traffic noise levels less than 66 dBA) but benefited by a noise barrier.
[b] Barriers are considered cost reasonable if the cost per benefited receiver is less than $42,000.

Table 7 Additional Barrier Considerations – Sites 2 - 10 (Sun City Mobile Home Park)	
Evaluation Criteria	Comment
1. Relationship of future levels to the abatement criteria	With the ultimate proposed improvements to SR 674, the seven affected receivers that would be benefited by the barrier are predicted to experience traffic noise levels ranging from 67.6 to 70.7 dBA.
2. Amount of noise reduction	Traffic noise from SR 674 would be reduced a minimum of 5 dBA at seven of the nine affected receivers.
3. Safety	The barrier would be located outside of the clear zone.
4. Community desires	The owners of the mobile home park owner indicated that they are interested in a noise barrier if the analysis indicates a barrier would remain a feasible and reasonable abatement measure during design.
5. Accessibility	A noise barrier could be designed in two segments to accommodate the entrance roadway to the community. As such, there would be no accessibility issues for residences within the mobile home park.
6. Land use stability	Land use in the area is residential. It is expected that this land use will remain in the future.
7. Local controls	Hillsborough County does not have any regulations related to traffic noise.
8. Views of local officials with jurisdiction	The views of local officials will be solicited as part of the ongoing public involvement process.
9. Antiquity	The mobile home park was constructed prior to the date of public knowledge for the improvements to SR 674.
10. Constructability	It is anticipated that the barrier could be constructed using routine construction methods. This item will be reviewed in greater detail during the design phase of the project.
11. Maintainability	There would be adequate right-of-way for maintenance purposes. This item will be reviewed in greater detail during the design phase of the project.
12. Aesthetics	The aesthetics of the noise barrier will be determined by the District in consultation with the property owner.
13. ROW needs including access rights, easements for construction and/or maintenance, and additional land	The noise barrier would be located as close to the right-of-way line as possible (5 feet or less) within the proposed right-of-way for the project.
14. Cost	At a length of 628 feet and a height of 12 feet, the total estimated cost to construct the barrier is $226,080 and the cost per benefited receiver is $32,297 – a cost below the FDOT cost reasonable guideline.
15. Utilities	It does not appear that the barrier would pose any conflicts with existing/planned utilities. This item will be reviewed in greater detail during the design phase of the project.
16. Drainage	It is not anticipated that the barrier would impede/restrict drainage in the area. This item will be reviewed in greater detail during the design phase of the project.
17. Special land use considerations	None.
18. Other environmental considerations	None.

4.4.2 Sites 12 - 15 (Church of God Cottages between 13th and 14th Street)

The results of the noise barrier analysis for the four affected single-family residences (cottages) on Church of God property that are located between 13th and 14th Street indicate that a noise barrier would not provide at least the minimum required insertion loss of 5 dBA regardless of barrier height. This would be the case because, due to access requirements to and from the affected properties and SR 674, a barrier of continuous and sufficient length could not be constructed.

4.4.3 Sites 16 - 26 (Church of God Cottages between 9th and 10th Street)

Table 8 presents the results of the noise barrier analysis for the 11 affected single-family residences (cottages) on Church of God property between 9th and 10th Street.

At heights of 8 to 22 feet, a noise barrier would provide an average insertion loss ranging from 5.0 to 6.1 dBA for up to three of the affected residences. However, regardless of height, the cost per benefited receiver is greater than the cost reasonable guideline (the lowest cost per benefited site is an estimated $50,580). As such, although feasible, a noise barrier is not considered to be a reasonable noise abatement measure.

4.4.4 Sites 29 - 36 (Isolated Single-Family Residences between 4th and 9th Street)

The results of the noise barrier analysis for the eight affected single-family residence located between 4th and 9th Street indicate that noise barriers would not provide at least the minimum required insertion loss of 5 dBA regardless of barrier height. This would be the case because, due to access requirements to and from the affected property and SR 674, a barrier of continuous and sufficient length could not be constructed at the locations.

4.5 Commitments

During the project's future design a detailed traffic noise analysis for the potential noise barrier at Sun City Mobile Home Park will be undertaken. If the analysis confirms that a noise barrier is a cost reasonable and feasible method of reducing predicted impacts, the noise barrier will be included as part of the SR 674 project contingent on the following:

- The owners of the Sun City Mobile Home Park indicate a positive desire for a barrier (including type, height, length, and location).
- All safety and engineering aspects of a barrier, as they related to the roadway user and to the adjacent property owners, have been reviewed and approved.

Table 8
Noise Barrier Results – Sites 16 - 26 (Church of God Cottages between 9th and 10th Street)

Barrier Height (ft)	Noise Sensitive Sites With Insertion Loss (IL) of (dBA)						Avg IL of Impacted/ Benefited	Number of Benefited Noise Sensitive Sites			Total Estimated Barrier Cost	Cost Per Benefited Noise Sensitive Site	Cost Reasonable[b] (Yes/No)
	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 or >		Impacted	Other[a]	Total			
8	1	0	0	0	0	0	5.0	1	0	1	$67,440	$67,440	No
10	1	0	0	0	0	0	5.1	1	0	1	$72,300	$72,300	No
12	1	1	0	0	0	0	5.9	2	0	2	$101,160	$50,580	No
14	1	1	0	0	0	0	5.9	2	0	2	$109,620	$54,810	No
16	1	1	0	0	0	0	5.7	2	0	2	$115,680	$57,840	No
18	1	1	0	0	0	0	5.8	2	0	2	$130,140	$65,070	No
20	1	1	0	0	0	0	5.8	2	0	2	$144,600	$72,300	No
22	2	0	1	0	0	0	6.1	3	0	3	$207,900	$69,300	No

[a] Other = Receivers not impacted by the project (traffic noise levels less than 66 dBA) but benefited by a noise barrier.
[b] Barriers are considered cost reasonable if the cost per benefited receiver is less than $42,000.

5.0 CONSTRUCTION NOISE AND VIBRATION

Construction of roadway improvements would have a temporary impact on noise-sensitive sites adjacent to the project corridor. Trucks, earth moving equipment, pumps, and generators are construction noise and vibration sources. Construction noise and vibration could be controlled by the contractor's adherence to the FDOT's "Standard Specifications for Road and Bridge Construction".

6.0 NOISE CONTOURS

As previously stated, land uses such as residences, motels, schools, churches, recreation areas and parks are considered *incompatible* with highway noise levels above 66 dBA. In order to reduce the possibility of additional noise sensitive sites being located within an area with traffic noise of this level, a noise contour was developed for the future improved roadway facility. This noise contour delineates the distance from the improved roadway's edge of pavement where the FHWA's NAC would be approached (within 1 dBA of the NAC). **Table 9** provides the distances from the edge of the near travel lane to where traffic noise levels are predicted to be 66.0 dBA or higher.

Table 9
Noise Contours

Roadway Segment	Distance from Edge of Near Travel Lane (feet)
Segment 1a US 301 to Westlake Village	150
Segment 1b Westlake Village to West Lake Drive	110
Segment 2 & 3 West Lake Drive to CR 579	85
Segment 4 East of CR 579	55

Figure 4 is an example illustration of the noise contour for Segment 1a of SR 674 from US 301 to Westlake Village. Notably, local officials should not approve construction of any noise-sensitive sites (e.g., residences, parks, churches, etc.) within the traffic noise contour areas.

7.0 PUBLIC INVOLVEMENT

In lieu of an Alternatives Public Workshop, the status of the study and the alternative design concepts developed for the project were presented at the Wimauma Senior Center and the Wimauma Civic Center from March 20, 2008 to April 18, 2008. Meetings were also held with local government. A Public Hearing was held on December 16, 2008 at our Lady of Guadalupe Catholic Church in Wimauma. The results of the traffic noise study were presented at the Hearing.

8.0 REFERENCES

Federal Highway Administration, Traffic Noise Model, Version 2.5, February 2004.

Federal Highway Administration, Title 23 CFR, Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, April 1, 1992 Edition.

Florida Department of Transportation, Project Development and Environment Manual, Chapter 17 (Noise), April 18, 2007.

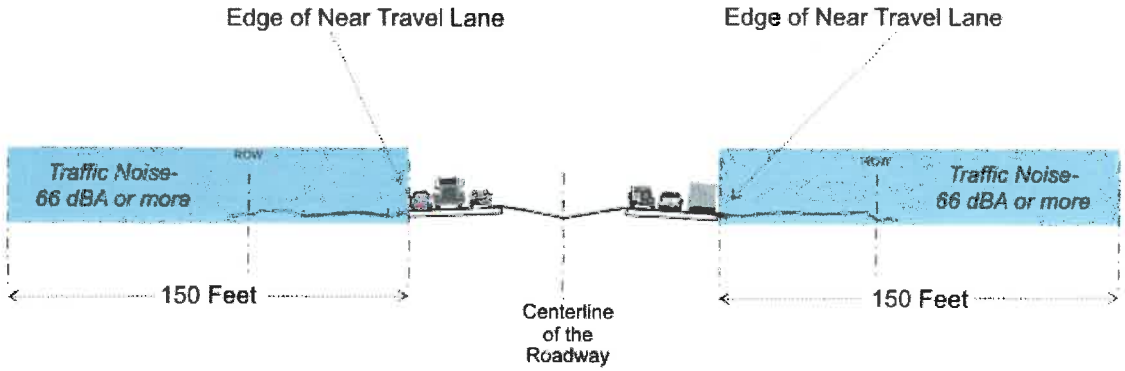
Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, 2000.

Federal Highway Administration, Measurement of Highway-Related Noise: Final Report, October 2003.

Federal Highway Administration, Highway Traffic Noise Analysis and Abatement: Policy and Guidance, June 1995.

H.W. Lochner, Inc., Traffic Data for Noise Studies Sheets, Memorandum, June 9, 2008.

6 Lane Roadway (Segment 1a - US 301 to Westlake Village)



Not to Scale

SR 674 from US 301 to CR 597	**TRAFFIC NOISE CONTOUR**	**FIGURE 4**

APPENDICES

Appendix A – Traffic Data Sheets

Appendix B – Noise Measurement Data Sheets/TNM Validation

Appendix C - TNM Input/Output

APPENDIX A

This spreadsheet is designed to calculate the appropriate traffic data for use in the noise model - do not input values for items in "red".

TRAFFIC DATA FOR NOISE STUDIES

Project: SR 674 from US 301 to CR 579 Date: 5/1/2007

State Project Number(s): Prepared By: RBW

Financial Project ID: 422762 1 21 01

Federal Aid Number(s):

Segment Description: Segment 1a and 1b, US 301 to Westlake Lake Drive (Interim)

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build-C (Design Year)	
Lanes:		Lanes:		Lanes:	4 (called Phase I improvement)
Year:		Year:		Year:	2030
ADT:		ADT:		ADT:	
LOS (C)		LOS (C)		LOS (C)	34,700
Demand		Demand		Demand	
Speed:	mph	Speed:	mph	Speed:	45 mph
	kmh		kmh		72 kmh
K=	%	K=	%	K=	9.6 %
D=	%	D=	%	D=	57 %
T=	% for 24 hrs.	T=	% for 24 hrs.	T=	12.0 % for 24 hrs.
T=	% Design hr	T=	% Design hr	T=	6.0 % Design hr
	% Medium Trucks DHV		% Medium Trucks DHV	2.0	% Medium Trucks DHV
	% Heavy Trucks DHV		% Heavy Trucks DHV	4.0	% Heavy Trucks DHV
	% Buses DHV		% Buses DHV	0.0	% Buses DHV
	% Motorcycles DHV		% Motorcycles DHV	0.0	% Motorcycles DHV

STAMINA/TNM INPUT

The following are spreadsheet calculations based on the input above - do not enter data below this line

Existing Facility Model:		Demand	No-Build (Design Year) Model:		Demand	Build (Design Year) Model:		Demand
LOS (C)			LOS (C)			LOS (C)		
Southbound:	Autos	0	Southbound:	Autos	0	Southbound:	Autos	1785
	Med Trucks	0		Med Trucks	0		Med Trucks	38
	Hvy Trucks	0		Hvy Trucks	0		Hvy Trucks	76
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	0	Northbound:	Autos	0	Northbound:	Autos	1346
	Med Trucks	0		Med Trucks	0		Med Trucks	29
	Hvy Trucks	0		Hvy Trucks	0		Hvy Trucks	57
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Demand			Demand			Demand		
Southbound:	Autos	0	Southbound:	Autos	0	Southbound:	Autos	0
	Med Trucks	0		Med Trucks	0		Med Trucks	0
	Hvy Trucks	0		Hvy Trucks	0		Hvy Trucks	0
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	0	Northbound:	Autos	0	Northbound:	Autos	0
	Med Trucks	0		Med Trucks	0		Med Trucks	0
	Hvy Trucks	0		Hvy Trucks	0		Hvy Trucks	0
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0

TRAFFIC DATA FOR NOISE STUDIES

Project: SR 674 from US 301 to CR 579

Date: 5/1/2007

State Project Number(s):

Prepared By: RBW

Financial Project ID: 422762 1 21 01

Federal Aid Number(s):

Segment Description: Segment 1a: US 301 to Westlake Village

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build-C (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	6
Year:	2004	Year:	2030	Year:	2030
ADT: LOS (C)	13,800	ADT: LOS (C)	13,800	ADT: LOS (C)	52,100
Demand	12,200	Demand	41,700	Demand	41,700
Speed:	45 mph	Speed:	45 mph	Speed:	45 mph
	72 kmh		72 kmh		72 kmh
K=	9.6 %	K=	9.6 %	K=	9.6 %
D=	57 %	D=	57 %	D=	57 %
T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.
T=	6.0 % Design hr	T=	6.0 % Design hr	T=	6.0 % Design hr
2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV
4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV
0.0	% Buses DHV	0.0	% Buses DHV	0.0	% Buses DHV
0.0	% Motorcycles DHV	0.0	% Motorcycles DHV	0.0	% Motorcycles DHV

