

# Traffic Noise Analysis

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## Sunport Boulevard Extension Project

Prepared for:

**URS Corporation**  
6501 Americas Pkwy NE, Ste. 900  
Albuquerque, NM 87110

**March 2014**





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## ACRONYMS

Broadway	Broadway Boulevard
dBa	A-weighted decibels
EA	environmental assessment
FHWA	Federal Highway Administration
I-25	Interstate 25
Leq	equivalent noise level
mph	miles per hour
NAC	noise abatement criteria
NMDOT	New Mexico Department of Transportation
Receptors	residential sites
Sunport	Sunport Boulevard Extension
TNM	Traffic Noise Model
URS	URS Corporation
Woodward	Woodward Road

## 1. SUMMARY

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This report documents the methodology and findings of a traffic noise analysis prepared for the Sunport Boulevard Extension (Sunport project). The Sunport project consists of a proposed new four-lane roadway that will extend from Interstate 25 (I-25) to Woodward Road (Woodward) at the intersection of Broadway Boulevard (Broadway), in Bernalillo County, New Mexico (see Figure 1). The project is sponsored by Bernalillo County (County) as the local government lead, with participation by the Federal Highway Administration (FHWA) and the New Mexico Department of Transportation (NMDOT). An environmental assessment (EA) has been prepared by URS Corporation (URS) to document the social, economic, and environmental effects of the proposed improvements. The noise analysis is a supporting report for the EA and is based on existing and future traffic data, mapping, and preliminary roadway design information developed for the project.

The analysis was prepared according to state and federal traffic noise policies and procedures, including the NMDOT's Infrastructure Design Directive IDD-2011-02: Procedures for Abatement of Highway Traffic Noise and Construction Noise (April 2011) and the FHWA's Highway Traffic Noise: Analysis and Abatement Guidance (June 2010). The analysis methodology included measurements of existing noise and predictive modeling of existing and future noise levels, with and without the proposed project improvements.

The results of the analysis show that a number of residential sites (receptors) near the Broadway and Sunport/Woodward intersection experience relatively high noise levels under current conditions and in the future design year (2035), both with or without the project. The high noise levels at these receptors result from the large volume of traffic on Broadway, which includes a high percentage of trucks. Traffic on the Sunport project contributes only a minor amount of noise to the residential area, which is over 550 feet from the proposed new alignment. No noise mitigation measures are recommended at this time because improvements are not proposed along Broadway except at the immediate intersection of Sunport/Woodward and it would be impossible to maintain safe visibility and access to properties along Broadway if noise barriers were to be constructed.



Figure 1: Project Area and Noise Receptors

## 2. FHWA/NMDOT NOISE POLICIES AND PROCEDURES

The relative loudness of a sound or noise is described in units of decibels (dB), a measure of sound pressure on a logarithmic scale. For highway noise studies, traffic noise is averaged over the one-hour peak noise period and is expressed as an equivalent noise level (Leq). An A-weighted filter is also used to correlate physical noise levels with the frequency sensitivity of human hearing and the subjective response to noise. Thus, traffic noise conditions are generally discussed in terms of hourly average A-weighted noise levels in decibels, or Leq dBA.

The FHWA and NMDOT have adopted specific policies and procedures for evaluating traffic noise impacts and the need for noise abatement. According to FHWA and NMDOT procedures, noise abatement must be considered when predicted traffic noise levels approach or exceed specified noise abatement criteria (NAC) (or noise level thresholds) defined for various land use categories or when future noise levels substantially exceed existing levels (by 10 dBA or more). NMDOT's noise policy defines "approach" as being within 1 decibel of the appropriate NAC. Table 1 summarizes the NAC defined by FHWA and NMDOT's noise policies.

**Table 1. Noise Abatement Criteria from 23 CFR, Part 772  
(Average A-Weighted Decibels [Leq dBA])**

Activity Category	Activity Criteria	Activity Location	Activity Location
A	57	Exterior	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.
B	67	Exterior	Residential.
C	67	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in previous A-D or F activity categories.
F	NA	NA	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	NA	NA	Undeveloped lands that are not permitted.

