SR 400 (I-4) Project Development and Environment (PD&E) Study

FM No.: 201210-2-22-01

Noise Study Report

Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line)

Polk County (16320)

April 2017

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TABLE OF CONTENTS

FIGURES

LIST OF TABLES

APPENDICES

1.0 Summary of Project

The Florida Department of Transportation (FDOT) is conducting an update/reevaluation for the Project Development and Environment (PD&E) studies for the extension of proposed express lanes for State Road 400 (SR 400)/Interstate 4 (I-4). The project limits in the original PD&E studies were:

- West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line, (29.5 miles)
- CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway (13.7 miles)
- West of SR 528 Beachline Expressway to SR 472 (43 miles).

The corresponding environmental documents associated with these PD&E studies include: Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line [Financial Project Number (FPN) 201210 (December 1998)] and from CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) [FPN 242526 and 242483 (December 1999)] and Final Environmental Impact Statement (FEIS) for I-4 from SR 528 (Beachline Expressway) to SR 472 [FPN 242486, 242592 and 242703 (2002)].

The project limits of the current SR 400 (I-4) PD&E reevaluation, herein referred to as I-4 Beyond the Ultimate (BtU) PD&E Reevaluation Study, include a total of approximately 43 miles of roadway sections east and west of the 21-mile, I-4 Ultimate project. The I-4 Ultimate project consists of reconstruction, to include new express lanes, for the section of I-4 which extends from west of SR 435 (Kirkman Road) to east of SR 434, and began construction in early 2015. The current I-4 BtU project has been divided into the following five segments:

- Segment 1: SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway - Osceola County (92130) and Orange County (75280)
- Segment 2: SR 400 (I-4) from West of SR 528 Beachline Expressway to West of SR 435 Kirkman Road - Orange County (75280)
- Segment 3: SR 400 (I-4) from 1 Mile East of SR 434 to East of SR 15-600/US 17-92 (Seminole/Volusia County Line) - Seminole County (77160)
- Segment 4: SR 400 (I-4) from East of SR 15-600/US 17-92 (Seminole/Volusia County Line) to ½ Mile East of SR 472 - Volusia County (79110)
- Segment 5: SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line) Polk County (16320)

This Noise Study Report was prepared for Segment 5 of the SR 400 (I-4) BtU PD&E Reevaluation of the FONSI for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line (FPN 201210, December 1998). The purpose of this report is to update the original PD&E study by documenting any changes that have occurred since the PD&E study. This reevaluation includes environmental and engineering analysis of the original design concept, that showed six general use lanes (GUL) and four special use lanes (SUL) for high occupancy vehicles (HOV)/single occupant through vehicles (SOV), to the current proposed design that includes six GULs and four express lanes (EL) operating under a variable price toll plan. Other changes being reanalyzed include stormwater management, access plan and interchange configurations. There were no commitments related to traffic noise impacts or abatement within this segment of the project in the original PD&E Study.

1.1 Description of Proposed Action

FDOT is proposing to reconstruct and widen I-4 as part of the I-4 BtU concept. This involves the build-out of I-4 to its ultimate condition through Central Florida, including segments in Polk, Osceola, Orange, Seminole and Volusia Counties. The concept design proposes the addition of two new express lanes in each direction, resulting in a total of ten dedicated lanes. The project limits for the segment analyzed in this report are within an approximate 4.5-mile segment of I-4 which extends from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County Line), from Milepost (MP) 27.145 to MP 31.607 in Polk County (herein referred to as I-4 Segment 5) and as shown in **Figure 1.1**. Although, the interstate is a designated east-west corridor, the alignment follows a southwest to northeast orientation through the limits of Segment 5. The study area in this section from west of SR 25/US 27 to west of CR 532 includes only one interchange at US 27.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. Generally, the typical section will be consistent throughout Segment 5 and will have three 12-foot general use travel lanes with 12-foot inside and outside shoulders and two 12-foot express lanes with 10-foot inside and 12-foot outside shoulders in each direction. A 2-foot barrier wall between the adjacent shoulders will separate the express lanes from the general use lanes. The typical section includes a 44-foot rail envelope in the median within a minimum 300 foot right of way (ROW). **Figure 1.2** illustrates the proposed mainline typical section for I-4 Segment 5.

1.2 Purpose and Need

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway in order to improve traffic operations, enhance connectivity and improve mobility by providing travel choices to the motoring public. I-4 is an east-west limited access freeway which links the west and east coasts of Florida, from I-275 in Tampa to I-95 in Daytona Beach. I-4 spans across six counties in Central Florida, traversing many cities including Lakeland, Orlando, Altamonte Springs, Sanford and DeLand. I-4 is a critical component of Florida's Strategic Intermodal System (SIS) which links seaports, rail, airports and other intermodal facilities. This aspect of I-4's significance is evidenced through connectivity provided by major junctions with I-275 and I-75 in the Tampa Bay area, SR 429 (Daniel Webster Western Beltway), SR 417 (Southern Connector/Central Florida Greenway/Seminole Expressway), SR 528 (Martin Andersen Beachline Expressway), SR 91 (Florida's Turnpike), SR 408 (Spessard Lindsay Holland East-West Expressway) in Central Florida, and I-95 on the east coast.

I-4 serves as the primary corridor in the movement of people and freight between major population, employment and activity centers in the Central Florida region. When the entire Interstate was fully opened in the early 1960's, it was designed to serve intrastate and interstate travel by providing a critical link between the east and west coasts of Central Florida. Although this role continues to be a crucial transportation function of I-4, the highway also serves large volumes of local and commuter traffic with shorter trip distances.

Today, the highway serves as the primary link between hotel/resort complexes and tourist attractions such as Walt Disney World, Universal Studios, Sea World, the International Drive Resort Area and downtown Orlando. Since I-4 is the only north-south limited access facility that is centrally located between the predominant employment centers and the major suburbs to the north, it has become the primary commuting corridor in the Central Florida metropolitan area.

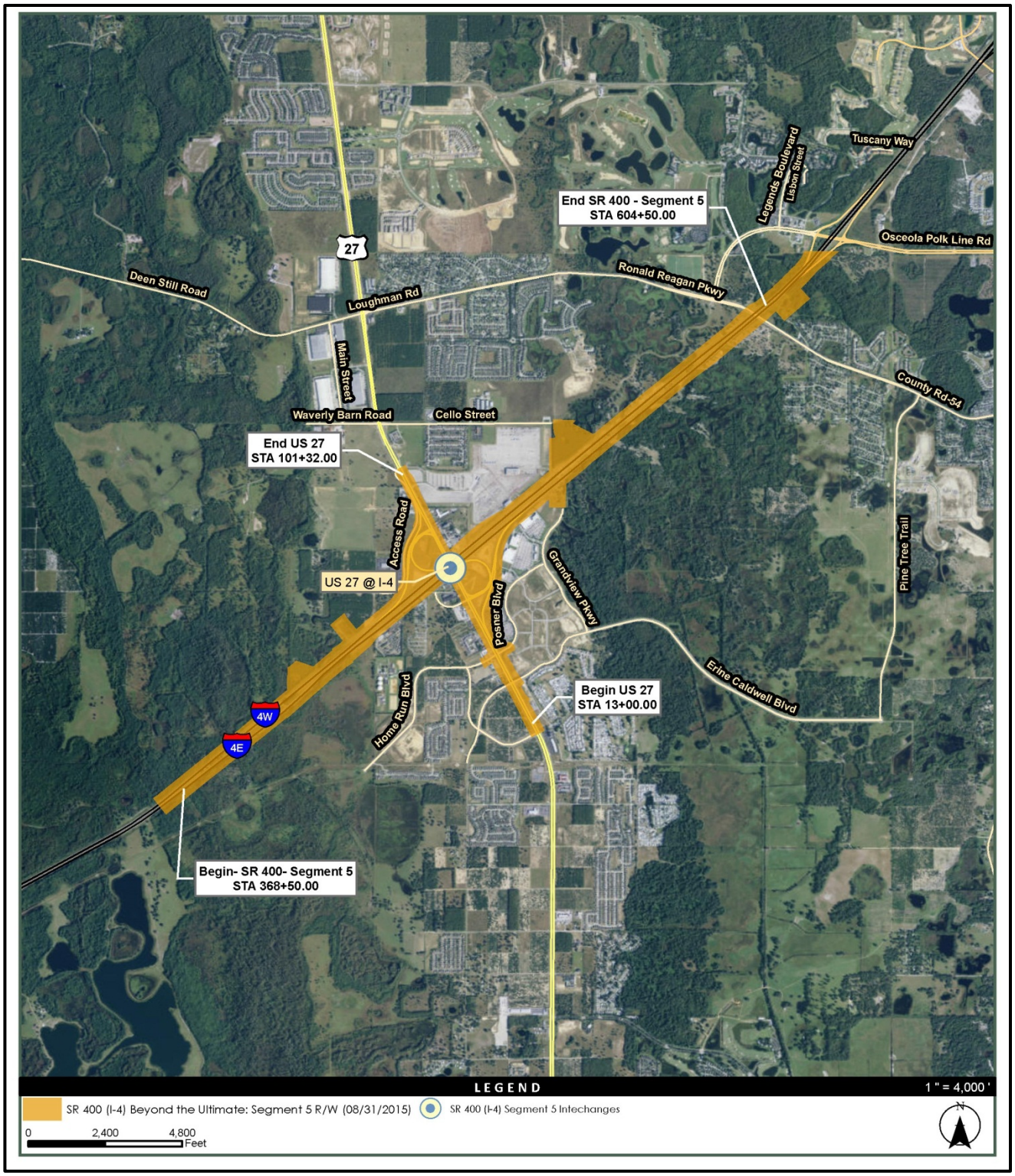


Figure 1.1 – Project Location Map

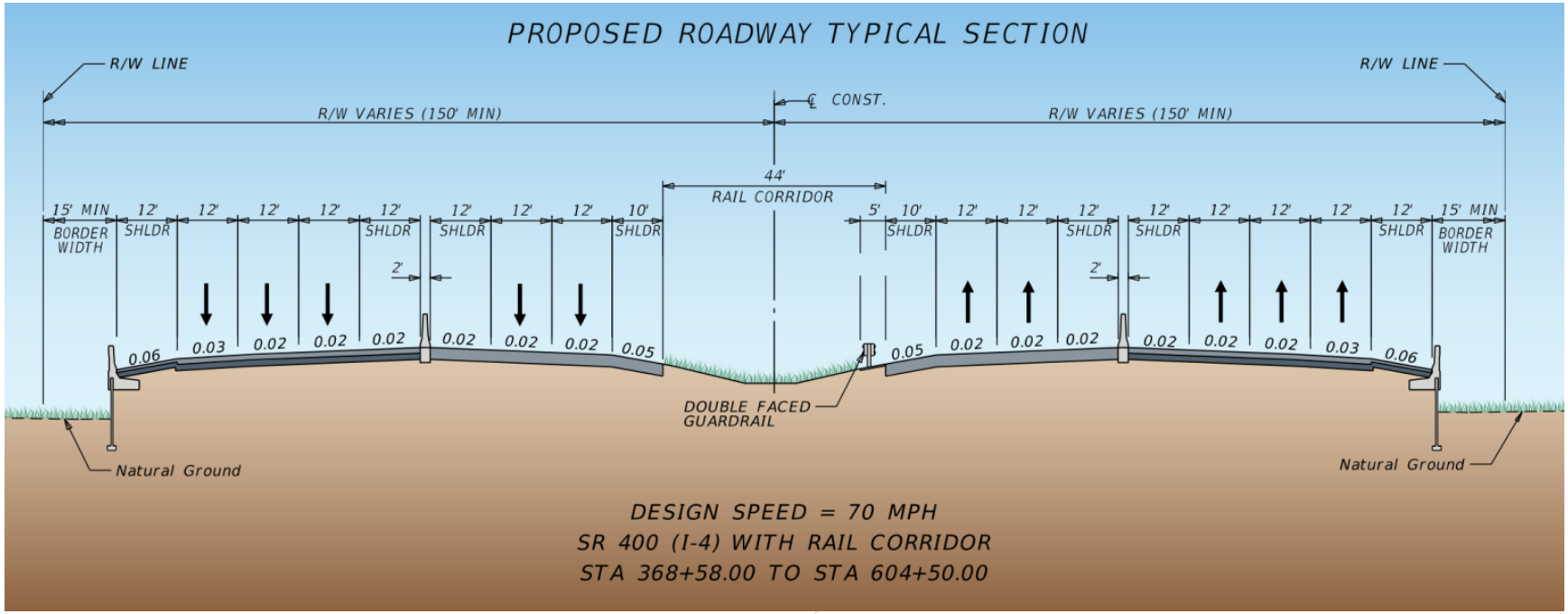


Figure 1.2 – SR 400 (I -4) Segment 5 Proposed Typical Section (6+4 with rail envelope)

Growth in Central Florida over the past decades has made it difficult for the transportation system to accommodate travel demand. Traffic congestion and crash incidents have resulted in major delays on the Interstate as well as other arterials surrounding the corridor. Increased congestion levels are experienced outside of the typical morning and afternoon rush-hour periods, affecting mobility levels for more hours of the day and impacting other non-commuter/non-weekday travel. The congestion on I-4 is further evidenced by the less than desirable levels of service on the Interstate as well as the crossroads.

Projections of future population and employment in the region indicate that travel demand will continue to increase well into the future. The ability to accommodate the new travel patterns resulting from growth must be provided to sustain the region's economy. Without the improvements, extremely congested conditions are expected to occur for extended periods of time in both the morning and evening peak periods. Due to these congested conditions, user travel times will continue to increase, the movement of goods through the urban area will be slower, and the deliveries of goods within the urban area will be forced to other times throughout the day. The need for improvements to I-4 is illustrated by the important transportation role I-4 serves to the Central Florida region and the State of Florida. If no improvements are made to the Interstate, a loss in mobility for the area's residents, visitors, and commuters can be expected, resulting in a severe threat to the continued viability of the economy and the quality of life.

This reevaluation involves revising the original design concept showing 6 GUL + 4 SUL from west of SR 25/US 27 to west of CR 532 (Polk/Osceola County Line, as recommended in the FONSI for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line (FPN 201210, December 1998), to the current proposed design of six general use and four express lanes. The Express Lanes are tolled lanes and will extend the full length of the project. The access to/from the tolled lanes will be evaluated as part of this effort to determine if changes are needed from the previously approved concept for access to/from the SUL/HOV Lanes.

The original I-4 PD&E Studies involved physical separation between the general use lanes and the SUL/HOV lanes on I-4, with demand management in the HOV lanes. The original demand management strategy was to control the use of the HOV lanes by requiring a minimum number of occupants per vehicle to maintain an acceptable level of service (Level of Service D). This reevaluation also addresses revising the demand management tool to convert the HOV lanes to tolled express lanes. The express lanes will be separated from the general use travel lanes by two shoulders with a barrier wall between the shoulders. A variable pricing tolling plan is proposed for the express lanes. The tolls will vary by time of day and day of week to maintain acceptable levels of service in the express lanes. The tolls will be collected electronically through existing E-Pass, SunPass and other systems currently in place in the Orlando metropolitan area. The conversion to Express Lanes will maintain the same right of way limits as documented previously and will not change the impacts to the social, natural or physical environment. An update to the Systems Access Modification Report (SAMR) prepared in January, 2013 is being completed in conjunction with this effort.

If future design-year noise levels at noise-sensitive receptors approach, meet, or exceed the Noise Abatement Criteria established by FHWA in 23 CFR 772 or increase 15 dB(A) over existing noise levels as a direct result of the transportation improvement project, noise abatement must be considered. If noise levels reach or exceed 66 decibels (dB(A)), or increase 15 dB(A) over existing noise, noise abatement must be considered. The Federal Highway Administration’s (FHWA) Traffic Noise Modeling (TNM) Version 2.5 computer program was used to determine if noise abatement was warranted, and, if so, considered reasonable and feasible for any noise-sensitive sites. The format and content of this report are based on the procedures and policy established in Part 2, Chapter 17 “Noise”, of the FDOT PD&E Manual.

The noise analysis procedures used are based on the regulatory material found in 23 Code of Federal Regulations (CFR), Part 772, and entitled "Procedures for Abatement of Highway Traffic Noise and Construction Noise". This regulation is available from the FHWA and FDOT.

1.3 Existing Facility

The land use adjacent to I-4 within the proposed project limits consists primarily of commercial and services, retail, residential, and natural lands. The commercial, and retail development is concentrated around the interchange with US 27. Some undeveloped natural areas are located along both sides of I-4 south of the Ronald Reagan Parkway overpass and along the western limits of the project area. Some areas to the southeast of the US 27 interchange are classified as open land, and are not currently developed. The remaining land use within the corridor is primarily pine tree plantations and citrus groves with some areas of pasture (see Land Use and Habitat Coverage maps, **Figure A** in **Appendix II**).

Residential (1200-1300) – These land use codes consist of areas containing medium and high density residential housing. Low density housing was not observed in the project corridor. These areas are found along adjacent roads at the US 27 and I-4 interchange, as well as along Ronald Reagan Parkway.

Commercial and Services (1400) – This land use includes numerous types of businesses in malls, strip malls and as stand-alone establishments along the corridor. It was primarily observed at the US 27 and I-4 interchange and along the adjacent roadways.

Retail Sales and Services (1410) – This land use consists of office complexes, shopping centers, and other service/retail oriented businesses, which was observed at the US 27 and I-4 interchange and along the adjacent roadways.

Professional Services (1430) – Several medical offices, dental offices, veterinary offices, and other professional offices are located along US 27 in the project corridor.

Tourist Services (1450) – There are several hotels and resorts located in the vicinity of the US 27 and I-4 interchange.

Institutional (1700) – This land use consists of schools and institutions. The only example of this land use was the Oak Hill Baptist Church on Osceola Polk Line Road at the eastern end of the project corridor.

Open Land (1900) – This land use consists of undeveloped land within urban areas and inactive land with street patterns but without structures. Several examples of this land use were observed in the vicinity of the US 27 and I-4 interchange.

Improved Pasture (2110) – This category of land use consists of land which has been cleared, tilled, reseeded with specific grass types and periodically improved with brush control and fertilizer application. Several small areas of this land use were observed along the project corridor.

Unimproved Pasture (2120) – This category of land use consists of land which has been cleared, with major stands of trees and brush where native grasses have been allowed to develop. Several small areas of this land use were observed along the project corridor.

Citrus Groves (2210) – Some citrus groves are located along Home Run Boulevard and US 27.

Other Open Lands <Rural> (2600) – This category of land use consists of agricultural lands whose intended usage cannot be determined. Several areas of this land use were observed along the project corridor.

Shrub and Brushland (3200) – This land use consists of primarily shrubs and brush species. A few small areas of this land use were observed along the project corridor.

Pine Flatwoods (4110) – This land use consists of natural pine flatwoods, a small area is located at the southern end of the project corridor.

Coniferous Plantations (4410) – Some small areas of planted pine were observed along the right-of-way.

Reservoirs (5300) – This land use designates all retention ponds and other artificial impoundments used for irrigation and flood control along the project corridor and within residential developments.

Mixed Wetland Hardwoods (6170) – This land use is reserved for those wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions yet exhibit an ill-defined mixture of species. This habitat type was observed in a small area within the median at the western end of the project area.

Cypress (6210) – Dominant vegetation consisted of cypress is present at the southern end of the project corridor.

Wetland Forested Mixed (6300) – This land use is defined as mixed wetlands forest communities in which neither hardwoods or conifers achieve a 66 percent dominance of the crown canopy composition. This habitat type was observed adjacent to I-4 eastbound east of US 27.

Freshwater Marsh (6410) – This land use designates vegetated non-forested wetlands usually defined as low-lying areas or depressions in the landscape. Several of these marshes can be found adjacent to the roadway, as well as in isolated areas within the project corridor.

Emergent Aquatic Vegetation (6440) – This land use is defined as being wetland areas where floating vegetation and vegetation which is found either partially or completely above the surface. Small areas of this land use were observed in the western portion of the project corridor.

Roads and Highways (8140) – This land use designates all major and minor roads throughout the project corridor.

Sewage Treatment Facilities (8340) – There is a sewage treatment facility south of I-4 at Westview Road.

2.0 Methodology

2.1 Noise Metrics

The noise levels documented in this report are based upon the hourly equivalent sound level [Leq(h)]. The Leq(h) represents the steady-state sound level, which contains the same amount of acoustic energy as the actual time-varying sound level over a one hour period. Sound levels are measured and calculated in decibels (dB(A)), which is a unit of measure used to determine sound intensities. Leq(h) is measured on an A-weighted decibel scale (dB(A)), which is the scale that most closely approximates the response characteristics of the human ear to typical traffic noise levels.

2.2 Traffic Noise Modeling

The Federal Highway Administration's (FHWA) Traffic Noise Modeling (TNM) Version 2.5 computer program was used to determine if noise abatement was warranted, and, if so, considered reasonable and feasible for any noise-sensitive sites. This model is the latest version of TNM and was used as required by 23 CFR 772. The model estimates the acoustic intensity

at noise receptor sites based upon the roadway design and is influenced by vehicle speed and type. TNM 2.5 predicted noise levels are reported in dB(A) Leq(h). To validate TNM, potential noise receptor sites were identified throughout the project corridor. Information that was loaded into the noise model to predict existing and projected noise levels includes: roadway geometry; vehicle types, volumes, and speeds; existing barrier and buffer information, propagation path; and, climatic conditions. The results of the validation are shown in Section 4.1.

2.3 Noise Model Validation

The primary purpose of field measuring existing traffic noise levels is to ensure that traffic noise is the main source of noise, and to validate the TNM input values and verify that the model accurately predicts the existing traffic noise based upon the current conditions. In order to collect data required, field monitoring was conducted by four noise monitoring specialists in accordance with the FHWA's guidance document "Measurement of Highway-Related Noise" on June 3, 2014. Quest™ Model M-28 Noise Logging Dosimeters were used to collect sound levels at the location. Sound measurements were collected in decibels (dB), which is a unit of measure used to determine sound intensities. The decibel levels were measured on an A-weighted scale (dB(A)), which is the frequency of sound that is heard by a human ear. The average sound level over a one-hour period is considered the Level Equivalent Hourly (Leq(h)), and is used in the noise modeling process. The dosimeter was calibrated on site just prior to the onset of sampling to ensure accuracy and mounted on a tripod at a height of approximately 5 feet which is standard and equivalent to the average height of the human ear. Noise readings were taken 3 separate times at 15-minute intervals during both the morning (9:00 – 11:30 AM) and afternoon (1:00 – 4:00 PM), periods of non-peak traffic activity along the project corridor.

One location was used for the collection of noise levels for the purpose of model validation: adjacent to the westbound lanes of I-4 east of the US 27 interchange between the 1 ¼ mile exit signpost and the overhead cantilever sign, with the meter placed at the right-of-way fence line. The location provided clear sight lines to observe traffic in both directions of I-4. Vegetation was grass or low weedy vegetation, with no trees or any natural or man-made obstructions to affect the noise readings. Additional data collected included any unusual noises (aircraft, trains, barking dogs), and all input parameters necessary to run the computer model such as distance to the edge of the nearest travel lane, roadway width, paved shoulder widths, and local terrain.

Design files supplied by HNTB were used to establish the input parameters for modeling the roadway, including vertical and horizontal geometry and ground elevations.

2.4 Traffic Data

In order to gauge traffic volumes during the monitoring periods, traffic counts of the number and type of vehicles traveling in each direction at the monitoring station were recorded. Traffic counts were taken simultaneously during each of the 3 noise recording events. Vehicles were categorized as either 1) passenger cars or light trucks, 2) medium trucks (box or panel trucks with one double-axle) or 3) heavy trucks (two or more double-axles) and motorcycles. Field notes were collected to record general weather and environmental conditions, and all unusual or otherwise noteworthy sound events. Traffic speeds for passing vehicles were determined by the use of a radar gun and recording the resulting speeds during timed monitoring runs.

The speeds used in the TNM modeling program for the model validation were based on the average observed speeds of 65 mph for both cars and trucks during the data collection. Level of Service C volume at speeds of 65 mph was utilized to model the existing / no-build and build (worst case scenario) for future noise projections (See **Table 4**).

2.5 Noise Abatement Criteria

The FHWA has established seven land use categories that are used to assess the impact of noise on these activities, of which five of these have Noise Abatement Criteria (NAC) to consider. If predicted noise levels approach or exceed the NAC levels, or a substantial noise increase is predicted, noise abatement must be considered. A substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 dB(A) or more by the project. FDOT defines 'approach' as within 1.0 dB(A) of the FHWA criteria.