STAMINA/TNM INPUT

The following are spreadsheet calculations based on the input above - do not enter data below this line

Existing Facility Model:		Demand	No-Build (Design Year) Model:		LOS (C)	Build (Design Year) Model:		Demand
LOS (C)			LOS (C)			LOS (C)		
Southbound:	Autos	710	Southbound:	Autos	710	Southbound:	Autos	2680
	Med Trucks	15		Med Trucks	15		Med Trucks	57
	Hvy Trucks	30		Hvy Trucks	30		Hvy Trucks	114
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	535	Northbound:	Autos	535	Northbound:	Autos	2022
	Med Trucks	11		Med Trucks	11		Med Trucks	43
	Hvy Trucks	23		Hvy Trucks	23		Hvy Trucks	86
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Demand			Demand			Demand		
Southbound:	Autos	628	Southbound:	Autos	2145	Southbound:	Autos	2145
	Med Trucks	13		Med Trucks	46		Med Trucks	46
	Hvy Trucks	27		Hvy Trucks	91		Hvy Trucks	91
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	473	Northbound:	Autos	1618	Northbound:	Autos	1618
	Med Trucks	10		Med Trucks	34		Med Trucks	34
	Hvy Trucks	20		Hvy Trucks	69		Hvy Trucks	69
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0

TRAFFIC DATA FOR NOISE STUDIES

Project: SR 674 from US 301 to CR 579 Date: 5/1/2007

State Project Number(s): Prepared By: RBW

Financial Project ID: 422762 1 21 01

Federal Aid Number(s):

Segment Description: Segment 1b: Westlake Village to West Lake Drive

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	6
Year:	2004	Year:	2030	Year:	2030
ADT: LOS (C)	13,800	ADT: LOS (C)	13,800	ADT: LOS (C)	52,100
Demand	10,000	Demand	29,800	Demand	29,800
Speed:	45 mph	Speed:	45 mph	Speed:	45 mph
	72 kmh		72 kmh		72 kmh
K=	9.6 %	K=	9.6 %	K=	9.6 %
D=	57 %	D=	57 %	D=	57 %
T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.
T=	6.0 % Design hr	T=	6.0 % Design hr	T=	6.0 % Design hr
2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV
4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV
0.0	% Buses DHV	0.0	% Buses DHV	0.0	% Buses DHV
0.0	% Motorcycles DHV	0.0	% Motorcycles DHV	0.0	% Motorcycles DHV

STAMINA/TNM INPUT

The following are spreadsheet calculations based on the input above - do not enter data below this line

Existing Facility Model:		**Demand**	**No-Build (Design Year) Model:**		**LOS (C)**	**Build (Design Year) Model:**		**Demand**
LOS (C)			LOS (C)			LOS (C)		
Southbound:	Autos	710	Southbound:	Autos	710	Southbound:	Autos	2680
	Med Trucks	15		Med Trucks	15		Med Trucks	57
	Hvy Trucks	30		Hvy Trucks	30		Hvy Trucks	114
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	535	Northbound:	Autos	535	Northbound:	Autos	2022
	Med Trucks	11		Med Trucks	11		Med Trucks	43
	Hvy Trucks	23		Hvy Trucks	23		Hvy Trucks	86
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Demand			Demand			Demand		
Southbound:	Autos	514	Southbound:	Autos	1533	Southbound:	Autos	1533
	Med Trucks	11		Med Trucks	33		Med Trucks	33
	Hvy Trucks	22		Hvy Trucks	65		Hvy Trucks	65
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	388	Northbound:	Autos	1156	Northbound:	Autos	1156
	Med Trucks	8		Med Trucks	25		Med Trucks	25
	Hvy Trucks	17		Hvy Trucks	49		Hvy Trucks	49
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0

TRAFFIC DATA FOR NOISE STUDIES

Project: SR 674 from US 301 to CR 579 Date: 5/1/2007

State Project Number(s): Prepared By: RBW

Financial Project ID: 422762 1 21 01

Federal Aid Number(s):

Segment Description: Segments 2 & 3: West Lake Drive to CR 579

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2004	Year:	2030	Year:	2030
ADT: LOS (C)	13,800	ADT: LOS (C)	13,800	ADT: LOS (C)	34,700
Demand	8,600	Demand	17,800	Demand	17,800
Speed:	45 mph	Speed:	45 mph	Speed:	45 mph
	72 kmh		72 kmh		72 kmh
K=	9.6 %	K=	9.6 %	K=	9.6 %
D=	57 %	D=	57 %	D=	57 %
T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.
T=	6.0 % Design hr	T=	6.0 % Design hr	T=	6.0 % Design hr
2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV
4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV
0.0	% Buses DHV	0.0	% Buses DHV	0.0	% Buses DHV
0.0	% Motorcycles DHV	0.0	% Motorcycles DHV	0.0	% Motorcycles DHV

STAMINA/TNM INPUT

The following are spreadsheet calculations based on the input above - do not enter data below this line

Existing Facility Model:		**Demand**	**No-Build (Design Year) Model**		**LOS (C)**	**Build (Design Year) Model:**		**Demand**
LOS (C)			LOS (C)			LOS (C)		
Southbound:	Autos	710	Southbound:	Autos	710	Southbound:	Autos	1785
	Med Trucks	15		Med Trucks	15		Med Trucks	38
	Hvy Trucks	30		Hvy Trucks	30		Hvy Trucks	76
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	535	Northbound:	Autos	535	Northbound:	Autos	1346
	Med Trucks	11		Med Trucks	11		Med Trucks	29
	Hvy Trucks	23		Hvy Trucks	23		Hvy Trucks	57
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Demand			Demand			Demand		
Southbound:	Autos	442	Southbound:	Autos	916	Southbound:	Autos	916
	Med Trucks	9		Med Trucks	19		Med Trucks	19
	Hvy Trucks	19		Hvy Trucks	39		Hvy Trucks	39
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	334	Northbound:	Autos	691	Northbound:	Autos	691
	Med Trucks	7		Med Trucks	15		Med Trucks	15
	Hvy Trucks	14		Hvy Trucks	29		Hvy Trucks	29
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0

TRAFFIC DATA FOR NOISE STUDIES

Project: SR 674 from US 301 to CR 579 Date: 5/1/2007

State Project Number(s): Prepared By: RBW

Financial Project ID: 422762 1 21 01

Federal Aid Number(s):

Segment Description: Segment 4: East of CR 579

(Data sheets are to be filled out for every segment having a change in traffic parameters such as volumes, posted speeds, typical section, etc.)

NOTE: Modeled ADT is the LOS(C) volume referenced in the FDOT LOS tables or demand, whichever is less.

Existing Facility		No-Build (Design Year)		Build (Design Year)	
Lanes:	2	Lanes:	2	Lanes:	4
Year:	2005	Year:	2030	Year:	2030
ADT: LOS (C)	13,800	ADT: LOS (C)	13,800	ADT: LOS (C)	34,700
Demand	6,000	Demand	11,000	Demand	11,000
Speed:	45 mph	Speed:	45 mph	Speed:	45 mph
	72 kmh		72 kmh		72 kmh
K=	9.6 %	K=	9.6 %	K=	9.6 %
D=	57 %	D=	57 %	D=	57 %
T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.	T=	12.0 % for 24 hrs.
T=	6.0 % Design hr	T=	6.0 % Design hr	T=	6.0 % Design hr
2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV	2.0	% Medium Trucks DHV
4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV	4.0	% Heavy Trucks DHV
0.0	% Buses DHV	0.0	% Buses DHV	0.0	% Buses DHV
0.0	% Motorcycles DHV	0.0	% Motorcycles DHV	0.0	% Motorcycles DHV

STAMINA/TNM INPUT

The following are spreadsheet calculations based on the input above - do not enter data below this line

Existing Facility Model:		Demand	No-Build (Design Year) Model		Demand	Build (Design Year) Model:		Demand
LOS (C)			LOS (C)			LOS (C)		
Southbound:	Autos	710	Southbound:	Autos	710	Southbound:	Autos	1785
	Med Trucks	15		Med Trucks	15		Med Trucks	38
	Hvy Trucks	30		Hvy Trucks	30		Hvy Trucks	76
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	535	Northbound:	Autos	535	Northbound:	Autos	1346
	Med Trucks	11		Med Trucks	11		Med Trucks	29
	Hvy Trucks	23		Hvy Trucks	23		Hvy Trucks	57
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Demand			Demand			Demand		
Southbound:	Autos	309	Southbound:	Autos	566	Southbound:	Autos	566
	Med Trucks	7		Med Trucks	12		Med Trucks	12
	Hvy Trucks	13		Hvy Trucks	24		Hvy Trucks	24
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0
Northbound:	Autos	233	Northbound:	Autos	427	Northbound:	Autos	427
	Med Trucks	5		Med Trucks	9		Med Trucks	9
	Hvy Trucks	10		Hvy Trucks	18		Hvy Trucks	18
	Buses	0		Buses	0		Buses	0
	Motorcycles	0		Motorcycles	0		Motorcycles	0

APPENDIX B

NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Bryan Whitehead and Sarah Moss Date: 5/10/07
Time Study Started: 0755 Time Study Ended: 0841
Project Identification:
Financial Project ID: 422762 1 21 01
Project Location: SR 674 from US 301 to CR 579

Site Identification: Site 1, Runs 1 - 3
North Side of SR 674 between 12th and 13th Street

Weather Conditions:
Sky: Clear X Partly Cloudy ____ Cloudy ____ Other ____
Temperature 73 F Wind Speed 5 mph Wind Direction NW Humidity 78 %

Equipment:
Sound Level Meter:
Type: Rion NL-31

Did you check the battery?	Yes	X	No	
Pre & Post Calibration?	Yes	X	No	
Response Settings:	Fast		Slow	X
Weighting:	A	X	Other	

Calibrator:
Type: Rion NC-73

Did you check the battery?	Yes	X	No	

TRAFFIC DATA

Roadway Identification	SR 674 Westbound		SR 674 Eastbound	
	Roadway 1		Roadway 2	
Vehicle Type	Volume	Speed (mph)	Volume	Speed (mph)
Autos	68-58-45	43-43-44	58-45-47	43-43-44
Medium Trucks	4-6-5	39-48-41	4-3-4	39-48-41
Heavy Trucks	4-4-9	42-45-45	4-8-6	42-45-45
Buses	N/A	N/A	N/A	N/A
Motorcycles	N/A	N/A	N/A	N/A
Duration	10 minutes		10 minutes	

RESULTS [dB(A)]

L_{EQ} 61.8-62.4-62.4 Lmax 73.4-75.5-74.7

Background Noise:
Major Sources: SR 674
Unusual Events:

NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Bryan Whitehead and Sarah Moss Date: 5/10/07
Time Study Started: 1650 Time Study Ended: 1725
Project Identification:
Financial Project ID: 422762 1 21 01
Project Location: SR 674 from US 301 to CR 579

Site Identification: Site 2, Runs 1-3
Southwest corner of SR 674 and Kenilworth Avenue

Weather Conditions:
Sky: Clear ____ Partly Cloudy X Cloudy ____ Other ____
Temperature 80 F Wind Speed 9 mph Wind Direction NW Humidity 64 %
Equipment:
Sound Level Meter:
Type: Rion NL-31
Did you check the battery? Yes X No ____
Pre & Post Calibration? Yes X No ____
Response Settings: Fast ____ Slow X
Weighting: A X Other ____
Calibrator:
Type: Rion NC-73
Did you check the battery? Yes X No ____

TRAFFIC DATA

Roadway Identification	SR 674 Westbound		SR 674 Eastbound	
	Roadway 1		Roadway 2	
Vehicle Type	Volume	Speed (mph)	Volume	Speed (mph)
Autos	76-76-71	42-41-41	87-108-111	42-41-41
Medium Trucks	3-1-2	45-46-49	2-3-0	45-46-0
Heavy Trucks	4-6-1	44-46-43	4-3-2	44-46-43
Buses	N/A	N/A	N/A	N/A
Motorcycles	N/A	N/A	N/A	N/A
Duration	10 minutes		10 minutes	