Source: Highway Traffic Noise: Analysis and Abatement Guidance (FHWA, June 2010)

### 3. EXISTING CONDITIONS

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The Sunport project is within the South Valley Census Designated Place and extends along the boundary between the San Jose Neighborhood and the Mountain View Neighborhood (see Figures 1). Land use along Woodward, Broadway, and the proposed Sunport project is primarily industrial. However, a residential neighborhood is located about 565 feet north of the alignment, along Wesmeco Drive. Nine homes are located east and west of Broadway Boulevard, on the north side of Wesmeco Drive (four homes west of Broadway and five east of Broadway). Many of these homes have front-yard walls facing the street, but there are also some exposed areas where residents may spend time outdoors (see attached photos in Appendix A). These residences are the only sensitive receptors (Category B) in the project area. All other land uses are industrial (Category F), which are not subject to the NAC or noise analysis (FHWA, 2010).

Existing noise conditions in the Sunport project area were evaluated by conducting field noise measurements and using computer models to predict noise levels with existing traffic count data. Noise measurements were conducted on February 25, 2013 at three sites representative of noise sensitive locations in the project area (see Figure 1 1). The measurements were performed with a Larson Davis Model 831, LxT Type I Integrating Sound Level Meter (serial number 3277) set to collect A-weighted Leq at a slow response time. The meter was calibrated February 4, 2014. Noise measurements were performed during the AM and PM peak traffic periods (7:00 to 8:15 AM and 4:30 to 6:00 PM). The noise meter microphone was located 5-feet aboveground. Temperatures were approximately 36 degrees Fahrenheit (°F) in the morning and 67 degrees °F in the afternoon. Winds were light and variable, having little effect on sound propagation. Typical ambient noise included existing traffic with a high percentage of trucks on Broadway, distant trains and airplanes, and animals such as birds and dogs. Each noise measurement consisted of recording a 20- to 30-minute average noise level at each monitoring site<sup>1</sup>. Table 2 summarizes the existing noise levels measured in the project area.

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<sup>1</sup> Statistical accuracy requires minimum measurements of approximately eight minutes. Most highway agencies typically measure 15-minute time periods to represent the Leq(h) (FHWA, 2010).

**Table 2. Existing Noise Measurements and Modeling Results  
(Average A-Weighted Decibels [Leq dBA])**

Receptor Number	Description	Peak Period	Start Time	End Time	Measured Noise	Modeled Noise
1	East end of Wesmeco on north side of right-of-way	AM	7:01	7:23	57.4	55.6
		PM	5:04	5:29	55.5	56.2
2	North side of right-of-way, 75 feet east of Broadway	AM	7:53	8:14	65.0	67.1
		PM	5:31	5:58	62.2	67.9
3	West end of Wesmeco on north side of right-of-way	AM	7:29	7:50	53.9	53.8
		PM	4:30	4:58	56.7	54.5

In addition to noise measurements, existing noise levels were calculated with the FHWA’s Traffic Noise Model (TNM) (Version 2.5) using existing peak hour traffic data obtained from the Mid Region Council of Governments. The TNM model uses site-specific information including traffic volumes and speeds, vehicle classification data, roadway geometry, and site acoustical properties to predict peak-hour noise levels at selected receptor locations. In all cases except for the PM period at Receptor 2 the measured and modeled levels were within 3 dBA, which is the standard typically used for validating a noise model. In the case of the Receptor 2 PM measurement, it appeared that peak-hour traffic dropped off after about 5:30 PM on the day of the measurements. Appendix B contains the TNM model data.

#### 4. FUTURE NOISE ANALYSIS

Noise impacts are identified when predicted noise levels approach or exceed 67 dBA at noise sensitive locations (Category B receptors in the case of the Sunport project), or when the implementation of a roadway project results in a 10 dBA increase over existing noise levels. A noise modeling analysis was conducted to evaluate the potential for noise impacts to occur as a result of roadway improvements associated with the Sunport project and as a result of future traffic growth. FHWA’s TNM (Version 2.5) was used to evaluate future noise conditions (year 2035) in the Sunport project area.

