SR 400 (I-4) Project Development and Environment (PD&E) Study
FM No.: 432100-1-22-01

Noise Study Report

Segment 1: from west of CR 532 (Polk/Osceola County Line) to west of SR 528 Beachline Expressway

Polk County (16320), Osceola County (92130), Orange County (75280)

July 2016

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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), and
- 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 [FPN 201210 (1998)] and from CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) [FPN 242526 and 242483 (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 1 of the SR 400 (I-4) BtU PD&E Reevaluation Study. The purpose of this report is to update the original PD&E study by documenting any changes that have occurred since the studies conducted for the SR 400)/I-4 from West of CR 532 (Osceola/Polk County Line) to West of SR 528 (Beachline Expressway) PD&E study. This includes changes in the current proposed concept being analyzed (the original design concept showed two high occupancy vehicle (HOV) lanes), changes to the PD&E process, and changes in the environmental regulations that have occurred in support of the PD&E reevaluation of the FONSI for SR 400 (I-4) from CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) (FPN 242526 and 242483, December 23, 1999).

This reevaluation includes environmental analysis of the original design concept, which showed six general use lanes (GUL) and four special use lanes (SUL) from CR 532 to southwest of World Drive (6+4), six GUL and two High Occupancy Vehicle (HOV) lanes from southwest of World Drive to northeast of Lake Avenue (6+2) and six GUL and 4 HOV lanes from northeast

of Lake Avenue to SR 528 (Beachline Expressway) (6+4), to the current proposed design which includes six GULs and four express lanes operating under a variable price toll plan (6+4). Other changes being reanalyzed include stormwater management, access plan and interchange configurations.

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 14-mile segment of I-4 which extends from just west of CR 532 (Polk/Osceola County Line) to west of SR 528 (Beachline Expressway), from Milepost (MP) 31.607 to MP 32.022 in Polk County, MP 0.000 to MP 7.885 in Osceola County and from MP 0.000 to 5.650 in Orange County (herein referred to as I-4, Segment 1) 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 1. The study area in this section from west of CR 532 to west of SR 528 includes the following interchanges:

Osceola County

- I-4 and CR 532 (Osceola Polk Line Road)
- I-4 and SR 429 (Daniel Webster Western Beltway)
- I-4 and World Drive
- I-4 and SR 417 (Southern Connector)
- I-4 and US 192/SR 530 (W. Irlo Bronson Memorial Highway)
- I-4 and W. Osceola Parkway

Orange County

- I-4 and SR 536 (Epcot Center/World Center Drive)
- I-4 and SR 535 (S. Apopka Vineland Road)
- I-4 and Daryl Carter Parkway*
- I-4 and Central Florida Parkway

*Formerly Fenton Street/Wildwood Avenue (previously identified as Lake Avenue in the December 1999 FONSI). Daryl Carter Parkway is currently an existing overpass; alternative evaluations include a proposed full-access interchange.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. The primary typical section for Segment 1 will have three 12-foot general use travel lanes with 10-foot inside and 12-foot outside shoulders and two 12-foot express lanes with 4-foot inside and 10-foot outside shoulders in each direction (**Figure 1.2**). A barrier wall between the adjacent shoulders will separate the express lanes from the general use lanes. Twelve-foot auxiliary lanes will be provided in some areas in both the eastbound and westbound directions. The typical section includes a 44-foot rail envelope in the median within a minimum 300 foot right of way. Additional typical sections are proposed in 3 areas: just east of the SR 429 Interchange, the eastbound express lanes will be elevated until just west of World Drive (**Figure 1.3**); from just east of the SR 536 Interchange to just west of SR 535, the General Use Lanes in both directions will be elevated (**Figure 1.4**); with the westbound General Use Lanes remaining elevated until east of Daryl Carter Parkway (**Figure 1.5**).

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 through many cities including Lakeland, Celebration, 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, I-75, 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) and I-95.