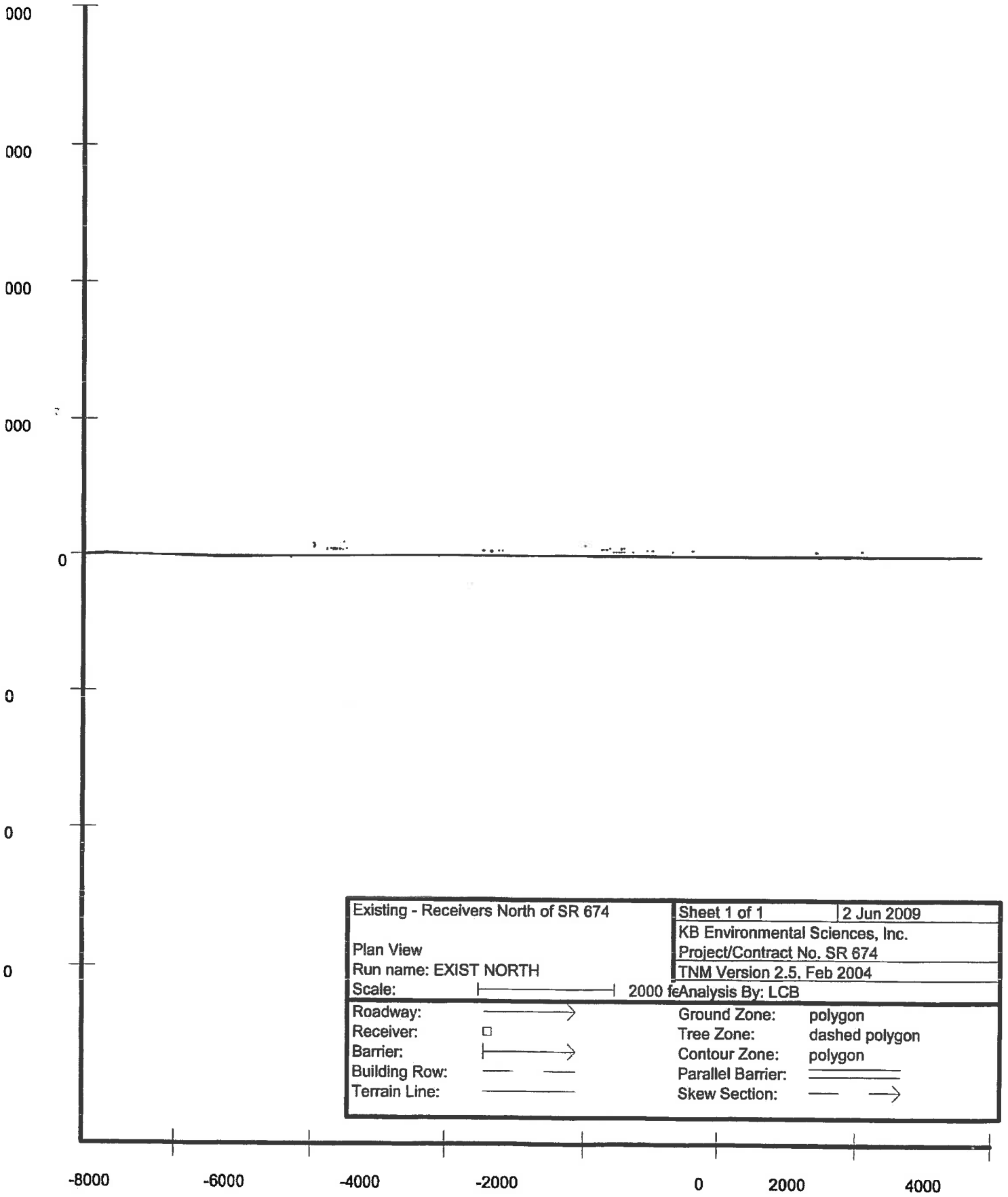
RESULTS [dB(A)]

L_{EQ} 61.9-62.9-62.5 Lmax 72.8-74.5-74.6

Background Noise: ____
Major Sources: SR 674
Unusual Events: ____

APPENDIX C

Contents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-8000
-6000
-4000
-2000
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4000
Existing - Receivers North of SR 674
Plan View
Run name: EXIST NORTH
Scale:
2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc. 2 June 2009
LCB TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers North of SR 674

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	12.2	5a	6	-6,325.0	13.0	0.00				Average	
		5	5	-7,340.0	10.0	0.00				Average	
		4	4	-8,575.0	32.0	0.00				Average	
		3	3	-9,019.0	45.0	0.00				Average	
		2	2	-9,372.0	20.0	0.00				Average	
		1	1	-9,832.0	0.0	0.00					
WB Segment 1b	12.2	6	8	-4,130.0	30.0	0.00				Average	
		5a	7	-6,325.0	13.0	0.00					
WB Segment 2 and 3	12.2	11	14	3,340.0	30.0	0.00				Average	
		10	13	1,065.0	25.0	0.00				Average	
		9	12	830.0	28.0	0.00				Average	
		8	11	489.0	25.0	0.00				Average	
		7	10	-4,080.0	33.0	0.00				Average	
		6	9	-4,130.0	30.0	0.00					
WB Segment 4	12.2	12	16	3,812.0	35.0	0.00				Average	
		11	15	3,340.0	30.0	0.00					
EB Segment 1a	12.2	1	17	-9,832.0	-12.0	0.00				Average	
		2	18	-9,372.0	8.0	0.00				Average	
		3	19	-9,019.0	33.0	0.00				Average	
		4	20	-8,575.0	20.0	0.00				Average	
		5	21	-7,340.0	-2.0	0.00				Average	
		5a	22	-6,325.0	1.0	0.00					
EB Segment 1b	12.2	5a	23	-6,325.0	1.0	0.00				Average	
		6	24	-4,130.0	18.0	0.00					
EB Segment 2 and 3	12.2	6	25	-4,130.0	18.0	0.00				Average	

		7	26	-4,080.0	21.0	0.00				Average	
		8	27	489.0	13.0	0.00				Average	
		9	28	830.0	16.0	0.00				Average	
		10	29	1,065.0	13.0	0.00				Average	
		11	30	3,340.0	18.0	0.00					
EB Segment 4	12.2	11	31	3,340.0	18.0	0.00				Average	
		12	32	3,812.0	23.0	0.00					

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2 June 2009
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers North of SR 674

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
WB Segment 1a	5a	6	628	45	13	45	27	45	0	0	0	0
	5	5	628	45	13	45	27	45	0	0	0	0
	4	4	628	45	13	45	27	45	0	0	0	0
	3	3	628	45	13	45	27	45	0	0	0	0
	2	2	628	45	13	45	27	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	514	45	11	45	22	45	0	0	0	0
	5a	7										
WB Segment 2 and 3	11	14	442	45	9	45	19	45	0	0	0	0
	10	13	442	45	9	45	19	45	0	0	0	0
	9	12	442	45	9	45	19	45	0	0	0	0
	8	11	442	45	9	45	19	45	0	0	0	0
	7	10	442	45	9	45	19	45	0	0	0	0
	6	9										
WB Segment 4	12	16	309	45	7	45	13	45	0	0	0	0
	11	15										
EB Segment 1a	1	17	473	45	10	45	20	45	0	0	0	0
	2	18	473	45	10	45	20	45	0	0	0	0
	3	19	473	45	10	45	20	45	0	0	0	0
	4	20	473	45	10	45	20	45	0	0	0	0
	5	21	473	45	10	45	20	45	0	0	0	0
	5a	22										

INPUT: TRAFFIC FOR LAeq1h Volumes **SR 674**

EB Segment 1b	5a	23	388	45	8	45	17	45	0	0	0	0
	6	24										
EB Segment 2 and 3	6	25	334	45	7	45	14	45	0	0	0	0
	7	26	334	45	7	45	14	45	0	0	0	0
	8	27	334	45	7	45	14	45	0	0	0	0
	9	28	334	45	7	45	14	45	0	0	0	0
	10	29	334	45	7	45	14	45	0	0	0	0
	11	30										
EB Segment 4	11	31	233	45	5	45	10	45	0	0	0	0
	12	32										

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2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers North of SR 674

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	1	1	-5,985.0	205.0	0.00	5.00	0.00	66	10.0	8.0	Y
2	2	1	-5,980.0	170.0	0.00	5.00	0.00	66	10.0	8.0	Y
3	3	1	-5,980.0	150.0	0.00	5.00	0.00	66	10.0	8.0	Y
4	4	1	-5,790.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
5	5	1	-5,722.0	118.0	0.00	5.00	0.00	66	10.0	8.0	Y
6	6	1	-5,680.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
7	7	1	-5,645.0	113.0	0.00	5.00	0.00	66	10.0	8.0	Y
8	8	1	-5,600.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
9	9	1	-5,560.0	110.0	0.00	5.00	0.00	66	10.0	8.0	Y
10	10	1	-5,500.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
11	11	1	-5,540.0	220.0	0.00	5.00	0.00	66	10.0	8.0	Y
12	12	1	-3,500.0	100.0	0.00	5.00	0.00	66	10.0	8.0	Y
13	13	1	-3,385.0	95.0	0.00	5.00	0.00	66	10.0	8.0	Y
14	14	1	-3,280.0	105.0	0.00	5.00	0.00	66	10.0	8.0	Y
15	15	1	-3,215.0	100.0	0.00	5.00	0.00	66	10.0	8.0	Y
16	16	1	-1,770.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
17	17	1	-1,740.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
18	18	1	-1,710.0	127.0	0.00	5.00	0.00	66	10.0	8.0	Y
19	19	1	-1,688.0	130.0	0.00	5.00	0.00	66	10.0	8.0	Y
20	20	1	-1,650.0	135.0	0.00	5.00	0.00	66	10.0	8.0	Y
21	21	1	-1,600.0	85.0	0.00	5.00	0.00	66	10.0	8.0	Y
22	22	1	-1,560.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y

INPUT: RECEIVERS

SR 674

23	23	1	-1,520.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y
24	24	1	-1,475.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y
25	25	1	-1,435.0	78.0	0.00	5.00	0.00	66	10.0	8.0	Y
26	26	1	-1,480.0	132.0	0.00	5.00	0.00	66	10.0	8.0	Y
27	27	1	-1,440.0	140.0	0.00	5.00	0.00	66	10.0	8.0	Y
28	28	1	-1,300.0	90.0	0.00	5.00	0.00	66	10.0	8.0	Y
30	29	1	-1,095.0	108.0	0.00	5.00	0.00	66	10.0	8.0	Y
31	30	1	-1,010.0	102.0	0.00	5.00	0.00	66	10.0	8.0	Y
32	31	1	-720.0	90.0	0.00	5.00	0.00	66	10.0	8.0	Y
33	32	1	-415.0	103.0	0.00	5.00	0.00	66	10.0	8.0	Y
35	33	1	1,385.0	88.0	0.00	5.00	0.00	66	10.0	8.0	Y
38	34	1	2,055.0	97.0	0.00	5.00	0.00	66	10.0	8.0	Y
39	35	1	-2,010.0	188.0	0.00	5.00	0.00	66	10.0	8.0	Y

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2 June 2009
TNM 2.5
Calculated with TNM 2.5

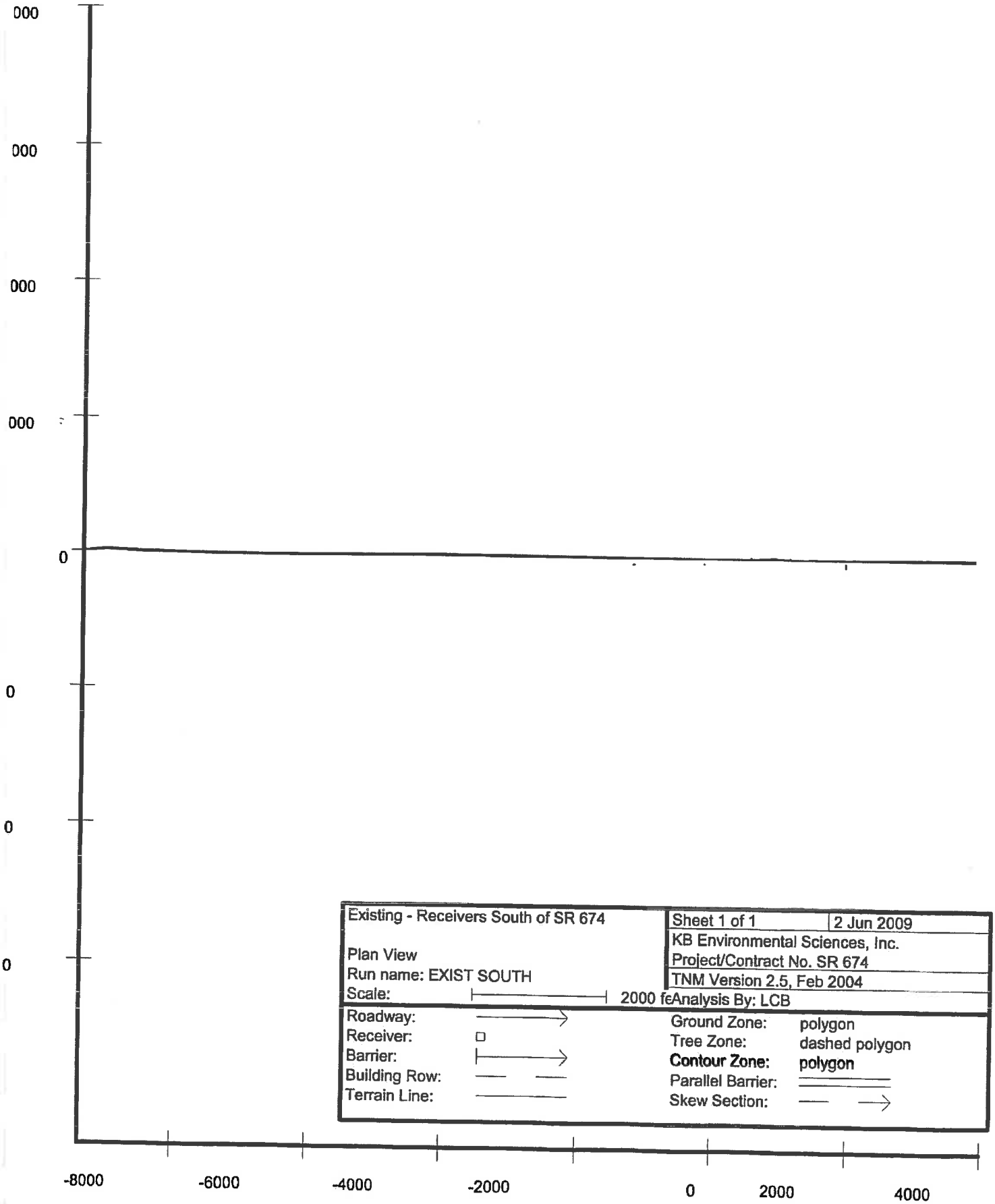
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers North of SR 674
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	1	1	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
2	2	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
3	3	1	0.0	58.8	66	58.8	10	----	58.8	0.0	8	-8.0
4	4	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
5	5	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
6	6	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
7	7	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
8	8	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
9	9	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
10	10	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
11	11	1	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
12	12	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
13	13	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
14	14	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
15	15	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
16	16	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
17	17	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
18	18	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
19	19	1	0.0	60.5	66	60.5	10	----	60.5	0.0	8	-8.0
20	20	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
21	21	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
22	22	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
23	23	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0