The modeling analysis included the I-25/Sunport Interchange, Broadway, and the Sunport/Woodward Extension (see Figure 1). The analysis assumed an average travel speed of 65 miles per hour (mph) for the I-25 mainline, 35 mph on the interchange ramps, 35 mph on Broadway, and 30 mph on Sunport/Woodward. On Broadway and Sunport/Woodward, it was assumed that there would be 11 percent heavy vehicles, including 7 percent medium trucks and 4 percent heavy trucks. The analysis evaluated existing and future noise conditions at the three-receptor locations, which represent the nine residences along Wesmeco Road. The future 2035 No-Build noise analysis utilized existing roadway geometry and peak hour traffic volumes (AM and PM) for the I-25/Sunport Interchange, Broadway, and Woodward. The 2035 Build analysis evaluated the roadway configurations and associated traffic data recommended in the URS reports. Table 3 summarizes the existing and future modeled noise levels for the Sunport project study area for the AM and PM 2035 No-Build and Build conditions.

**Table 3. Existing and Future Noise Measurements and Modeling Results  
(Average A-Weighted Decibels [Leq dBA])**

Receptor Number	Description	Peak Period	Existing Modeled Noise Levels	2035 No-Build Modeled Noise Levels	2035 Build Modeled Noise Levels	Difference 2035 Build Minus Existing
1	East end of Wesmeco on north side of right-of-way	AM	55.6	53.5	58.6	3.0
		PM	56.2	57.7	59.7	3.5
2	North side of right-of-way, 75 feet east of Broadway	AM	67.1	63.8	69.9	2.8
		PM	67.9	69.6	71.1	3.2
3	West end of Wesmeco on north side of right-of-way	AM	53.8	52.3	57.0	3.2
		PM	54.5	55.8	58.0	3.5

## 5. EVALUATION OF IMPACTS

As shown in Table 3, noise at most receptors in the project area increase by 3 to 3.5 dBA between existing and 2035 levels. The data indicate that traffic is expected to approximately double by 2035 design year on Broadway and increase even more on Sunport/Woodward. A general principle of traffic noise is that noise levels will generally increase by approximately 3 dBA with a doubling of traffic. In general, human hearing can perceive a difference of approximately 2-3 dBA in outdoor noise levels. Therefore, future noise levels will likely be perceived as being louder than existing noise levels at most locations in the project area. The expected increases in noise at all locations are below the 10 dBA increase used by NMDOT to define a substantial increase; however, the levels near Broadway exceed the 67 dBA NAC for residential land uses in the existing year and future scenarios.

Because Broadway is much closer than Sunport/Woodward to the receptors on Wesmeco, the traffic on Broadway can be assumed to have a greater influence on noise at the receptors. The residences on Wesmeco range in distance from approximately 75 to 400 feet to Broadway and from 550 to 570 feet to Sunport/Woodward. To evaluate the relative noise contribution of Broadway versus Sunport/Woodward, the TNM model was applied with only 2035 traffic on Broadway and no traffic on Sunport/Woodward. The results, shown in Table 4, indicate very little change at the noise receptors (generally 1 dBA or less) when future traffic on Sunport/Woodward is removed completely. Conversely, when traffic is removed from Broadway and only 2035 build traffic is analyzed with TNM on Sunport/Woodward (as shown in Table 5) noise levels decrease significantly, from over 5 dBA to almost 18 dBA. This exercise shows that the majority of noise and impacts along Wesmeco are related to traffic on Broadway.