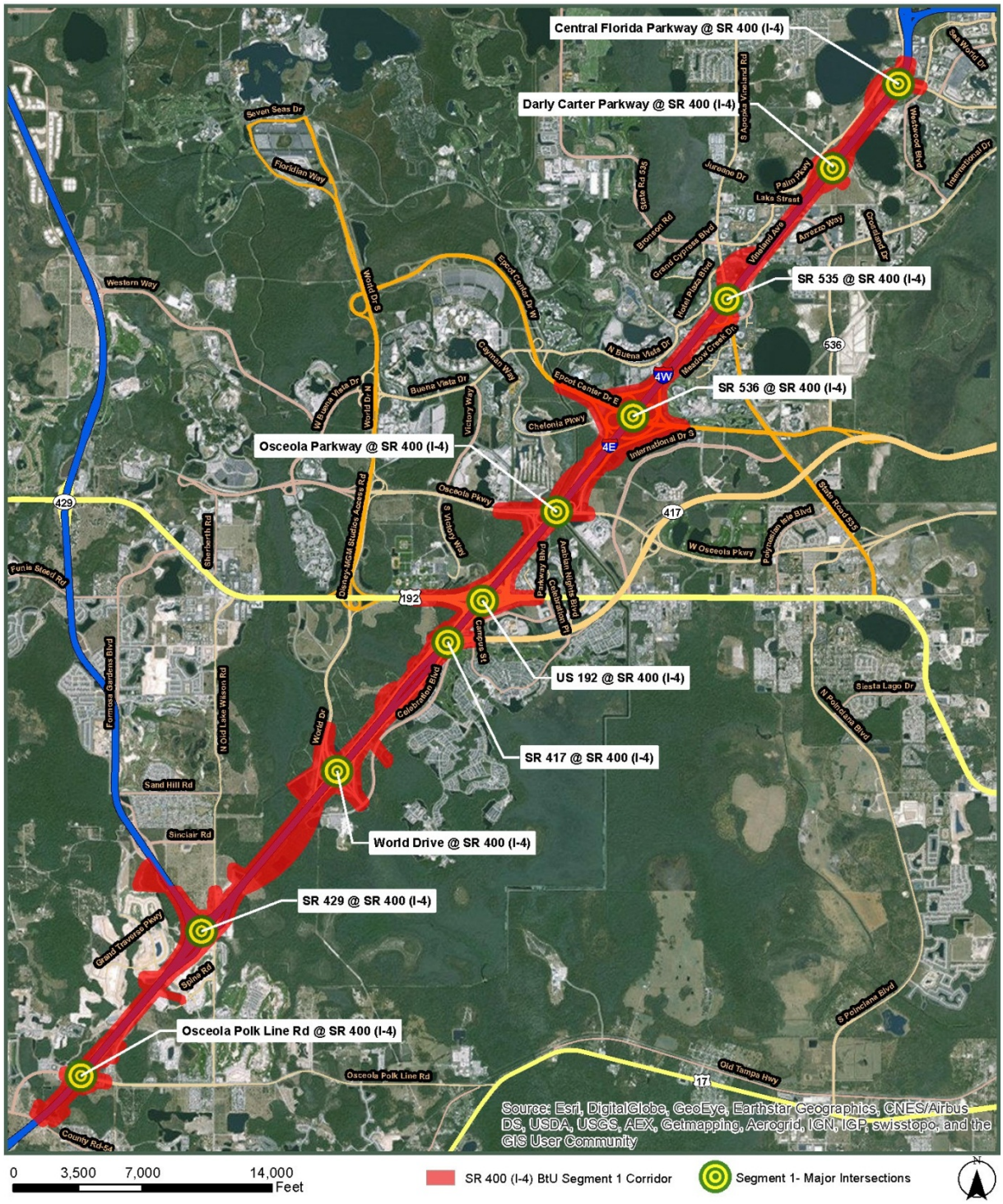
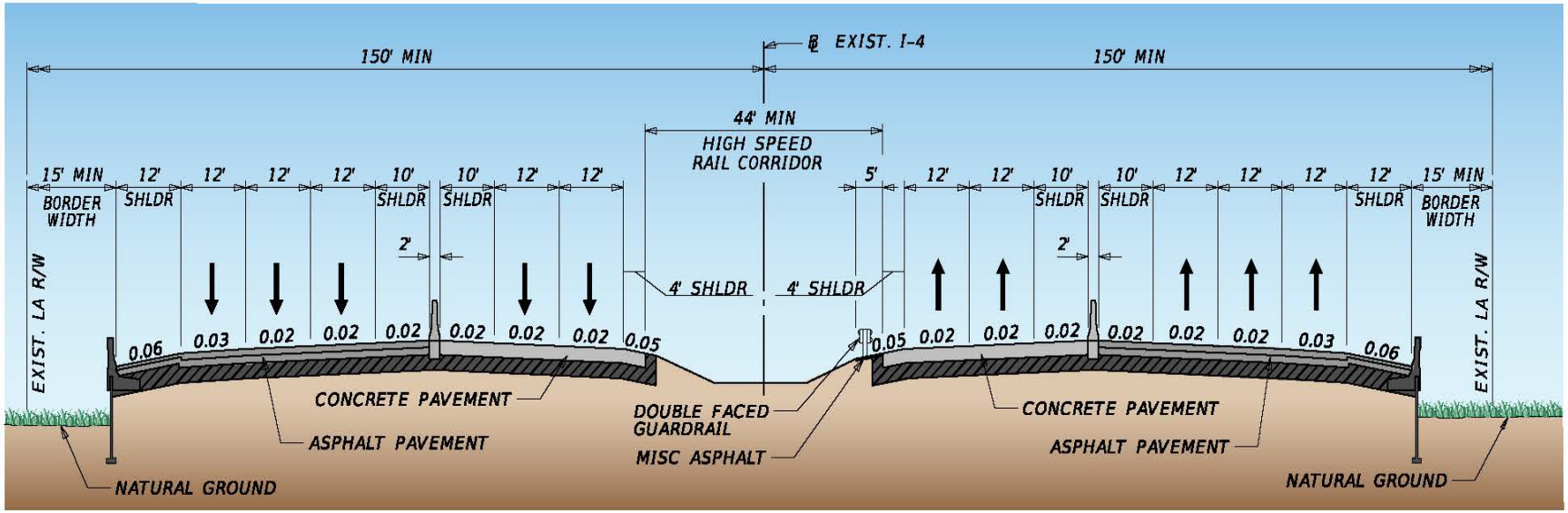