24	24	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
25	25	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
26	26	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
27	27	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0
28	28	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
30	29	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
31	30	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
32	31	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
33	32	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
35	33	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
38	34	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
39	35	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	35	0.0	0.0	0.0
All Impacted	4	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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Existing - Receivers South of SR 674
Plan View
Run name: EXIST SOUTH
Scale: 2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers South of SR 674

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	12.2	5a	6	-6,325.0	13.0	0.00				Average	
		5	5	-7,340.0	10.0	0.00				Average	
		4	4	-8,575.0	32.0	0.00				Average	
		3	3	-9,019.0	45.0	0.00				Average	
		2	2	-9,372.0	20.0	0.00				Average	
		1	1	-9,832.0	0.0	0.00					
WB Segment 1b	12.2	6	8	-4,130.0	30.0	0.00				Average	
		5a	7	-6,325.0	13.0	0.00					
WB Segment 2 and 3	12.2	11	14	3,340.0	30.0	0.00				Average	
		10	13	1,065.0	25.0	0.00				Average	
		9	12	830.0	28.0	0.00				Average	
		8	11	489.0	25.0	0.00				Average	
		7	10	-4,080.0	33.0	0.00				Average	
		6	9	-4,130.0	30.0	0.00					
WB Segment 4	12.2	12	16	3,812.0	35.0	0.00				Average	
		11	15	3,340.0	30.0	0.00					
EB Segment 1a	12.2	1	17	-9,832.0	-12.0	0.00				Average	
		2	18	-9,372.0	8.0	0.00				Average	
		3	19	-9,019.0	33.0	0.00				Average	
		4	20	-8,575.0	20.0	0.00				Average	
		5	21	-7,340.0	-2.0	0.00				Average	
		5a	22	-6,325.0	1.0	0.00					
EB Segment 1b	12.2	5a	23	-6,325.0	1.0	0.00				Average	
		6	24	-4,130.0	18.0	0.00					
EB Segment 2 and 3	12.2	6	25	-4,130.0	18.0	0.00				Average	

		7	26	-4,080.0	21.0	0.00				Average	
		8	27	489.0	13.0	0.00				Average	
		9	28	830.0	16.0	0.00				Average	
		10	29	1,065.0	13.0	0.00				Average	
		11	30	3,340.0	18.0	0.00					
EB Segment 4	12.2	11	31	3,340.0	18.0	0.00				Average	
		12	32	3,812.0	23.0	0.00					

KB Environmental Sciences, Inc. 2 June 2009
LCB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers South of SR 674

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
WB Segment 1a	5a	6	473	45	10	45	20	45	0	0	0	0
	5	5	473	45	10	45	20	45	0	0	0	0
	4	4	473	45	10	45	20	45	0	0	0	0
	3	3	473	45	10	45	20	45	0	0	0	0
	2	2	473	45	10	45	20	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	388	45	8	45	17	45	0	0	0	0
	5a	7										
WB Segment 2 and 3	11	14	334	45	7	45	14	45	0	0	0	0
	10	13	334	45	7	45	14	45	0	0	0	0
	9	12	334	45	7	45	14	45	0	0	0	0
	8	11	334	45	7	45	14	45	0	0	0	0
	7	10	334	45	7	45	14	45	0	0	0	0
	6	9										
WB Segment 4	12	16	233	45	5	45	10	45	0	0	0	0
	11	15										
EB Segment 1a	1	17	628	45	13	45	27	45	0	0	0	0
	2	18	628	45	13	45	27	45	0	0	0	0
	3	19	628	45	13	45	27	45	0	0	0	0
	4	20	628	45	13	45	27	45	0	0	0	0
	5	21	628	45	13	45	27	45	0	0	0	0
	5a	22										

INPUT: TRAFFIC FOR LAeq1h Volumes **SR 674**

EB Segment 1b	5a	23	514	45	11	45	22	45	0	0	0	0
	6	24										
EB Segment 2 and 3	6	25	442	45	9	45	19	45	0	0	0	0
	7	26	442	45	9	45	19	45	0	0	0	0
	8	27	442	45	9	45	19	45	0	0	0	0
	9	28	442	45	9	45	19	45	0	0	0	0
	10	29	442	45	9	45	19	45	0	0	0	0
	11	30										
EB Segment 4	11	31	309	45	7	45	13	45	0	0	0	0
	12	32										

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers South of SR 674

Receiver Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
29	1	1	-1,240.0	-80.0	0.00	5.00	0.00	66	10.0	8.0	Y
34	2	1	-200.0	-60.0	0.00	5.00	0.00	66	10.0	8.0	Y
36	3	1	1,888.0	-50.0	0.00	5.00	0.00	66	10.0	8.0	Y
37	34	1	1,890.0	-90.0	0.00	5.00	0.00	66	10.0	8.0	Y

KB Environmental Sciences, Inc.
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2 June 2009
TNM 2.5
Calculated with TNM 2.5

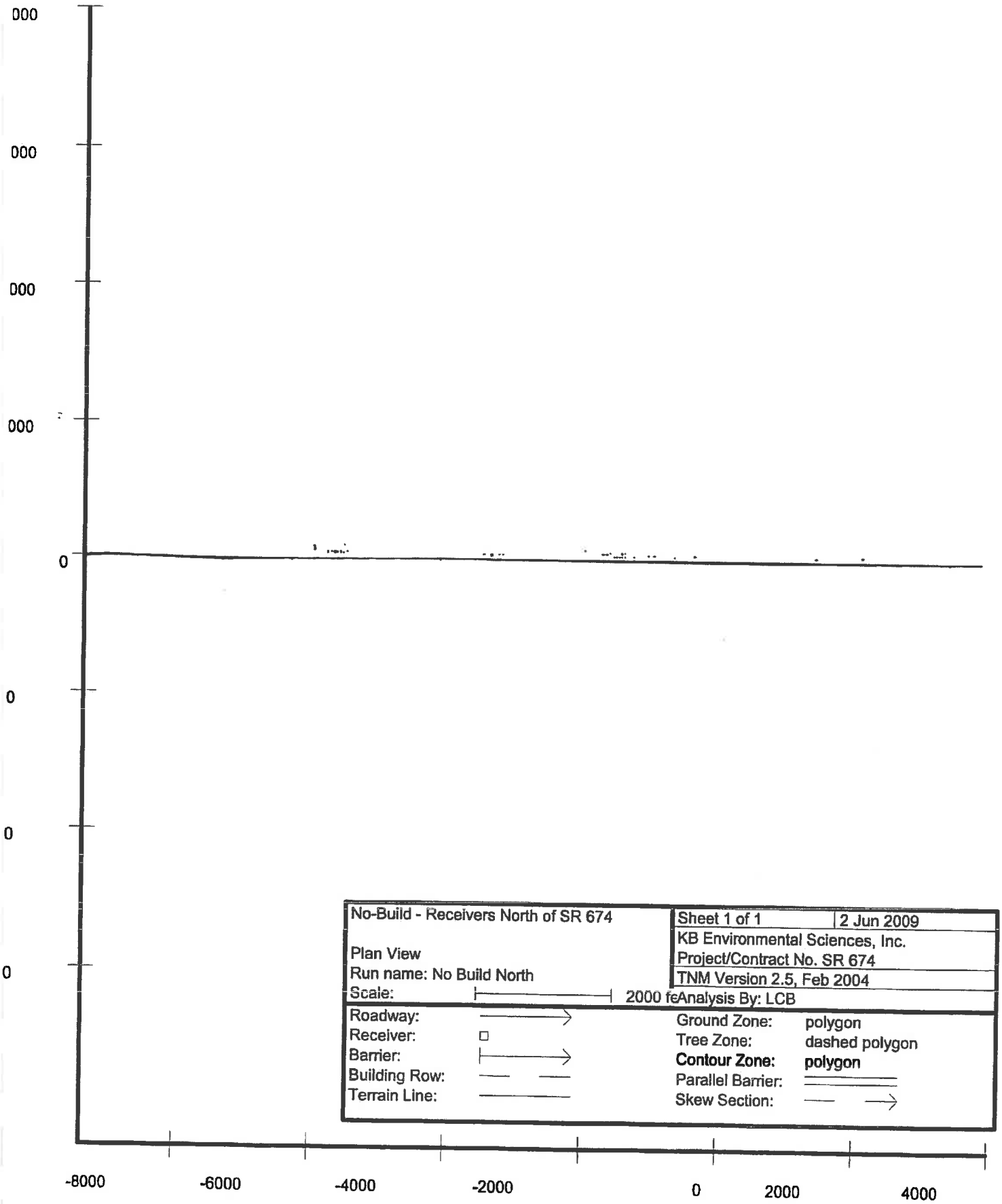
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: Existing - Receivers South of SR 674
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
29	1	1	0.0	60.9	66	60.9	10	---	60.9	0.0	8	-8.0
34	2	1	0.0	63.1	66	63.1	10	---	63.1	0.0	8	-8.0
36	3	1	0.0	64.4	66	64.4	10	---	64.4	0.0	8	-8.0
37	34	1	0.0	60.2	66	60.2	10	---	60.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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No-Build - Receivers North of SR 674
Plan View
Run name: No Build North
Scale: 2000 fe
Analysis By: LCB
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers North of SR 674

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	12.2	5a	6	-6,325.0	13.0	0.00				Average	
		5	5	-7,340.0	10.0	0.00				Average	
		4	4	-8,575.0	32.0	0.00				Average	
		3	3	-9,019.0	45.0	0.00				Average	
		2	2	-9,372.0	20.0	0.00				Average	
		1	1	-9,832.0	0.0	0.00					
WB Segment 1b	12.2	6	8	-4,130.0	30.0	0.00				Average	
		5a	7	-6,325.0	13.0	0.00					
WB Segment 2 and 3	12.2	11	14	3,340.0	30.0	0.00				Average	
		10	13	1,065.0	25.0	0.00				Average	
		9	12	830.0	28.0	0.00				Average	
		8	11	489.0	25.0	0.00				Average	
		7	10	-4,080.0	33.0	0.00				Average	
		6	9	-4,130.0	30.0	0.00					
WB Segment 4	12.2	12	16	3,812.0	35.0	0.00				Average	
		11	15	3,340.0	30.0	0.00					
EB Segment 1a	12.2	1	17	-9,832.0	-12.0	0.00				Average	
		2	18	-9,372.0	8.0	0.00				Average	
		3	19	-9,019.0	33.0	0.00				Average	
		4	20	-8,575.0	20.0	0.00				Average	
		5	21	-7,340.0	-2.0	0.00				Average	
		5a	22	-6,325.0	1.0	0.00					
EB Segment 1b	12.2	5a	23	-6,325.0	1.0	0.00				Average	
		6	24	-4,130.0	18.0	0.00					
EB Segment 2 and 3	12.2	6	25	-4,130.0	18.0	0.00				Average	

		7	26	-4,080.0	21.0	0.00				Average	
		8	27	489.0	13.0	0.00				Average	
		9	28	830.0	16.0	0.00				Average	
		10	29	1,065.0	13.0	0.00				Average	
		11	30	3,340.0	18.0	0.00					
EB Segment 4	12.2	11	31	3,340.0	18.0	0.00				Average	
		12	32	3,812.0	23.0	0.00					

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers North of SR 674

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
WB Segment 1a	5a	6	710	45	15	45	30	45	0	0	0	0
	5	5	710	45	15	45	30	45	0	0	0	0
	4	4	710	45	15	45	30	45	0	0	0	0
	3	3	710	45	15	45	30	45	0	0	0	0
	2	2	710	45	15	45	30	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	710	45	15	45	30	45	0	0	0	0
	5a	7										
WB Segment 2 and 3	11	14	710	45	15	45	30	45	0	0	0	0
	10	13	710	45	15	45	30	45	0	0	0	0
	9	12	710	45	15	45	30	45	0	0	0	0
	8	11	710	45	15	45	30	45	0	0	0	0
	7	10	710	45	15	45	30	45	0	0	0	0
	6	9										
WB Segment 4	12	16	566	45	12	45	24	45	0	0	0	0
	11	15										
EB Segment 1a	1	17	535	45	11	45	23	45	0	0	0	0
	2	18	535	45	11	45	23	45	0	0	0	0
	3	19	535	45	11	45	23	45	0	0	0	0
	4	20	535	45	11	45	23	45	0	0	0	0
	5	21	535	45	11	45	23	45	0	0	0	0
	5a	22										

INPUT: TRAFFIC FOR LAeq1h Volumes **SR 674**

EB Segment 1b	5a	23	535	45	11	45	23	45	0	0	0	0
	6	24										
EB Segment 2 and 3	6	25	535	45	11	45	23	45	0	0	0	0
	7	26	535	45	11	45	23	45	0	0	0	0
	8	27	535	45	11	45	23	45	0	0	0	0
	9	28	535	45	11	45	23	45	0	0	0	0
	10	29	535	45	11	45	23	45	0	0	0	0
	11	30										
EB Segment 4	11	31	427	45	9	45	18	45	0	0	0	0
	12	32										

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers North of SR 674

Receiver Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	1	1	-5,985.0	205.0	0.00	5.00	0.00	66	10.0	8.0	Y
2	2	1	-5,980.0	170.0	0.00	5.00	0.00	66	10.0	8.0	Y
3	3	1	-5,980.0	150.0	0.00	5.00	0.00	66	10.0	8.0	Y
4	4	1	-5,790.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
5	5	1	-5,722.0	118.0	0.00	5.00	0.00	66	10.0	8.0	Y
6	6	1	-5,680.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
7	7	1	-5,645.0	113.0	0.00	5.00	0.00	66	10.0	8.0	Y
8	8	1	-5,600.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
9	9	1	-5,560.0	110.0	0.00	5.00	0.00	66	10.0	8.0	Y
10	10	1	-5,500.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
11	11	1	-5,540.0	220.0	0.00	5.00	0.00	66	10.0	8.0	Y
12	12	1	-3,500.0	100.0	0.00	5.00	0.00	66	10.0	8.0	Y
13	13	1	-3,385.0	95.0	0.00	5.00	0.00	66	10.0	8.0	Y
14	14	1	-3,280.0	105.0	0.00	5.00	0.00	66	10.0	8.0	Y
15	15	1	-3,215.0	100.0	0.00	5.00	0.00	66	10.0	8.0	Y
16	16	1	-1,770.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
17	17	1	-1,740.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
18	18	1	-1,710.0	127.0	0.00	5.00	0.00	66	10.0	8.0	Y
19	19	1	-1,688.0	130.0	0.00	5.00	0.00	66	10.0	8.0	Y
20	20	1	-1,650.0	135.0	0.00	5.00	0.00	66	10.0	8.0	Y
21	21	1	-1,600.0	85.0	0.00	5.00	0.00	66	10.0	8.0	Y
22	22	1	-1,560.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y