**Table 4. Comparison of Noise Levels With and Without Traffic on Sunport/Woodward  
(Average A-Weighted Decibels [Leq dBA])**

Receptor Number	Description	Peak Period	2035 Build Modeled Noise Levels With Full Street Network	2035 Build Modeled Noise Levels with Broadway Traffic Only	Difference Full Network minus Broadway Only
1	East end of Wesmeco on north side of right-of-way	AM	58.6	57.9	-0.7
		PM	59.7	59.0	-0.7
2	North side of right-of-way, 75 feet east of Broadway	AM	69.9	69.8	-0.1
		PM	71.1	71.1	0.0
3	West end of Wesmeco on north side of right-of-way	AM	57.0	55.9	-1.1
		PM	58.0	57.1	-0.9

**Table 5. Comparison of Noise Levels With and Without Traffic on Broadway  
(Average A-Weighted Decibels [Leq dBA])**

Receptor Number	Description	Peak Period	2035 Build Modeled Noise Levels With Full Street Network	2035 Build Modeled Noise Levels with Sunport/Woodward Traffic Only	Difference Full Network minus Sunport/Woodward Only
1	East end of Wesmeco on north side of right-of-way	AM	58.6	51.8	-6.8
		PM	59.7	52.7	-7.0
2	North side of right-of-way, 75 feet east of Broadway	AM	69.9	52.6	-17.3
		PM	71.1	53.4	-17.7
3	West end of Wesmeco on north side of right-of-way	AM	57.0	51.5	-5.5
		PM	58.0	52.7	-5.3

Several alternative alignments were considered as part of the initial URS design studies. These alternatives were located several hundred feet to the south of the preferred alignment. Because the proposed alignment has negligible noise impacts on the residential receptors, these alternatives were not analyzed in detail.

## **6. CONSIDERATION OF ABATEMENT MEASURES**

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State and federal noise policy stipulates that when traffic noise impacts occur, noise abatement must be considered and implemented if found to be feasible and reasonable. The term “feasibility” indicates that noise abatement measures will achieve at least 5 dBA of noise reduction at 50 percent of the impacted receptors and that it is possible to construct the abatement measures. The criteria for “reasonableness” include consideration of the viewpoints of affected property owners and residents, a determination that the abatement measures are cost effective (cost less than \$40,000 per benefited receptor), and an analysis showing that a noise reduction of 7 dBA will be achieved at 10 percent of the benefited receptors. Typically, noise abatement includes measures such as construction of noise barriers, modification of horizontal or vertical geometric design features, or traffic management techniques such as limitations on truck traffic.

The analysis of the Sunport project shows that noise impacts at residential receptors in the corridor are related to high traffic and truck volumes on Broadway and are not directly related to the proposed improvements. Abatement measures such as noise barriers along Broadway or in the Broadway and Sunport/Woodwad intersection would not be feasible because they would make it impossible to maintain safe visibility and access to properties. Because of the existing industrial land-use patterns along Broadway and in the general region, it is not realistic to change the horizontal or vertical alignments of existing roads or implement significant traffic management techniques, such as limiting trucks. For these reasons, no noise mitigation measures are recommended at this time.

## **7. CONSTRUCTION NOISE**

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It is difficult to predict levels of construction noise at a particular receptor or group of receptors. Heavy equipment, the major source of construction noise, moves in unpredictable or irregular patterns. Construction normally occurs during daylight hours when people tolerate occasional loud noises. The duration of construction noise for individual receptors is typically short; therefore, significant disruptions of normal activities are not anticipated. However, the project plans and specifications will include provisions requiring the contractor to make every reasonable effort to minimize construction noise through measures, such as work-hour controls and maintenance of muffler systems.

## 8. REFERENCES

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FHWA Traffic Noise Model: Report No, FHWA-PD-96-010, April 2004. Federal Highway Administration.

Highway Traffic Noise: Analysis and Abatement Guidance. June 2010. Federal Highway Administration.

Infrastructure Design Directive IDD-2011-02: Procedures for Abatement of Highway Traffic Noise and Construction Noise. April 2011. New Mexico Department of Transportation.

Sunport Boulevard Extension, Interchange Modification Report. May 2012. URS Corporation.

Sunport Boulevard Extension, Traffic Operational Analysis Woodward Road, February 2014, URS Corporation.