Figure 1.1 – Project Location Map



SR 400 (I-4) TYPICAL SECTION
Station 604 + 50.00 to Station 1345 + 48.48
MP 31.607 to MP 32.022 (Polk County)
MP 0.000 to MP 7.885 (Osceola County)
MP 0.000 to MP 5.650 (Orange County)

Figure 1.2 – SR 400 (I -4) Segment 1 Proposed Typical Section (6+4 with rail envelope)

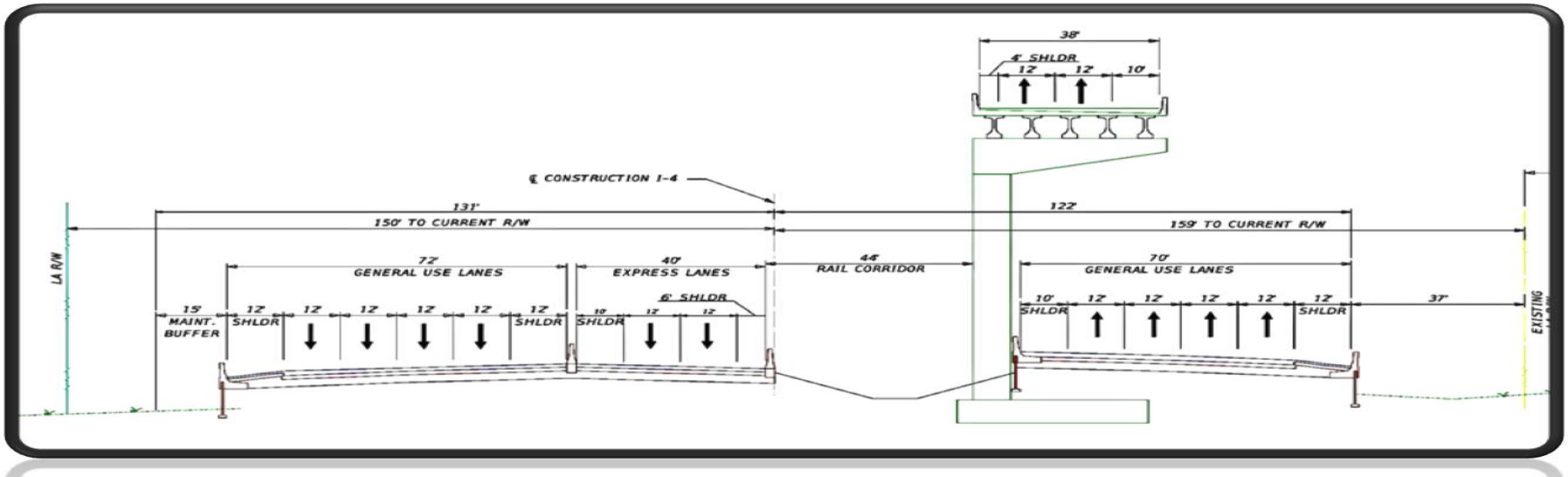


Figure 1.3 – SR 400 (I -4) Segment 1 Proposed Typical Section (elevated EB Express Lanes between SR 429 and World Drive)