Noise sensitive receptor sites include areas where frequent exterior human use occurs. Included are lands which require quiet (Activity Category A), residential areas (Activity Category B), a variety of non-residential land uses such as parks, schools, places of worship, and medical facilities (Activity Category C), and commercial properties with areas of exterior use such as restaurants, hotels, and other places of business (Activity Category E) (see Table 1 - Noise Abatement Criteria [NAC]). Activity Category D includes noise sensitive sites that have interior uses but no exterior activities such as hospitals, libraries, recording studios, television studios, and public meeting rooms. Activity Categories F includes developed lands that are not sensitive to highway traffic noise such as agriculture, airports, and industrial and retail facilities. Retail facilities, warehouses, maintenance facilities, utilities and agriculture were noted within the project area as Activity Category F land uses, which do not require a noise analysis as stipulated in 23 CFR 772. Undeveloped vacant lands (Activity Category G) were noted in the project corridor. There is not an NAC level for this category, though FDOT must document highway traffic noise levels and provide it to local officials. A land use review will be performed during the Design phase of the project to ensure that all noise-sensitive land uses that have received a building permit prior to the project's Date of Public Knowledge are evaluated. The only site of construction noted during the noise study was at the Festival Resort Orlando along the westbound side of I-4 south of CR 54. The land uses occurring within the project study area were described previously in Section 1.3.

TABLE 1 – NOISE ABATEMENT CRITERIA

NOISE ABATEMENT CRITERIA [Hourly A-Weighted Sound Level-decibels (dB(A))]				
Activity Category	Activity Leq(h)[1]		Evaluation location	Description of activity category
	FHWA	FDOT		
A	57	56	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[2]	67	66	Exterior	Residential
C[2]	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care 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[2]	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.

NOISE ABATEMENT CRITERIA [Hourly A-Weighted Sound Level-decibels (dB(A))]				
F	-	-	-	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	-	-	-	Undeveloped lands that are not permitted.

Part 2, Chapter 17 of PD&E Manual (5/24/2011) (Based on Table 1 of 23 CFR Part 772)

[1] The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

[2] Includes undeveloped lands permitted for this activity category.

Note: FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.

For reference, the relationship between typical noise levels and common indoor/outdoor activities is provided in **Table 2**.

Table 2 – Typical Noise Levels

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL dB(A)	COMMON INDOOR ACTIVITIES
	---110---	Rock Band
Jet Fly-over at 1000 ft		
	---100---	
Gas Lawn Mower at 3 ft		
	---90---	
Diesel Truck at 50 ft, at 50 mph		Food Blender at 1 m (3 ft)
	---80---	Garbage Disposal at 1 m (3 ft)
Noise Urban Area (Daytime)		
Gas Lawn Mower at 100 ft	---70---	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 ft	---60---	
		Large Business Office
Quiet Urban Daytime	---50---	Dishwasher Next Room
Quiet Urban Nighttime	---40---	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
	---30---	Bedroom at Night, Concert Hall (Background)
Quiet Rural Nighttime		
	---20---	
	---10---	
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

Source: California Dept. of Transportation Technical Noise Supplement, Oct. 1998, Page 18.

3.0 Noise-Sensitive Sites

A noise-sensitive receptor is defined as "any property (owner occupied, rented, or leased) where frequent exterior human use occurs." The project was broken up into geographic noise sensitive areas to facilitate the analysis of traffic related noise impacts. Three (3) noise sensitive areas that have the potential to be impacted by the project were identified (see **Figure**

4.1, Noise Sensitive Area Map). The potentially impacted noise-sensitive sites identified for this segment consist of single family residences, multi-family vacation residences, hotels, and a campground. The Polk County Building Department was contacted for all approved building permits within the developments along the project corridor. The properties identified during this search were all modeled as existing receptors in the TNM runs. The noise sensitive areas within the study area present several different types of sites to model within TNM: multi-family buildings with external balconies were modeled using several points to represent similar receptors at different locations in the building, while single family residences were modeled using a point to represent each site. Hotels with no external balconies were represented only by areas of common outdoor usage (pools, outdoor recreation areas).

Following is a description of each Noise Sensitive Area:

Noise Sensitive Area A
This area is located south of I-4 and west of US 27 adjacent to the eastbound lanes of I-4 and includes the Themeworld RV Resort, Fort Summit KOA Campground, Ramada Inn Hotel, and Days Inn and Suites.

Noise Sensitive Area B
This area is located north of I-4 and east of US 27 adjacent to the westbound lanes of I-4 and includes the Comfort Inn & Suites Maingate South, Holiday Inn Express and Suites Orlando, Hampton Inn Orlando Maingate South, and Travelodge Hotel.

Noise Sensitive Area C
This area is located north of I-4 adjacent to the westbound lanes of I-4 south of Ronald Reagan Parkway and consists of the Festival Orlando Resort Vacation Residences.

4.0 Predicted Noise Levels

4.1 Model Validation and Background Noise Levels

The TNM model was validated at the field sampling location along I-4 in one location as described in Section 2.3. Field recorded noise levels varied slightly from TNM predictions. As seen in **Table 3**, TNM Version 2.5 predictions were within 3 decibels (dB(A)) of the field recorded noise levels. Therefore, the model was validated.

Table 3. TNM Validation Results (dB(A))

Field Recording Station	Field Recorded	TNM Predicted	Δ	Threshold	Validate
Location 1	69.2	72.0	2.8	3	YES

Figure 4.1 – Noise Sensitive Areas Map

4.2 Future Noise Impact Analysis

Future noise was modeled for the proposed project at potential noise receptor areas for the future build conditions in the design year 2040 (TNM results are included in **Appendix II**). Traffic data utilized was based upon Level of Service (LOS) C as obtained from the generalized tables of FDOT's Level of Service Handbook (December 2012) and shown in Table 4 below. Based upon the design traffic forecasted for the design year, I-4 is expected to operate at a low level of service (D or E), which precipitated the use of LOS C for the TNM model. LOS C was also used for the existing / No-Build model as shown in **Table 4**.

Table 4. Traffic Data for TNM Modeling

Scenario	Roadway Segment	Level of Service "C" Volume	Cars	Medium Trucks	Heavy Trucks	Speed
Existing / No-Build	**Outside**	**4,580**	**1429**	**49**	**98**	**65**
	Middle	**4,580**	**1429**	**49**	**97**	**65**
	Inside	**4,580**	**1429**	**0**	**0**	**65**
Build	**General Use Outside**	**4,580**	**1429**	**49**	**98**	**65**
	General Use Middle		**1429**	**49**	**97**	**65**
	General Use Inside		**1429**	**0**	**0**	**65**
	Express Inside	**3,320**	**1660**	**0**	**0**	**65**
	Express Outside		**1660**	**0**	**0**	**65**

Note: trucks will not be permitted in the Express Lanes, and for the purpose of the TNM model, trucks were only spread into the middle and outside General Use lanes.

Noise Sensitive Area A

This area represents Activity Categories B, C, and E and has **14** sites predicted to be impacted.

Noise Sensitive Area B

This area represents Activity Category E and has **1** site predicted to be impacted.

Noise Sensitive Area C

This area represents Activity Category B and has **90** sites predicted to be impacted.

Table 5 shows the results of the TNM analysis of noise sensitive sites in locations most likely to be impacted and those predicted to exceed the Noise Abatement Criteria threshold in the future build scenarios. Table 6 shows the TNM analysis of the existing / No-Build scenario versus the build scenario and demonstrates that there is no "Significant Increase" of 15 dB(A) over existing noise levels as a result of the project. The existing condition has impacts to 16 receptors representing 23 total sites, while the future scenario has impacts to 19 receptors representing 47 total sites. The complete set of results for all TNM runs for potential noise sensitive sites can be found in **Appendix III**.

Table 5. Noise Sensitive Areas

Noise Sensitive Area	Activity Category	Number of Impacted Sites
A	**B, C, E**	**14**
B	**E**	**1**
C	**B**	**90**

Table 6. Predicted Noise Results

Receptor	NSA Location	Existing/No-Build (Leq)	Build (Leq)	Change (Leq)
Themeworld 1a	**A**	65.0	65.0	0.0
Themeworld 1b	**A**	64.1	64.1	0.0
Themeworld 1c	**A**	64.1	64.1	0.0
Themeworld 1d	**A**	64.1	64.0	-0.1
Themeworld 1e	**A**	65.0	64.2	-0.8
Themeworld 1f	**A**	64.7	64.6	-0.1
Themeworld 1g	**A**	65.2	64.4	-0.8
Themeworld 1h	**A**	**67.2**	**66.5**	-0.7
Themeworld 1i	**A**	**66.8**	**68.0**	1.2
Themeworld 1j	**A**	**66.4**	**67.9**	1.5
Themeworld 1k	**A**	**66.6**	**68.1**	1.5
Themeworld 1l	**A**	**66.8**	**68.1**	1.3
Themeworld 1m	**A**	**66.7**	**68.0**	1.3
Themeworld 1n	**A**	**66.4**	**67.7**	1.3
Themeworld 1o	**A**	**66.3**	**67.7**	1.4
Themeworld 1p	**A**	**66.2**	**67.3**	1.1
Themeworld 1q	**A**	**68.0**	**67.9**	-0.1
Themeworld 2a	**A**	64.4	64.9	0.5
Themeworld 2b	**A**	61.8	62.4	0.6
Themeworld 2c	**A**	62.0	62.5	0.5
Themeworld 2d	**A**	62.0	62.2	0.2
Themeworld 2e	**A**	62.6	62.6	0.0
Themeworld 2f	**A**	62.7	62.7	0.0
Themeworld 2g	**A**	64.3	65.3	1.0
Themeworld 2h	**A**	62.8	64.0	1.2
Themeworld 2i	**A**	62.4	63.5	1.1
Themeworld 2j	**A**	62.1	63.4	1.3
Themeworld 2k	**A**	62.7	63.3	0.6
Themeworld 2l	**A**	63.1	63.2	0.1
Themeworld 2m	**A**	64.0	63.6	-0.4
Themeworld 2n	**A**	**66.6**	65.4	-1.2
Themeworld 3a	**A**	62.9	63.8	0.9
Themeworld 3b	**A**	60.1	60.9	0.8
Themeworld 3c	**A**	59.8	60.4	0.6
Themeworld 3d	**A**	59.8	60.1	0.3
Themeworld 3e	**A**	59.7	60.0	0.3

Receptor	NSA Location	Existing/No-Build (Leq)	Build (Leq)	Change (Leq)
Themeworld 3f	**A**	60.0	60.3	0.3
Themeworld 3g	**A**	64.3	64.8	0.5
Themeworld 4a	**A**	59.5	61.5	2.0
Themeworld 4b	**A**	57.8	59.4	1.6
Themeworld 4c	**A**	57.2	58.8	1.6
Themeworld 4d	**A**	57.1	58.6	1.5
Themeworld 4e	**A**	57.2	58.3	1.1
Themeworld 4f	**A**	57.6	58.3	0.7
Themeworld 4g	**A**	57.7	58.3	0.6
Themeworld 4h	**A**	58.1	58.4	0.3
Themeworld 4i	**A**	59.5	59.6	0.1
Themeworld 5a	**A**	**67.5**	**67.9**	0.4
Themeworld 5b	**A**	**66.1**	**66.9**	0.8
Themeworld 5c	**A**	65.1	**66.3**	1.2
Themeworld 5d	**A**	64.3	65.7	1.4
Themeworld RV Pool	**A**	64.2	65.0	0.8
Themeworld Playground	**A**	**69.0**	**67.4**	
Fort Summit KOA 1	**A**	63.6	64.0	0.4
Fort Summit KOA 2	**A**	61.3	61.3	0.0
Fort Summit KOA 3	**A**	61.6	61.8	0.2
Fort Summit KOA 4	**A**	60.5	60.7	0.2
Fort Summit KOA Pool	**A**	63.1	63.7	0.6
Festival 1	**C**	63.7	**66.7**	3.0
Festival 2	**C**	64.5	**68.4**	3.9
Festival 3	**C**	**67.1**	**66.5**	-0.5
Festival 4	**C**	65.2	**67.5**	2.3
Festival 5	**C**	63.3	63.9	0.6
Festival 6	**C**	63.1	65.0	0.4
Festival 2nd a	**C**	57.6	59.8	2.2
Festival 2nd b	**C**	57.6	59.0	1.4
Festival 2nd c	**C**	58.5	60.0	1.5
Festival Phase II a	**C**	**66.1**	**67.4**	1.3
Festival Phase II b	**C**	**66.1**	**68.4**	2.3
Festival Phase II c	**C**	65.9	**68.3**	2.4
Festival Phase II d	**C**	65.6	**67.6**	2.0
Festival Phase II e	**C**	64.6	**66.3**	1.7
Festival Phase II f	**C**	64.6	65.9	1.3
Festival Phase II g	**C**	**70.5**	**74.4**	3.9
Festival Phase II h	**C**	**70.3**	**74.7**	4.4
Festival Phase II i	**C**	64.6	64.7	0.3

Receptor	NSA Location	Existing/No-Build (Leq)	Build (Leq)	Change (Leq)
Festival Phase II j	**C**	64.6	65.3	0.7
Festival Phase II k	**C**	64.8	64.5	-0.3
Festival Phase II l	**C**	**70.3**	**74.8**	4.5
Festival Phase II m	**C**	**70.0**	**74.9**	4.9
Festival Phase II n	**C**	**70.1**	**74.8**	4.7
Festival Phase II o	**C**	**69.9**	**75.1**	5.2
Festival Phase II p	**C**	**70.1**	**74.6**	4.5
Festival Phase II q	**C**	**70.2**	**75.0**	4.8
Festival Phase II r	**C**	**70.2**	**74.8**	4.6
Festival Phase II s	**C**	**70.0**	**74.9**	4.9
Festival Phase II t	**C**	64.3	65.1	0.8
Festival Phase II u	**C**	61.9	62.4	0.5
Festival Phase II v	**C**	62.8	64.1	1.3
Festival Phase II w	**C**	61.5	61.7	0.2
Festival Phase II x	**C**	60.0	60.0	0.0
Ramada Pool	**A**	61.0	62.9	1.8
Quality Pool	**A**	57.0	58.4	1.4
Holiday Inn Express Pool	**B**	61.1	64.2	3.1
Home Suites	**B**	53.1	56.2	3.1
Comfort Inn Pool	**B**	**67.5**	**71.5**	4.0

5.0 Noise Abatement

The FHWA requires that noise abatement measures be considered for a proposed project when the predicted noise levels approach, equal, or exceed noise abatement criteria, or, will increase substantially over existing levels. If none of the potential receptors approach, equal, or exceed the abatement criteria or show a substantial increase over existing levels, noise abatement will not be required for the project. The most common and effective noise abatement measure is the construction of a noise barrier. As noted in 23 CFR 772.13(c)(1), the FHWA requires that, at a minimum, FDOT shall consider noise abatement in the form of a noise barrier. FHWA also considers the following activities as acceptable noise abatement measures.

5.1 Alignment Selection

Alignment selection involves the orientation of the project location in such a way as to minimize impacts and costs. For noise abatement, alignment selection is primarily a matter of (a) positioning the roadway at a sufficient distance from the noise-sensitive sites, and, (b) positioning the roadway at a location where other noise abatement techniques such as a noise abatement wall could be implemented. The project is constrained as a widening of an existing roadway and the existing alignment cannot be altered without substantial changes to the surrounding land uses.

5.2 Property Acquisition

Property acquisition for buffer zones alone is considered to be costly. Buffer zones can provide relief from noise impacts by creating added distance between the noise generator and the noise receptor. Methods of applying land use controls to maintain and establish buffered areas through zoning may be established by local jurisdiction. No acquisition for noise abatement is proposed for this project.

5.3 Land Use Controls

One of the most effective noise abatement measures is the proper implementation of land use controls to minimize future noise impacts. Local jurisdictions with zoning control can implement policies to limit the growth on noise-sensitive land uses adjacent to the roadway. Development planned for the study area includes additional residential and commercial areas in this heavily developed urban area. Noise contours for the Activity Categories within the study area were predicted using the TNM model, and both a 66dB(A) and 71 dB(A) line is shown on the Noise Analysis Maps (**Figure B in Appendix II**). No potential land use controls are available to assist in noise abatement in this corridor.

5.4 Traffic Management

Traffic management measures that limit vehicle type, speed, volume, and time of operations can be effective noise abatement measures. No traffic management measures will be utilized as I-4 is a heavily traveled interstate highway and the only direct north-south Interstate through the greater Orlando area.

5.5 Noise Barriers

Noise barriers reduce noise levels by blocking the sound path between a roadway and noise-sensitive sites. To be effective, barriers have to be continuous, sufficiently long and tall, shield a reasonably sized impacted area or a number of people, and provide appreciable noise level reduction. Noise barriers are to be modeled at locations where noise increases exceeded abatement criteria during the design year, and evaluated for feasibility and reasonableness. A wide range of factors are used to evaluate noise abatement measures as reasonable and feasible. Feasibility deals with engineering considerations such as the ability to construct a barrier using standard construction techniques and methods to provide a reduction of at least 5 dB(A) to an impacted receptor site. Additionally, in order for a noise barrier to be considered acoustically feasible, at least two impacted receptor sites must achieve a 5 dB(A) reduction or greater.

When a noise abatement measure such as a sound barrier is determined to be feasible, the reasonableness is then evaluated. Three reasonableness factors must be collectively achieved in order for the noise abatement measure to be deemed reasonable: the achievement of the noise reduction design goal (7 dB(A)) for at least one receptor per FDOT criteria), the cost effectiveness of the noise abatement measure, and the consideration of the viewpoints of the benefited property owners and residents. As specified by 23 CFR 772, when examining the cost reasonableness of a modeled noise barrier design for a residential area, the upper limit of $42,000 per benefited receptor has been set by FDOT using the standard construction cost of $30.00 per square foot. A benefited receptor is defined as a noise sensitive site that will obtain a minimum of 5 dB(A) of noise reduction as a result of a specific noise abatement measure whether or not they are predicted as having a noise impact. Only benefited receptor sites can be included in the calculation of a barrier being cost reasonable.

No Noise Barriers were deemed reasonable and feasible during the original PD&E study completed for this segment [Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for SR 400 (I-4) from West of Memorial Boulevard (SR 546) to the Polk/Osceola County Line [Financial Project Number (FPN) 201210 (December 1998)]. Noise barriers were modeled for Noise Sensitive Areas with multiple impacted sites along the corridor during this analysis as described below. For each area, barriers were modeled as either ground-mounted at the edge of the right-of-way, and/or as a traffic railing

noise barrier that is ground-mounted along the edge of the shoulder. For the ground-mounted barriers, barrier heights were analyzed from 16 feet to 22 feet tall, while the heights of the barriers at the edge of shoulder were limited to 14 feet. The optimal barrier design for each analysis (See **Figure B,** Noise Analysis Maps in **Appendix II)** is described below and detailed in **Table 7**.

Noise Sensitive Area A

Noise barriers were modeled for the Themeworld RV Resort within Noise Sensitive Area A. Due to the topography in this area, there is an existing retaining wall adjacent to the I-4 eastbound shoulder from the approximately mid-point of the Themeworld RV Resort to US 27 (see photos in Appendix I). The wall gradually increases in height from ground level to approximately 25 feet at the US 27 overpass. This barrier wall and the overhead power lines that run adjacent to it along the ROW line provide potential problems with any barrier being constructed at this location. There were sites with predicted noise impacts at the Themeworld RV Resort, so barriers were modeled along the edge of shoulder and at the right-of-way adjacent to / on top of the retaining wall. A barrier design combining both a wall located at the edge of shoulder and one at the right-of-way was also modeled. The best case scenario for traffic railing barrier located at the edge of shoulder was for a 14-foot tall, 902-foot long barrier, which provided an insertion loss of at least 5dB(A) for three receptors at an average cost of $126,270 per benefited receptor. This barrier design did not meet the design criteria of providing at least 7dB(A) for one receptor and exceeds the $42,000 cost per benefited receptor threshold set forth in Chapter 17 of the PD&E Manual. The best case scenario for the ground-mounted barrier placed at the right-of-way was for a 22-foot-tall, 1,455-foot long ground mounted wall at a total cost of $960,096 provided an insertion loss of at least 5dB(A) to 21 receptors at an average cost of $45,719 per benefited receptor. The 22-foot tall barrier cost average also exceeds the $42,000 per benefited receptor threshold and is therefore is not cost reasonable. Alternate barrier heights of 16, 18, and 20 feet tall were modeled as described in **Table 7**, though the 22-foot tall barrier provided the best abatement. Combination barrier designs were also modeled utilizing both 14-foot tall barriers located at the edge of shoulder and various heights of ground-mounted barriers located at the edge of right-of-way (see **Table 7** for all designs). The best case scenario was for a 992 foot-long, 14-foot tall barrier placed at the shoulder along with an 828-foot long, 22-foot tall barrier placed at the right-of-way. This design, at a total cost of $963,078, provided an insertion loss of at least 5dB(A) for 25 receptors, at an average cost of $38,523 per benefited receptor. This barrier design does meet the cost reasonable criteria of $42,000 per benefited receptor.

However, it is not likely feasible to construct the right-of-way wall as it is modeled. The location at the edge of the right-of-way is within 2 feet of the existing retaining wall (or directly on top of it) and may either affect the structural integrity of the existing wall and any tiebacks that may be utilized. If the barrier were located on top of the existing retaining wall, it would exceed the height limits allowed. Additionally, there are existing overhead power lines that run along the edge of the right-of-way here that would conflict with the construction and placement of a wall at this location (see photos in **Appendix I**). Moving the barrier slightly away from the edge of the right-of-way would require the purchase of right-of-way for the wall, and require a right of entry or an easement for construction from the Themeworld RV resort for construction. Therefore, any barrier design located at the right-of-way is not reasonable and feasible for construction.

Noise Sensitive Area B

No noise barriers were modeled for this area as only a single receptor was predicted to be impacted by the project. Under FDOT policy, a noise barrier must benefit two or more impacted receptors at least a 5dB(A) or greater, therefore a noise barrier could not be feasible at this location.

Noise Sensitive Area C

Barriers were modeled at the Festival Orlando Resort within Noise Sensitive Area C. Two separate phases of the Festival Orlando were modeled: Phase I which is currently under construction and Phase II which is in the planning stages but does have an approved site plan. Various heights of ground-mounted barriers were modeled along the right-of-way adjacent to westbound I-4, and traffic railing noise barriers were modeled at the edge of the shoulder (see **Table 7** for barrier design details).

For Phase I, the best case scenario for the Ground Mounted Barrier was for an 898-foot long, 16-foot high wall at a total cost of $430,862 that provided an insertion loss of 5 dB(A) or greater to 32 receptors for an average cost of $13,464 per benefited receptor. A 954-foot long, 14-foot tall shoulder mounted barrier at a total cost of $400,523 provided an insertion loss of 5 dB(A) or greater to 32 receptors for an average cost of $12,516 per benefited receptor. Both barriers cost average is less than the $42,000 per benefited receptor threshold set forth in Chapter 17 of the PD&E Manual and are therefore cost reasonable.

For Phase II, the best case scenario for the Ground Mounted Barrier was for a 1,157-foot long, 16-foot high wall at a total cost of $555,597 that provided an insertion loss of 5 dB(A) or greater to 48 receptors for an average cost of $11,575 per benefited receptor. A 1,552-foot long, 12-foot tall shoulder mounted barrier at a total cost of $558,711 provided an insertion loss of 5 dB(A) or greater to 74 receptors for an average cost of $7,550 per benefited receptor. Both barriers cost average is less than the $42,000 per benefited receptor threshold and are therefore cost reasonable.