INPUT: RECEIVERS

SR 674

23	23	1	-1,520.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y
24	24	1	-1,475.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y
25	25	1	-1,435.0	78.0	0.00	5.00	0.00	66	10.0	8.0	Y
26	26	1	-1,480.0	132.0	0.00	5.00	0.00	66	10.0	8.0	Y
27	27	1	-1,440.0	140.0	0.00	5.00	0.00	66	10.0	8.0	Y
28	28	1	-1,300.0	90.0	0.00	5.00	0.00	66	10.0	8.0	Y
30	29	1	-1,095.0	108.0	0.00	5.00	0.00	66	10.0	8.0	Y
31	30	1	-1,010.0	102.0	0.00	5.00	0.00	66	10.0	8.0	Y
32	31	1	-720.0	90.0	0.00	5.00	0.00	66	10.0	8.0	Y
33	32	1	-415.0	103.0	0.00	5.00	0.00	66	10.0	8.0	Y
35	33	1	1,385.0	88.0	0.00	5.00	0.00	66	10.0	8.0	Y
38	34	1	2,055.0	97.0	0.00	5.00	0.00	66	10.0	8.0	Y
39	35	1	-2,010.0	188.0	0.00	5.00	0.00	66	10.0	8.0	Y

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5
Calculated with TNM 2.5

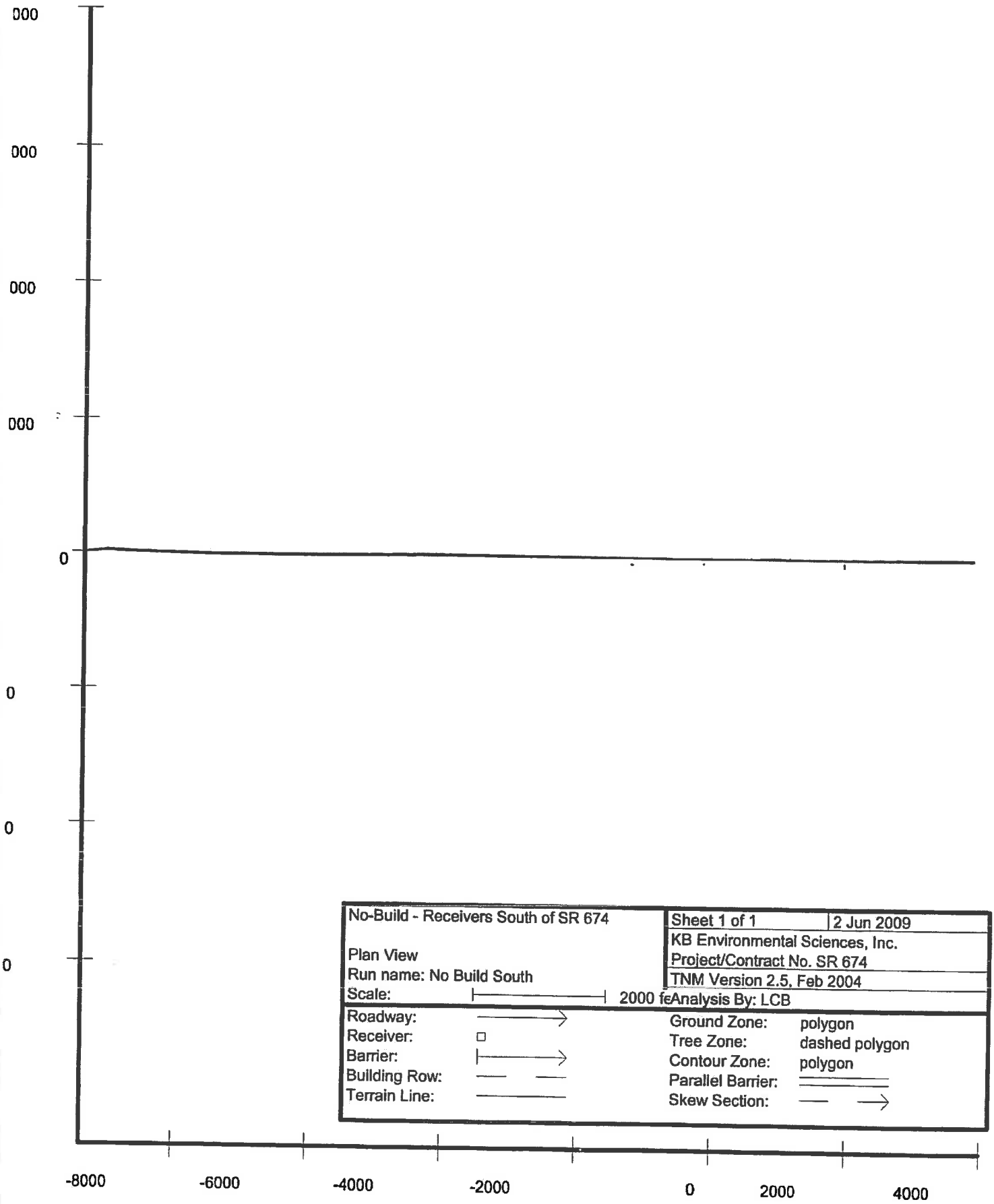
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers North of SR 674
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	1	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
2	2	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
3	3	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
4	4	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
5	5	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
6	6	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
7	7	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
8	8	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
9	9	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
10	10	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
11	11	1	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
12	12	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
13	13	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
14	14	1	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
15	15	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
16	16	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
17	17	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
18	18	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
19	19	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
20	20	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
21	21	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
22	22	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
23	23	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0

24	24	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
25	25	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
26	26	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
27	27	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
28	28	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
30	29	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
31	30	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
32	31	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
33	32	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
35	33	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
38	34	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
39	35	1	0.0	58.8	66	58.8	10	----	58.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	35	0.0	0.0	0.0
All Impacted	9	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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-2000
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No-Build - Receivers South of SR 674
Plan View
Run name: No Build South
Scale: 2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers South of SR 674

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	12.2	5a	6	-6,325.0	13.0	0.00				Average	
		5	5	-7,340.0	10.0	0.00				Average	
		4	4	-8,575.0	32.0	0.00				Average	
		3	3	-9,019.0	45.0	0.00				Average	
		2	2	-9,372.0	20.0	0.00				Average	
		1	1	-9,832.0	0.0	0.00					
WB Segment 1b	12.2	6	8	-4,130.0	30.0	0.00				Average	
		5a	7	-6,325.0	13.0	0.00					
WB Segment 2 and 3	12.2	11	14	3,340.0	30.0	0.00				Average	
		10	13	1,065.0	25.0	0.00				Average	
		9	12	830.0	28.0	0.00				Average	
		8	11	489.0	25.0	0.00				Average	
		7	10	-4,080.0	33.0	0.00				Average	
		6	9	-4,130.0	30.0	0.00					
WB Segment 4	12.2	12	16	3,812.0	35.0	0.00				Average	
		11	15	3,340.0	30.0	0.00					
EB Segment 1a	12.2	1	17	-9,832.0	-12.0	0.00				Average	
		2	18	-9,372.0	8.0	0.00				Average	
		3	19	-9,019.0	33.0	0.00				Average	
		4	20	-8,575.0	20.0	0.00				Average	
		5	21	-7,340.0	-2.0	0.00				Average	
		5a	22	-6,325.0	1.0	0.00					
EB Segment 1b	12.2	5a	23	-6,325.0	1.0	0.00				Average	
		6	24	-4,130.0	18.0	0.00					
EB Segment 2 and 3	12.2	6	25	-4,130.0	18.0	0.00				Average	

		7	26	-4,080.0	21.0	0.00				Average	
		8	27	489.0	13.0	0.00				Average	
		9	28	830.0	16.0	0.00				Average	
		10	29	1,065.0	13.0	0.00				Average	
		11	30	3,340.0	18.0	0.00					
EB Segment 4	12.2	11	31	3,340.0	18.0	0.00				Average	
		12	32	3,812.0	23.0	0.00					

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers South of SR 674

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
WB Segment 1a	5a	6	535	45	11	45	23	45	0	0	0	0
	5	5	535	45	11	45	23	45	0	0	0	0
	4	4	535	45	11	45	23	45	0	0	0	0
	3	3	535	45	11	45	23	45	0	0	0	0
	2	2	535	45	11	45	23	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	535	45	11	45	23	45	0	0	0	0
	5a	7										
WB Segment 2 and 3	11	14	535	45	11	45	23	45	0	0	0	0
	10	13	535	45	11	45	23	45	0	0	0	0
	9	12	535	45	11	45	23	45	0	0	0	0
	8	11	535	45	11	45	23	45	0	0	0	0
	7	10	535	45	11	45	23	45	0	0	0	0
	6	9										
WB Segment 4	12	16	427	45	9	45	18	45	0	0	0	0
	11	15										
EB Segment 1a	1	17	710	45	15	45	30	45	0	0	0	0
	2	18	710	45	15	45	30	45	0	0	0	0
	3	19	710	45	15	45	30	45	0	0	0	0
	4	20	710	45	15	45	30	45	0	0	0	0
	5	21	710	45	15	45	30	45	0	0	0	0
	5a	22										

INPUT: TRAFFIC FOR LAeq1h Volumes **SR 674**

EB Segment 1b	5a	23	710	45	15	45	30	45	0	0	0	0
	6	24										
EB Segment 2 and 3	6	25	710	45	15	45	30	45	0	0	0	0
	7	26	710	45	15	45	30	45	0	0	0	0
	8	27	710	45	15	45	30	45	0	0	0	0
	9	28	710	45	15	45	30	45	0	0	0	0
	10	29	710	45	15	45	30	45	0	0	0	0
	11	30										
EB Segment 4	11	31	566	45	12	45	24	45	0	0	0	0
	12	32										

KB Environmental Sciences, Inc.
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2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers South of SR 674

Receiver Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
29	1	1	-1,240.0	-80.0	0.00	5.00	0.00	66	10.0	8.0	Y
34	2	1	-200.0	-60.0	0.00	5.00	0.00	66	10.0	8.0	Y
36	3	1	1,888.0	-50.0	0.00	5.00	0.00	66	10.0	8.0	Y
37	34	1	1,890.0	-90.0	0.00	5.00	0.00	66	10.0	8.0	Y

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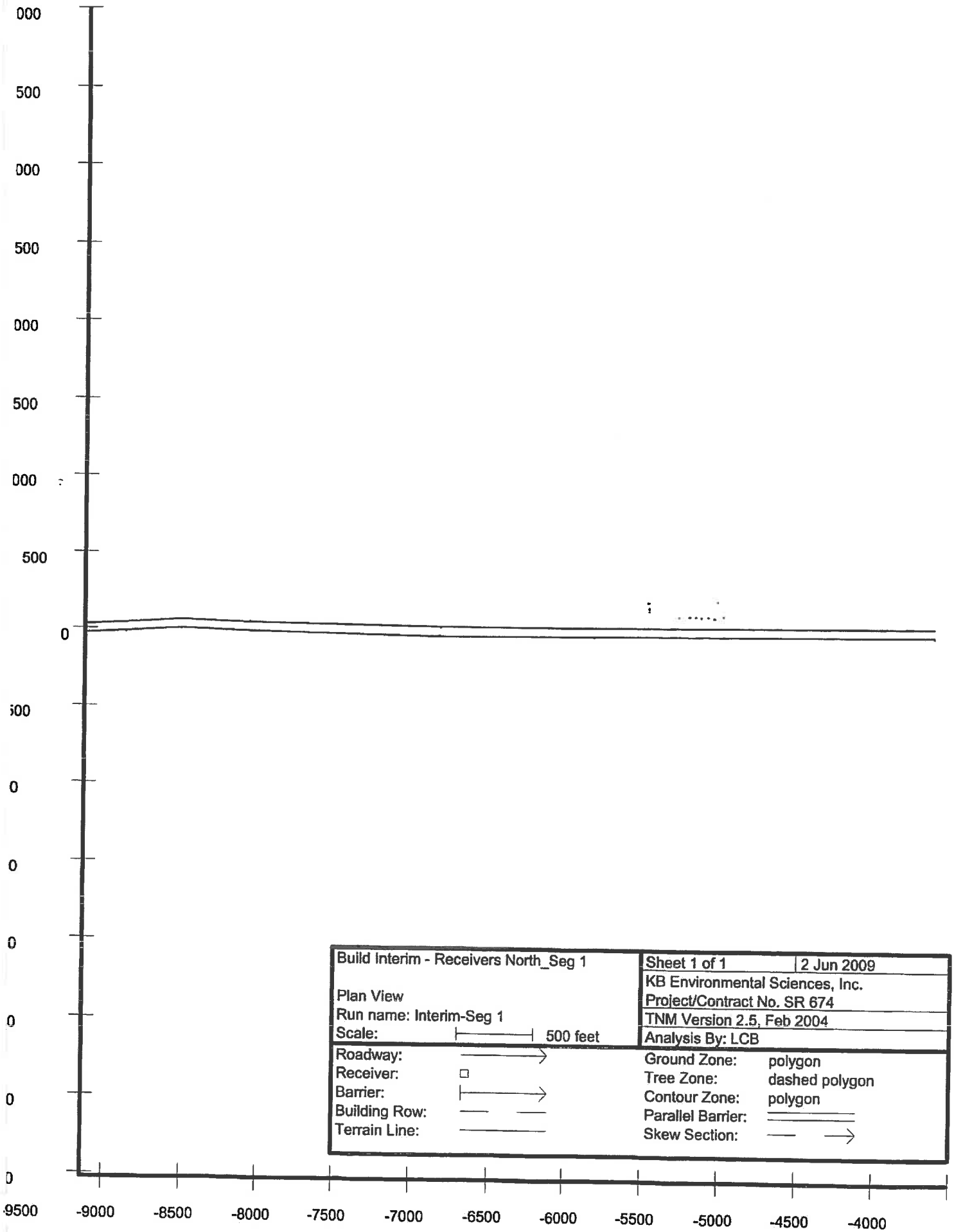
2 June 2009
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: No-Build - Receivers South of SR 674
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
29	1	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
34	2	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
36	3	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
37	34	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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-7500
-7000
-6500
-6000
-5500
-5000
-4500
-4000
Build Interim - Receivers North_Seg 1
Plan View
Run name: Interim-Seg 1
Scale: 500 feet
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: Build Interim - Receivers North_Seg 1