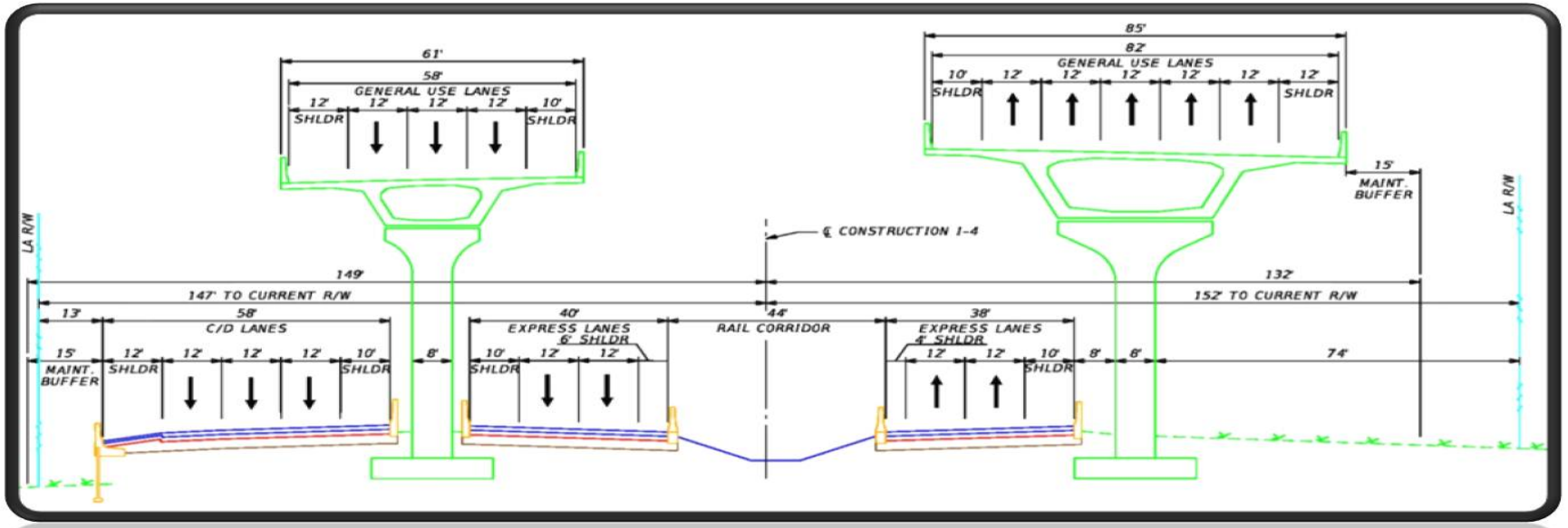


Figure 1.4 - SR 400 (I -4) Segment 1 Proposed Typical Section (elevated EB and WB GUL Lanes between SR 536 and SR 535)

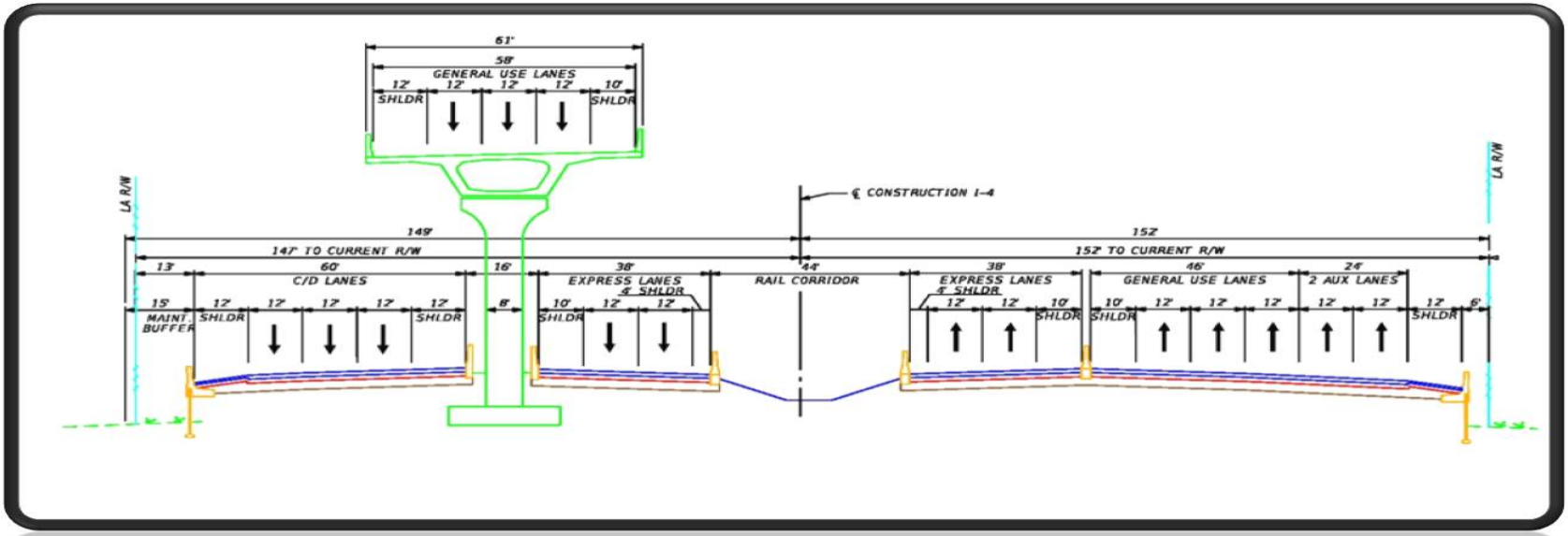


Figure 1.5 - SR 400 (I -4) Segment 1 Proposed Typical Section (elevated WB GUL Lanes from SR 535 to Daryl Carter Parkway)

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.

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 roles 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 CR 532 to southwest of World Drive , 6 GUL + 2 HOV lanes from southwest of World Drive to northeast of Lake Avenue and 6 GUL + 4 HOV lanes from northeast of Lake Avenue to SR 528, as recommended in the FONSI for SR 400 (I-4) from CR 532 (Polk/Osceola County Line to West of SR 528 (Beachline Expressway) (December 23, 1999), to the current proposed design of four (4) 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.

The purpose of this traffic noise study is to determine if noise levels will be likely to increase, if noise-sensitive receptors are (or will be) located within the project area, and if noise impacts will occur. 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 established in Part 2, Chapter 17 "Noise", of the FDOT PD&E Manual.