Table 7 – Barrier Analysis

Noise Sensitive Locations	Barrier Type	Barrier Name	Barrier Location	Height (feet)	Length (feet)	# of Impacted Receptors	# of Impacted Benefited Receptors	# of Non-Impacted Benefited Receptors	Total # of Benefited Receptors	Avg. Noise Reduction (dB(A))	Cost ($30.00 per square foot)	Average Cost per Benefited Receptor	Comment
NSA A	Traffic railing	BW A1	I-4 Eastbound Shoulder	14	902	14	3	0	3	5.2	$378,812	$126,270	Not cost reasonable, doesn't meet noise design goal
	ground	BW A2	I-4 Eastbound ROW	22	1455	14	13	8	21	6.4	$960,096	$45,719	not cost reasonable, not feasible for construction
	ground	BW A2	I-4 Eastbound ROW	20	1455	14	13	5	18	6.1	$872,814	$48,490	Not cost reasonable, not feasible for construction
	ground	BW A2	I-4 Eastbound ROW	18	1455	14	12	4	16	5.6	$785,533	$49,096	Not cost reasonable, does not meet noise design goal, not feasible for construction
	ground	BW A2	I-4 Eastbound ROW	16	1455	14	4	2	6	5.6	$698,252	$116,375	Not cost reasonable, does not meet noise design goal, not feasible for construction
	Traffic railing / ground combination	BW A3	I-4 Eastbound Shoulder / ROW	14 / 22	992 / 828	14	14	11	25	6.3	$963,078	$38,523	Cost Reasonable / not feasible for Construction
	Traffic railing / ground combination	BW A3	I-4 Eastbound Shoulder / ROW	14 / 20	992 / 828	14	14	8	22	6.2	$913,412	$41,519	Cost Reasonable, not feasible for construction
	Traffic railing / ground combination	BW A3	I-4 Eastbound Shoulder / ROW	14 / 18	992 / 828	14	14	7	21	6.2	$863,747	$41,131	Cost reasonable, not feasible for construction
	Traffic railing / ground combination	BW A3	I-4 Eastbound Shoulder / ROW	14 / 16	992 / 828	14	13	6	19	5.6	$814,082	$42,846	Not cost reasonable, does not meet design goal, not feasible for construction
NSA C Phase I	Traffic railing	BW C1	I-4 Westbound Shoulder	14	954	32	32	0	32	6.6	$400,523	$12,516	**Cost Reasonable**
	Traffic railing	BW C1A	I-4 Westbound Shoulder	14	1287	32	32	0	32	6.9	$540,330	$16,885	**Cost Reasonable**
	ground	BW C2	I-4 Westbound ROW	22	898	32	32	0	32	9.9	$592,435	$18,514	**Cost Reasonable**
	ground	BW C2	I-4 Westbound ROW	20	898	32	32	0	32	9.2	$538,577	$16,830	**Cost Reasonable**
	ground	BW C2	I-4 Westbound ROW	18	898	32	32	0	32	8.2	$484,719	$15,147	**Cost Reasonable**
	ground	BW C2	I-4 Westbound ROW	16	898	32	32	0	32	7.1	$430,862	$13,464	**Cost Reasonable**
NSA C Phase II	Traffic railing	BW C3a	I-4 Westbound Shoulder	12	1,164	58	40	0	40	8.5	$419,125	$10,478	**Cost Reasonable**
	Traffic railing	BW C3a	I-4 Westbound Shoulder	14	1,164	58	40	0	40	9.4	$488,980	$12,225	**Cost Reasonable**
	Traffic railing	BW C3b	I-4 Westbound Shoulder	12	1,552	62	62	12	74	7.1	$558,711	$7,550	**Cost Reasonable**
	Traffic railing	BW C3b	I-4 Westbound Shoulder	14	1,552	62	62	12	74	8.0	$651,829	$8,809	**Cost Reasonable**
	Ground	BW C4	I-4 Westbound ROW	12	1,157	58	40	0	40	9.0	$416,698	$10,417	**Cost Reasonable**
	Ground	BW C4	I-4 Westbound ROW	14	1,157	58	40	0	40	9.9	$486,147	$12,154	**Cost Reasonable**
	Ground	BW C4	I-4 Westbound ROW	16	1,157	58	40	8	48	9.7	$555,597	$11,575	**Cost Reasonable**
	Ground	BW C4	I-4 Westbound ROW	18	1,157	58	40	8	48	10.4	$625,046	$13,022	**Cost Reasonable**
	Ground	BW C4	I-4 Westbound ROW	20	1,157	58	40	12	52	10.4	$694,496	$13,356	**Cost Reasonable**
	Ground	BW C4	I-4 Westbound ROW	22	1,157	58	40	12	52	10.8	$763,946	$14,691	**Cost Reasonable**

6.0 Conclusions

Based upon the analysis conducted, one noise barrier is recommended for further consideration during the design phase of this segment of the project: For Phase I of the Festival Orlando Resort within Noise Sensitive Area C, both a 16-foot tall, 898-foot long ground mounted barrier and a 14-foot tall, 954-foot long shoulder mounted barrier provide the required noise abatement and meet the requirements as reasonable and feasible. Both barriers provide an insertion loss of at least 5 dB(A) for 32 receptors. For Phase II of the Festival Orlando Resort, both a 16-foot tall, 1,157-foot long ground mounted barrier and a 12-foot tall, 1,552-foot long shoulder mounted barrier provide the required noise abatement and meet the requirements as reasonable and feasible. The ground mounted barrier provides an insertion loss of at least 5 dB(A) for 48 receptors, while the shoulder mounted barrier provides an insertion loss of at least 5 dB(A) for 74 receptors.

7.0 Commitments

FDOT is committed to the construction of feasible and reasonable noise abatement measures at the noise impacted location describe in the conclusion above and shown in Table 7 and on the Noise Study Maps Figure B contingent upon the following conditions:

- Cost analysis indicates that the cost of the noise barriers will not exceed the cost-reasonable criterion.
- Community input supporting types, heights, and locations of the noise barrier is provided to the District Office.
- Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved.

Based upon the noise analyses performed to date, there appears to be no apparent solutions available to mitigate the noise impacts at Noise Sensitive Areas A and B, as shown on the Noise Study Maps (**Figure B in Appendix II**).

8.0 Construction Noise and Vibration

Construction activities for any of the proposed improvements will have temporary noise impacts for those residents and visitors within the immediate vicinity of the project. Noise and vibration impacts will be caused by heavy equipment movement and construction activities such as pile driving and vibratory compaction. Noise control measures should be implemented according to the FDOT's Standard Specifications for Road and Bridge Construction to minimize or eliminate some potential construction noise and vibration impacts. Section 335, F.S., exempts FDOT from compliance with local ordinances. FDOT policy is to follow the requirement of local ordinances to the extent that is reasonable. However, should unanticipated noise or vibration issues arise during the construction process, the Project Engineer, in coordination with the District Noise Specialist will investigate additional methods of controlling these impacts.

9.0 Public Involvement

As this project will have significant public involvement, the Final NSR will be made available in multiple forms (Public Meetings, Website, circulated to the appropriate local planning/zoning officials) in order to eliminate or minimize noise impacts at future development sites that are incompatible with traffic noise. Noise contours for the relevant Activity Categories were developed for this study and are shown on the Noise Study Maps in Appendix I. The public will have opportunities for input during the public meetings and via the web site while the planning and design of the project are ongoing.

10.0 References

FDOT's PD&E Manual - Part 2, Chapter 17 "Noise" (dated 05/24/2011))
FHWA's guidance document "Measurement of Highway-Related Noise."
FDOT's Standard Specifications for Road and Bridge Construction

APPENDIX I
Photos

I-4 EB shoulder - NSA A

NSA A – ROW and Power Line

NSA A – Existing Wall

APPENDIX II
PROJECT MAPS AND FIGURES

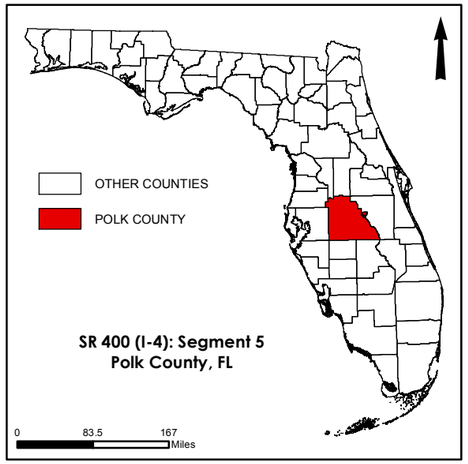
SR 400 (I-4) BEYOND THE ULTIMATE
PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY

SEGMENT 5

FDOT FM NO. 201210-2-22-01

NOISE STUDY REPORT
(NSR)

POLK COUNTY
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 1



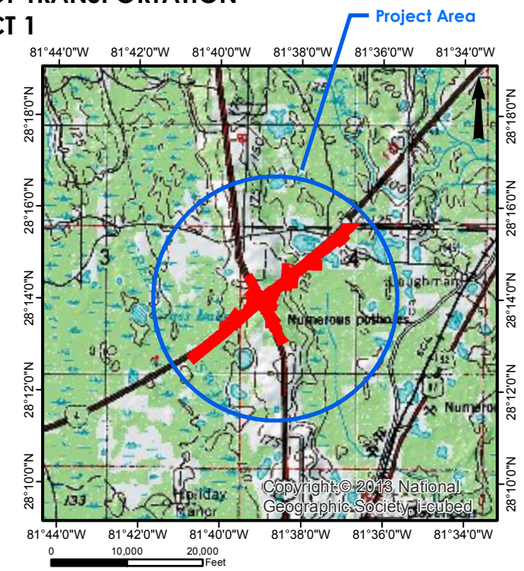


FIGURE NO.	SHEET NO.	TITLE
Figure A	Sheets 1-2	Land Use and Habitat Coverage Map
Figure B	Sheets 1-9	Noise Analysis Map

PROJECT DETAILS

NOISE STUDY REPORT:
Segment 5 - Report Maps

SR 400 (I-4) from West of SR 25/US 27 to West of CR 532
(Polk/Osceola County Line Polk County (16320)

16320 Polk County
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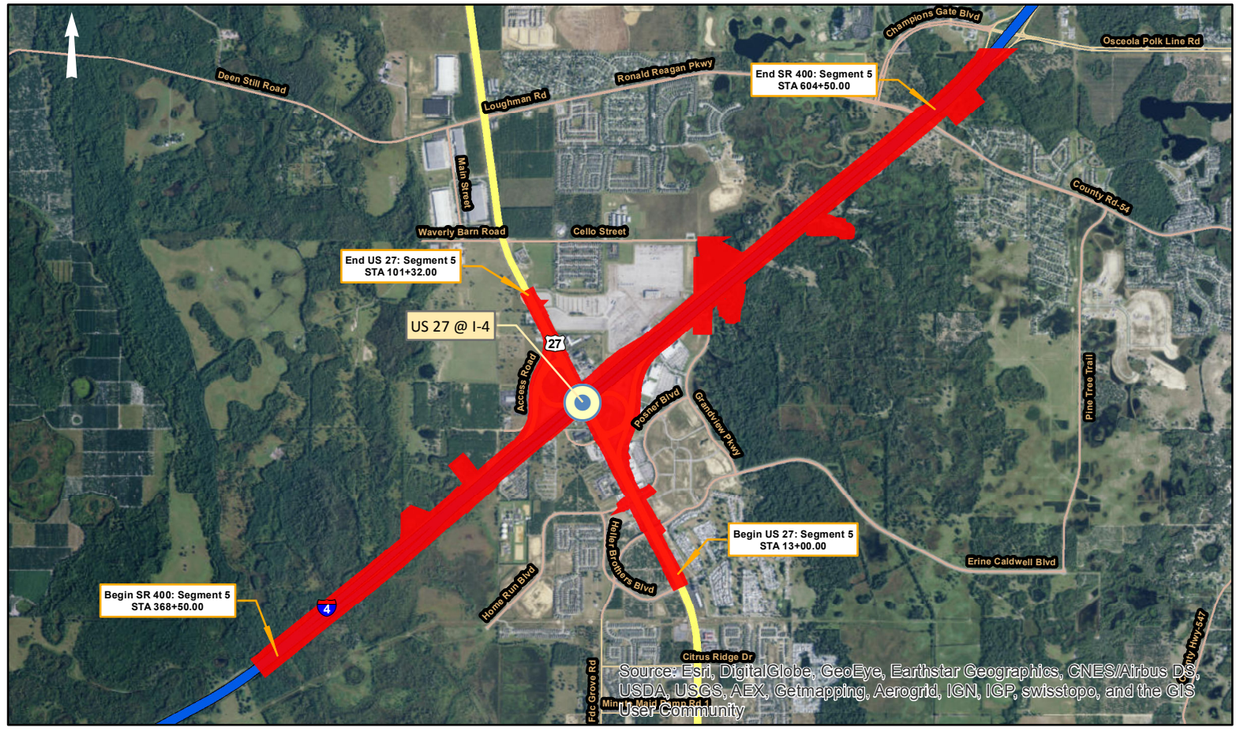
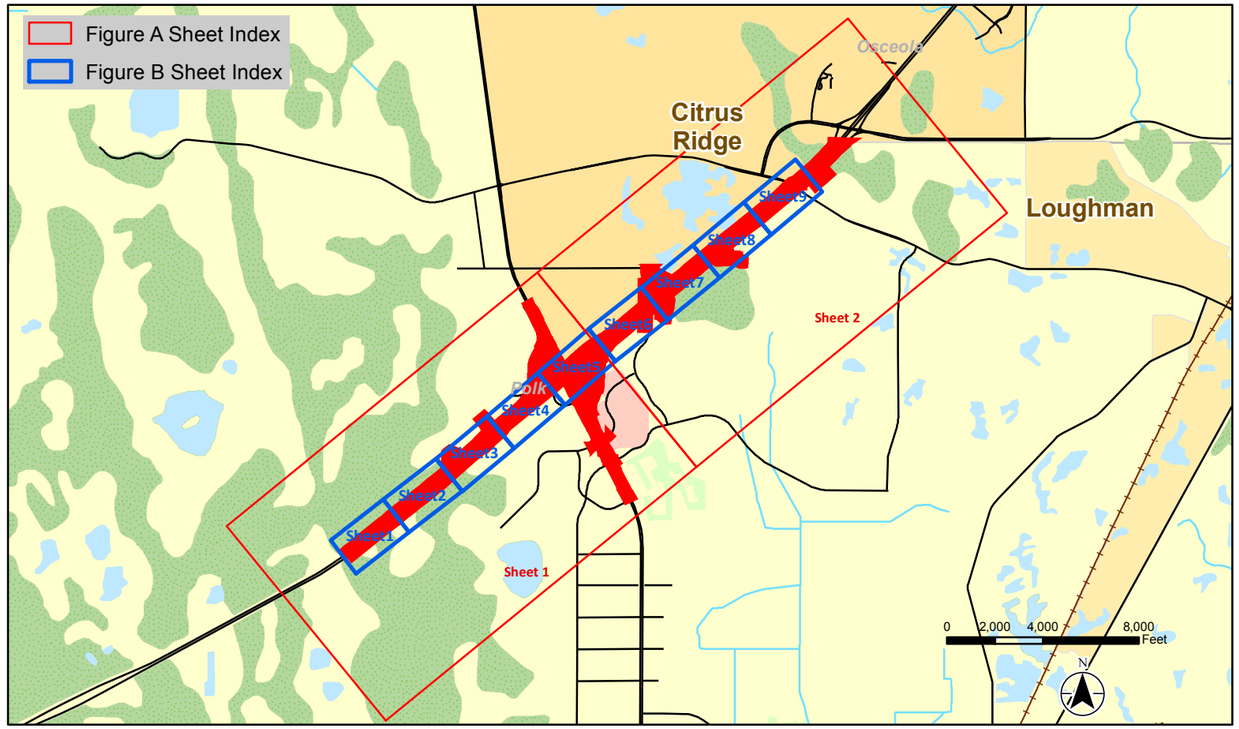
STA 604+50.00 (End)





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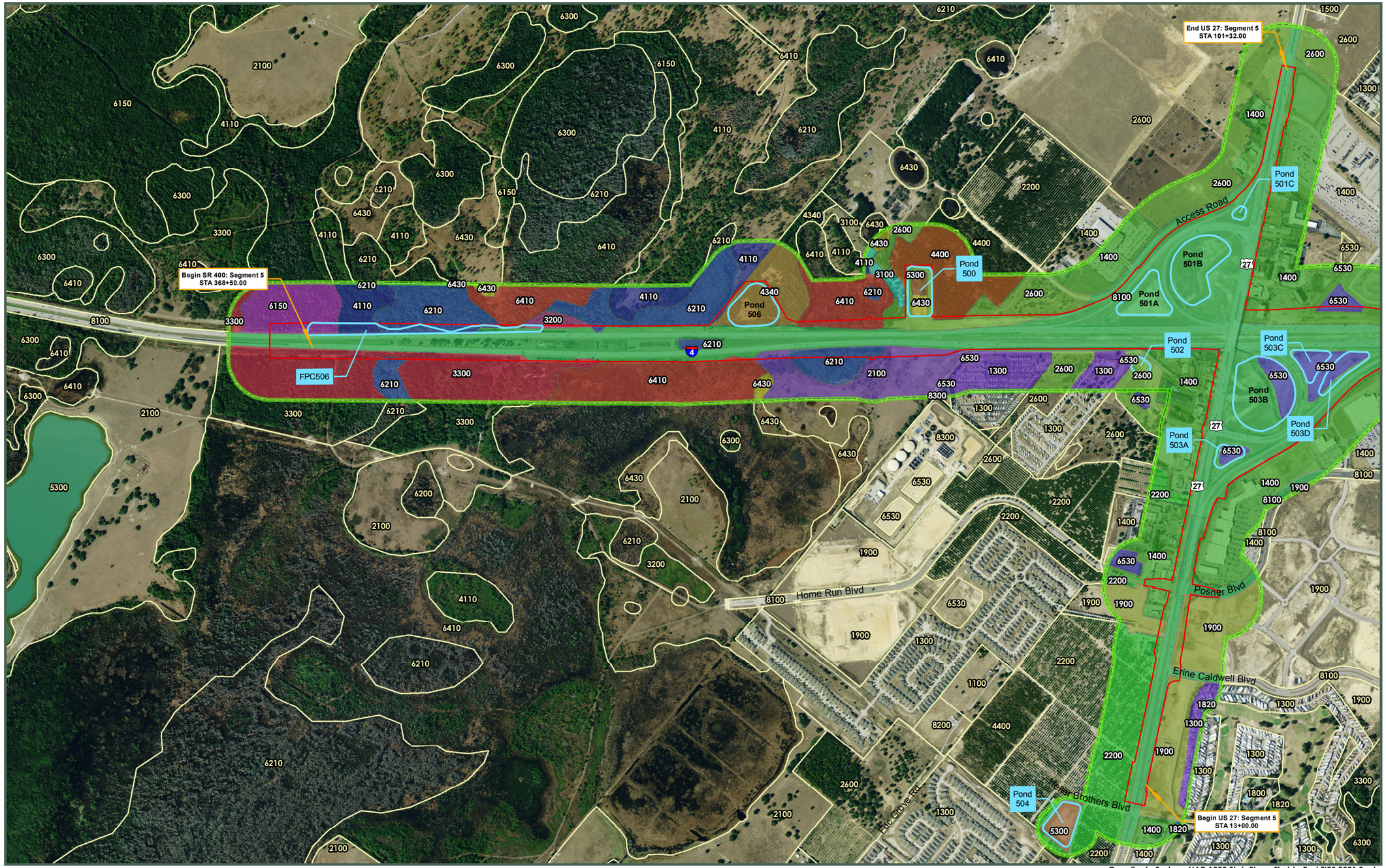
LAND USE AND HABITAT COVERAGE MAPS

NOISE STUDY REPORT: Segment 5 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line Polk County (16320)



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Proposed Pond Sites (12/02/15)

Land Use and Habitat Coverage

- 1200:RESIDENTIAL MED DENSITY (2-5 DWELLING UNITS)
- 1300:RESIDENTIAL HIGH DENSITY
- 1400:COMMERCIAL AND SERVICES
- 1700:INSTITUTIONAL
- 1820:GOLF COURSES
- 1900:OPEN LAND
- 2100:CROPLAND AND PASTURELAND
- 2200:TREE CROPS
- 2600:OTHER OPEN LANDS (RURAL)
- 3100:HERBACEOUS
- 3200:SHRUB AND BRUSHLAND
- 3300:MIXED RANGELAND
- 4110:PINE FLATWOODS
- 4340:HARDWOOD CONIFER MIXED
- 4400:TREE PLANTATIONS
- 5300:RESERVOIRS
- 6150:STREAM AND LAKE SWAMPS (BOTTOMLAND)
- 6200:WETLAND CONIFEROUS FORESTS
- 6210:CYPRESS
- 6300:WETLAND FORESTED MIXED
- 6410:FRESHWATER MARSHES
- 6430:WET PRAIRIES
- 6440:EMERGENT AQUATIC VEGETATION
- 6530:INTERMITTENT PONDS
- 8100:TRANSPORTATION
- 8300:UTILITIES
- County Land Use Coverage

Title:

NOISE STUDY REPORT: Segment 5 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 600 1,200 2,400 Feet

Figure A - Sheet 1 of 2 : Land Use and Habitat Coverage Map

1 " = 1,200 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 201210-2-22-01

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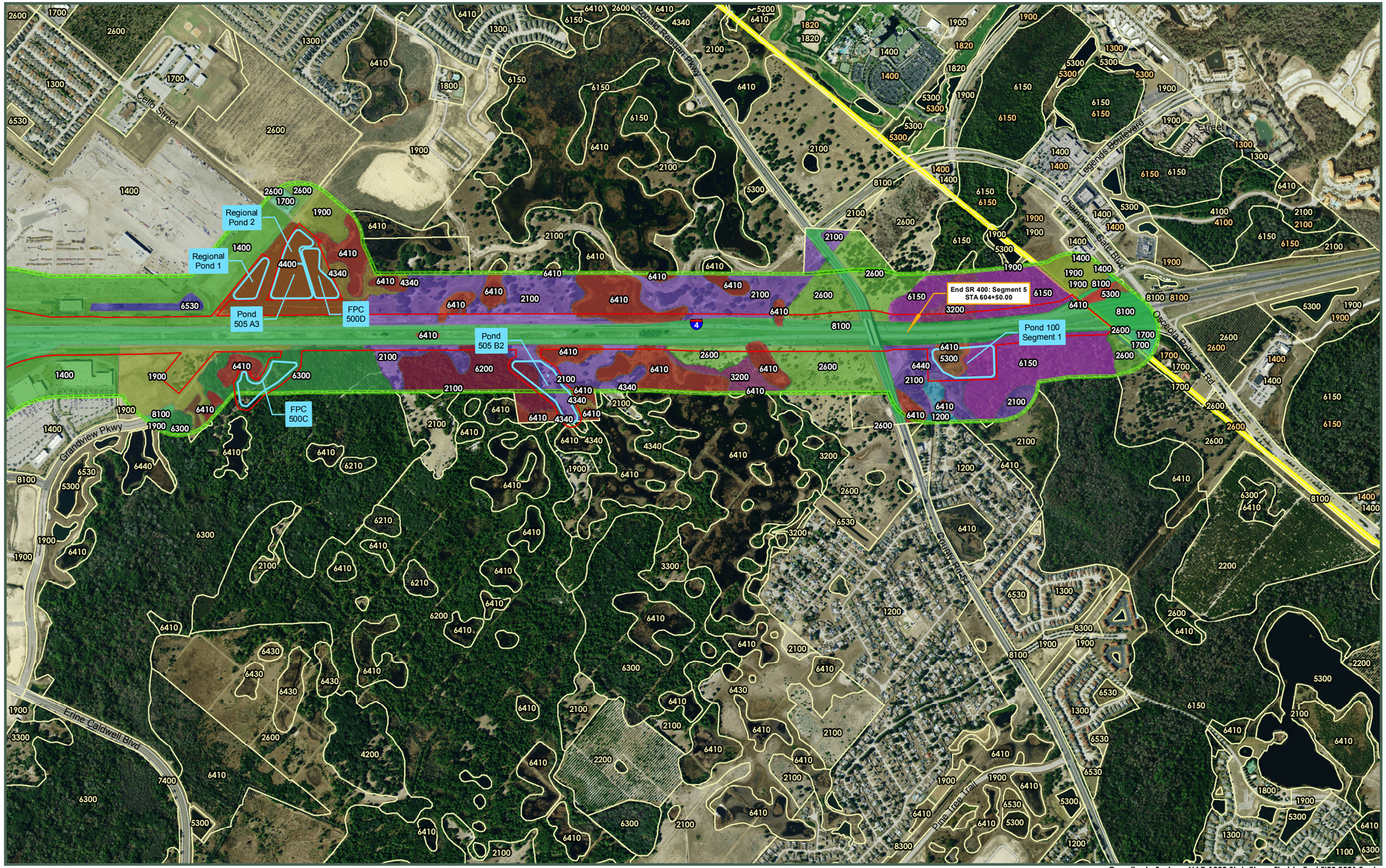
NOISE STUDY REPORT: Segment 5 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of SR 25/US 27 to West of CR 532 (Polk/Osceola County Line Polk County (16320)



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Proposed Pond Sites (12/02/15)

Land Use and Habitat Coverage

- 1200:RESIDENTIAL MED DENSITY (2-5 DWELLING UNITS)
- 1300:RESIDENTIAL HIGH DENSITY
- 1400:COMMERCIAL AND SERVICES
- 1700:INSTITUTIONAL
- 1820:GOLF COURSES
- 1900:OPEN LAND
- 2100:CROPLAND AND PASTURELAND
- 2200:TREE CROPS
- 2600:OTHER OPEN LANDS (RURAL)
- 3100:HERBACEOUS
- 3200:SHRUB AND BRUSHLAND
- 3300:MIXED RANGELAND
- 4110:PINE FLATWOODS
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- 4400:TREE PLANTATIONS
- 5300:RESERVOIRS
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- 6200:WETLAND CONIFEROUS FORESTS
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- 6300:WETLAND FORESTED MIXED
- 6410:FRESHWATER MARSHES
- 6430:WET PRAIRIES
- 6440:EMERGENT AQUATIC VEGETATION
- 6530:INTERMITTENT PONDS
- 8100:TRANSPORTATION
- 8300:UTILITIES
- County Land Use Coverage