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	24.0	5a	6	-6,325.0	36.0	0.00				Average	
		5	5	-7,340.0	33.0	0.00				Average	
		4	4	-8,575.0	55.0	0.00				Average	
		3	3	-9,019.0	68.0	0.00				Average	
		2	2	-9,372.0	43.0	0.00				Average	
		1	1	-9,832.0	23.0	0.00					
WB Segment 1b	24.0	6	8	-4,130.0	53.0	0.00				Average	
		5a	7	-6,325.0	36.0	0.00					
EB Segment 1a	24.0	1	17	-9,832.0	-35.0	0.00				Average	
		2	18	-9,372.0	-15.0	0.00				Average	
		3	19	-9,019.0	10.0	0.00				Average	
		4	20	-8,575.0	-3.0	0.00				Average	
		5	21	-7,340.0	-25.0	0.00				Average	
		5a	22	-6,325.0	-22.0	0.00					
EB Segment 1b	24.0	5a	23	-6,325.0	-22.0	0.00				Average	
		6	24	-4,130.0	-5.0	0.00					

KB Environmental Sciences, Inc. 2 June 2009
LCB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: Build Interim - Receivers North_Seg 1

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
WB Segment 1a	5a	6	1785	45	38	45	76	45	0	0	0	0
	5	5	1785	45	38	45	76	45	0	0	0	0
	4	4	1785	45	38	45	76	45	0	0	0	0
	3	3	1785	45	38	45	76	45	0	0	0	0
	2	2	1785	45	38	45	76	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	1785	45	38	45	76	45	0	0	0	0
	5a	7										
EB Segment 1a	1	17	1346	45	29	45	57	45	0	0	0	0
	2	18	1346	45	29	45	57	45	0	0	0	0
	3	19	1346	45	29	45	57	45	0	0	0	0
	4	20	1346	45	29	45	57	45	0	0	0	0
	5	21	1346	45	29	45	57	45	0	0	0	0
	5a	22										
EB Segment 1b	5a	23	1346	45	29	45	57	45	0	0	0	0
	6	24										

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: Build Interim - Receivers North_Seg 1

Receiver Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	1	1	-5,985.0	205.0	0.00	5.00	0.00	66	10.0	8.0	Y
2	2	1	-5,980.0	170.0	0.00	5.00	0.00	66	10.0	8.0	Y
3	3	1	-5,980.0	150.0	0.00	5.00	0.00	66	10.0	8.0	Y
4	4	1	-5,790.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
5	5	1	-5,722.0	118.0	0.00	5.00	0.00	66	10.0	8.0	Y
6	6	1	-5,680.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
7	7	1	-5,645.0	113.0	0.00	5.00	0.00	66	10.0	8.0	Y
8	8	1	-5,600.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
9	9	1	-5,560.0	110.0	0.00	5.00	0.00	66	10.0	8.0	Y
10	10	1	-5,500.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
11	35	1	-5,540.0	220.0	0.00	5.00	0.00	66	10.0	8.0	Y

KB Environmental Sciences, Inc.
LCB

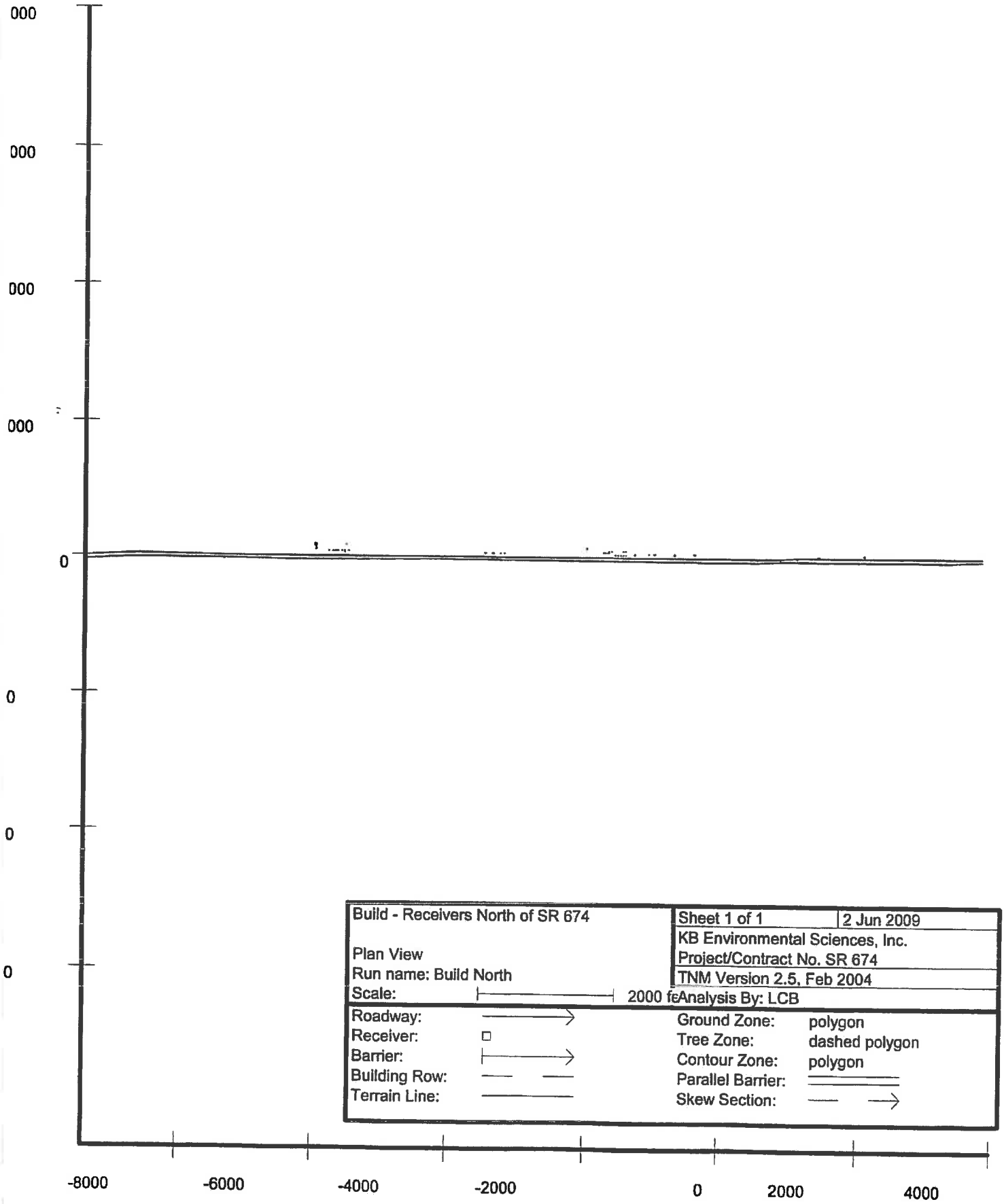
2 June 2009
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: Build Interim - Receivers North_Seg 1
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	1	1	0.0	63.6	66	63.6	10	---	63.6	0.0	8	-8.0
2	2	1	0.0	65.8	66	65.8	10	---	65.8	0.0	8	-8.0
3	3	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
4	4	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
5	5	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
6	6	1	0.0	70.2	66	70.2	10	Snd Lvl	70.2	0.0	8	-8.0
7	7	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
8	8	1	0.0	70.2	66	70.2	10	Snd Lvl	70.2	0.0	8	-8.0
9	9	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
10	10	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0
11	35	1	0.0	62.9	66	62.9	10	---	62.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	0.0	0.0	0.0
All Impacted	8	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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Build - Receivers North of SR 674
Plan View
Run name: Build North
Scale:
2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers North of SR 674

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	36.0	5a	6	-6,325.0	50.0	0.00				Average	
		5	5	-7,340.0	50.0	0.00				Average	
		4	4	-8,575.0	60.0	0.00				Average	
		3	3	-9,019.0	50.0	0.00				Average	
		2	2	-9,372.0	32.0	0.00				Average	
		1	1	-9,832.0	8.0	0.00					
WB Segment 1b	36.0	6	8	-4,130.0	49.0	0.00				Average	
		5a	7	-6,325.0	50.0	0.00					
WB Segment 2 and 3	24.0	11	14	3,340.0	57.0	0.00				Average	
		10	13	1,065.0	54.0	0.00				Average	
		9	12	830.0	49.0	0.00				Average	
		8	11	489.0	34.0	0.00				Average	
		7	10	-4,080.0	49.0	0.00				Average	
		6	9	-4,130.0	49.0	0.00					
WB Segment 4	24.0	12	16	3,812.0	64.0	0.00				Average	
		11	15	3,340.0	57.0	0.00					
EB Segment 1a	36.0	1	17	-9,832.0	-57.0	0.00				Average	
		2	18	-9,372.0	-30.0	0.00				Average	
		3	19	-9,019.0	-15.0	0.00				Average	
		4	20	-8,575.0	-2.0	0.00				Average	
		5	21	-7,340.0	-3.0	0.00				Average	
		5a	22	-6,325.0	-8.0	0.00					
EB Segment 1b	36.0	5a	23	-6,325.0	-8.0	0.00				Average	
		6	24	-4,130.0	4.0	0.00					
EB Segment 2 and 3	24.0	6	25	-4,130.0	4.0	0.00				Average	

		7	26	-4,080.0	4.0	0.00				Average	
		8	27	489.0	-11.0	0.00				Average	
		9	28	830.0	4.0	0.00				Average	
		10	29	1,065.0	9.0	0.00				Average	
		11	30	3,340.0	10.0	0.00					
EB Segment 4	24.0	11	31	3,340.0	10.0	0.00				Average	
		12	32	3,812.0	21.0	0.00					

KB Environmental Sciences, Inc. 2 June 2009
LCB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers North of SR 674

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
WB Segment 1a	5a	6	2145	45	46	45	91	45	0	0	0	0
	5	5	2145	45	46	45	91	45	0	0	0	0
	4	4	2145	45	46	45	91	45	0	0	0	0
	3	3	2145	45	46	45	91	45	0	0	0	0
	2	2	2145	45	46	45	91	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	1533	45	33	45	65	45	0	0	0	0
	5a	7										
WB Segment 2 and 3	11	14	916	45	19	45	39	45	0	0	0	0
	10	13	916	45	19	45	39	45	0	0	0	0
	9	12	916	45	19	45	39	45	0	0	0	0
	8	11	916	45	19	45	39	45	0	0	0	0
	7	10	916	45	19	45	39	45	0	0	0	0
	6	9										
WB Segment 4	12	16	566	45	12	45	24	45	0	0	0	0
	11	15										
EB Segment 1a	1	17	1618	45	34	45	69	45	0	0	0	0
	2	18	1618	45	34	45	69	45	0	0	0	0
	3	19	1618	45	34	45	69	45	0	0	0	0
	4	20	1618	45	34	45	69	45	0	0	0	0
	5	21	1618	45	34	45	69	45	0	0	0	0
	5a	22										

INPUT: TRAFFIC FOR LAeq1h Volumes **SR 674**

EB Segment 1b	5a	23	1156	45	25	45	49	45	0	0	0	0
	6	24										
EB Segment 2 and 3	6	25	691	45	15	45	29	45	0	0	0	0
	7	26	691	45	15	45	29	45	0	0	0	0
	8	27	691	45	15	45	29	45	0	0	0	0
	9	28	691	45	15	45	29	45	0	0	0	0
	10	29	691	45	15	45	29	45	0	0	0	0
	11	30										
EB Segment 4	11	31	427	45	9	45	18	45	0	0	0	0
	12	32										

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2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers North of SR 674

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	1	1	-5,985.0	205.0	0.00	5.00	0.00	66	10.0	8.0	Y
2	2	1	-5,980.0	170.0	0.00	5.00	0.00	66	10.0	8.0	Y
3	3	1	-5,980.0	150.0	0.00	5.00	0.00	66	10.0	8.0	Y
4	4	1	-5,790.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
5	5	1	-5,722.0	118.0	0.00	5.00	0.00	66	10.0	8.0	Y
6	6	1	-5,680.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
7	7	1	-5,645.0	113.0	0.00	5.00	0.00	66	10.0	8.0	Y
8	8	1	-5,600.0	115.0	0.00	5.00	0.00	66	10.0	8.0	Y
9	9	1	-5,560.0	110.0	0.00	5.00	0.00	66	10.0	8.0	Y
10	10	1	-5,500.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
11	11	1	-5,540.0	220.0	0.00	5.00	0.00	66	10.0	8.0	Y
12	12	1	-3,500.0	100.0	0.00	5.00	0.00	66	10.0	8.0	Y
13	13	1	-3,385.0	95.0	0.00	5.00	0.00	66	10.0	8.0	Y
14	14	1	-3,280.0	105.0	0.00	5.00	0.00	66	10.0	8.0	Y
15	15	1	-3,215.0	100.0	0.00	5.00	0.00	66	10.0	8.0	Y
16	16	1	-1,770.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
17	17	1	-1,740.0	125.0	0.00	5.00	0.00	66	10.0	8.0	Y
18	18	1	-1,710.0	127.0	0.00	5.00	0.00	66	10.0	8.0	Y
19	19	1	-1,688.0	130.0	0.00	5.00	0.00	66	10.0	8.0	Y
20	20	1	-1,650.0	135.0	0.00	5.00	0.00	66	10.0	8.0	Y
21	21	1	-1,600.0	85.0	0.00	5.00	0.00	66	10.0	8.0	Y
22	22	1	-1,560.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y