The noise analysis guidance provided is 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" for FDOT noise assessments, regardless of funding. This regulation, pursuant to Rule Chapter 335.17, Florida Statutes (F.S.), 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, Residential, and natural lands. Undeveloped natural areas are located between SR 429 and US 192 (Irlo Bronson Memorial Highway) and a few other small isolated patches along the right-of-way. Reedy Creek and Bonnet Creek pass underneath I-4 and several lakes are located along the project corridor. Five golf courses are located within the project corridor, as well as Disney's Wide World of Sports Complex. The Reunion and Celebration resorts, along with several apartment complexes or condominiums represent the majority of the residential land use within the project corridor. The majority of the project corridor between US 192 and SR 528 is commercial, retail, hotel and restaurants, and includes the Gaylord Palms Resort, Disney's Typhoon Lagoon Water Park, Downtown Disney (proposed Disney Springs), and the Orlando Premium Outlets (see Land Use and Habitat Coverage maps, **Figure A** in **Appendix A**).

Residential (1100 - 1300) – This range of land use codes consists of areas containing medium, and high density residential housing. Low density housing was only observed along Lake Willis Drive and is comprised of single family homes. Medium density housing was observed within the Celebration and Reunion developments, but not directly adjacent to the right-of-way. High density housing was observed primarily in the southern and northern portions of the project corridor. The most densely populated areas include the Tuscana development along South Goodman Road, portions of the Reunion development just south of the SR 429 interchange, portions of the Celebration development along Celebration Boulevard, and multiple apartments or condominiums near the SR 535 interchange and the Central Florida Parkway interchange.

Commercial and Services (1400) – This land use was observed throughout the majority of the project corridor along Champions Gate Boulevard/Osceola Polk Line Road, Celebration Boulevard, US 192, Buena Vista Drive, SR 535, Vineland Avenue, Central Florida Parkway, and Westwood Boulevard. It includes numerous types of businesses in malls, strip malls and as stand-alone establishments along the corridor.

Retail Sales and Services (1410) – This land use was observed in several portions of the project corridor, primarily along Buena Vista Drive, SR 535, and Vineland Avenue. It consists of shopping centers, and other service/retail oriented businesses along the adjacent roadways. This land use includes the Orlando Premium Outlets along Vineland Avenue.

Professional Services (1430) – Several medical offices, dental offices, veterinary offices, and other professional offices are located along the corridor, primarily along Celebration Boulevard and Celebration Place.

Tourist Services (1450) – Numerous hotels and resorts were identified throughout the project corridor. Some of the larger complexes include the Gaylord Palms Resort along Osceola Parkway, the Waldorf Astoria Orlando Resort along Bonnet Creek Resort Lane, and the Orlando World Center Marriott along World Center Drive. The densest concentration of hotels was observed along Hotel Plaza Boulevard.

Industrial (1500) – The only area where this land use was observed was at the SR 429 interchange, where the Florida Gas Transmission Company has a small facility along Old Lake Wilson Road.

Institutional (1700) – This land use consists of schools and institutions such as Oak Hill Baptist Church on Osceola Polk Line Road, Celebration High School, Celebration Fire Station, Celebration Community Church, and Mary Queen of the Universe Church.

Medical and Health Care (1740) – This land use consists of medical and healthcare related institutions such as the Florida Hospital Celebration Health and the Central Florida Behavioral Hospital.

Golf Courses (1820) – This land use was observed at the Reunion Resort, Celebration Golf Club, Waldorf Astoria Resort, and the Hawks Landing Golf Club at the Orlando World Drive Marriott.

Parks and Zoos (1850) – This land use consists of recreational facilities that are either parks or zoos. Disney's Wide World of Sports complex and Disney's Typhoon Lagoon were identified along the project corridor.

Community Recreational Facilities (1860) – This land use is represented by Dr. P. Phillips Community Park along Big Sand Lake.

Open Land (1900) – This land use consists of undeveloped land within urban areas and inactive land with street patterns but without structures. Several large patches of this land use was observed in areas along Celebration Boulevard, to the southwest of the Osceola Parkway interchange, to the east of I-4, north of the Epcot Center Drive/World Center Drive interchange, in the vicinity of Lake Willis, and an area to the southeast of the Central Florida Parkway 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. Large swaths of land along the eastern side of I-4 just north of Osceola Polk Line Road and on both sides of I-4 just north of the SR 429 interchange has been converted to improved pasture.

Unimproved Pasture (2120) – This category of land use consists of cleared land with major stands of trees and brush where native grasses have been allowed to grow and is typically not managed with brush control or fertilizer application. A large swath of land along Old Lake Wilson Road to the north of I-4 and an area just north of the Osceola Parkway to the east of I-4 have been converted into unimproved pasture.

Woodland Pastures (2130) – This category of land use consists of forest lands which are used as pastures. An area of land to the north of the SR 429 interchange was identified as woodland pasture.

Abandoned Groves (2240) – This category of land use consists of citrus groves which are no longer being actively used. This land use was observed to the northeast of the Champions Gate Boulevard/Osceola Polk Line Road interchange, along Old Lake Wilson Road, and along Palm Parkway to the west of I-4.