Title:

NOISE STUDY REPORT: Segment 5 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 600 1,200 2,400 Feet

Figure A - Sheet 2 of 2 : Land Use and Habitat Coverage Map

1 " = 1,200 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 201210-2-22-01

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NOISE BARRIER ANALYSIS MAPS

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

- NSA-A
- NSA-B
- NSA-C

Themeworld Receivers

- No Impact/No Benefit
- No Impact/Benefited
- Impacted/No Benefit
- Impacted/Benefited

Festival Receivers

- No Impact/No Benefit
- No Impact/Benefited
- Impacted/No Benefit
- Impacted/Benefited

Other Receivers

- Kampgrounds of America (KOA) Orlando Southwest
- Quality Inn (Pool)
- Ramada Inn (Pool)

Noise Decibel Contours

- 66 dB Contour
- 71 dB Contour

Noise Barrier Walls

- Proposed Wall (Cost Reasonable)
- Proposed Wall (Not Cost Reasonable or Feasible)

Title:

NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 1 of 9 : Noise Analysis Map

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Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

- NSA-A
- NSA-B
- NSA-C

Themeworld Receivers

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- No Impact/Benefited
- Impacted/No Benefit
- Impacted/Benefited

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Title:

NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 2 of 9 : Noise Analysis Map

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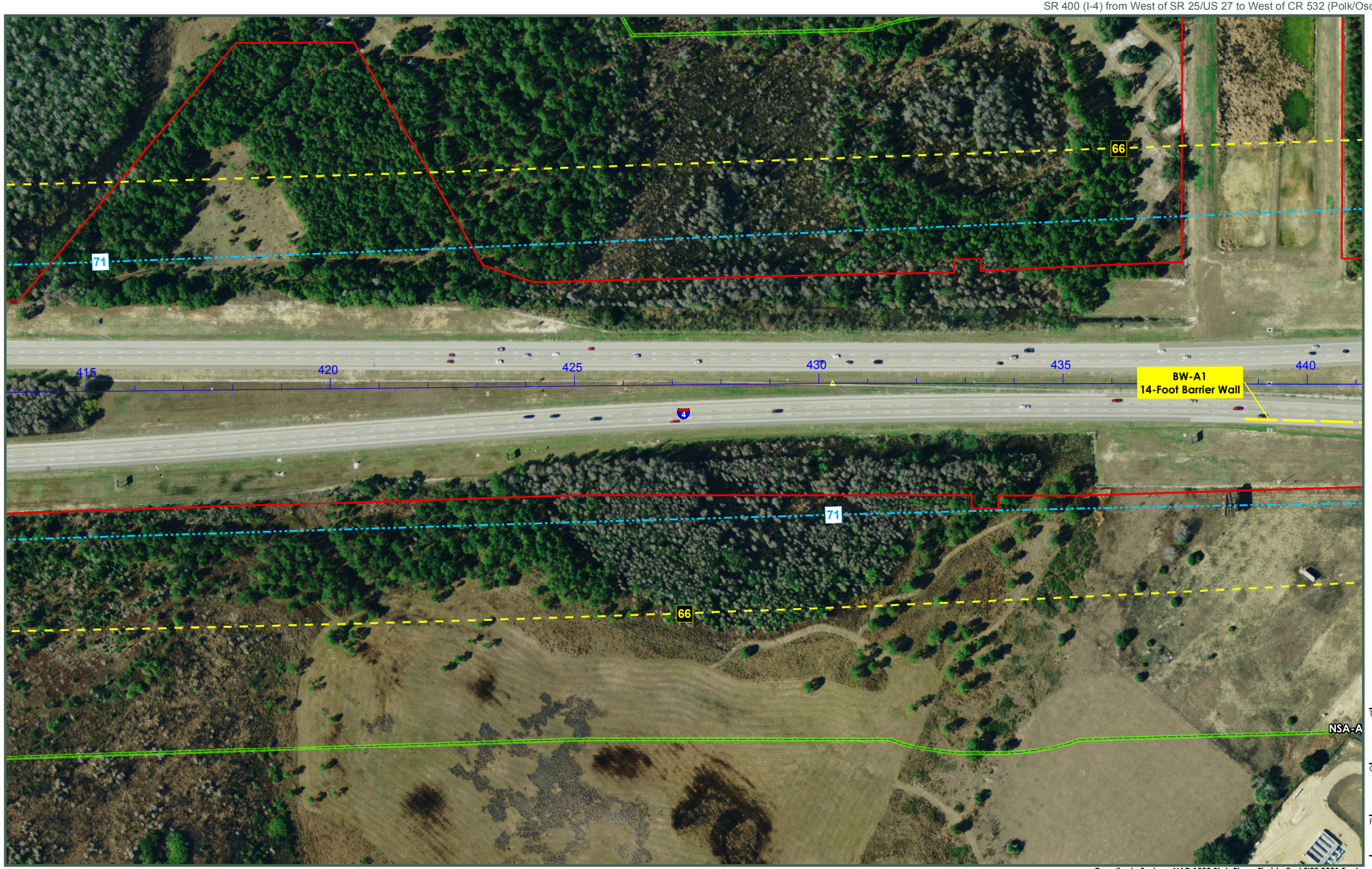

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

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- NSA-C

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NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

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Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
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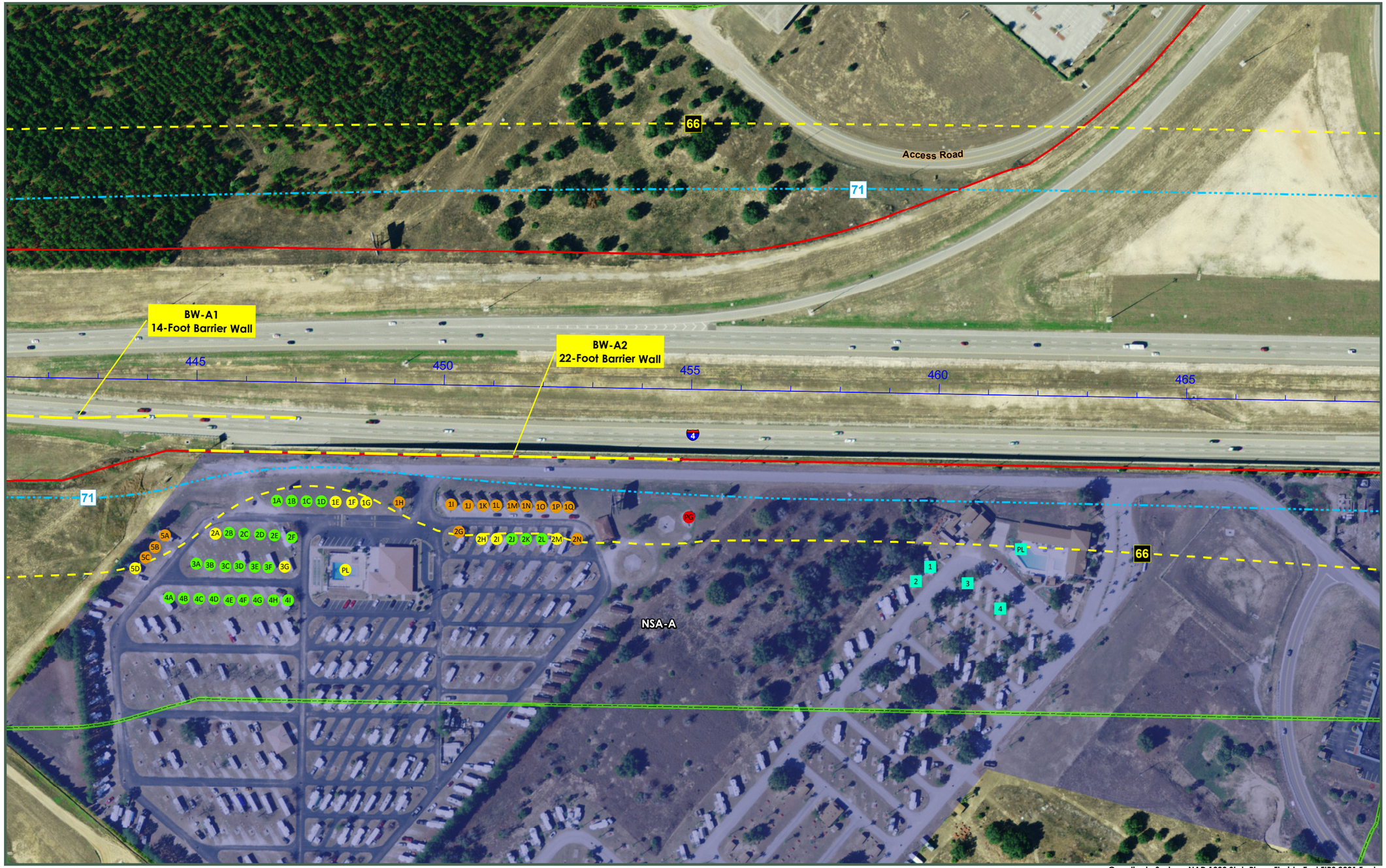
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 3 of 9 : Noise Analysis Map



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

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- NSA-B
- NSA-C

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- 71 dB Contour

Noise Barrier Walls

- Proposed Wall (Cost Reasonable)
- Proposed Wall (Not Cost Reasonable or Feasible)

Title:

NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

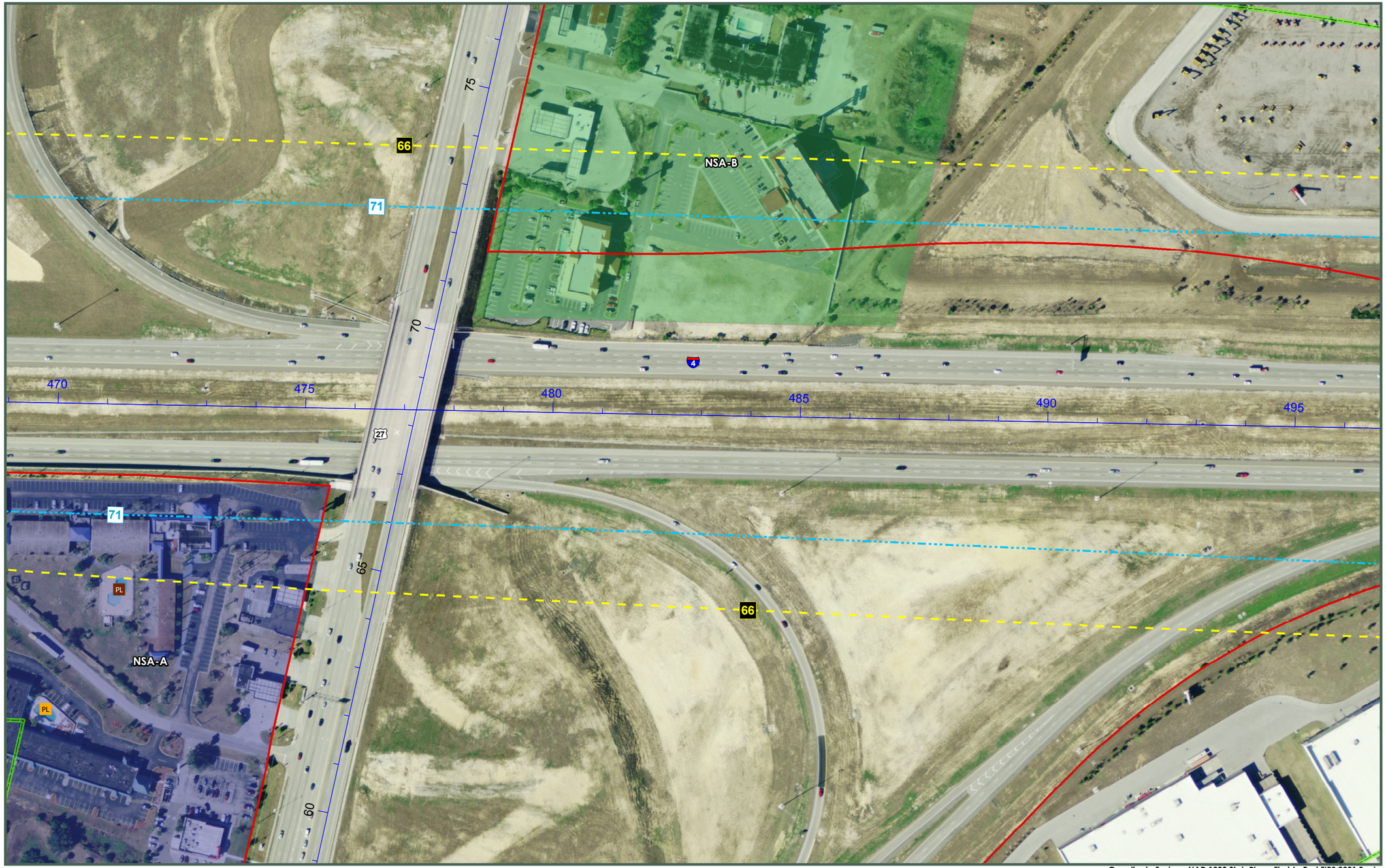
Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 4 of 9 : Noise Analysis Map



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

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- NSA-B
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- 71 dB Contour

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NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 5 of 9 : Noise Analysis Map

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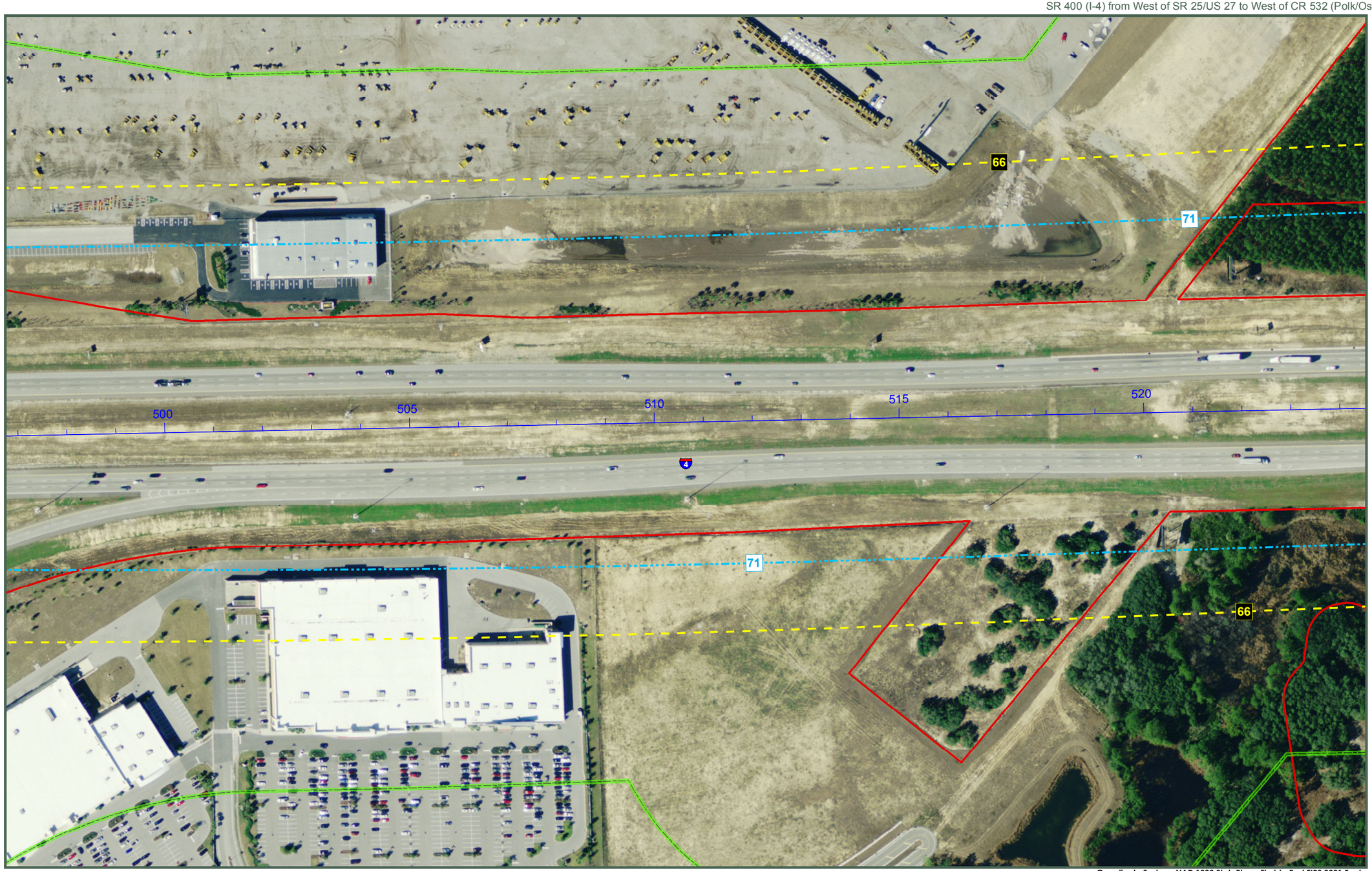

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

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Noise Barrier Walls

- Proposed Wall (Cost Reasonable)
- Proposed Wall (Not Cost Reasonable or Feasible)

Title:

NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 6 of 9 : Noise Analysis Map

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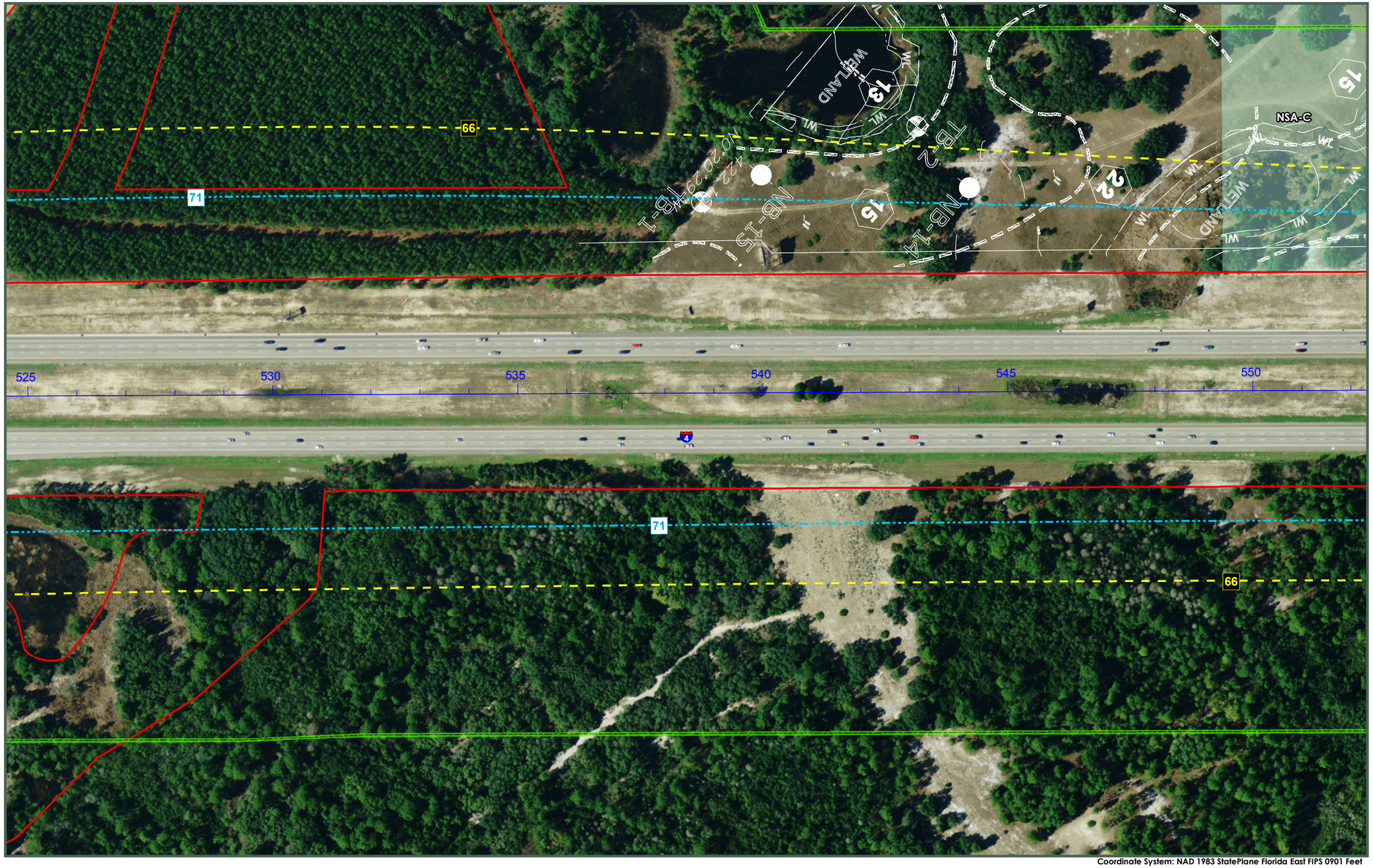

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

- NSA-A
- NSA-B
- NSA-C

Themeworld Receivers

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- Impacted/No Benefit
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Noise Decibel Contours

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- 71 dB Contour

Noise Barrier Walls

- Proposed Wall (Cost Reasonable)
- Proposed Wall (Not Cost Reasonable or Feasible)

Title:
NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 7 of 9 : Noise Analysis Map

1 " = 200 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 201210-2-22-01

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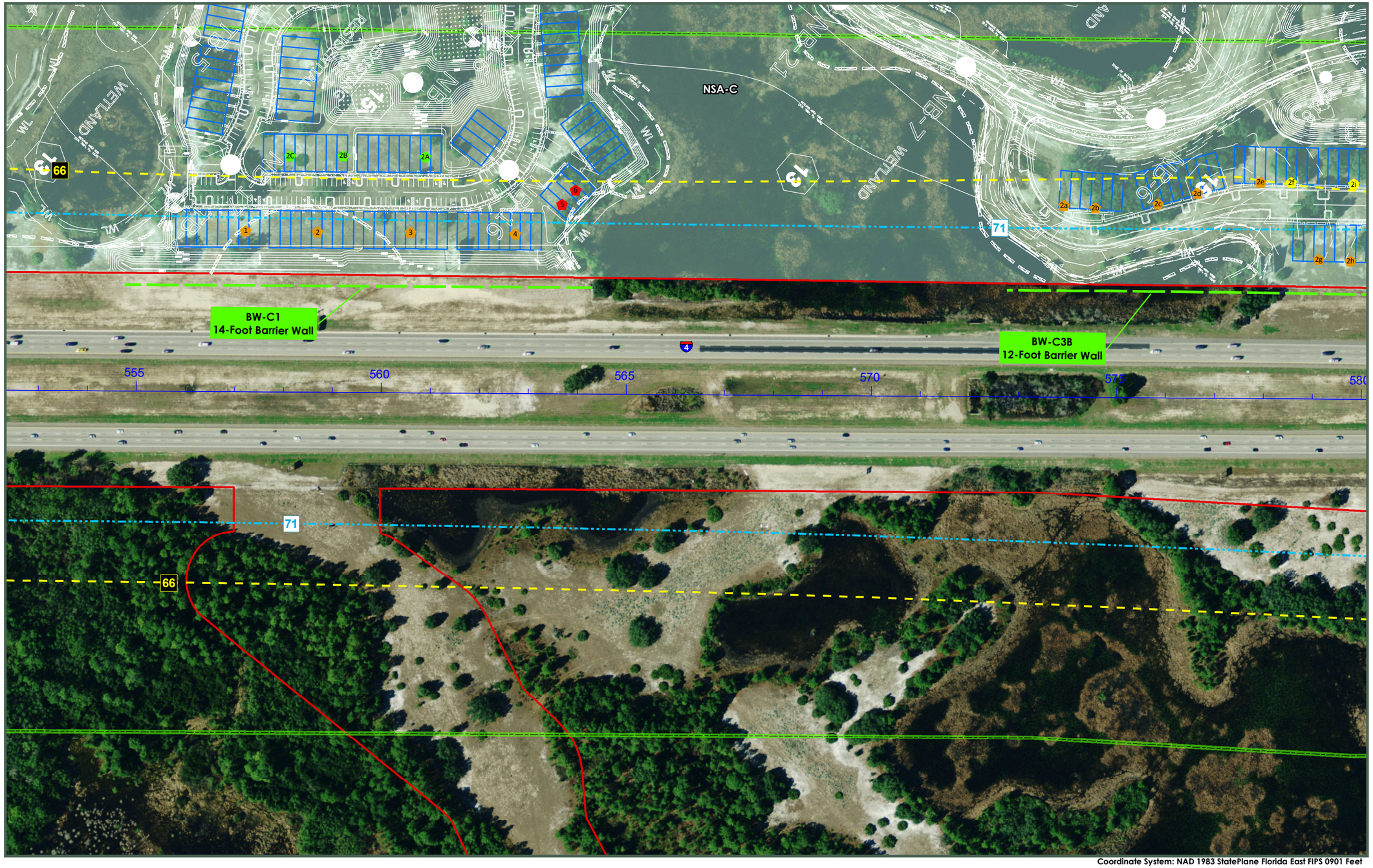