INPUT: RECEIVERS

								SR 674			
23	23	1	-1,520.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y
24	24	1	-1,475.0	80.0	0.00	5.00	0.00	66	10.0	8.0	Y
25	25	1	-1,435.0	78.0	0.00	5.00	0.00	66	10.0	8.0	Y
26	26	1	-1,480.0	132.0	0.00	5.00	0.00	66	10.0	8.0	Y
27	27	1	-1,440.0	140.0	0.00	5.00	0.00	66	10.0	8.0	Y
28	28	1	-1,300.0	90.0	0.00	5.00	0.00	66	10.0	8.0	Y
30	29	1	-1,095.0	108.0	0.00	5.00	0.00	66	10.0	8.0	Y
31	30	1	-1,010.0	102.0	0.00	5.00	0.00	66	10.0	8.0	Y
32	31	1	-720.0	90.0	0.00	5.00	0.00	66	10.0	8.0	Y
33	32	1	-415.0	103.0	0.00	5.00	0.00	66	10.0	8.0	Y
35	33	1	1,385.0	88.0	0.00	5.00	0.00	66	10.0	8.0	Y
38	34	1	2,055.0	97.0	0.00	5.00	0.00	66	10.0	8.0	Y
39	35	1	-2,010.0	188.0	0.00	5.00	0.00	66	10.0	8.0	Y

KB Environmental Sciences, Inc.
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2 June 2009
TNM 2.5
Calculated with TNM 2.5

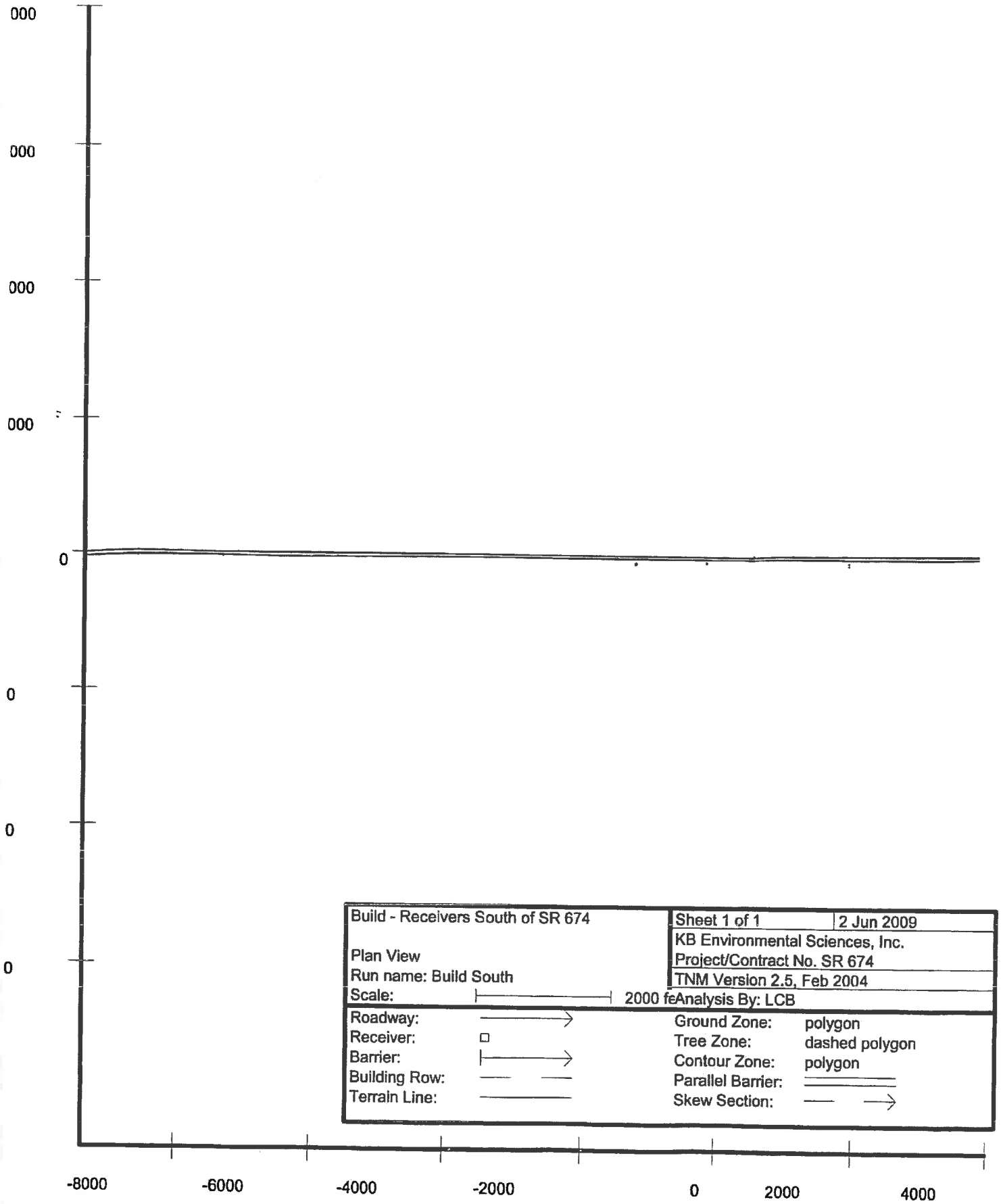
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers North of SR 674
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	1	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
2	2	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
3	3	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
4	4	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
5	5	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
6	6	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
7	7	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	8	-8.0
8	8	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
9	9	1	0.0	70.9	66	70.9	10	Snd Lvl	70.9	0.0	8	-8.0
10	10	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
11	11	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
12	12	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
13	13	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
14	14	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
15	15	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	8	-8.0
16	16	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
17	17	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
18	18	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
19	19	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
20	20	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
21	21	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
22	22	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
23	23	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0

24	24	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
25	25	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	8	-8.0
26	26	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
27	27	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
28	28	1	0.0	69.5	66	69.5	10	Snd Lvl	69.5	0.0	8	-8.0
30	29	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
31	30	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
32	31	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
33	32	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
35	33	1	0.0	71.2	66	71.2	10	Snd Lvl	71.2	0.0	8	-8.0
38	34	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
39	35	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	35	0.0	0.0	0.0
All Impacted	31	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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-6000
-4000
-2000
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2000
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Build - Receivers South of SR 674
Plan View
Run name: Build South
Scale:
2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers South of SR 674

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
WB Segment 1a	36.0	5a	6	-6,325.0	50.0	0.00				Average	
		5	5	-7,340.0	50.0	0.00				Average	
		4	4	-8,575.0	60.0	0.00				Average	
		3	3	-9,019.0	50.0	0.00				Average	
		2	2	-9,372.0	32.0	0.00				Average	
		1	1	-9,832.0	8.0	0.00					
WB Segment 1b	36.0	6	8	-4,130.0	49.0	0.00				Average	
		5a	7	-6,325.0	50.0	0.00					
WB Segment 2 and 3	24.0	11	14	3,340.0	57.0	0.00				Average	
		10	13	1,065.0	54.0	0.00				Average	
		9	12	830.0	49.0	0.00				Average	
		8	11	489.0	34.0	0.00				Average	
		7	10	-4,080.0	49.0	0.00				Average	
		6	9	-4,130.0	49.0	0.00					
WB Segment 4	24.0	12	16	3,812.0	64.0	0.00				Average	
		11	15	3,340.0	57.0	0.00					
EB Segment 1a	36.0	1	17	-9,832.0	-57.0	0.00				Average	
		2	18	-9,372.0	-30.0	0.00				Average	
		3	19	-9,019.0	-15.0	0.00				Average	
		4	20	-8,575.0	-2.0	0.00				Average	
		5	21	-7,340.0	-3.0	0.00				Average	
		5a	22	-6,325.0	-8.0	0.00					
EB Segment 1b	36.0	5a	23	-6,325.0	-8.0	0.00				Average	
		6	24	-4,130.0	4.0	0.00					
EB Segment 2 and 3	24.0	6	25	-4,130.0	4.0	0.00				Average	

		7	26	-4,080.0	4.0	0.00				Average	
		8	27	489.0	-11.0	0.00				Average	
		9	28	830.0	4.0	0.00				Average	
		10	29	1,065.0	9.0	0.00				Average	
		11	30	3,340.0	10.0	0.00					
EB Segment 4	24.0	11	31	3,340.0	10.0	0.00				Average	
		12	32	3,812.0	21.0	0.00					

KB Environmental Sciences, Inc. 2 June 2009
LCB TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers South of SR 674

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
WB Segment 1a	5a	6	1618	45	34	45	69	45	0	0	0	0
	5	5	1618	45	34	45	69	45	0	0	0	0
	4	4	1618	45	34	45	69	45	0	0	0	0
	3	3	1618	45	34	45	69	45	0	0	0	0
	2	2	1618	45	34	45	69	45	0	0	0	0
	1	1										
WB Segment 1b	6	8	1156	45	25	45	49	45	0	0	0	0
	5a	7										
WB Segment 2 and 3	11	14	691	45	15	45	29	45	0	0	0	0
	10	13	691	45	15	45	29	45	0	0	0	0
	9	12	691	45	15	45	29	45	0	0	0	0
	8	11	691	45	15	45	29	45	0	0	0	0
	7	10	691	45	15	45	29	45	0	0	0	0
	6	9										
WB Segment 4	12	16	427	45	9	45	18	45	0	0	0	0
	11	15										
EB Segment 1a	1	17	2145	45	46	45	91	45	0	0	0	0
	2	18	2145	45	46	45	91	45	0	0	0	0
	3	19	2145	45	46	45	91	45	0	0	0	0
	4	20	2145	45	46	45	91	45	0	0	0	0
	5	21	2145	45	46	45	91	45	0	0	0	0
	5a	22										

INPUT: TRAFFIC FOR LAeq1h Volumes **SR 674**

EB Segment 1b	5a	23	1533	45	33	45	65	45	0	0	0	0
	6	24										
EB Segment 2 and 3	6	25	916	45	19	45	39	45	0	0	0	0
	7	26	916	45	19	45	39	45	0	0	0	0
	8	27	916	45	19	45	39	45	0	0	0	0
	9	28	916	45	19	45	39	45	0	0	0	0
	10	29	916	45	19	45	39	45	0	0	0	0
	11	30										
EB Segment 4	11	31	566	45	12	45	24	45	0	0	0	0
	12	32										

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers South of SR 674

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
29	1	1	-1,240.0	-80.0	0.00	5.00	0.00	66	10.0	8.0	Y
34	2	1	-200.0	-60.0	0.00	5.00	0.00	66	10.0	8.0	Y
36	3	1	1,888.0	-50.0	0.00	5.00	0.00	66	10.0	8.0	Y
37	34	1	1,890.0	-90.0	0.00	5.00	0.00	66	10.0	8.0	Y

KB Environmental Sciences, Inc.
LCB

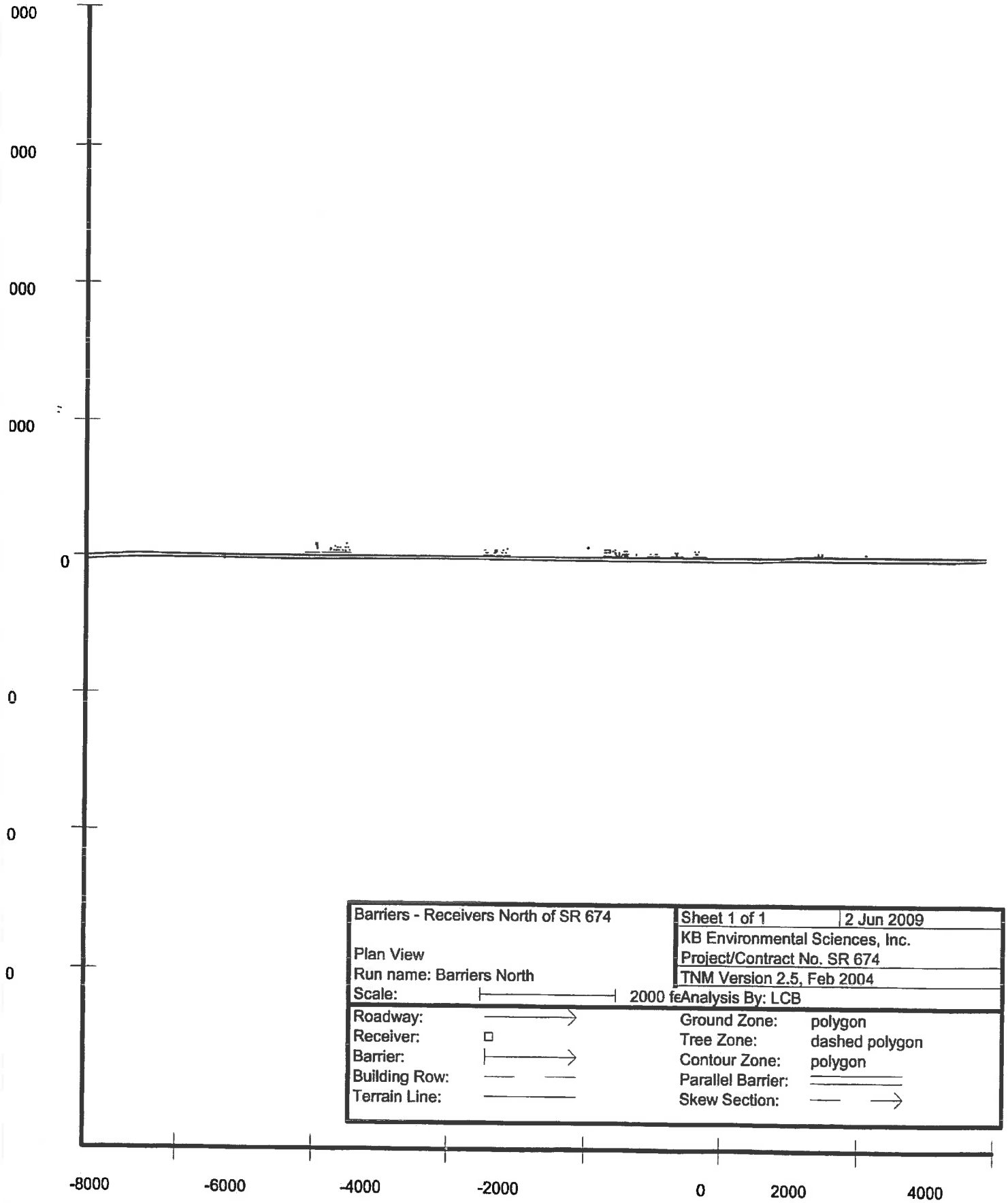
2 June 2009
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: SR 674
RUN: Build - Receivers South of SR 674
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
29	1	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
34	2	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
36	3	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
37	34	1	0.0	65.8	66	65.8	10	—	65.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0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0
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0
0
-8000
-6000
-4000
-2000
0
2000
4000
Barriers - Receivers North of SR 674
Plan View
Run name: Barriers North
Scale:
2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc. 2 June 2009
LCB TNM 2.5