Herbaceous- Dry Prairie (3100) – This land use consists of open, dry treeless areas containing grasses, forbs, sedges, rushes and other herbaceous vegetation. This habitat was observed along the northwest corner ramps of the US 192 interchange and several other small isolated patches throughout the project corridor. This land use may also be used to describe some areas surrounding reservoirs in this project corridor.

Shrub and Brushland (3200) – This land use consists of primarily shrubs and brush species. A few small patches of this land use were observed along the project corridor, primarily around the World Drive interchange and along Palm Parkway.

Mixed Upland Non-forested (3300) – This land use is described as not being dominated by any species and may be comprised of multiple species. It was observed in small patches to the west of I-4 south of Central Florida Parkway and just west of Palm Parkway.

Upland Coniferous Forests (4100) – This land use consists of any natural forest stand whose canopy is at least 66 percent dominated by coniferous species including natural pine flatwoods. It was observed along portions of the World Drive interchange and several small isolated patches along the project corridor.

Sand Pine (4130) – This land use consists of upland forest communities dominated by sand pine. It was observed in one small strip between Palm Parkway and I-4.

Hardwood-Conifer Mixed (4340) – Vegetation within this land use consists of oaks, pine, and other species with no clear canopy dominance between hardwoods and conifers. This land use was observed along the eastern side of I-4 north of the SR 429 interchange, southwest of the Osceola Parkway interchange, and several small isolated patches along the project corridor.

Streams and Waterways (5100) – This land use designates rivers, creeks, canals, and other linear water bodies. Reedy Creek passes under I-4 between the interchanges at SR 429 and World Drive. Bonnet Creek, which is highly channelized in this portion of its course, passes under I-4 at the Osceola Parkway interchange.

Lakes (5200) – This land use designates inland water bodies which are not classified as reservoirs. Lake Willis is a moderate sized lake that borders the right-of-way to the east of I-4 between the interchanges at SR 535 and the Central Florida Parkway. Several other named lakes, including Little Lake Bryan, Lake Ruby and Big Sand Lake are located along the project corridor.

Reservoirs (5300) – This land use designates all retention ponds and other artificial impoundments used for irrigation and flood control. Numerous reservoirs were observed along the project corridor, primarily in urban areas and within interchanges. Several reservoirs are located within the median, just south of the SR 417 interchange.

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 primarily observed within the Reedy Creek basin between the interchanges at SR 429 and World Drive and surrounding Little Lake Bryan. Other small isolated patches of this land use were observed primarily in the southern portion of the project corridor.

Wetland Coniferous Forests (6200) – This land use is defined as wetlands which meet the crown closure requirements for coniferous forests that are a result of natural generation. Several areas along the floodplain of Bonnet Creek were identified as meeting the definition of this land use.

Cypress (6210) – Dominant vegetation consists of cypress and was observed in low areas bordering Reedy Creek and other small isolated patches near the interchange with World Drive.

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 to the northeast of the Old Lake Wilson Road overpass and several small areas along Celebration Boulevard.

Freshwater Marsh (6410) – This land use is defined as vegetated non-forested wetlands which are usually found in low-lying areas or depressions in the landscape. Small isolated patches of this habitat type occur in several areas near the lakes along 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. Several patches of this habitat type were observed along the project corridor, usually near or adjacent to waterways.

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

Communications (8200) – This land use designates all communications structures. A Cell Phone Tower is located along International Drive near the Epcot Center Drive/World Center Drive interchange.

Electrical Power Facilities (8310) – This land use designates power plants and substations, including the Tampa Electric (TECO) - Disney substation along the right-of-way at the World Drive interchange.

Electrical Power Transmission Lines (8320) – There are electrical power transmission lines that cross the right-of-way several times and run along I-4 from the vicinity of the SR 429 interchange to the US 192 interchange.

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), which is a unit of measure used to determine sound intensities. Leq(h) is measured on an A-weighted decibel scale (dBA), which is the frequency of sound that is heard by the human ear.

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 Existing Noise Levels

In order to collect data on existing noise levels throughout the project area, 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 (dBA), which is the frequency of sound that is heard by a human ear. The average sound level over an 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.

Two locations were used: the first location was adjacent to the eastbound side of I-4 on the north side of the Orlando Premium Outlets near the Waterford Commons, 10 feet outside of the right-of-way fence. The second location was along the eastbound side of I-4, north of the on ramp from CR 532, at the north end of an FDOT stormwater pond approximately 50 feet from the edge of the paved shoulder. 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.

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 daily calibrated 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 volumes at speeds of 65 mph was utilized to model the worst case scenario for future noise projections (See **Table 4**).