Map Key

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- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

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- NSA-C

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- Impacted/Benefited

Other Receivers

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- Quality Inn (Pool)
- Ramada Inn (Pool)

Noise Decibel Contours

- 66 dB Contour
- 71 dB Contour

Noise Barrier Walls

- Proposed Wall (Cost Reasonable)
- Proposed Wall (Not Cost Reasonable or Feasible)

Title:

NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

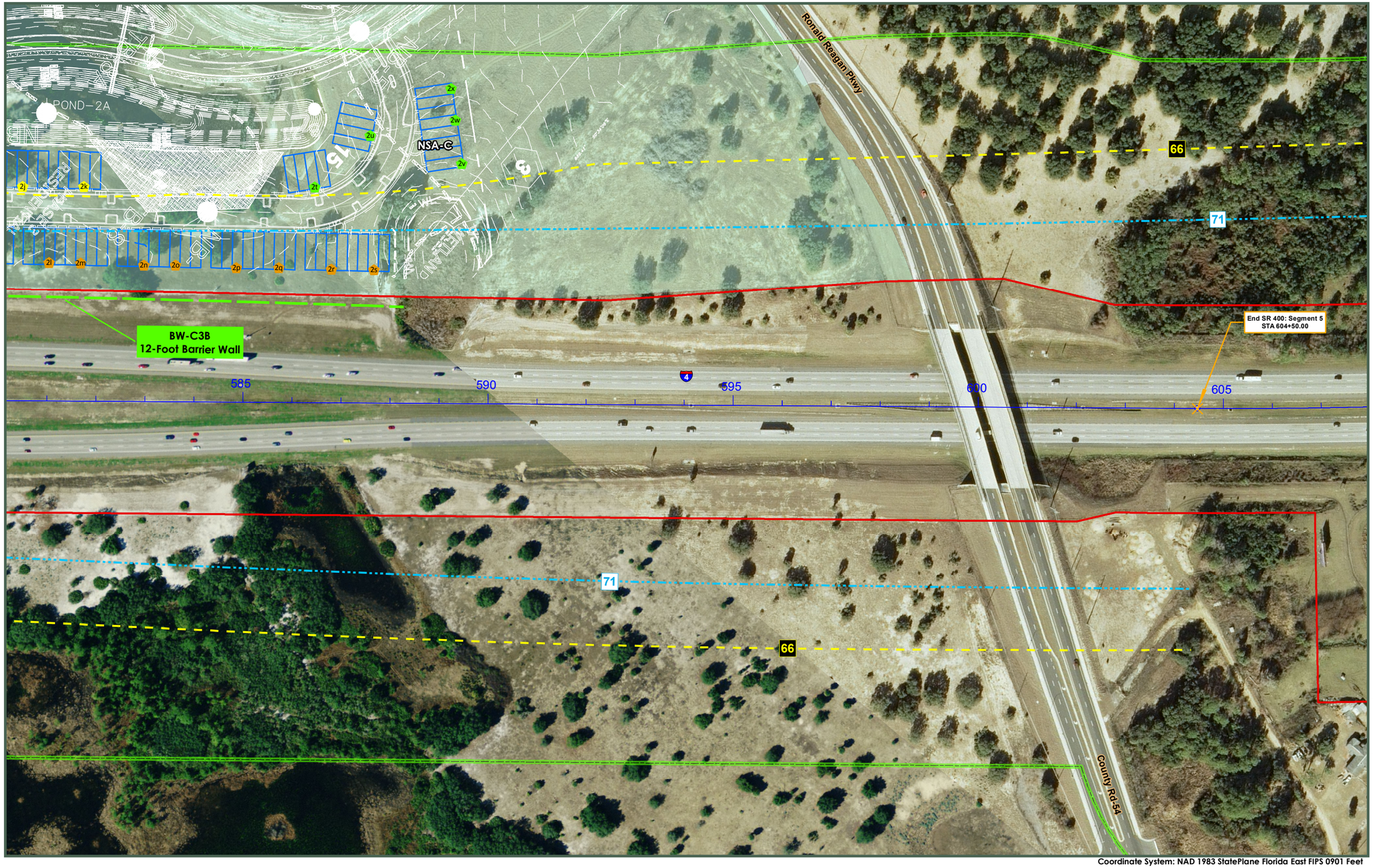
Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 8 of 9 : Noise Analysis Map



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (8/31/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Noise Sensitive Area (NSA)

- NSA-A
- NSA-B
- NSA-C

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- Impacted/Benefited

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- Impacted/No Benefit
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- Kampgrounds of America (KOA) Orlando Southwest
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Noise Decibel Contours

- 66 dB Contour
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Noise Barrier Walls

- Proposed Wall (Cost Reasonable)
- Proposed Wall (Not Cost Reasonable or Feasible)

Title:

NOISE STUDY REPORT: Segment 5 - Noise Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 5: SR 400 (I-4) from W of SR 25/US 27 to W of CR 532

Project Location:
16320 Polk County
STA 368+50.00 (Begin)
STA 604+50.00 (End)

Prepared by: mLeonard 5/9/2016
Technical Review by: mDrauer 5/9/2016
Independent Review by: jMoore 5/9/2016

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 100 200 400 Feet

Figure B - Sheet 9 of 9 : Noise Analysis Map

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APPENDIX III

TNM RESULTS

Stantec
M Drauer

23 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Existing
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
Val Pt 1	1	1	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	8	-8.0
themeworld 1f	3	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
themeworld 1j	4	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
themeworld 1k	5	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
themeworld 1l	6	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
themworld 1m	7	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
Theme RV Pool	8	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
themeworld 1n	9	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
themeworld 1o	10	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
themeworld 1p	11	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
themeworld 1q	12	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
Themeworld Playground	13	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
Fort Summit KOA Pool	14	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
Fort Summit KOA 1	15	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0
Fort Summit KOA 2	16	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
Fort Summit KOA 3	17	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
Fort Summit KOA 4	18	1	0.0	60.5	66	60.5	10	----	60.5	0.0	8	-8.0
Ramada Pool	19	1	0.0	61.0	66	61.0	10	----	61.0	0.0	8	-8.0
Quality Pool	20	1	0.0	57.0	66	57.0	10	----	57.0	0.0	8	-8.0
Holiday Inn Express Pool	21	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
Home Suites	22	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
Comfort Pool	23	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Festiva 1	24	6	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
Festiva 3	25	8	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
Festiva 2	26	9	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0

Festiva 4	27	9	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Festiva 5	28	2	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
Festiva 6	29	2	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
Themeworld 1g	30	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Themeworld 1e	31	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Themeworld 1i	32	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
Themeworld 1h	33	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
Themeworld 1d	34	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
Themeworld 1c	35	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
Themeworld 1b	36	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
Themeworld 1a	37	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Themeworld 2b	38	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
Themeworld 2c	39	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
Themeworld 2d	40	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
Themeworld 2e	41	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
Themeworld 2f	42	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
Themeworld 3b	43	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
Themeworld 3c	44	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
Themeworld 3d	45	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
Themeworld 3e	46	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0
Themeworld 3f	47	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
Themeworld 3g	48	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Themeworld 4c	49	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
Themeworld 4d	50	1	0.0	57.1	66	57.1	10	----	57.1	0.0	8	-8.0
Themeworld 4e	51	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
Themeworld 4f	52	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Themeworld 4g	53	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
Themeworld 4h	54	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
Themeworld 4i	55	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
Themeworld 5a	56	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Themeworld 5b	57	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
Themeworld 5c	58	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
Themeworld 5d	59	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Themeworld 2g	60	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Themeworld 2h	61	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
Themeworld 2i	62	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
Themeworld 2j	63	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
Themeworld 2k	64	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
Themeworld 2l	65	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
Festiva 2nd a	67	6	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Festiva 2nd b	68	4	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Festiva 2nd c	69	6	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0

themeworld 2m	70	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
themeworld 2n	71	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
themeworld 2a	72	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
themeworld 3a	73	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
themeworld 4b	74	1	0.0	57.8	66	57.8	10	----	57.8	0.0	8	-8.0
themeworld 4a	75	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	116	0.0	0.0	0.0
All Impacted	24	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

3 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Existing
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
Val Pt 1	1	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1f	3	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1j	4	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1k	5	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1l	6	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themworld 1m	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Theme RV Pool	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1n	9	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1o	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1p	11	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1q	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld Playground	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA Pool	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 1	15	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 2	16	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 3	17	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 4	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Ramada Pool	19	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Holiday Inn Express Pool	21	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Home Suites	22	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Comfort Pool	23	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Festiva 1	24	6	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
Festiva 3	25	8	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
Festiva 2	26	9	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0

Festiva 4	27	9	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Festiva 5	28	2	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
Festiva 6	29	2	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
Themeworld 1g	30	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1e	31	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1i	32	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1h	33	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1d	34	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1c	35	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1b	36	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1a	37	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2b	38	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2c	39	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2d	40	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2e	41	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2f	42	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 3b	43	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 3c	44	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 3d	45	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 3e	46	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 3f	47	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 3g	48	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4c	49	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4d	50	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4e	51	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4f	52	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4g	53	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4h	54	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 4i	55	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 5a	56	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 5b	57	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 5c	58	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 5d	59	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2g	60	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2h	61	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2i	62	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2j	63	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2k	64	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 2l	65	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Festiva 2nd a	67	6	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Festiva 2nd b	68	4	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Festiva 2nd c	69	6	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0

themeworld 2m	70	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 2n	71	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 2a	72	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 3a	73	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 4b	74	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 4a	75	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
F Phase 2 a	76	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
F Phase 2 b	77	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
F Phase 2 c	78	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
F Phase 2 d	79	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
F Phase 2 e	80	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
F Phase 2 f	81	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
F Phase 2 g	82	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
F Phase 2 h	83	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
F Phase 2 i	84	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
F Phase 2 j	85	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
F Phase 2 k	86	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
F Phase 2 l	87	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	8	-8.0
F Phase 2 m	88	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
F Phase 2 n	89	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
F Phase 2 o	90	1	0.0	69.9	66	69.9	10	Snd Lvl	69.9	0.0	8	-8.0
F Phase 2 p	91	1	0.0	70.1	66	70.1	10	Snd Lvl	70.1	0.0	8	-8.0
F Phase 2 q	92	1	0.0	70.2	66	70.2	10	Snd Lvl	70.2	0.0	8	-8.0
F Phase 2 r	93	1	0.0	70.2	66	70.2	10	Snd Lvl	70.2	0.0	8	-8.0
F Phase 2 s	94	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
F Phase 2 t	95	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
F Phase 2 u	96	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
F Phase 2 v	97	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
F Phase 2 w	98	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
F Phase 2 x	99	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	140	0.0	0.0	0.0
All Impacted	20	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

23 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 All
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	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc		LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Themeworld 1f	1	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
Themeworld 1j	2	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
Themeworld 1k	3	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
Themeworld 1l	4	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
Themeworld 1m	5	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
Themeworld RV Pool	6	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Themeworld 1n	7	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
Themeworld 1p	9	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Themeworld 1q	10	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
Themeworld playground	11	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
Fort Summit KOA pool	12	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Fort Summit KOA 2	14	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
Fort Summit KOA 3	15	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
Ramada Pool	18	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
Quality Pool	20	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Holiday Inn Express Pool	22	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
Home Suites	24	1	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
Comfort Pool	26	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
Festiva 1	28	6	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
Festiva 3	29	8	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
Festiva 2	31	9	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
Festiva 4	32	9	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0

Festiva 5	33	2	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0
Festiva 6	34	2	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Themeworld 1g	36	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Themeworld 1e	37	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
themeworld 1i	39	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
themeworld 1h	41	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
themeworld 1d	43	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
themeworld 1c	44	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
themeworld 1b	45	1	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
themeworld 1a	46	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
themeworld 2b	48	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
themeworld 2c	49	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
themeworld 2d	50	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
themeworld 2f	52	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
themeworld 3b	53	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
themeworld 3c	54	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
themeworld 3d	55	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
themeworld 3e	56	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
themeworld 3f	57	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
themeworld 5a	59	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
themeworld 5b	60	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
themeworld 5c	61	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
themeworld 5d	62	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
themeworld 4c	63	1	0.0	58.8	66	58.8	10	----	58.8	0.0	8	-8.0
themeworld 4d	64	1	0.0	58.6	66	58.6	10	----	58.6	0.0	8	-8.0
themeworld 4f	65	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
themeworld 4g	66	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
themeworld 4i	68	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
themeworld 4e	69	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
themeworld 2g	71	1	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
themeworld 2h	72	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
themeworld 2i	73	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
themeworld 2j	74	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
themeworld 2k	75	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
themeworld 2l	76	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
Festiva 2nd a	77	6	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0
Festiva 2nd b	78	4	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
Festiva 2nd c	79	6	0.0	59.9	66	59.9	10	----	59.9	0.0	8	-8.0
themeworld 2m	80	1	0.0	63.6	66	63.6	10	----	63.6	0.0	8	-8.0

themeworld 2n	81	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
themeworld 2a	82	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
themeworld 3a	83	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
themeworld 4b	84	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
themeworld 4a	85	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	115	0.0	0.0	0.0
All Impacted	47	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

2 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festival Phase II
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
Themeworld 1f	1	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1j	2	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1k	3	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1l	4	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1m	5	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld RV Pool	6	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1n	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1o	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1p	9	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1q	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld playground	11	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA pool	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 1	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 2	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 3	15	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fort Summit KOA 4	16	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Holiday Inn Express Pool	22	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Home Suites	24	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Comfort Pool	26	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Festiva 1	28	6	0.0	72.2	66	72.2	10	Snd Lvl	72.2	0.0	8	-8.0
Festiva 3	29	8	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	8	-8.0
Festiva 2	31	9	0.0	74.7	66	74.7	10	Snd Lvl	74.7	0.0	8	-8.0
Festiva 4	32	9	0.0	73.6	66	73.6	10	Snd Lvl	73.6	0.0	8	-8.0

Festiva 5	33	2	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Festiva 6	34	2	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
Themeworld a	36	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld b	37	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Festiva 2nd a	39	6	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
Festiva 2nd b	40	4	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Festiva 2nd c	41	6	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
F Phase 2 d	45	4	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
F Phase 2 g	48	4	0.0	74.4	66	74.4	10	Snd Lvl	74.4	0.0	8	-8.0
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	74.7	0.0	8	-8.0
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
F Phase 2 j	52	4	0.0	65.3	66	65.3	10	----	65.3	0.0	8	-8.0
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
F Phase 2 l	54	4	0.0	74.8	66	74.8	10	Snd Lvl	74.8	0.0	8	-8.0
F Phase 2 m	55	4	0.0	74.9	66	74.9	10	Snd Lvl	74.9	0.0	8	-8.0
F Phase 2 n	56	4	0.0	74.8	66	74.8	10	Snd Lvl	74.8	0.0	8	-8.0
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	75.1	0.0	8	-8.0
F Phase 2 p	59	4	0.0	74.6	66	74.6	10	Snd Lvl	74.6	0.0	8	-8.0
F Phase 2 q	60	4	0.0	75.0	66	75.0	10	Snd Lvl	75.0	0.0	8	-8.0
F Phase 2 r	61	4	0.0	74.8	66	74.8	10	Snd Lvl	74.8	0.0	8	-8.0
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	74.9	0.0	8	-8.0
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	64.1	0.0	8	-8.0
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	165	0.0	0.0	0.0
All Impacted	94	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

BARRIER ANALYSIS

Stantec
M Drauer

24 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld 14'
BARRIER DESIGN: Theme_14

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Theme 14'	W	14.00	14.00	14.00	902	12627				378812
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	378812

Stantec
M Drauer

24 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld 14'
BARRIER DESIGN: Theme_14
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
Themeworld 1f	1	1	0.0	64.5	66	64.5	10	----	62.1	2.4	8	-5.6
Themeworld 1j	2	1	0.0	68.0	66	68.0	10	Snd Lvl	67.4	0.6	8	-7.4
Themeworld 1k	3	1	0.0	68.2	66	68.2	10	Snd Lvl	67.7	0.5	8	-7.5
Themeworld 1l	4	1	0.0	68.1	66	68.1	10	Snd Lvl	67.7	0.4	8	-7.6
Themeworld 1m	5	1	0.0	68.0	66	68.0	10	Snd Lvl	67.6	0.4	8	-7.6
Themeworld 1n	7	1	0.0	67.7	66	67.7	10	Snd Lvl	67.4	0.3	8	-7.7
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	67.5	0.2	8	-7.8
Themeworld 1p	9	1	0.0	67.3	66	67.3	10	Snd Lvl	67.0	0.3	8	-7.7
Themeworld 1q	10	1	0.0	67.9	66	67.9	10	Snd Lvl	67.7	0.2	8	-7.8
Fort Summit KOA pool	12	1	0.0	63.7	66	63.7	10	----	63.6	0.1	8	-7.9
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.9	0.1	8	-7.9
Fort Summit KOA 2	14	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
Fort Summit KOA 3	15	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1d	43	1	0.0	64.0	66	64.0	10	----	62.4	1.6	8	-6.4
themeworld 1c	44	1	0.0	64.1	66	64.1	10	----	61.9	2.2	8	-5.8
themeworld 1b	45	1	0.0	64.1	66	64.1	10	----	61.6	2.5	8	-5.5
themeworld 1a	46	1	0.0	65.0	66	65.0	10	----	61.1	3.9	8	-4.1
themeworld 2b	48	1	0.0	62.3	66	62.3	10	----	59.7	2.6	8	-5.4
themeworld 2c	49	1	0.0	62.4	66	62.4	10	----	60.4	2.0	8	-6.0
themeworld 2d	50	1	0.0	62.2	66	62.2	10	----	59.0	3.2	8	-4.8
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	59.5	3.1	8	-4.9
themeworld 2f	52	1	0.0	62.7	66	62.7	10	----	60.5	2.2	8	-5.8

themeworld 3b	53	1	0.0	61.1	66	61.1	10	----	58.9	2.2	8	-5.8
themeworld 3c	54	1	0.0	60.5	66	60.5	10	----	58.5	2.0	8	-6.0
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	58.7	1.5	8	-6.5
themeworld 3e	56	1	0.0	60.1	66	60.1	10	----	57.6	2.5	8	-5.5
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	57.8	2.6	8	-5.4
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	62.5	2.3	8	-5.7
themeworld 5a	59	1	0.0	67.7	66	67.7	10	Snd Lvl	62.2	5.5	8	-2.5
themeworld 5b	60	1	0.0	66.8	66	66.8	10	Snd Lvl	61.6	5.2	8	-2.8
themeworld 5c	61	1	0.0	66.3	66	66.3	10	Snd Lvl	61.3	5.0	8	-3.0
themeworld 5d	62	1	0.0	65.7	66	65.7	10	----	61.1	4.6	8	-3.4
themeworld 4c	63	1	0.0	58.9	66	58.9	10	----	56.3	2.6	8	-5.4
themeworld 4d	64	1	0.0	58.6	66	58.6	10	----	55.8	2.8	8	-5.2
themeworld 4f	65	1	0.0	58.5	66	58.5	10	----	56.0	2.5	8	-5.5
themeworld 4g	66	1	0.0	58.4	66	58.4	10	----	56.1	2.3	8	-5.7
themeworld 4h	67	1	0.0	58.5	66	58.5	10	----	56.4	2.1	8	-5.9
themeworld 4i	68	1	0.0	59.7	66	59.7	10	----	58.3	1.4	8	-6.6
themeworld 4e	69	1	0.0	58.4	66	58.4	10	----	55.5	2.9	8	-5.1
themeworld 2g	71	1	0.0	65.3	66	65.3	10	----	63.7	1.6	8	-6.4
themeworld 2h	72	1	0.0	64.0	66	64.0	10	----	63.3	0.7	8	-7.3
themeworld 2i	73	1	0.0	63.5	66	63.5	10	----	63.0	0.5	8	-7.5
themeworld 2j	74	1	0.0	63.3	66	63.3	10	----	63.0	0.3	8	-7.7
themeworld 2k	75	1	0.0	63.3	66	63.3	10	----	63.1	0.2	8	-7.8
themeworld 2l	76	1	0.0	63.2	66	63.2	10	----	63.0	0.2	8	-7.8
themeworld 2m	77	1	0.0	63.6	66	63.6	10	----	63.5	0.1	8	-7.9
themeworld 2n	78	1	0.0	65.2	66	65.2	10	----	65.1	0.1	8	-7.9
themeworld 2a	79	1	0.0	65.0	66	65.0	10	----	60.2	4.8	8	-3.2
themeworld 3a	80	1	0.0	63.6	66	63.6	10	----	59.9	3.7	8	-4.3
themeworld 4b	81	1	0.0	59.7	66	59.7	10	----	57.2	2.5	8	-5.5
themeworld 4a	82	1	0.0	63.2	66	63.2	10	----	59.3	3.9	8	-4.1
Themeworld RV Pool	6	1	0.0	65.0	66	65.0	10	----	62.7	2.3	8	-5.7
Themeworld playground	11	1	0.0	70.4	66	70.4	10	Snd Lvl	70.2	0.2	8	-7.8
Themeworld 1g	36	1	0.0	64.9	66	64.9	10	----	63.0	1.9	8	-6.1
Themeworld 1e	37	1	0.0	64.8	66	64.8	10	----	62.1	2.7	8	-5.3
themeworld 1i	39	1	0.0	68.0	66	68.0	10	Snd Lvl	66.9	1.1	8	-6.9
themeworld 1h	41	1	0.0	66.5	66	66.5	10	Snd Lvl	65.4	1.1	8	-6.9

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	1.8	5.5
All Impacted	14	0.2	1.5	5.5
All that meet NR Goal	0	0.0	0.0	0.0

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24 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 16

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Theme ROW	W	16.00	16.00	16.00	1455	23275				698252
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	698252