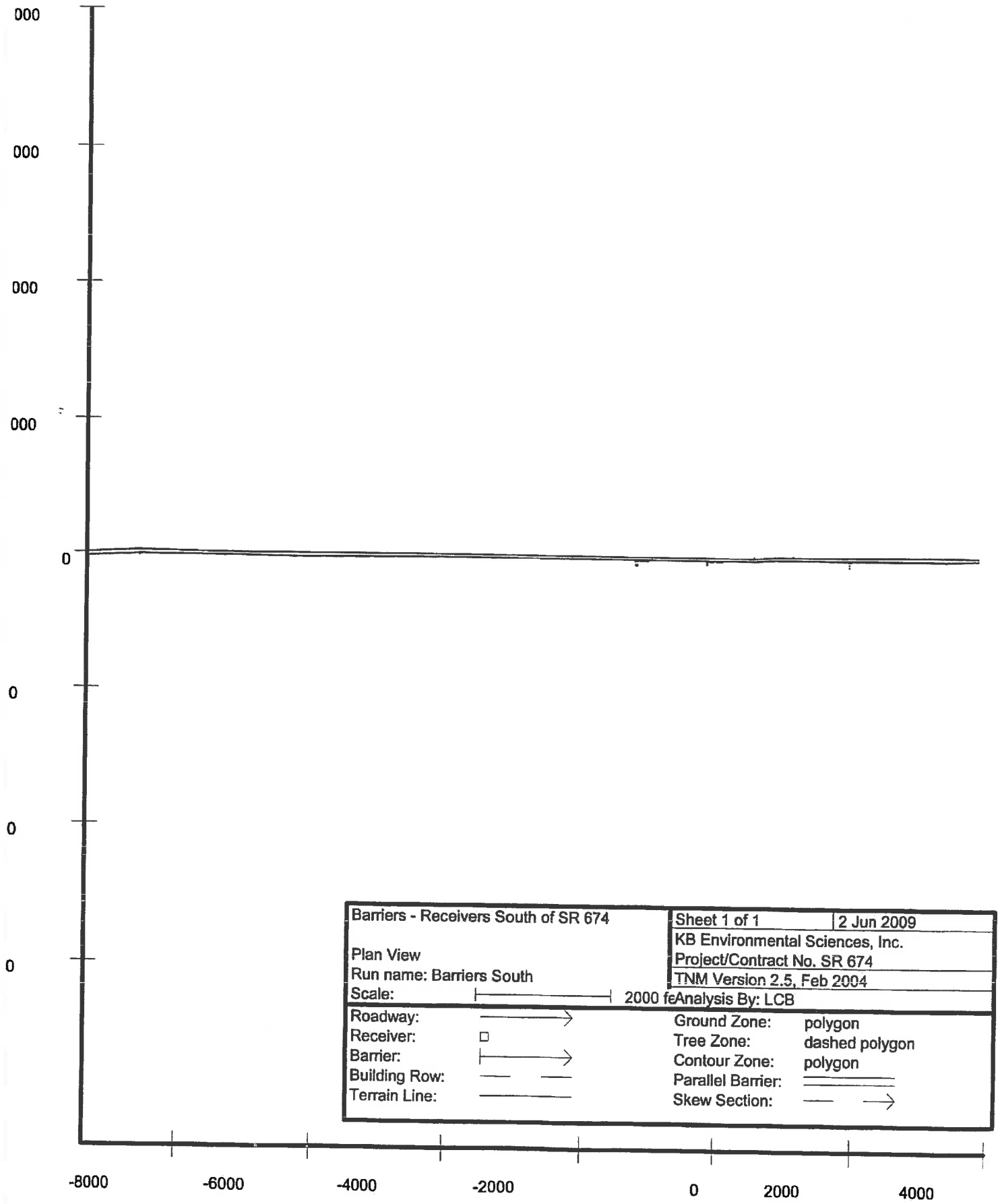
INPUT: BARRIERS
PROJECT/CONTRACT: SR 674
RUN: Barriers - Receivers North of SR 674

Barrier Name	Type	Height Min	Height Max	If Wall $ per Unit Area	If Berm $ per Unit Vol.	If Berm Top Width	If Berm Run:Rise	Add'tnl $ per Unit Length	Points Name	No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Increment	Perturbs #Up	Perturbs #Dn	On Struct?	Important Reflections?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1a	W	0.00	99.99	0.00				0.00	point1	1	-6,148.0	80.0	0.00	8.00	2.00	7	0		
									point6	6	-6,128.0	80.0	0.00	8.00	2.00	7	0		
									point7	7	-6,108.0	80.0	0.00	8.00	2.00	7	0		
									point8	8	-6,088.0	80.0	0.00	8.00	2.00	7	0		
									point9	9	-6,068.0	80.0	0.00	8.00	2.00	7	0		
									point5	5	-6,050.0	80.0	0.00	8.00	2.00	7	0		
									point2	2	-5,935.0	80.0	0.00	8.00					
Barrier1b	W	0.00	99.99	0.00				0.00	point3	3	-5,897.0	80.0	0.00	8.00	2.00	7	0		
									point76	76	-5,877.0	80.0	0.00	8.00	2.00	7	0		
									point77	77	-5,857.0	80.1	0.00	8.00	2.00	7	0		
									point14	14	-5,842.0	80.1	0.00	8.00	2.00	7	0		
									point15	15	-5,822.0	80.2	0.00	8.00	2.00	7	0		
									point16	16	-5,802.0	80.3	0.00	8.00	2.00	7	0		
									point10	10	-5,786.0	80.4	0.00	8.00	2.00	7	0		
									point11	11	-5,710.0	80.8	0.00	8.00	2.00	7	0		
									point12	12	-5,634.0	81.2	0.00	8.00	2.00	7	0		
									point13	13	-5,558.0	81.6	0.00	8.00	2.00	7	0		
									point4	4	-5,482.0	82.0	0.00	8.00					
Barrier2a	W	0.00	99.99	0.00				0.00	point17	17	-3,552.0	68.0	0.00	8.00	2.00	7	0		
									point55	55	-3,387.0	68.0	0.00	8.00					
Barrier4a	W	0.00	99.99	0.00				0.00	point31	31	-1,130.0	58.0	0.00	8.00	2.00	7	0		
									point32	32	-1,065.0	58.0	0.00	8.00					
Barrier4b	W	0.00	99.99	0.00				0.00	point33	33	-1,038.0	58.0	0.00	8.00	2.00	7	0		
									point34	34	-960.0	58.0	0.00	8.00					
Barrier5a	W	0.00	99.99	0.00				0.00	point35	35	-786.0	55.0	0.00	8.00	2.00	7	0		
									point36	36	-678.0	55.0	0.00	8.00					
Barrier5b	W	0.00	99.99	0.00				0.00	point37	37	-654.0	55.0	0.00	8.00	2.00	7	0		
									point38	38	-625.0	55.0	0.00	8.00					
Barrier6	W	0.00	99.99	0.00				0.00	point39	39	-465.0	58.0	0.00	8.00	2.00	7	0		
									point41	41	-365.0	58.0	0.00	8.00	2.00	7	0		
									point42	42	-345.0	58.0	0.00	8.00	2.00	7	0		
									point43	43	-325.0	58.0	0.00	8.00	2.00	7	0		
									point44	44	-305.0	58.0	0.00	8.00	2.00	7	0		
									point45	45	-285.0	58.0	0.00	8.00	2.00	7	0		
									point40	40	-265.0	58.0	0.00	8.00					

INPUT: BARRIERS

SR 674

Barrier9	W	0.00	99.99	0.00				0.00	point47	47	1,300.0	75.0	0.00	8.00	2.00	7	0		
									point49	49	1,320.0	75.0	0.00	8.00	2.00	7	0		
									point50	50	1,340.0	75.0	0.00	8.00	2.00	7	0		
									point51	51	1,360.0	75.0	0.00	8.00	2.00	7	0		
									point52	52	1,380.0	75.0	0.00	8.00	2.00	7	0		
									point53	53	1,400.0	75.0	0.00	8.00	2.00	7	0		
Barrier2b	W	0.00	99.99	0.00					point48	48	1,420.0	75.0	0.00	8.00					
								0.00	point57	57	-3,350.0	68.0	0.00	8.00	2.00	7	0		
Barrier2c	W	0.00	99.99	0.00					point58	58	-3,272.0	68.0	0.00	8.00					
								0.00	point59	59	-3,245.0	68.0	0.00	8.00	2.00	7	0		
Barrier3a	W	0.00	99.99	0.00					point18	18	-3,172.0	68.0	0.00	8.00					
								0.00	point60	60	-1,784.0	60.0	0.00	8.00	2.00	7	0		
									point65	65	-1,770.0	60.0	0.00	8.00	2.00	7	0		
									point66	66	-1,750.0	60.0	0.00	8.00	2.00	7	0		
									point67	67	-1,730.0	60.0	0.00	8.00	2.00	7	0		
									point68	68	-1,710.0	60.0	0.00	8.00	2.00	7	0		
									point69	69	-1,690.0	60.0	0.00	8.00	2.00	7	0		
									point70	70	-1,670.0	60.0	0.00	8.00	2.00	7	0		
									point71	71	-1,650.0	60.0	0.00	8.00	2.00	7	0		
									point64	64	-1,647.5	60.0	0.00	8.00	2.00	7	0		
									point75	75	-1,629.7	60.0	0.00	8.00	2.00	7	0		
									point72	72	-1,611.9	60.0	0.00	8.00	2.00	7	0		
									point73	73	-1,576.2	60.0	0.00	8.00	2.00	7	0		
									point74	74	-1,540.6	60.0	0.00	8.00	2.00	7	0		
									point61	61	-1,518.0	60.0	0.00	8.00					
Barrier3b	W	0.00	99.99	0.00				0.00	point62	62	-1,470.0	60.0	0.00	8.00	2.00	7	0		
									point63	63	-1,421.0	60.0	0.00	8.00					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Barriers - Receivers South of SR 674
Plan View
Run name: Barriers South
Scale: 2000 fe
Sheet 1 of 1
2 Jun 2009
KB Environmental Sciences, Inc.
Project/Contract No. SR 674
TNM Version 2.5, Feb 2004
Analysis By: LCB
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:

KB Environmental Sciences, Inc.
LCB

2 June 2009
TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: SR 674
RUN: Barriers - Receivers South of SR 674

Barrier Name	Type	Height Min	Height Max	If Wall $ per Unit Area	If Berm $ per Unit Vol.	If Berm Top Width	If Berm Run:Rise	Add'tnl $ per Unit Length
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft
Barrier7a	W	0.00	99.99	0.00				0.00
Barrier7b	W	0.00	99.99	0.00				0.00
Barrier8a	W	0.00	99.99	0.00				0.00
Barrier8b	W	0.00	99.99	0.00				0.00
Barrier8c	W	0.00	99.99	0.00				0.00
Barrier10	W	0.00	99.99	0.00				0.00

Points Name	No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Increment	Perturbs #Up	Perturbs #Dn	On Struct?	Important Reflections?
		ft	ft	ft	ft	ft				
point1	1	-1,260.0	-35.0	0.00	8.00	2.00	7	0		
point2	2	-1,212.0	-35.0	0.00	8.00					
point3	3	-1,186.0	-35.0	0.00	8.00	2.00	7	0		
point4	4	-1,052.0	-35.0	0.00	8.00					
point5	5	-210.0	-35.0	0.00	8.00	2.00	7	0		
point6	6	-185.0	-35.0	0.00	8.00					
point7	7	-159.0	-35.0	0.00	8.00	2.00	7	0		
point8	8	-100.0	-35.0	0.00	8.00					
point9	9	-70.0	-35.0	0.00	8.00	2.00	7	0		
point10	10	35.0	-35.0	0.00	8.00					
point11	11	1,878.0	-15.0	0.00	8.00	2.00	7	0		
point12	12	1,925.0	-15.0	0.00	8.00					