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 Noise Abatement Criteria

The FHWA has established Noise Abatement Criteria (NAC) for seven land use categories. 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 and where a reduced noise level would be beneficial. 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). 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 (industrial and retail facilities) and G (undeveloped lands) have no exterior uses and are not considered noise sensitive and thus do not have any noise abatement criteria (see Table 1 - Noise Abatement Criteria [NAC]). 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] FHWA	Activity Leq(h)[1] FDOT	Evaluation location	Description of activity category
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.
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. Seventeen (17) noise sensitive areas that have the potential to be impacted by the project were identified (see **Figure 3.1**, Noise Sensitive Area Maps). The potential noise-sensitive sites identified for this segment consist of churches, a cemetery, hotels, resorts, recreational facilities, multi-family residences, and single-family residences. Both the Orange County Building Department and Osceola County Building Department were 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). Multi-story buildings were modeled using representative points on the ground floor, first floor, and second floor where appropriate. First floor receptor sites were modeled 5 feet above ground level, while second and third story receptors were

modeled at 15 and 25 feet above ground level, respectively. All noise-sensitive sites within the project corridor will likely experience noise and/or vibration impacts during construction of any proposed roadway improvements.

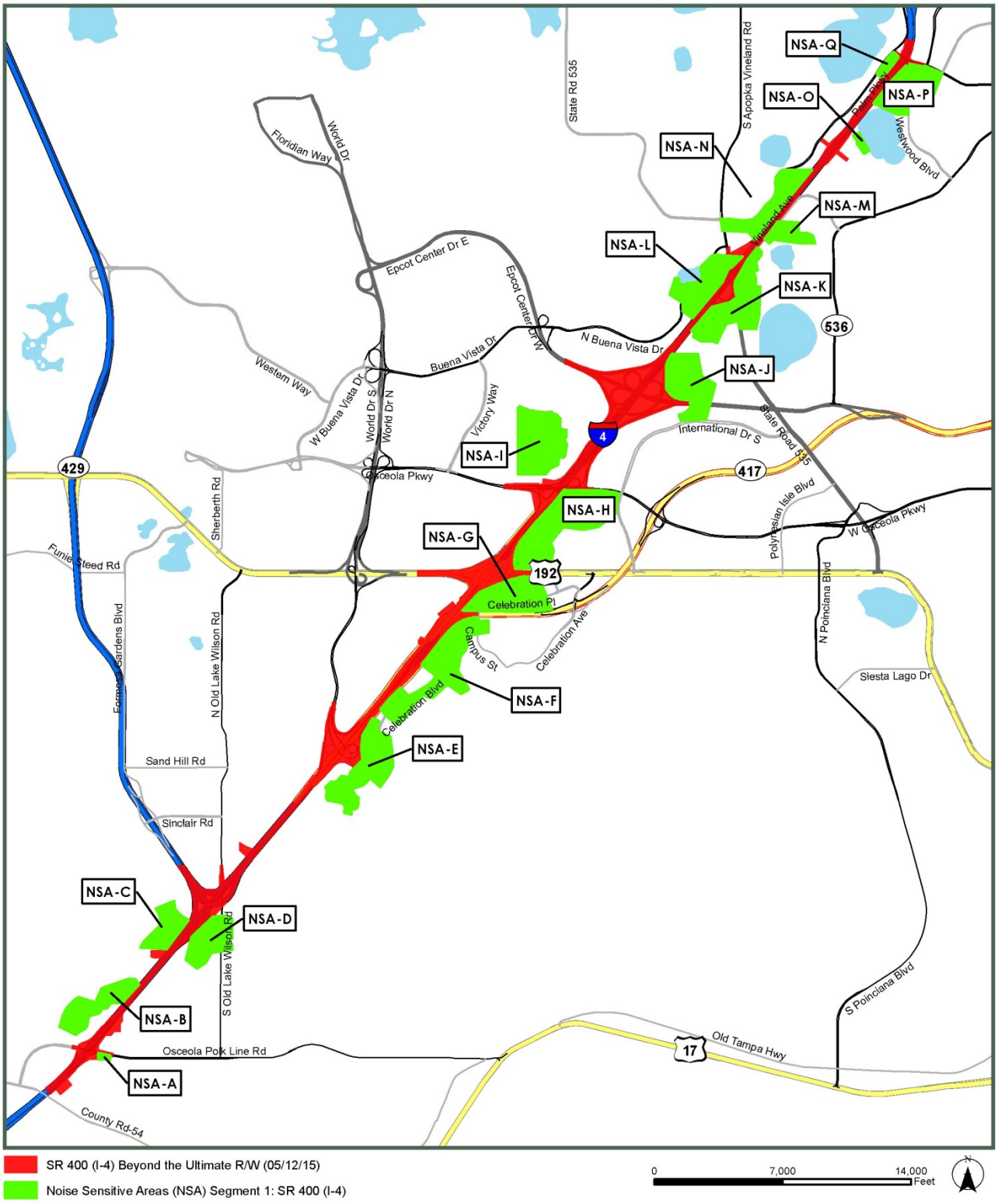


Figure 3.1 – Noise Sensitive Areas Map

Following is a description of each Noise Sensitive Area:

Noise Sensitive Area A
This area is located east of I-4 on the south side of Osceola Polk Line Road and consists of Oak Hill Baptist Church and the Oak Hill Cemetery.

Noise Sensitive Area B
This area is located west of I-4 and north of Osceola Polk Line Road and consists of the Tuscana Resort Orlando, The Fountains at Champions Gate, and Reunion Golf Course.