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24 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 16
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
Themeworld 1f	1	1	0.0	64.3	66	64.3	10	----	61.3	3.0	8	-5.0
Themeworld 1j	2	1	0.0	68.1	66	68.1	10	Snd Lvl	64.0	4.1	8	-3.9
Themeworld 1k	3	1	0.0	68.2	66	68.2	10	Snd Lvl	64.0	4.2	8	-3.8
Themeworld 1l	4	1	0.0	68.2	66	68.2	10	Snd Lvl	63.9	4.3	8	-3.7
Themeworld 1m	5	1	0.0	68.1	66	68.1	10	Snd Lvl	63.7	4.4	8	-3.6
Themeworld 1n	7	1	0.0	67.8	66	67.8	10	Snd Lvl	63.5	4.3	8	-3.7
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	63.3	4.4	8	-3.6
Themeworld 1p	9	1	0.0	67.3	66	67.3	10	Snd Lvl	63.2	4.1	8	-3.9
Themeworld 1q	10	1	0.0	67.9	66	67.9	10	Snd Lvl	63.4	4.5	8	-3.5
Fort Summit KOA pool	12	1	0.0	63.7	66	63.7	10	----	63.5	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.7	0.3	8	-7.7
Fort Summit KOA 2	14	1	0.0	61.2	66	61.2	10	----	60.9	0.3	8	-7.7
Fort Summit KOA 3	15	1	0.0	61.8	66	61.8	10	----	61.7	0.1	8	-7.9
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.6	0.1	8	-7.9
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1d	43	1	0.0	63.2	66	63.2	10	----	61.2	2.0	8	-6.0
themeworld 1c	44	1	0.0	63.2	66	63.2	10	----	61.5	1.7	8	-6.3
themeworld 1b	45	1	0.0	63.0	66	63.0	10	----	61.6	1.4	8	-6.6
themeworld 1a	46	1	0.0	64.3	66	64.3	10	----	60.7	3.6	8	-4.4
themeworld 2b	48	1	0.0	61.8	66	61.8	10	----	59.8	2.0	8	-6.0
themeworld 2c	49	1	0.0	61.8	66	61.8	10	----	62.0	-0.2	8	-8.2
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	58.2	3.9	8	-4.1
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	58.6	4.0	8	-4.0
themeworld 2f	52	1	0.0	62.3	66	62.3	10	----	58.7	3.6	8	-4.4

themeworld 3b	53	1	0.0	61.1	66	61.1	10	----	58.4	2.7	8	-5.3
themeworld 3c	54	1	0.0	60.6	66	60.6	10	----	58.1	2.5	8	-5.5
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	59.4	0.8	8	-7.2
themeworld 3e	56	1	0.0	60.2	66	60.2	10	----	57.8	2.4	8	-5.6
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	56.4	4.0	8	-4.0
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	58.7	6.1	8	-1.9
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	61.5	6.1	8	-1.9
themeworld 5b	60	1	0.0	66.8	66	66.8	10	Snd Lvl	61.0	5.8	8	-2.2
themeworld 5c	61	1	0.0	66.1	66	66.1	10	Snd Lvl	60.8	5.3	8	-2.7
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.7	4.9	8	-3.1
themeworld 4c	63	1	0.0	59.0	66	59.0	10	----	56.1	2.9	8	-5.1
themeworld 4d	64	1	0.0	58.6	66	58.6	10	----	55.6	3.0	8	-5.0
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.4	3.0	8	-5.0
themeworld 4g	66	1	0.0	58.3	66	58.3	10	----	55.5	2.8	8	-5.2
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.5	2.9	8	-5.1
themeworld 4i	68	1	0.0	59.5	66	59.5	10	----	56.2	3.3	8	-4.7
themeworld 4e	69	1	0.0	58.4	66	58.4	10	----	55.9	2.5	8	-5.5
themeworld 2g	71	1	0.0	65.4	66	65.4	10	----	61.5	3.9	8	-4.1
themeworld 2h	72	1	0.0	63.9	66	63.9	10	----	60.6	3.3	8	-4.7
themeworld 2i	73	1	0.0	63.4	66	63.4	10	----	60.3	3.1	8	-4.9
themeworld 2j	74	1	0.0	63.2	66	63.2	10	----	60.2	3.0	8	-5.0
themeworld 2k	75	1	0.0	63.2	66	63.2	10	----	60.1	3.1	8	-4.9
themeworld 2l	76	1	0.0	63.1	66	63.1	10	----	60.4	2.7	8	-5.3
themeworld 2m	77	1	0.0	63.5	66	63.5	10	----	60.9	2.6	8	-5.4
themeworld 2n	78	1	0.0	65.3	66	65.3	10	----	62.0	3.3	8	-4.7
themeworld 2a	79	1	0.0	64.8	66	64.8	10	----	59.9	4.9	8	-3.1
themeworld 3a	80	1	0.0	65.0	66	65.0	10	----	59.6	5.4	8	-2.6
themeworld 4b	81	1	0.0	59.3	66	59.3	10	----	57.1	2.2	8	-5.8
themeworld 4a	82	1	0.0	61.5	66	61.5	10	----	59.2	2.3	8	-5.7
Themeworld RV Pool	6	1	0.0	64.9	66	64.9	10	----	59.5	5.4	8	-2.6
Themeworld playground	11	1	0.0	70.4	66	70.4	10	Snd Lvl	68.0	2.4	8	-5.6
Themeworld 1g	36	1	0.0	64.8	66	64.8	10	----	59.1	5.7	8	-2.3
Themeworld 1e	37	1	0.0	64.4	66	64.4	10	----	59.1	5.3	8	-2.7
themeworld 1i	39	1	0.0	68.1	66	68.1	10	Snd Lvl	63.5	4.6	8	-3.4
themeworld 1h	41	1	0.0	66.3	66	66.3	10	Snd Lvl	60.4	5.9	8	-2.1

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	-0.2	3.2	6.1
All Impacted	14	2.4	4.6	6.1
All that meet NR Goal	0	0.0	0.0	0.0

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24 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 18

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Theme ROW	W	18.00	18.00	18.00	1455	26184				785533
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	785533

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24 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 18
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
Themeworld 1f	1	1	0.0	64.3	66	64.3	10	----	60.8	3.5	8	-4.5
Themeworld 1j	2	1	0.0	68.1	66	68.1	10	Snd Lvl	62.9	5.2	8	-2.8
Themeworld 1k	3	1	0.0	68.2	66	68.2	10	Snd Lvl	62.9	5.3	8	-2.7
Themeworld 1l	4	1	0.0	68.2	66	68.2	10	Snd Lvl	62.9	5.3	8	-2.7
Themeworld 1m	5	1	0.0	68.1	66	68.1	10	Snd Lvl	62.7	5.4	8	-2.6
Themeworld 1n	7	1	0.0	67.8	66	67.8	10	Snd Lvl	62.6	5.2	8	-2.8
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	62.4	5.3	8	-2.7
Themeworld 1p	9	1	0.0	67.3	66	67.3	10	Snd Lvl	62.5	4.8	8	-3.2
Themeworld 1q	10	1	0.0	67.9	66	67.9	10	Snd Lvl	62.7	5.2	8	-2.8
Fort Summit KOA pool	12	1	0.0	63.7	66	63.7	10	----	63.5	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.2	66	61.2	10	----	60.9	0.3	8	-7.7
Fort Summit KOA 3	15	1	0.0	61.8	66	61.8	10	----	61.7	0.1	8	-7.9
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.6	0.1	8	-7.9
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1d	43	1	0.0	63.2	66	63.2	10	----	60.7	2.5	8	-5.5
themeworld 1c	44	1	0.0	63.2	66	63.2	10	----	61.0	2.2	8	-5.8
themeworld 1b	45	1	0.0	63.0	66	63.0	10	----	61.1	1.9	8	-6.1
themeworld 1a	46	1	0.0	64.3	66	64.3	10	----	60.1	4.2	8	-3.8
themeworld 2b	48	1	0.0	61.8	66	61.8	10	----	59.3	2.5	8	-5.5
themeworld 2c	49	1	0.0	61.8	66	61.8	10	----	61.7	0.1	8	-7.9
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	57.9	4.2	8	-3.8
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	58.3	4.3	8	-3.7
themeworld 2f	52	1	0.0	62.3	66	62.3	10	----	58.3	4.0	8	-4.0

themeworld 3b	53	1	0.0	61.1	66	61.1	10	----	58.0	3.1	8	-4.9
themeworld 3c	54	1	0.0	60.6	66	60.6	10	----	57.7	2.9	8	-5.1
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	59.2	1.0	8	-7.0
themeworld 3e	56	1	0.0	60.2	66	60.2	10	----	57.5	2.7	8	-5.3
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	56.2	4.2	8	-3.8
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	58.2	6.6	8	-1.4
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	61.0	6.6	8	-1.4
themeworld 5b	60	1	0.0	66.8	66	66.8	10	Snd Lvl	60.6	6.2	8	-1.8
themeworld 5c	61	1	0.0	66.1	66	66.1	10	Snd Lvl	60.4	5.7	8	-2.3
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.4	5.2	8	-2.8
themeworld 4c	63	1	0.0	59.0	66	59.0	10	----	55.7	3.3	8	-4.7
themeworld 4d	64	1	0.0	58.6	66	58.6	10	----	55.3	3.3	8	-4.7
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.2	3.2	8	-4.8
themeworld 4g	66	1	0.0	58.3	66	58.3	10	----	55.3	3.0	8	-5.0
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 4i	68	1	0.0	59.5	66	59.5	10	----	56.0	3.5	8	-4.5
themeworld 4e	69	1	0.0	58.4	66	58.4	10	----	55.7	2.7	8	-5.3
themeworld 2g	71	1	0.0	65.4	66	65.4	10	----	60.7	4.7	8	-3.3
themeworld 2h	72	1	0.0	63.9	66	63.9	10	----	59.9	4.0	8	-4.0
themeworld 2i	73	1	0.0	63.4	66	63.4	10	----	59.6	3.8	8	-4.2
themeworld 2j	74	1	0.0	63.2	66	63.2	10	----	59.6	3.6	8	-4.4
themeworld 2k	75	1	0.0	63.2	66	63.2	10	----	59.6	3.6	8	-4.4
themeworld 2l	76	1	0.0	63.1	66	63.1	10	----	59.9	3.2	8	-4.8
themeworld 2m	77	1	0.0	63.5	66	63.5	10	----	60.5	3.0	8	-5.0
themeworld 2n	78	1	0.0	65.3	66	65.3	10	----	61.5	3.8	8	-4.2
themeworld 2a	79	1	0.0	64.8	66	64.8	10	----	59.4	5.4	8	-2.6
themeworld 3a	80	1	0.0	65.0	66	65.0	10	----	59.2	5.8	8	-2.2
themeworld 4b	81	1	0.0	59.3	66	59.3	10	----	56.8	2.5	8	-5.5
themeworld 4a	82	1	0.0	61.5	66	61.5	10	----	58.9	2.6	8	-5.4
Themeworld RV Pool	6	1	0.0	64.9	66	64.9	10	----	59.1	5.8	8	-2.2
Themeworld playground	11	1	0.0	70.4	66	70.4	10	Snd Lvl	67.7	2.7	8	-5.3
Themeworld 1g	36	1	0.0	64.8	66	64.8	10	----	58.7	6.1	8	-1.9
Themeworld 1e	37	1	0.0	64.4	66	64.4	10	----	58.7	5.7	8	-2.3
themeworld 1i	39	1	0.0	68.1	66	68.1	10	Snd Lvl	62.5	5.6	8	-2.4
themeworld 1h	41	1	0.0	66.3	66	66.3	10	Snd Lvl	59.9	6.4	8	-1.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	3.6	6.6
All Impacted	14	2.7	5.3	6.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 24 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 20

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Theme ROW	W	20.00	20.00	20.00	1455	29094				872814
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	872814

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24 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 20

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
Themeworld 1f	1	1	0.0	64.3	66	64.3	10	----	60.5	3.8	8	-4.2
Themeworld 1j	2	1	0.0	68.1	66	68.1	10	Snd Lvl	62.0	6.1	8	-1.9
Themeworld 1k	3	1	0.0	68.2	66	68.2	10	Snd Lvl	62.0	6.2	8	-1.8
Themeworld 1l	4	1	0.0	68.2	66	68.2	10	Snd Lvl	62.0	6.2	8	-1.8
Themeworld 1m	5	1	0.0	68.1	66	68.1	10	Snd Lvl	61.9	6.2	8	-1.8
Themeworld 1n	7	1	0.0	67.8	66	67.8	10	Snd Lvl	61.8	6.0	8	-2.0
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	61.7	6.0	8	-2.0
Themeworld 1p	9	1	0.0	67.3	66	67.3	10	Snd Lvl	61.8	5.5	8	-2.5
Themeworld 1q	10	1	0.0	67.9	66	67.9	10	Snd Lvl	62.1	5.8	8	-2.2
Fort Summit KOA pool	12	1	0.0	63.7	66	63.7	10	----	63.5	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.2	66	61.2	10	----	60.9	0.3	8	-7.7
Fort Summit KOA 3	15	1	0.0	61.8	66	61.8	10	----	61.6	0.2	8	-7.8
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.6	0.1	8	-7.9
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1d	43	1	0.0	63.2	66	63.2	10	----	60.2	3.0	8	-5.0
themeworld 1c	44	1	0.0	63.2	66	63.2	10	----	60.6	2.6	8	-5.4
themeworld 1b	45	1	0.0	63.0	66	63.0	10	----	60.6	2.4	8	-5.6
themeworld 1a	46	1	0.0	64.3	66	64.3	10	----	59.6	4.7	8	-3.3
themeworld 2b	48	1	0.0	61.8	66	61.8	10	----	58.9	2.9	8	-5.1
themeworld 2c	49	1	0.0	61.8	66	61.8	10	----	61.2	0.6	8	-7.4
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	57.6	4.5	8	-3.5
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	57.9	4.7	8	-3.3
themeworld 2f	52	1	0.0	62.3	66	62.3	10	----	57.9	4.4	8	-3.6

themeworld 3b	53	1	0.0	61.1	66	61.1	10	----	57.6	3.5	8	-4.5
themeworld 3c	54	1	0.0	60.6	66	60.6	10	----	57.5	3.1	8	-4.9
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	59.0	1.2	8	-6.8
themeworld 3e	56	1	0.0	60.2	66	60.2	10	----	57.3	2.9	8	-5.1
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	55.9	4.5	8	-3.5
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	57.8	7.0	8	-1.0
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	60.6	7.0	8	-1.0
themeworld 5b	60	1	0.0	66.8	66	66.8	10	Snd Lvl	60.2	6.6	8	-1.4
themeworld 5c	61	1	0.0	66.1	66	66.1	10	Snd Lvl	60.0	6.1	8	-1.9
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.1	5.5	8	-2.5
themeworld 4c	63	1	0.0	59.0	66	59.0	10	----	55.4	3.6	8	-4.4
themeworld 4d	64	1	0.0	58.6	66	58.6	10	----	55.0	3.6	8	-4.4
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.0	3.4	8	-4.6
themeworld 4g	66	1	0.0	58.3	66	58.3	10	----	55.1	3.2	8	-4.8
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.0	3.4	8	-4.6
themeworld 4i	68	1	0.0	59.5	66	59.5	10	----	55.7	3.8	8	-4.2
themeworld 4e	69	1	0.0	58.4	66	58.4	10	----	55.5	2.9	8	-5.1
themeworld 2g	71	1	0.0	65.4	66	65.4	10	----	60.1	5.3	8	-2.7
themeworld 2h	72	1	0.0	63.9	66	63.9	10	----	59.3	4.6	8	-3.4
themeworld 2i	73	1	0.0	63.4	66	63.4	10	----	59.1	4.3	8	-3.7
themeworld 2j	74	1	0.0	63.2	66	63.2	10	----	59.1	4.1	8	-3.9
themeworld 2k	75	1	0.0	63.2	66	63.2	10	----	59.1	4.1	8	-3.9
themeworld 2l	76	1	0.0	63.1	66	63.1	10	----	59.5	3.6	8	-4.4
themeworld 2m	77	1	0.0	63.5	66	63.5	10	----	60.1	3.4	8	-4.6
themeworld 2n	78	1	0.0	65.3	66	65.3	10	----	61.2	4.1	8	-3.9
themeworld 2a	79	1	0.0	64.8	66	64.8	10	----	59.0	5.8	8	-2.2
themeworld 3a	80	1	0.0	65.0	66	65.0	10	----	58.8	6.2	8	-1.8
themeworld 4b	81	1	0.0	59.3	66	59.3	10	----	56.5	2.8	8	-5.2
themeworld 4a	82	1	0.0	61.5	66	61.5	10	----	58.6	2.9	8	-5.1
Themeworld RV Pool	6	1	0.0	64.9	66	64.9	10	----	58.7	6.2	8	-1.8
Themeworld playground	11	1	0.0	70.4	66	70.4	10	Snd Lvl	67.5	2.9	8	-5.1
Themeworld 1g	36	1	0.0	64.8	66	64.8	10	----	58.3	6.5	8	-1.5
Themeworld 1e	37	1	0.0	64.4	66	64.4	10	----	58.3	6.1	8	-1.9
themeworld 1i	39	1	0.0	68.1	66	68.1	10	Snd Lvl	61.7	6.4	8	-1.6
themeworld 1h	41	1	0.0	66.3	66	66.3	10	Snd Lvl	59.5	6.8	8	-1.2

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	4.0	7.0
All Impacted	14	2.9	6.0	7.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

24 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 22

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Theme ROW	W	22.00	22.00	22.00	1455	32003				960096
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	960096

Stantec
M Drauer

24 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Themeworld ROW
BARRIER DESIGN: ROW 22
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
Themeworld 1f	1	1	0.0	64.3	66	64.3	10	----	60.3	4.0	8	-4.0
Themeworld 1j	2	1	0.0	68.1	66	68.1	10	Snd Lvl	61.3	6.8	8	-1.2
Themeworld 1k	3	1	0.0	68.2	66	68.2	10	Snd Lvl	61.3	6.9	8	-1.1
Themeworld 1l	4	1	0.0	68.2	66	68.2	10	Snd Lvl	61.2	7.0	8	-1.0
Themeworld 1m	5	1	0.0	68.1	66	68.1	10	Snd Lvl	61.1	7.0	8	-1.0
Themeworld 1n	7	1	0.0	67.8	66	67.8	10	Snd Lvl	61.1	6.7	8	-1.3
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	61.0	6.7	8	-1.3
Themeworld 1p	9	1	0.0	67.3	66	67.3	10	Snd Lvl	61.2	6.1	8	-1.9
Themeworld 1q	10	1	0.0	67.9	66	67.9	10	Snd Lvl	61.6	6.3	8	-1.7
Fort Summit KOA pool	12	1	0.0	63.7	66	63.7	10	----	63.5	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.2	66	61.2	10	----	60.8	0.4	8	-7.6
Fort Summit KOA 3	15	1	0.0	61.8	66	61.8	10	----	61.6	0.2	8	-7.8
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.6	0.1	8	-7.9
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
themeworld 1d	43	1	0.0	63.2	66	63.2	10	----	59.8	3.4	8	-4.6
themeworld 1c	44	1	0.0	63.2	66	63.2	10	----	60.1	3.1	8	-4.9
themeworld 1b	45	1	0.0	63.0	66	63.0	10	----	60.1	2.9	8	-5.1
themeworld 1a	46	1	0.0	64.3	66	64.3	10	----	59.2	5.1	8	-2.9
themeworld 2b	48	1	0.0	61.8	66	61.8	10	----	58.5	3.3	8	-4.7
themeworld 2c	49	1	0.0	61.8	66	61.8	10	----	60.9	0.9	8	-7.1
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	57.3	4.8	8	-3.2
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	57.6	5.0	8	-3.0
themeworld 2f	52	1	0.0	62.3	66	62.3	10	----	57.6	4.7	8	-3.3

themeworld 3b	53	1	0.0	61.1	66	61.1	10	----	57.3	3.8	8	-4.2
themeworld 3c	54	1	0.0	60.6	66	60.6	10	----	57.2	3.4	8	-4.6
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	58.3	1.9	8	-6.1
themeworld 3e	56	1	0.0	60.2	66	60.2	10	----	57.1	3.1	8	-4.9
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	55.7	4.7	8	-3.3
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	57.4	7.4	8	-0.6
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	60.2	7.4	8	-0.6
themeworld 5b	60	1	0.0	66.8	66	66.8	10	Snd Lvl	59.9	6.9	8	-1.1
themeworld 5c	61	1	0.0	66.1	66	66.1	10	Snd Lvl	59.7	6.4	8	-1.6
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	59.8	5.8	8	-2.2
themeworld 4c	63	1	0.0	59.0	66	59.0	10	----	55.2	3.8	8	-4.2
themeworld 4d	64	1	0.0	58.6	66	58.6	10	----	54.8	3.8	8	-4.2
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	54.8	3.6	8	-4.4
themeworld 4g	66	1	0.0	58.3	66	58.3	10	----	54.9	3.4	8	-4.6
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	54.8	3.6	8	-4.4
themeworld 4i	68	1	0.0	59.5	66	59.5	10	----	55.5	4.0	8	-4.0
themeworld 4e	69	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 2g	71	1	0.0	65.4	66	65.4	10	----	59.6	5.8	8	-2.2
themeworld 2h	72	1	0.0	63.9	66	63.9	10	----	58.9	5.0	8	-3.0
themeworld 2i	73	1	0.0	63.4	66	63.4	10	----	58.7	4.7	8	-3.3
themeworld 2j	74	1	0.0	63.2	66	63.2	10	----	58.6	4.6	8	-3.4
themeworld 2k	75	1	0.0	63.2	66	63.2	10	----	58.6	4.6	8	-3.4
themeworld 2l	76	1	0.0	63.1	66	63.1	10	----	59.1	4.0	8	-4.0
themeworld 2m	77	1	0.0	63.5	66	63.5	10	----	59.7	3.8	8	-4.2
themeworld 2n	78	1	0.0	65.3	66	65.3	10	----	60.9	4.4	8	-3.6
themeworld 2a	79	1	0.0	64.8	66	64.8	10	----	58.6	6.2	8	-1.8
themeworld 3a	80	1	0.0	65.0	66	65.0	10	----	58.4	6.6	8	-1.4
themeworld 4b	81	1	0.0	59.3	66	59.3	10	----	56.3	3.0	8	-5.0
themeworld 4a	82	1	0.0	61.5	66	61.5	10	----	58.3	3.2	8	-4.8
Themeworld RV Pool	6	1	0.0	64.9	66	64.9	10	----	58.5	6.4	8	-1.6
Themeworld playground	11	1	0.0	70.4	66	70.4	10	Snd Lvl	67.3	3.1	8	-4.9
Themeworld 1g	36	1	0.0	64.8	66	64.8	10	----	57.9	6.9	8	-1.1
Themeworld 1e	37	1	0.0	64.4	66	64.4	10	----	58.0	6.4	8	-1.6
themeworld 1i	39	1	0.0	68.1	66	68.1	10	Snd Lvl	61.0	7.1	8	-0.9
themeworld 1h	41	1	0.0	66.3	66	66.3	10	Snd Lvl	59.0	7.3	8	-0.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	4.4	7.4
All Impacted	14	3.1	6.5	7.4
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 23 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO22

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
ROW Themeworld	W	22.00	22.00	22.00	828	18211				546317
14' shoulder	W	14.00	14.00	14.00	992	13892				416761
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	963078

Stantec
M Drauer

23 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO22
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
Themeworld 1f	1	1	0.0	64.1	66	64.1	10	----	58.5	5.6	8	-2.4
Themeworld 1j	2	1	0.0	68.0	66	68.0	10	Snd Lvl	61.0	7.0	8	-1.0
Themeworld 1k	3	1	0.0	68.1	66	68.1	10	Snd Lvl	60.8	7.3	8	-0.7
Themeworld 1l	4	1	0.0	68.0	66	68.0	10	Snd Lvl	60.8	7.2	8	-0.8
Themeworld 1m	5	1	0.0	68.0	66	68.0	10	Snd Lvl	60.7	7.3	8	-0.7
Themeworld RV Pool	6	1	0.0	65.0	66	65.0	10	----	59.0	6.0	8	-2.0
Themeworld 1n	7	1	0.0	67.9	66	67.9	10	Snd Lvl	60.6	7.3	8	-0.7
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	60.6	7.1	8	-0.9
Themeworld 1p	9	1	0.0	67.5	66	67.5	10	Snd Lvl	60.9	6.6	8	-1.4
Themeworld 1q	10	1	0.0	68.0	66	68.0	10	Snd Lvl	61.3	6.7	8	-1.3
Themeworld playground	11	1	0.0	70.3	66	70.3	10	Snd Lvl	67.3	3.0	8	-5.0
Fort Summit KOA pool	12	1	0.0	63.8	66	63.8	10	----	63.6	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.3	66	61.3	10	----	60.8	0.5	8	-7.5
Fort Summit KOA 3	15	1	0.0	61.9	66	61.9	10	----	61.6	0.3	8	-7.7
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.5	0.2	8	-7.8
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1g	36	1	0.0	64.7	66	64.7	10	----	58.2	6.5	8	-1.5
Themeworld 1e	37	1	0.0	64.6	66	64.6	10	----	58.4	6.2	8	-1.8
themeworld 1i	39	1	0.0	67.9	66	67.9	10	Snd Lvl	60.7	7.2	8	-0.8
themeworld 1h	41	1	0.0	66.6	66	66.6	10	Snd Lvl	59.0	7.6	8	-0.4
themeworld 1d	43	1	0.0	63.3	66	63.3	10	----	60.9	2.4	8	-5.6
themeworld 1c	44	1	0.0	63.3	66	63.3	10	----	60.7	2.6	8	-5.4
themeworld 1b	45	1	0.0	63.1	66	63.1	10	----	60.4	2.7	8	-5.3

themeworld 1a	46	1	0.0	64.4	66	64.4	10	----	59.9	4.5	8	-3.5
themeworld 2b	48	1	0.0	62.0	66	62.0	10	----	59.8	2.2	8	-5.8
themeworld 2c	49	1	0.0	62.0	66	62.0	10	----	59.6	2.4	8	-5.6
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	57.9	4.2	8	-3.8
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	58.1	4.5	8	-3.5
themeworld 2f	52	1	0.0	62.4	66	62.4	10	----	57.9	4.5	8	-3.5
themeworld 3b	53	1	0.0	61.0	66	61.0	10	----	58.4	2.6	8	-5.4
themeworld 3c	54	1	0.0	60.5	66	60.5	10	----	58.0	2.5	8	-5.5
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	58.8	1.4	8	-6.6
themeworld 3e	56	1	0.0	60.1	66	60.1	10	----	57.2	2.9	8	-5.1
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	56.1	4.3	8	-3.7
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	57.5	7.3	8	-0.7
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	61.6	6.0	8	-2.0
themeworld 5b	60	1	0.0	66.9	66	66.9	10	Snd Lvl	61.0	5.9	8	-2.1
themeworld 5c	61	1	0.0	66.3	66	66.3	10	Snd Lvl	60.7	5.6	8	-2.4
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.4	5.2	8	-2.8
themeworld 4c	63	1	0.0	58.8	66	58.8	10	----	56.0	2.8	8	-5.2
themeworld 4d	64	1	0.0	58.5	66	58.5	10	----	55.4	3.1	8	-4.9
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.2	3.2	8	-4.8
themeworld 4g	66	1	0.0	58.4	66	58.4	10	----	55.2	3.2	8	-4.8
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.0	3.4	8	-4.6
themeworld 4i	68	1	0.0	59.7	66	59.7	10	----	55.7	4.0	8	-4.0
themeworld 4e	69	1	0.0	58.3	66	58.3	10	----	55.0	3.3	8	-4.7
themeworld 2g	71	1	0.0	66.5	66	66.5	10	Snd Lvl	60.8	5.7	8	-2.3
themeworld 2h	72	1	0.0	65.0	66	65.0	10	----	60.0	5.0	8	-3.0
themeworld 2i	73	1	0.0	64.6	66	64.6	10	----	59.5	5.1	8	-2.9
themeworld 2j	74	1	0.0	64.2	66	64.2	10	----	59.5	4.7	8	-3.3
themeworld 2k	75	1	0.0	64.2	66	64.2	10	----	59.6	4.6	8	-3.4
themeworld 2l	76	1	0.0	64.3	66	64.3	10	----	59.6	4.7	8	-3.3
themeworld 2m	77	1	0.0	64.9	66	64.9	10	----	59.8	5.1	8	-2.9
themeworld 2n	78	1	0.0	66.2	66	66.2	10	Snd Lvl	60.9	5.3	8	-2.7
themeworld 2a	79	1	0.0	65.2	66	65.2	10	----	59.8	5.4	8	-2.6
themeworld 3a	80	1	0.0	63.5	66	63.5	10	----	59.4	4.1	8	-3.9
themeworld 4b	81	1	0.0	59.5	66	59.5	10	----	56.6	2.9	8	-5.1
themeworld 4a	82	1	0.0	63.4	66	63.4	10	----	59.1	4.3	8	-3.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	4.2	7.6
All Impacted	16	3.0	6.4	7.6
All that meet NR Goal	0	0.0	0.0	0.0