**Appendix A: Photos**



**Receptor 1 at the east end of Wesmeco, looking west toward Broadway**



**Receptor 2 about 75 feet east of Broadway on Wesmeco**



**Receptor 3 at the west end of Wesmeco, looking east toward Broadway**

**Appendix B: TNM Data**

## **Appendix C: Existing AM Peak**

RESULTS: SOUND LEVELS

<Project Name?>

Ecosphere										6 November 2003			
J. Taschek										TNM 2.5			
										Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Sunport existing am peak-1											
BARRIER DESIGN:		INPUT HEIGHTS											
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name													
No. #DUs Existing No Barrier With Barrier													
L <sub>Aeq1h</sub> L <sub>Aeq1h</sub> Increase over existing Type Calculated Noise Reduction													
Calculated Crit'n Calculated Crit'n Impact Calculated Goal Calculated													
Sub'l Inc Goal minus													
Goal													
dBA dBA dBA dB dB dBA dB dB dB													
Receiver1	1	1	0.0	53.8	66	53.8	10	----	53.8	0.0	8	-8.0	
Receiver2	2	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0	
Receiver3	3	1	0.0	55.6	66	55.6	10	----	55.6	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		3	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								

INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere			6 November 2003										
J. Taschek			TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:			<Project Name?>										
RUN:			Sunport existing am peak-1										
Roadway		Points											
Name		Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
				Autos									
				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
Broadway		point12	12	829	35	65	35	37	35	0	0	0	0
		point13	13	1295	35	102	35	58	35	0	0	0	0
		point14	14										
Southbound off ramp		point15	15	1036	35	16	35	5	35	0	0	0	0
		point16	16										
I-25		point21	21	10251	65	342	65	797	65	0	0	0	0
		point22	22										
Woodward		point27	27	418	30	33	30	19	30	0	0	0	0
		point28	28	145	30	10	30	6	30	0	0	0	0
		point29	29										

## **Appendix D: Existing PM Peak**

RESULTS: SOUND LEVELS

<Project Name?>

Ecosphere													6 November 2003																							
J. Taschek													TNM 2.5																							
RESULTS: SOUND LEVELS													Calculated with TNM 2.5																							
PROJECT/CONTRACT:													<Project Name?>																							
RUN:													Sunport existing pm peak2																							
BARRIER DESIGN:													INPUT HEIGHTS																							
ATMOSPHERICS:													68 deg F, 50% RH																							
Receiver																																				
Name													No.		#DUs		Existing		No Barrier		With Barrier															
															LAeq1h		LAeq1h		Increase over existing		Type		Calculated		Noise Reduction											
																	Calculated		Crit'n		Calculated		Crit'n		Impact		Calculated		Goal		Calculated					
																													minus							
																													Goal							
															dBA		dBA		dBA		dB		dB		dBA		dB		dB		dB					
Receiver1													1		1		0.0		54.5		66		54.5		10		----		54.5		0.0		8		-8.0	
Receiver2													2		1		0.0		67.9		66		67.9		10		Snd Lvl		67.9		0.0		8		-8.0	
Receiver3													3		1		0.0		56.2		66		56.2		10		----		56.2		0.0		8		-8.0	
Dwelling Units													# DUs		Noise Reduction																					
															Min		Avg		Max																	
															dB		dB		dB																	
All Selected															3		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															

INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003														
J. Taschek		TNM 2.5														
INPUT: TRAFFIC FOR LAeq1h Volumes																
PROJECT/CONTRACT:		<Project Name?>														
RUN:		Sunport existing pm peak2														
Roadway		Points														
Name		Name	No.	Segment	Autos				MTrucks		HTrucks		Buses		Motorcycles	
					V	S	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	veh/hr	mph
Broadway		point12	12	1007	35	79	35	45	35	0	0	0	0			
		point13	13	1564	35	123	35	70	35	0	0	0	0			
		point14	14													
Southbound off ramp		point15	15	508	35	8	35	3	35	0	0	0	0			
		point16	16													
I-25		point21	21	10251	65	342	65	797	65	0	0	0	0			
		point22	22													
Woodward		point27	27	448	30	35	30	20	30	0	0	0	0			
		point28	28	150	30	12	30	7	30	0	0	0	0			
		point29	29													

## **Appendix E: 2035 No Build AM Peak**



INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere			6 November 2003										
J. Taschek			TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:			<Project Name?>										
RUN:			Sunport 2035 No-Build AM2										
Roadway		Points											
Name		Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
				Autos									
				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
Broadway		point12	12	596	35	47	35	27	35	0	0	0	0
		point13	13	599	35	47	35	27	35	0	0	0	0
		point14	14										
Southbound off ramp		point15	15	689	35	11	35	4	35	0	0	0	0
		point16	16										
I-25		point21	21	10251	65	342	65	797	65	0	0	0	0
		point22	22										
Woodward		point27	27	703	30	55	30	32	30	0	0	0	0
		point28	28	150	30	12	30	7	30	0	0	0	0
		point29	29										

## **Appendix F: 2035 No Build PM Peak**

RESULTS: SOUND LEVELS

<Project Name?>

Ecosphere										6 November 2003			
J. Taschek										TNM 2.5			
										Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Sunport 2035 No-Build PM2											
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	Increase over existing	Type	Calculated	Noise Reduction						
			Calculated	Crit'n	Calculated	Crit'n	Impact	Calculated	Goal	Calculated	Goal	Calculated	Goal
						Sub'l Inc						minus	
		dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	dB	dB
Receiver1	1	1	0.0	55.8	66	55.8	10	----	55.8	0.0	8	-8.0	
Receiver2	2	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0	
Receiver3	3	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		3	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								

INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003														
J. Taschek		TNM 2.5														
INPUT: TRAFFIC FOR LAeq1h Volumes																
PROJECT/CONTRACT:		<Project Name?>														
RUN:		Sunport 2035 No-Build PM2														
Roadway		Points														
Name		Name	No.	Segment	Autos				MTrucks		HTrucks		Buses		Motorcycles	
					V		S		V		S		V		S	
					veh/hr		mph		veh/hr		mph		veh/hr		mph	
Broadway		point12	12	1733	35		136		35		78		35		0	
		point13	13	2311	35		182		35		104		35		0	
		point14	14													
Southbound off ramp		point15	15	36	35		1		35		1		35		0	
		point16	16													
I-25		point21	21	10251	65		342		65		797		65		0	
		point22	22													
Woodward		point27	27	299	30		23		30		13		30		0	
		point28	28	150	30		12		30		7		30		0	
		point29	29													

## **Appendix G: 2035 Build AM Peak**

RESULTS: SOUND LEVELS

<Project Name?>

Ecosphere										6 November 2003				
J. Taschek										TNM 2.5				
										Calculated with TNM 2.5				
RESULTS: SOUND LEVELS														
PROJECT/CONTRACT:		<Project Name?>												
RUN:		Sunport 2035 AM Build2												
BARRIER DESIGN:		INPUT HEIGHTS										Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.		
ATMOSPHERICS:		68 deg F, 50% RH												
Receiver														
Name														
No.	#DUs	Existing		No Barrier		Increase over existing		Type	Calculated	Noise Reduction				
		LAeq1h	LAeq1h	Calculated	Crit'n	Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated	Goal	
							Sub'l Inc						minus	
		dBA	dBA	dBA	dB	dB	dB		dBA	dB	dB	dB	dB	
Receiver1	1	1	0.0	57.0	66	57.0	10	----	57.0	0.0	8	-8.0		
Receiver2	2	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0		
Receiver3	3	1	0.0	58.6	66	58.6	10	----	58.6	0.0	8	-8.0		
Dwelling Units														
	# DUs	Noise Reduction												
		Min	Avg	Max										
		dB	dB	dB										
All Selected		3	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									

INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003												
J. Taschek		TNM 2.5												
INPUT: TRAFFIC FOR LAeq1h Volumes														
PROJECT/CONTRACT:		<Project Name?>												
RUN:		Sunport 2035 AM Build2												
Roadway		Points												
Name		Name	No.	Segment	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
Sunport/Woodward		point1	1	1270	30	100	30	57	30	0	0	0	0	
		point2	2	1927	30	152	30	87	30	0	0	0	0	
		point3	3	1927	30	152	30	87	30	0	0	0	0	
		point4	4	1927	30	152	30	87	30	0	0	0	0	
		point5	5	1927	30	152	30	87	30	0	0	0	0	
		point6	6											
Broadway		point12	12	2526	35	199	35	113	35	0	0	0	0	
		point13	13	2424	35	191	35	109	35	0	0	0	0	
		point14	14											
Southbound off ramp		point15	15	1558	35	24	35	8	35	0	0	0	0	
		point16	16											
I-25		point21	21	10971	65	365	65	853	65	0	0	0	0	
		point22	22											

## **Appendix H: 2035 Build PM Peak**



INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003												
J. Taschek		TNM 2.5												
INPUT: TRAFFIC FOR LAeq1h Volumes														
PROJECT/CONTRACT:		<Project Name?>												
RUN:		Sunport 2035 PM Build2												
Roadway		Points												
Name		Name	No.	Segment	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
Sunport/Woodward		point1	1	1497	30	118	30	67	30	0	0	0	0	
		point2	2	2203	30	173	30	99	30	0	0	0	0	
		point3	3	2203	30	173	30	99	30	0	0	0	0	
		point4	4	2203	30	173	30	99	30	0	0	0	0	
		point5	5	2203	30	173	30	99	30	0	0	0	0	
		point6	6											
Broadway		point12	12	3196	35	251	35	144	35	0	0	0	0	
		point13	13	3247	35	255	35	146	35	0	0	0	0	
		point14	14											
Southbound off ramp		point15	15	1161	35	18	35	6	35	0	0	0	0	
		point16	16											
I-25		point21	21	10971	65	365	65	853	65	0	0	0	0	
		point22	22											

**Appendix I: 2035 Broadway Traffic Only AM Peak**

RESULTS: SOUND LEVELS

<Project Name?>

Ecosphere										6 November 2003			
J. Taschek										TNM 2.5			
										Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Sunport 2035 AM Build Broadway only2											
BARRIER DESIGN:		INPUT HEIGHTS										Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.	
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name		No.	#DUs	Existing	No Barrier	Increase over existing		Type	With Barrier	Noise Reduction			
				L <sub>Aeq1h</sub>	L <sub>Aeq1h</sub>	Crit'n	Calculated	Crit'n	Calculated	L <sub>Aeq1h</sub>	Calculated	Goal	Calculated
								Sub'l Inc					minus
													Goal
				dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1		1	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
Receiver2		2	1	0.0	69.8	66	69.8	10	Snd Lvl	69.8	0.0	8	-8.0
Receiver3		3	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		3	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								

INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003											
J. Taschek		TNM 2.5											
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Sunport 2035 AM Build Broadway only2											
Roadway		Points											
Name		Name	No.	Segment									
				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
Sunport/Woodward		point1	1	1	30	1	30	1	30	0	0	0	0
		point2	2	1	30	1	30	1	30	0	0	0	0
		point3	3	1	30	1	30	1	30	0	0	0	0
		point4	4	1	30	1	30	1	30	0	0	0	0
		point5	5	1	30	1	30	1	30	0	0	0	0
		point6	6										
Broadway		point12	12	2526	35	199	35	113	35	0	0	0	0
		point13	13	2424	35	191	35	109	35	0	0	0	0
		point14	14										
Southbound off ramp		point15	15	1558	35	24	35	8	35	0	0	0	0
		point16	16										
I-25		point21	21	10971	65	365	65	853	65	0	0	0	0
		point22	22										