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23 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO20

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
ROW Themeworld	W	20.00	20.00	20.00	828	16555				496652
14' shoulder	W	14.00	14.00	14.00	992	13892				416761
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	913412

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23 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO20

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
Themeworld 1f	1	1	0.0	64.1	66	64.1	10	----	58.7	5.4	8	-2.6
Themeworld 1j	2	1	0.0	68.0	66	68.0	10	Snd Lvl	61.5	6.5	8	-1.5
Themeworld 1k	3	1	0.0	68.1	66	68.1	10	Snd Lvl	61.4	6.7	8	-1.3
Themeworld 1l	4	1	0.0	68.0	66	68.0	10	Snd Lvl	61.4	6.6	8	-1.4
Themeworld 1m	5	1	0.0	68.0	66	68.0	10	Snd Lvl	61.3	6.7	8	-1.3
Themeworld RV Pool	6	1	0.0	65.0	66	65.0	10	----	59.1	5.9	8	-2.1
Themeworld 1n	7	1	0.0	67.9	66	67.9	10	Snd Lvl	61.2	6.7	8	-1.3
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	61.1	6.6	8	-1.4
Themeworld 1p	9	1	0.0	67.5	66	67.5	10	Snd Lvl	61.3	6.2	8	-1.8
Themeworld 1q	10	1	0.0	68.0	66	68.0	10	Snd Lvl	61.7	6.3	8	-1.7
Themeworld playground	11	1	0.0	70.3	66	70.3	10	Snd Lvl	67.4	2.9	8	-5.1
Fort Summit KOA pool	12	1	0.0	63.8	66	63.8	10	----	63.6	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.3	66	61.3	10	----	60.8	0.5	8	-7.5
Fort Summit KOA 3	15	1	0.0	61.9	66	61.9	10	----	61.6	0.3	8	-7.7
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.5	0.2	8	-7.8
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1g	36	1	0.0	64.7	66	64.7	10	----	58.3	6.4	8	-1.6
Themeworld 1e	37	1	0.0	64.6	66	64.6	10	----	58.5	6.1	8	-1.9
themeworld 1i	39	1	0.0	67.9	66	67.9	10	Snd Lvl	61.2	6.7	8	-1.3
themeworld 1h	41	1	0.0	66.6	66	66.6	10	Snd Lvl	59.3	7.3	8	-0.7
themeworld 1d	43	1	0.0	63.3	66	63.3	10	----	61.1	2.2	8	-5.8
themeworld 1c	44	1	0.0	63.3	66	63.3	10	----	60.8	2.5	8	-5.5
themeworld 1b	45	1	0.0	63.1	66	63.1	10	----	60.5	2.6	8	-5.4

themeworld 1a	46	1	0.0	64.4	66	64.4	10	----	60.0	4.4	8	-3.6
themeworld 2b	48	1	0.0	62.0	66	62.0	10	----	59.9	2.1	8	-5.9
themeworld 2c	49	1	0.0	62.0	66	62.0	10	----	59.6	2.4	8	-5.6
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	58.0	4.1	8	-3.9
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	58.1	4.5	8	-3.5
themeworld 2f	52	1	0.0	62.4	66	62.4	10	----	58.0	4.4	8	-3.6
themeworld 3b	53	1	0.0	61.0	66	61.0	10	----	58.5	2.5	8	-5.5
themeworld 3c	54	1	0.0	60.5	66	60.5	10	----	58.0	2.5	8	-5.5
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	58.8	1.4	8	-6.6
themeworld 3e	56	1	0.0	60.1	66	60.1	10	----	57.3	2.8	8	-5.2
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	56.2	4.2	8	-3.8
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	57.8	7.0	8	-1.0
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	61.6	6.0	8	-2.0
themeworld 5b	60	1	0.0	66.9	66	66.9	10	Snd Lvl	61.1	5.8	8	-2.2
themeworld 5c	61	1	0.0	66.3	66	66.3	10	Snd Lvl	60.7	5.6	8	-2.4
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.4	5.2	8	-2.8
themeworld 4c	63	1	0.0	58.8	66	58.8	10	----	56.0	2.8	8	-5.2
themeworld 4d	64	1	0.0	58.5	66	58.5	10	----	55.4	3.1	8	-4.9
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 4g	66	1	0.0	58.4	66	58.4	10	----	55.2	3.2	8	-4.8
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.1	3.3	8	-4.7
themeworld 4i	68	1	0.0	59.7	66	59.7	10	----	55.8	3.9	8	-4.1
themeworld 4e	69	1	0.0	58.3	66	58.3	10	----	55.0	3.3	8	-4.7
themeworld 2g	71	1	0.0	66.5	66	66.5	10	Snd Lvl	61.2	5.3	8	-2.7
themeworld 2h	72	1	0.0	65.0	66	65.0	10	----	60.3	4.7	8	-3.3
themeworld 2i	73	1	0.0	64.6	66	64.6	10	----	59.9	4.7	8	-3.3
themeworld 2j	74	1	0.0	64.2	66	64.2	10	----	59.9	4.3	8	-3.7
themeworld 2k	75	1	0.0	64.2	66	64.2	10	----	59.9	4.3	8	-3.7
themeworld 2l	76	1	0.0	64.3	66	64.3	10	----	60.0	4.3	8	-3.7
themeworld 2m	77	1	0.0	64.9	66	64.9	10	----	60.2	4.7	8	-3.3
themeworld 2n	78	1	0.0	66.2	66	66.2	10	Snd Lvl	61.2	5.0	8	-3.0
themeworld 2a	79	1	0.0	65.2	66	65.2	10	----	59.8	5.4	8	-2.6
themeworld 3a	80	1	0.0	63.5	66	63.5	10	----	59.4	4.1	8	-3.9
themeworld 4b	81	1	0.0	59.5	66	59.5	10	----	56.6	2.9	8	-5.1
themeworld 4a	82	1	0.0	63.4	66	63.4	10	----	59.1	4.3	8	-3.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	4.1	7.3
All Impacted	16	2.9	6.1	7.3
All that meet NR Goal	0	0.0	0.0	0.0

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23 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO18

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
ROW Themeworld	W	18.00	18.00	18.00	828	14900				446986
14' shoulder	W	14.00	14.00	14.00	992	13892				416761
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	863747

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23 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO18

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
Themeworld 1f	1	1	0.0	64.1	66	64.1	10	----	59.0	5.1	8	-2.9
Themeworld 1j	2	1	0.0	68.0	66	68.0	10	Snd Lvl	62.1	5.9	8	-2.1
Themeworld 1k	3	1	0.0	68.1	66	68.1	10	Snd Lvl	62.1	6.0	8	-2.0
Themeworld 1l	4	1	0.0	68.0	66	68.0	10	Snd Lvl	62.1	5.9	8	-2.1
Themeworld 1m	5	1	0.0	68.0	66	68.0	10	Snd Lvl	61.9	6.1	8	-1.9
Themeworld RV Pool	6	1	0.0	65.0	66	65.0	10	----	59.3	5.7	8	-2.3
Themeworld 1n	7	1	0.0	67.9	66	67.9	10	Snd Lvl	61.8	6.1	8	-1.9
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	61.7	6.0	8	-2.0
Themeworld 1p	9	1	0.0	67.5	66	67.5	10	Snd Lvl	61.9	5.6	8	-2.4
Themeworld 1q	10	1	0.0	68.0	66	68.0	10	Snd Lvl	62.2	5.8	8	-2.2
Themeworld playground	11	1	0.0	70.3	66	70.3	10	Snd Lvl	67.5	2.8	8	-5.2
Fort Summit KOA pool	12	1	0.0	63.8	66	63.8	10	----	63.6	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.3	66	61.3	10	----	60.8	0.5	8	-7.5
Fort Summit KOA 3	15	1	0.0	61.9	66	61.9	10	----	61.6	0.3	8	-7.7
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.5	0.2	8	-7.8
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1g	36	1	0.0	64.7	66	64.7	10	----	58.5	6.2	8	-1.8
Themeworld 1e	37	1	0.0	64.6	66	64.6	10	----	58.6	6.0	8	-2.0
themeworld 1i	39	1	0.0	67.9	66	67.9	10	Snd Lvl	61.8	6.1	8	-1.9
themeworld 1h	41	1	0.0	66.6	66	66.6	10	Snd Lvl	59.6	7.0	8	-1.0
themeworld 1d	43	1	0.0	63.3	66	63.3	10	----	61.3	2.0	8	-6.0
themeworld 1c	44	1	0.0	63.3	66	63.3	10	----	61.0	2.3	8	-5.7
themeworld 1b	45	1	0.0	63.1	66	63.1	10	----	60.6	2.5	8	-5.5

themeworld 1a	46	1	0.0	64.4	66	64.4	10	----	60.2	4.2	8	-3.8
themeworld 2b	48	1	0.0	62.0	66	62.0	10	----	59.9	2.1	8	-5.9
themeworld 2c	49	1	0.0	62.0	66	62.0	10	----	59.7	2.3	8	-5.7
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	58.0	4.1	8	-3.9
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	58.2	4.4	8	-3.6
themeworld 2f	52	1	0.0	62.4	66	62.4	10	----	58.2	4.2	8	-3.8
themeworld 3b	53	1	0.0	61.0	66	61.0	10	----	58.5	2.5	8	-5.5
themeworld 3c	54	1	0.0	60.5	66	60.5	10	----	58.0	2.5	8	-5.5
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	58.8	1.4	8	-6.6
themeworld 3e	56	1	0.0	60.1	66	60.1	10	----	57.3	2.8	8	-5.2
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	56.2	4.2	8	-3.8
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	58.0	6.8	8	-1.2
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	61.6	6.0	8	-2.0
themeworld 5b	60	1	0.0	66.9	66	66.9	10	Snd Lvl	61.1	5.8	8	-2.2
themeworld 5c	61	1	0.0	66.3	66	66.3	10	Snd Lvl	60.7	5.6	8	-2.4
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.4	5.2	8	-2.8
themeworld 4c	63	1	0.0	58.8	66	58.8	10	----	56.0	2.8	8	-5.2
themeworld 4d	64	1	0.0	58.5	66	58.5	10	----	55.4	3.1	8	-4.9
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 4g	66	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.2	3.2	8	-4.8
themeworld 4i	68	1	0.0	59.7	66	59.7	10	----	55.9	3.8	8	-4.2
themeworld 4e	69	1	0.0	58.3	66	58.3	10	----	55.0	3.3	8	-4.7
themeworld 2g	71	1	0.0	66.5	66	66.5	10	Snd Lvl	61.5	5.0	8	-3.0
themeworld 2h	72	1	0.0	65.0	66	65.0	10	----	60.8	4.2	8	-3.8
themeworld 2i	73	1	0.0	64.6	66	64.6	10	----	60.4	4.2	8	-3.8
themeworld 2j	74	1	0.0	64.2	66	64.2	10	----	60.3	3.9	8	-4.1
themeworld 2k	75	1	0.0	64.2	66	64.2	10	----	60.3	3.9	8	-4.1
themeworld 2l	76	1	0.0	64.3	66	64.3	10	----	60.3	4.0	8	-4.0
themeworld 2m	77	1	0.0	64.9	66	64.9	10	----	60.5	4.4	8	-3.6
themeworld 2n	78	1	0.0	66.2	66	66.2	10	Snd Lvl	61.5	4.7	8	-3.3
themeworld 2a	79	1	0.0	65.2	66	65.2	10	----	59.9	5.3	8	-2.7
themeworld 3a	80	1	0.0	63.5	66	63.5	10	----	59.5	4.0	8	-4.0
themeworld 4b	81	1	0.0	59.5	66	59.5	10	----	56.6	2.9	8	-5.1
themeworld 4a	82	1	0.0	63.4	66	63.4	10	----	59.1	4.3	8	-3.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	3.9	7.0
All Impacted	16	2.8	5.7	7.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
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23 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO16

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
ROW Themeworld	W	16.00	16.00	16.00	828	13244				397321
14' shoulder	W	14.00	14.00	14.00	992	13892				416761
Retaining Wall	W	2.00	16.65	20.00	2768	46097				0
									Total Cost:	814082

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23 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 ROW + Shoulder
BARRIER DESIGN: COMBO16

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
Themeworld 1f	1	1	0.0	64.1	66	64.1	10	----	59.2	4.9	8	-3.1
Themeworld 1j	2	1	0.0	68.0	66	68.0	10	Snd Lvl	62.9	5.1	8	-2.9
Themeworld 1k	3	1	0.0	68.1	66	68.1	10	Snd Lvl	62.8	5.3	8	-2.7
Themeworld 1l	4	1	0.0	68.0	66	68.0	10	Snd Lvl	62.9	5.1	8	-2.9
Themeworld 1m	5	1	0.0	68.0	66	68.0	10	Snd Lvl	62.6	5.4	8	-2.6
Themeworld RV Pool	6	1	0.0	65.0	66	65.0	10	----	59.5	5.5	8	-2.5
Themeworld 1n	7	1	0.0	67.9	66	67.9	10	Snd Lvl	62.5	5.4	8	-2.6
Themeworld 1o	8	1	0.0	67.7	66	67.7	10	Snd Lvl	62.4	5.3	8	-2.7
Themeworld 1p	9	1	0.0	67.5	66	67.5	10	Snd Lvl	62.5	5.0	8	-3.0
Themeworld 1q	10	1	0.0	68.0	66	68.0	10	Snd Lvl	62.7	5.3	8	-2.7
Themeworld playground	11	1	0.0	70.3	66	70.3	10	Snd Lvl	67.7	2.6	8	-5.4
Fort Summit KOA pool	12	1	0.0	63.8	66	63.8	10	----	63.6	0.2	8	-7.8
Fort Summit KOA 1	13	1	0.0	64.0	66	64.0	10	----	63.6	0.4	8	-7.6
Fort Summit KOA 2	14	1	0.0	61.3	66	61.3	10	----	60.8	0.5	8	-7.5
Fort Summit KOA 3	15	1	0.0	61.9	66	61.9	10	----	61.6	0.3	8	-7.7
Fort Summit KOA 4	16	1	0.0	60.7	66	60.7	10	----	60.5	0.2	8	-7.8
Ramada Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Themeworld 1g	36	1	0.0	64.7	66	64.7	10	----	58.7	6.0	8	-2.0
Themeworld 1e	37	1	0.0	64.6	66	64.6	10	----	58.8	5.8	8	-2.2
themeworld 1i	39	1	0.0	67.9	66	67.9	10	Snd Lvl	62.4	5.5	8	-2.5
themeworld 1h	41	1	0.0	66.6	66	66.6	10	Snd Lvl	59.9	6.7	8	-1.3
themeworld 1d	43	1	0.0	63.3	66	63.3	10	----	61.5	1.8	8	-6.2
themeworld 1c	44	1	0.0	63.3	66	63.3	10	----	61.2	2.1	8	-5.9
themeworld 1b	45	1	0.0	63.1	66	63.1	10	----	60.8	2.3	8	-5.7

themeworld 1a	46	1	0.0	64.4	66	64.4	10	----	60.3	4.1	8	-3.9
themeworld 2b	48	1	0.0	62.0	66	62.0	10	----	59.9	2.1	8	-5.9
themeworld 2c	49	1	0.0	62.0	66	62.0	10	----	59.7	2.3	8	-5.7
themeworld 2d	50	1	0.0	62.1	66	62.1	10	----	58.1	4.0	8	-4.0
themeworld 2e	51	1	0.0	62.6	66	62.6	10	----	58.3	4.3	8	-3.7
themeworld 2f	52	1	0.0	62.4	66	62.4	10	----	58.4	4.0	8	-4.0
themeworld 3b	53	1	0.0	61.0	66	61.0	10	----	58.5	2.5	8	-5.5
themeworld 3c	54	1	0.0	60.5	66	60.5	10	----	58.1	2.4	8	-5.6
themeworld 3d	55	1	0.0	60.2	66	60.2	10	----	58.9	1.3	8	-6.7
themeworld 3e	56	1	0.0	60.1	66	60.1	10	----	57.4	2.7	8	-5.3
themeworld 3f	57	1	0.0	60.4	66	60.4	10	----	56.3	4.1	8	-3.9
themeworld 3g	58	1	0.0	64.8	66	64.8	10	----	58.2	6.6	8	-1.4
themeworld 5a	59	1	0.0	67.6	66	67.6	10	Snd Lvl	61.6	6.0	8	-2.0
themeworld 5b	60	1	0.0	66.9	66	66.9	10	Snd Lvl	61.1	5.8	8	-2.2
themeworld 5c	61	1	0.0	66.3	66	66.3	10	Snd Lvl	60.7	5.6	8	-2.4
themeworld 5d	62	1	0.0	65.6	66	65.6	10	----	60.4	5.2	8	-2.8
themeworld 4c	63	1	0.0	58.8	66	58.8	10	----	56.0	2.8	8	-5.2
themeworld 4d	64	1	0.0	58.5	66	58.5	10	----	55.4	3.1	8	-4.9
themeworld 4f	65	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 4g	66	1	0.0	58.4	66	58.4	10	----	55.4	3.0	8	-5.0
themeworld 4h	67	1	0.0	58.4	66	58.4	10	----	55.3	3.1	8	-4.9
themeworld 4i	68	1	0.0	59.7	66	59.7	10	----	56.1	3.6	8	-4.4
themeworld 4e	69	1	0.0	58.3	66	58.3	10	----	55.1	3.2	8	-4.8
themeworld 2g	71	1	0.0	66.5	66	66.5	10	Snd Lvl	62.0	4.5	8	-3.5
themeworld 2h	72	1	0.0	65.0	66	65.0	10	----	61.3	3.7	8	-4.3
themeworld 2i	73	1	0.0	64.6	66	64.6	10	----	60.9	3.7	8	-4.3
themeworld 2j	74	1	0.0	64.2	66	64.2	10	----	60.8	3.4	8	-4.6
themeworld 2k	75	1	0.0	64.2	66	64.2	10	----	60.8	3.4	8	-4.6
themeworld 2l	76	1	0.0	64.3	66	64.3	10	----	60.8	3.5	8	-4.5
themeworld 2m	77	1	0.0	64.9	66	64.9	10	----	60.9	4.0	8	-4.0
themeworld 2n	78	1	0.0	66.2	66	66.2	10	Snd Lvl	61.9	4.3	8	-3.7
themeworld 2a	79	1	0.0	65.2	66	65.2	10	----	59.9	5.3	8	-2.7
themeworld 3a	80	1	0.0	63.5	66	63.5	10	----	59.5	4.0	8	-4.0
themeworld 4b	81	1	0.0	59.5	66	59.5	10	----	56.6	2.9	8	-5.1
themeworld 4a	82	1	0.0	63.4	66	63.4	10	----	59.1	4.3	8	-3.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	60	0.0	3.6	6.7
All Impacted	16	2.6	5.2	6.7
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 18 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva 14'
BARRIER DESIGN: Fest_14'

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Festiva 14	W	14.00	14.00	14.00	954	13351				400523
									Total Cost:	400523

Stantec
M Drauer

18 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva 14'
BARRIER DESIGN: Fest_14'

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	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Festiva 1	28	6	0.0	72.2	66	72.2	10	Snd Lvl	65.7	6.5	8	-1.5
Festiva 3	29	8	0.0	72.6	66	72.6	10	Snd Lvl	65.7	6.9	8	-1.1
Festiva 2	31	9	0.0	74.9	66	74.9	10	Snd Lvl	67.5	7.4	8	-0.6
Festiva 4	32	9	0.0	73.5	66	73.5	10	Snd Lvl	67.8	5.7	8	-2.3
Festiva 5	33	2	0.0	67.3	66	67.3	10	Snd Lvl	65.4	1.9	8	-6.1
Festiva 6	34	2	0.0	66.1	66	66.1	10	Snd Lvl	64.5	1.6	8	-6.4
Festiva 2nd a	39	6	0.0	62.1	66	62.1	10	----	60.3	1.8	8	-6.2
Festiva 2nd b	40	4	0.0	61.5	66	61.5	10	----	59.2	2.3	8	-5.7
Festiva 2nd c	41	6	0.0	61.7	66	61.7	10	----	59.3	2.4	8	-5.6

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	52	1.6	4.1	7.4
All Impacted	36	1.6	5.0	7.4
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

18 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5
BARRIER DESIGN: Fest_14long
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
Festiva 1	28	6	0.0	72.2	66	72.2	10	Snd Lvl	65.7	6.5	8	-1.5
Festiva 3	29	8	0.0	72.6	66	72.6	10	Snd Lvl	65.4	7.2	8	-0.8
Festiva 2	31	9	0.0	74.9	66	74.9	10	Snd Lvl	67.4	7.5	8	-0.5
Festiva 4	32	9	0.0	73.5	66	73.5	10	Snd Lvl	67.2	6.3	8	-1.7
Festiva 5	33	2	0.0	67.1	66	67.1	10	Snd Lvl	62.9	4.2	8	-3.8
Festiva 6	34	2	0.0	66.0	66	66.0	10	Snd Lvl	62.4	3.6	8	-4.4
Festiva 2nd a	39	6	0.0	62.1	66	62.1	10	----	59.5	2.6	8	-5.4
Festiva 2nd b	40	4	0.0	61.5	66	61.5	10	----	58.9	2.6	8	-5.4
Festiva 2nd c	41	6	0.0	61.5	66	61.5	10	----	59.2	2.3	8	-5.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	52	2.3	4.8	7.5
All Impacted	36	3.6	5.9	7.5
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 18 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5
BARRIER DESIGN: Fest_14long

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	14.00	14.00	14.00	1287	18011				540330
									Total Cost:	540330

Stantec 18 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_16'

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier9	W	16.00	16.00	16.00	898	14362				430862
									Total Cost:	430862

Stantec
M Drauer

18 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_16'

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
Festiva 1	28	6	0.0	72.9	66	72.9	10	Snd Lvl	65.9	7.0	8	-1.0
Festiva 3	29	8	0.0	73.3	66	73.3	10	Snd Lvl	66.1	7.2	8	-0.8
Festiva 2	31	9	0.0	75.1	66	75.1	10	Snd Lvl	67.5	7.6	8	-0.4
Festiva 4	32	9	0.0	74.2	66	74.2	10	Snd Lvl	67.5	6.7	8	-1.3
Festiva 5	33	2	0.0	67.6	66	67.6	10	Snd Lvl	65.3	2.3	8	-5.7
Festiva 6	34	2	0.0	66.3	66	66.3	10	Snd Lvl	64.6	1.7	8	-6.3
Festiva 2nd a	39	6	0.0	62.4	66	62.4	10	----	60.3	2.1	8	-5.9
Festiva 2nd b	40	4	0.0	61.8	66	61.8	10	----	59.2	2.6	8	-5.4
Festiva 2nd c	41	6	0.0	61.8	66	61.8	10	----	59.3	2.5	8	-5.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	52	1.7	4.4	7.6
All Impacted	36	1.7	5.4	7.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