**Appendix J: 2035 Broadway Traffic Only PM Peak**



INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003												
J. Taschek		TNM 2.5												
INPUT: TRAFFIC FOR LAeq1h Volumes														
PROJECT/CONTRACT:		<Project Name?>												
RUN:		Sunport 2035 PM Build Broadway only2												
Roadway		Points												
Name		Name	No.	Segment	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
Sunport/Woodward		point1	1	1	30	1	30	1	30	0	0	0	0	0
		point2	2	1	30	1	30	1	30	0	0	0	0	0
		point3	3	1	30	1	30	1	30	0	0	0	0	0
		point4	4	1	30	1	30	1	30	0	0	0	0	0
		point5	5	1	30	1	30	1	30	0	0	0	0	0
		point6	6											
Broadway		point12	12	3196	35	251	35	144	35	0	0	0	0	0
		point13	13	3247	35	255	35	146	35	0	0	0	0	0
		point14	14											
Southbound off ramp		point15	15	1558	35	24	35	8	35	0	0	0	0	0
		point16	16											
I-25		point21	21	10971	65	365	65	853	65	0	0	0	0	0
		point22	22											

**Appendix K: 2035 Sunport Traffic Only AM Peak**



INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003											
J. Taschek		TNM 2.5											
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Sunport 2035 AM Build Sunport only2											
Roadway		Points											
Name		Name	No.	Segment									
				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
Sunport/Woodward		point1	1	1270	30	100	30	57	30	0	0	0	0
		point2	2	1927	30	152	30	87	30	0	0	0	0
		point3	3	1927	30	152	30	87	30	0	0	0	0
		point4	4	1927	30	152	30	87	30	0	0	0	0
		point5	5	1927	30	152	30	87	30	0	0	0	0
		point6	6										
Broadway		point12	12	1	35	1	35	1	35	0	0	0	0
		point13	13	1	35	1	35	1	35	0	0	0	0
		point14	14										
Southbound off ramp		point15	15	1558	35	24	35	8	35	0	0	0	0
		point16	16										
I-25		point21	21	10971	65	365	65	853	65	0	0	0	0
		point22	22										

**Appendix L: 2035 Sunport Traffic Only PM Peak**

RESULTS: SOUND LEVELS

<Project Name?>

Ecosphere										6 November 2003				
J. Taschek										TNM 2.5				
										Calculated with TNM 2.5				
RESULTS: SOUND LEVELS														
PROJECT/CONTRACT:		<Project Name?>												
RUN:		Sunport 2035 PM Build Sunport only2												
BARRIER DESIGN:		INPUT HEIGHTS										Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.		
ATMOSPHERICS:		68 deg F, 50% RH												
Receiver														
Name														
No.	#DUs	Existing		No Barrier		Increase over existing		Type	Calculated	Noise Reduction				
		LAeq1h	LAeq1h	Calculated	Crit'n	Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated	Goal	
							Sub'l Inc						minus	
		dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB	dB	
Receiver1	1	1	0.0	52.7	66	52.7	10	----	52.7	0.0	8	-8.0		
Receiver2	2	1	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0		
Receiver3	3	1	0.0	52.7	66	52.7	10	----	52.7	0.0	8	-8.0		
Dwelling Units														
	# DUs	Noise Reduction												
		Min	Avg	Max										
		dB	dB	dB										
All Selected		3	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									

INPUT: TRAFFIC FOR LAeq1h Volumes

<Project Name?>

Ecosphere		6 November 2003											
J. Taschek		TNM 2.5											
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Sunport 2035 PM Build Sunport only2											
Roadway		Points											
Name		Name	No.	Segment									
				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
Sunport/Woodward		point1	1	1927	30	152	30	87	30	0	0	0	0
		point2	2	2203	30	173	30	99	30	0	0	0	0
		point3	3	2203	30	173	30	99	30	0	0	0	0
		point4	4	2203	30	173	30	99	30	0	0	0	0
		point5	5	2203	30	173	30	99	30	0	0	0	0
		point6	6										
Broadway		point12	12	1	35	1	35	1	35	0	0	0	0
		point13	13	1	35	1	35	1	35	0	0	0	0
		point14	14										
Southbound off ramp		point15	15	1558	35	24	35	8	35	0	0	0	0
		point16	16										
I-25		point21	21	10971	65	365	65	853	65	0	0	0	0
		point22	22										