18 November 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_18'

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier9	W	18.00	18.00	18.00	898	16157				484719
									Total Cost:	484719

Stantec
M Drauer

18 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_18'

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
Festiva 1	28	6	0.0	72.9	66	72.9	10	Snd Lvl	65.2	7.7	8	-0.3
Festiva 3	29	8	0.0	73.3	66	73.3	10	Snd Lvl	65.0	8.3	8	0.3
Festiva 2	31	9	0.0	75.1	66	75.1	10	Snd Lvl	66.3	8.8	8	0.8
Festiva 4	32	9	0.0	74.2	66	74.2	10	Snd Lvl	66.3	7.9	8	-0.1
Festiva 5	33	2	0.0	67.6	66	67.6	10	Snd Lvl	65.0	2.6	8	-5.4
Festiva 6	34	2	0.0	66.3	66	66.3	10	Snd Lvl	64.3	2.0	8	-6.0
Festiva 2nd a	39	6	0.0	62.4	66	62.4	10	----	59.8	2.6	8	-5.4
Festiva 2nd b	40	4	0.0	61.8	66	61.8	10	----	58.5	3.3	8	-4.7
Festiva 2nd c	41	6	0.0	61.8	66	61.8	10	----	58.8	3.0	8	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	52	2.0	5.1	8.8
All Impacted	36	2.0	6.2	8.8
All that meet NR Goal	17	8.3	8.5	8.8

Stantec 18 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_20'

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier9	W	20.00	20.00	20.00	898	17953				538577
									Total Cost:	538577

Stantec
M Drauer

18 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_20'

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	LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Festiva 1	28	6	0.0	72.9	66	72.9	10	Snd Lvl	64.6	8.3	8	0.3
Festiva 3	29	8	0.0	73.3	66	73.3	10	Snd Lvl	64.1	9.2	8	1.2
Festiva 2	31	9	0.0	75.1	66	75.1	10	Snd Lvl	65.2	9.9	8	1.9
Festiva 4	32	9	0.0	74.2	66	74.2	10	Snd Lvl	65.2	9.0	8	1.0
Festiva 5	33	2	0.0	67.6	66	67.6	10	Snd Lvl	64.7	2.9	8	-5.1
Festiva 6	34	2	0.0	66.3	66	66.3	10	Snd Lvl	64.1	2.2	8	-5.8
Festiva 2nd a	39	6	0.0	62.4	66	62.4	10	----	59.5	2.9	8	-5.1
Festiva 2nd b	40	4	0.0	61.8	66	61.8	10	----	58.0	3.8	8	-4.2
Festiva 2nd c	41	6	0.0	61.8	66	61.8	10	----	58.3	3.5	8	-4.5

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	52	2.2	5.7	9.9
All Impacted	36	2.2	6.9	9.9
All that meet NR Goal	32	8.3	9.1	9.9

Stantec 18 November 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_22'

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier9	W	22.00	22.00	22.00	898	19748				592435
									Total Cost:	592435

Stantec
M Drauer

18 November 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: Fest_22'

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	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Festiva 1	28	6	0.0	72.9	66	72.9	10	Snd Lvl	64.2	8.7	8	0.7
Festiva 3	29	8	0.0	73.3	66	73.3	10	Snd Lvl	63.4	9.9	8	1.9
Festiva 2	31	9	0.0	75.1	66	75.1	10	Snd Lvl	64.4	10.7	8	2.7
Festiva 4	32	9	0.0	74.2	66	74.2	10	Snd Lvl	64.4	9.8	8	1.8
Festiva 5	33	2	0.0	67.6	66	67.6	10	Snd Lvl	64.5	3.1	8	-4.9
Festiva 6	34	2	0.0	66.3	66	66.3	10	Snd Lvl	63.9	2.4	8	-5.6
Festiva 2nd a	39	6	0.0	62.4	66	62.4	10	----	59.2	3.2	8	-4.8
Festiva 2nd b	40	4	0.0	61.8	66	61.8	10	----	57.6	4.2	8	-3.8
Festiva 2nd c	41	6	0.0	61.8	66	61.8	10	----	58.0	3.8	8	-4.2

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	52	2.4	6.2	10.7
All Impacted	36	2.4	7.4	10.7
All that meet NR Goal	32	8.7	9.8	10.7

Stantec 29 April 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 12sh

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	12.00	12.00	12.00	1164	13971				419125
									Total Cost:	419125

Stantec
M Drauer

29 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 12sh
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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	66.9	0.5	8	-7.5
F Phase 2 b	43	4	0.0	68.3	66	68.3	10	Snd Lvl	67.8	0.5	8	-7.5
F Phase 2 c	44	4	0.0	68.2	66	68.2	10	Snd Lvl	67.0	1.2	8	-6.8
F Phase 2 d	45	4	0.0	67.6	66	67.6	10	Snd Lvl	65.8	1.8	8	-6.2
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	63.0	3.3	8	-4.7
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	62.4	3.5	8	-4.5
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	66.1	8.5	8	0.5
F Phase 2 h	49	4	0.0	74.8	66	74.8	10	Snd Lvl	65.8	9.0	8	1.0
F Phase 2 i	51	4	0.0	64.6	66	64.6	10	----	60.7	3.9	8	-4.1
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	60.7	4.5	8	-3.5
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	59.9	4.6	8	-3.4
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	65.5	9.4	8	1.4
F Phase 2 m	55	4	0.0	74.7	66	74.7	10	Snd Lvl	65.5	9.2	8	1.2
F Phase 2 n	56	4	0.0	74.8	66	74.8	10	Snd Lvl	65.6	9.2	8	1.2
F Phase 2 o	57	4	0.0	75.2	66	75.2	10	Snd Lvl	65.6	9.6	8	1.6
F Phase 2 p	59	4	0.0	74.7	66	74.7	10	Snd Lvl	65.9	8.8	8	0.8
F Phase 2 q	60	4	0.0	74.9	66	74.9	10	Snd Lvl	66.2	8.7	8	0.7
F Phase 2 r	61	4	0.0	74.8	66	74.8	10	Snd Lvl	67.2	7.6	8	-0.4
F Phase 2 s	62	4	0.0	74.8	66	74.8	10	Snd Lvl	69.4	5.4	8	-2.6
F Phase 2 t	63	4	0.0	65.2	66	65.2	10	----	61.9	3.3	8	-4.7
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.9	1.5	8	-6.5
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	4.8	9.6
All Impacted	58	0.5	6.2	9.6
All that meet NR Goal	32	8.5	9.1	9.6

Stantec
M Drauer

29 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 14sh

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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	66.9	0.5	8	-7.5
F Phase 2 b	43	4	0.0	68.3	66	68.3	10	Snd Lvl	67.8	0.5	8	-7.5
F Phase 2 c	44	4	0.0	68.2	66	68.2	10	Snd Lvl	66.9	1.3	8	-6.7
F Phase 2 d	45	4	0.0	67.6	66	67.6	10	Snd Lvl	65.6	2.0	8	-6.0
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	62.6	3.7	8	-4.3
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	62.1	3.8	8	-4.2
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	65.3	9.3	8	1.3
F Phase 2 h	49	4	0.0	74.8	66	74.8	10	Snd Lvl	64.9	9.9	8	1.9
F Phase 2 i	51	4	0.0	64.6	66	64.6	10	----	60.6	4.0	8	-4.0
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	60.4	4.8	8	-3.2
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	59.8	4.7	8	-3.3
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	64.5	10.4	8	2.4
F Phase 2 m	55	4	0.0	74.7	66	74.7	10	Snd Lvl	64.5	10.2	8	2.2
F Phase 2 n	56	4	0.0	74.8	66	74.8	10	Snd Lvl	64.5	10.3	8	2.3
F Phase 2 o	57	4	0.0	75.2	66	75.2	10	Snd Lvl	64.6	10.6	8	2.6
F Phase 2 p	59	4	0.0	74.7	66	74.7	10	Snd Lvl	64.9	9.8	8	1.8
F Phase 2 q	60	4	0.0	74.9	66	74.9	10	Snd Lvl	65.4	9.5	8	1.5
F Phase 2 r	61	4	0.0	74.8	66	74.8	10	Snd Lvl	66.6	8.2	8	0.2
F Phase 2 s	62	4	0.0	74.8	66	74.8	10	Snd Lvl	69.1	5.7	8	-2.3
F Phase 2 t	63	4	0.0	65.2	66	65.2	10	----	61.8	3.4	8	-4.6
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.8	1.6	8	-6.4
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	5.2	10.6
All Impacted	58	0.5	6.8	10.6
All that meet NR Goal	36	8.2	9.8	10.6

Stantec 29 April 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 14sh

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	14.00	14.00	14.00	1164	16299				488980
									Total Cost:	488980

Stantec 2 May 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festival Shoulder
BARRIER DESIGN: P2 long 12

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	12.00	12.00	12.00	1552	18624				558711
									Total Cost:	558711

Stantec
M Drauer

2 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festival Shoulder
BARRIER DESIGN: P2 long 12
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
F Phase 2 a	42	2	0.0	68.1	66	68.1	10	Snd Lvl	63.1	5.0	8	-3.0
F Phase 2 b	43	4	0.0	68.7	66	68.7	10	Snd Lvl	63.1	5.6	8	-2.4
F Phase 2 c	44	4	0.0	68.4	66	68.4	10	Snd Lvl	62.7	5.7	8	-2.3
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	62.2	5.5	8	-2.5
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	61.0	5.3	8	-2.7
F Phase 2 f	47	4	0.0	66.0	66	66.0	10	Snd Lvl	60.8	5.2	8	-2.8
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	65.1	9.5	8	1.5
F Phase 2 h	49	4	0.0	74.8	66	74.8	10	Snd Lvl	65.1	9.7	8	1.7
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	59.7	5.0	8	-3.0
F Phase 2 j	52	4	0.0	65.3	66	65.3	10	----	59.9	5.4	8	-2.6
F Phase 2 k	53	4	0.0	64.6	66	64.6	10	----	59.4	5.2	8	-2.8
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	65.2	9.7	8	1.7
F Phase 2 m	55	4	0.0	74.7	66	74.7	10	Snd Lvl	65.2	9.5	8	1.5
F Phase 2 n	56	4	0.0	74.8	66	74.8	10	Snd Lvl	65.4	9.4	8	1.4
F Phase 2 o	57	4	0.0	75.2	66	75.2	10	Snd Lvl	65.5	9.7	8	1.7
F Phase 2 p	59	4	0.0	74.7	66	74.7	10	Snd Lvl	65.8	8.9	8	0.9
F Phase 2 q	60	4	0.0	74.9	66	74.9	10	Snd Lvl	66.2	8.7	8	0.7
F Phase 2 r	61	4	0.0	74.8	66	74.8	10	Snd Lvl	67.2	7.6	8	-0.4
F Phase 2 s	62	4	0.0	74.8	66	74.8	10	Snd Lvl	69.4	5.4	8	-2.6
F Phase 2 t	63	4	0.0	65.2	66	65.2	10	----	61.9	3.3	8	-4.7
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.9	1.5	8	-6.5
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	5.9	9.7
All Impacted	62	5.0	7.5	9.7
All that meet NR Goal	32	8.7	9.4	9.7

Stantec 2 May 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festival Shoulder
BARRIER DESIGN: P2 long 14

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	14.00	14.00	14.00	1552	21728				651829
									Total Cost:	651829

Stantec
M Drauer

2 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festival Shoulder
BARRIER DESIGN: P2 long 14

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
F Phase 2 a	42	2	0.0	68.1	66	68.1	10	Snd Lvl	62.4	5.7	8	-2.3
F Phase 2 b	43	4	0.0	68.7	66	68.7	10	Snd Lvl	62.3	6.4	8	-1.6
F Phase 2 c	44	4	0.0	68.4	66	68.4	10	Snd Lvl	61.7	6.7	8	-1.3
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	61.2	6.5	8	-1.5
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	60.1	6.2	8	-1.8
F Phase 2 f	47	4	0.0	66.0	66	66.0	10	Snd Lvl	60.2	5.8	8	-2.2
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	63.9	10.7	8	2.7
F Phase 2 h	49	4	0.0	74.8	66	74.8	10	Snd Lvl	64.0	10.8	8	2.8
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	59.5	5.2	8	-2.8
F Phase 2 j	52	4	0.0	65.3	66	65.3	10	----	59.5	5.8	8	-2.2
F Phase 2 k	53	4	0.0	64.6	66	64.6	10	----	59.3	5.3	8	-2.7
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	64.1	10.8	8	2.8
F Phase 2 m	55	4	0.0	74.7	66	74.7	10	Snd Lvl	64.1	10.6	8	2.6
F Phase 2 n	56	4	0.0	74.8	66	74.8	10	Snd Lvl	64.3	10.5	8	2.5
F Phase 2 o	57	4	0.0	75.2	66	75.2	10	Snd Lvl	64.4	10.8	8	2.8
F Phase 2 p	59	4	0.0	74.7	66	74.7	10	Snd Lvl	64.8	9.9	8	1.9
F Phase 2 q	60	4	0.0	74.9	66	74.9	10	Snd Lvl	65.3	9.6	8	1.6
F Phase 2 r	61	4	0.0	74.8	66	74.8	10	Snd Lvl	66.6	8.2	8	0.2
F Phase 2 s	62	4	0.0	74.8	66	74.8	10	Snd Lvl	69.1	5.7	8	-2.3
F Phase 2 t	63	4	0.0	65.2	66	65.2	10	----	61.7	3.5	8	-4.5
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.8	1.6	8	-6.4
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Stantec 29 April 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 12

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	12.00	12.00	12.00	1157	13890				416698
									Total Cost:	416698

Stantec
M Drauer

29 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 12
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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	67.0	0.4	8	-7.6
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	68.0	0.4	8	-7.6
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	67.2	1.1	8	-6.9
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	66.0	1.7	8	-6.3
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	63.1	3.2	8	-4.8
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	62.3	3.6	8	-4.4
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	65.8	8.8	8	0.8
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	65.5	9.2	8	1.2
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	60.7	4.0	8	-4.0
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	60.6	4.6	8	-3.4
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	59.8	4.7	8	-3.3
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	65.4	9.5	8	1.5
F Phase 2 m	55	4	0.0	75.0	66	75.0	10	Snd Lvl	65.3	9.7	8	1.7
F Phase 2 n	56	4	0.0	74.7	66	74.7	10	Snd Lvl	65.3	9.4	8	1.4
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	65.4	9.7	8	1.7
F Phase 2 p	59	4	0.0	74.8	66	74.8	10	Snd Lvl	65.5	9.3	8	1.3
F Phase 2 q	60	4	0.0	75.1	66	75.1	10	Snd Lvl	65.7	9.4	8	1.4
F Phase 2 r	61	4	0.0	74.9	66	74.9	10	Snd Lvl	66.4	8.5	8	0.5
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	68.2	6.7	8	-1.3
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	61.7	3.4	8	-4.6
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.9	1.5	8	-6.5
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.4	0.3	8	-7.7
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.7	0.3	8	-7.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	5.0	9.7
All Impacted	58	0.4	6.5	9.7
All that meet NR Goal	36	8.5	9.3	9.7

Stantec
M Drauer

27 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 14

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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	67.0	0.4	8	-7.6
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	68.0	0.4	8	-7.6
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	67.1	1.2	8	-6.8
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	65.8	1.9	8	-6.1
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	62.7	3.6	8	-4.4
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	62.1	3.8	8	-4.2
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	64.9	9.7	8	1.7
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	64.5	10.2	8	2.2
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	60.7	4.0	8	-4.0
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	60.6	4.6	8	-3.4
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	59.9	4.6	8	-3.4
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	64.3	10.6	8	2.6
F Phase 2 m	55	4	0.0	75.0	66	75.0	10	Snd Lvl	64.3	10.7	8	2.7
F Phase 2 n	56	4	0.0	74.7	66	74.7	10	Snd Lvl	64.3	10.4	8	2.4
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	64.3	10.8	8	2.8
F Phase 2 p	59	4	0.0	74.8	66	74.8	10	Snd Lvl	64.5	10.3	8	2.3
F Phase 2 q	60	4	0.0	75.1	66	75.1	10	Snd Lvl	64.7	10.4	8	2.4
F Phase 2 r	61	4	0.0	74.9	66	74.9	10	Snd Lvl	65.7	9.2	8	1.2
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	67.8	7.1	8	-0.9
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	61.8	3.3	8	-4.7
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.8	1.6	8	-6.4
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	5.4	10.8
All Impacted	58	0.4	7.1	10.8
All that meet NR Goal	36	9.2	10.3	10.8

Stantec 27 April 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 14

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	14.00	14.00	14.00	1157	16205				486147
									Total Cost:	486147

Stantec 27 April 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 16

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	16.00	16.00	16.00	1157	18520				555597
									Total Cost:	555597

Stantec
M Drauer

27 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 16

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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	67.0	0.4	8	-7.6
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	67.9	0.5	8	-7.5
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	67.1	1.2	8	-6.8
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	65.7	2.0	8	-6.0
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	62.5	3.8	8	-4.2
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	61.7	4.2	8	-3.8
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	64.3	10.3	8	2.3
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	63.7	11.0	8	3.0
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	60.3	4.4	8	-3.6
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	60.1	5.1	8	-2.9
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	59.4	5.1	8	-2.9
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	63.5	11.4	8	3.4
F Phase 2 m	55	4	0.0	75.0	66	75.0	10	Snd Lvl	63.4	11.6	8	3.6
F Phase 2 n	56	4	0.0	74.7	66	74.7	10	Snd Lvl	63.4	11.3	8	3.3
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	63.5	11.6	8	3.6
F Phase 2 p	59	4	0.0	74.8	66	74.8	10	Snd Lvl	63.7	11.1	8	3.1
F Phase 2 q	60	4	0.0	75.1	66	75.1	10	Snd Lvl	64.0	11.1	8	3.1
F Phase 2 r	61	4	0.0	74.9	66	74.9	10	Snd Lvl	65.1	9.8	8	1.8
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	67.5	7.4	8	-0.6
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	61.4	3.7	8	-4.3
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.7	1.7	8	-6.3
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	5.8	11.6
All Impacted	58	0.4	7.6	11.6
All that meet NR Goal	36	9.8	11.0	11.6

Stantec
M Drauer

27 April 2016
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 18

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	18.00	18.00	18.00	1157	20835				625046
									Total Cost:	625046

Stantec
M Drauer

27 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 18

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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	67.0	0.4	8	-7.6
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	67.9	0.5	8	-7.5
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	67.0	1.3	8	-6.7
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	65.6	2.1	8	-5.9
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	62.3	4.0	8	-4.0
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	61.5	4.4	8	-3.6
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	63.6	11.0	8	3.0
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	63.0	11.7	8	3.7
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	59.9	4.8	8	-3.2
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	59.6	5.6	8	-2.4
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	59.0	5.5	8	-2.5
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	62.7	12.2	8	4.2
F Phase 2 m	55	4	0.0	75.0	66	75.0	10	Snd Lvl	62.7	12.3	8	4.3
F Phase 2 n	56	4	0.0	74.7	66	74.7	10	Snd Lvl	62.6	12.1	8	4.1
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	62.7	12.4	8	4.4
F Phase 2 p	59	4	0.0	74.8	66	74.8	10	Snd Lvl	63.0	11.8	8	3.8
F Phase 2 q	60	4	0.0	75.1	66	75.1	10	Snd Lvl	63.3	11.8	8	3.8
F Phase 2 r	61	4	0.0	74.9	66	74.9	10	Snd Lvl	64.6	10.3	8	2.3
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	67.3	7.6	8	-0.4
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	61.2	3.9	8	-4.1
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.6	1.8	8	-6.2
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	6.2	12.4
All Impacted	58	0.4	8.1	12.4
All that meet NR Goal	36	10.3	11.7	12.4

Stantec
M Drauer

27 April 2016
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 20

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	20.00	20.00	20.00	1157	23150				694496
									Total Cost:	694496

Stantec
M Drauer

27 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 20

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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	66.9	0.5	8	-7.5
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	67.9	0.5	8	-7.5
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	67.0	1.3	8	-6.7
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	65.6	2.1	8	-5.9
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	62.1	4.2	8	-3.8
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	61.3	4.6	8	-3.4
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	63.2	11.4	8	3.4
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	62.5	12.2	8	4.2
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	59.5	5.2	8	-2.8
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	59.3	5.9	8	-2.1
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	58.6	5.9	8	-2.1
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	62.2	12.7	8	4.7
F Phase 2 m	55	4	0.0	75.0	66	75.0	10	Snd Lvl	62.1	12.9	8	4.9
F Phase 2 n	56	4	0.0	74.7	66	74.7	10	Snd Lvl	62.0	12.7	8	4.7
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	62.1	13.0	8	5.0
F Phase 2 p	59	4	0.0	74.8	66	74.8	10	Snd Lvl	62.4	12.4	8	4.4
F Phase 2 q	60	4	0.0	75.1	66	75.1	10	Snd Lvl	62.8	12.3	8	4.3
F Phase 2 r	61	4	0.0	74.9	66	74.9	10	Snd Lvl	64.3	10.6	8	2.6
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	67.2	7.7	8	-0.3
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	60.9	4.2	8	-3.8
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.5	1.9	8	-6.1
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	6.5	13.0
All Impacted	58	0.5	8.4	13.0
All that meet NR Goal	36	10.6	12.2	13.0

Stantec 29 April 2016
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 22

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	22.00	22.00	22.00	1157	25465				763946
									Total Cost:	763946

Stantec
M Drauer

29 April 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 Segment 5 Festiva ROW
BARRIER DESIGN: P2 22
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
F Phase 2 a	42	2	0.0	67.4	66	67.4	10	Snd Lvl	66.9	0.5	8	-7.5
F Phase 2 b	43	4	0.0	68.4	66	68.4	10	Snd Lvl	67.9	0.5	8	-7.5
F Phase 2 c	44	4	0.0	68.3	66	68.3	10	Snd Lvl	66.9	1.4	8	-6.6
F Phase 2 d	45	4	0.0	67.7	66	67.7	10	Snd Lvl	65.5	2.2	8	-5.8
F Phase 2 e	46	4	0.0	66.3	66	66.3	10	Snd Lvl	62.0	4.3	8	-3.7
F Phase 2 f	47	4	0.0	65.9	66	65.9	10	----	61.0	4.9	8	-3.1
F Phase 2 g	48	4	0.0	74.6	66	74.6	10	Snd Lvl	62.8	11.8	8	3.8
F Phase 2 h	49	4	0.0	74.7	66	74.7	10	Snd Lvl	62.0	12.7	8	4.7
F Phase 2 i	51	4	0.0	64.7	66	64.7	10	----	59.2	5.5	8	-2.5
F Phase 2 j	52	4	0.0	65.2	66	65.2	10	----	58.9	6.3	8	-1.7
F Phase 2 k	53	4	0.0	64.5	66	64.5	10	----	58.1	6.4	8	-1.6
F Phase 2 l	54	4	0.0	74.9	66	74.9	10	Snd Lvl	61.6	13.3	8	5.3
F Phase 2 m	55	4	0.0	75.0	66	75.0	10	Snd Lvl	61.5	13.5	8	5.5
F Phase 2 n	56	4	0.0	74.7	66	74.7	10	Snd Lvl	61.5	13.2	8	5.2
F Phase 2 o	57	4	0.0	75.1	66	75.1	10	Snd Lvl	61.5	13.6	8	5.6
F Phase 2 p	59	4	0.0	74.8	66	74.8	10	Snd Lvl	61.9	12.9	8	4.9
F Phase 2 q	60	4	0.0	75.1	66	75.1	10	Snd Lvl	62.3	12.8	8	4.8
F Phase 2 r	61	4	0.0	74.9	66	74.9	10	Snd Lvl	64.0	10.9	8	2.9
F Phase 2 s	62	4	0.0	74.9	66	74.9	10	Snd Lvl	67.0	7.9	8	-0.1
F Phase 2 t	63	4	0.0	65.1	66	65.1	10	----	60.7	4.4	8	-3.6
F Phase 2 u	64	4	0.0	62.4	66	62.4	10	----	60.4	2.0	8	-6.0
F Phase 2 v	65	2	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
F Phase 2 w	66	4	0.0	61.7	66	61.7	10	----	61.3	0.4	8	-7.6
F Phase 2 x	67	2	0.0	60.0	66	60.0	10	----	59.6	0.4	8	-7.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.3	6.8	13.6
All Impacted	58	0.5	8.8	13.6
All that meet NR Goal	36	10.9	12.7	13.6