Noise Sensitive Area C
This area is located west of I-4 and south of SR 429. This noise sensitive area consists of the noise sensitive sites at the Reunion Resort, Reunion Golf Course, and the single family residences at Masters Landing.

Noise Sensitive Area D
This area is located east of I-4 and south of Old Lake Wilson Road. This noise sensitive area consists of the noise sensitive sites at the Reunion Resort and the multi-family residences at the Villas at Sandy Ridge.

Noise Sensitive Area E
This area is located east of I-4 around the World Center Drive Interchange including Celebration Boulevard. This noise sensitive area consists of the noise sensitive sites at Celebration High School, The Preserve at Celebration, Evander Square at Celebration, The Lofts at Celebration, and a playground at 1530 Celebration Blvd.

Noise Sensitive Area F
This area is located east of I-4 along Celebration Boulevard. This noise sensitive area consists of noise sensitive sites at Spring Lake Celebration, Siena at Celebration, and the Celebration Golf Course.

Noise Sensitive Area G
This area is located east of I-4, north of SR 417 and south of US 192. This noise sensitive area consists of noise sensitive sites at Florida Hospital Celebration Health, Celebration Community Church, Creation Kids Village, and Melia Orlando Suite Hotel.

Noise Sensitive Area H
This area is located east of I-4, from north of US 192 to Osceola Parkway. This noise sensitive area consists of the noise sensitive sites at a number of hotels including the Radisson Resort Orlando, The Palms Hotel and Villas, Vacation Village at Parkway, and the Gaylord Palms Resort.

Noise Sensitive Area I
This area is located west of I-4 and north of Osceola Parkway. This noise sensitive area consists of the noise sensitive sites at the Waldorf Astoria Hotel and the Waldorf Astoria Golf Club.

Noise Sensitive Area J
This area is located east of I-4 at SR 536. This noise sensitive area consists of the noise sensitive sites at several hotels such as the Nickelodeon Suites Resort and the Orlando World Center Marriott, and the Marriott Hawks Landing Golf Club.

Noise Sensitive Area K
This area is located east of I-4 at SR 535. This noise sensitive area consists of the noise sensitive sites at several hotels and resorts including the Sheraton Vistana Resort and the Marriott Village at Lake Buena Vista, several restaurants such as Bahama Breeze, and the residences at Vista Way.

Noise Sensitive Area L

This area is located west of I-4 at SR 535 and includes portions of Buena Vista Drive and Hotel Plaza Boulevard. This noise sensitive area consists of the noise sensitive sites at numerous hotels including the Hilton Resort in the Walt Disney World Village, Holiday Inn Lake Buena Vista, B Resort and Spa, Double Tree Suites Lake Buena Vista, and the Radisson Hotel Orlando.

Noise Sensitive Area M
This area is located east of I-4 along Vineland Avenue. This noise sensitive area consists of the noise sensitive sites at The Commons at Little Lake Bryan and the Mary Queen of the Universe Shrine Church.

Noise Sensitive Area N
This area is located west of I-4 along Palm Parkway. This noise sensitive area consists of the noise sensitive sites at several hotels including the Comfort Inn Lake Buena Vista, Clarion Inn, Quality Suites, Hampton Inn Lake Buena Vista, Extended Stay America Lake Buena Vista, Embassy Suites Lake Buena Vista, Residence Inn, Hilton Garden Inn, and Homewood Suites.

Noise Sensitive Area O
This area is located east of I-4 to the north of Daryl Carter Parkway. This noise sensitive area consists of the residential homes along Lake Willis Drive.

Noise Sensitive Area P
This area is located east of I-4 along Westwood Boulevard and south of Central Florida Parkway. This noise sensitive area consists of the noise sensitive sites at the Marriott Vacation Club Harbour Lake, Residence Inn at SeaWorld, and Integra Cove Apartment Homes.

Noise Sensitive Area Q
This area is located west of I-4 along Palm Parkway at Central Florida Parkway. This noise sensitive area consists of the noise sensitive sites at the Altis Sand Lake Apartments.

4.0 Predicted Noise Levels

4.1 Model Validation and Background Noise Levels

The TNM model was validated at the field sampling locations along I-4 in two locations as described in Section 2.3. Field recorded noise levels varied slightly from TNM predictions. Contributing noise levels from sources other than roadway-generated noise along I-4 were not input into the TNM. As seen in **Table 3**, TNM Version 2.5 predictions were within 3 decibels (dBA) of the field recorded noise levels. Therefore, the model was validated.

Table 3. TNM Validation Results (dBA)

Field Recording Station	Field Recorded	TNM Predicted	Δ	Threshold	Validate
Location 1	**74.7**	**73.7**	**1.0**	**3**	**YES**
Location 2	**74.6**	**76.6**	**2.0**	**3**	**YES**

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 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 models 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.

Table 4. Traffic Data for TNM Modeling

Roadway Segment	Level of Service "C" Volume	Cars	Medium Trucks	Heavy Trucks	Speed
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 Category C and has **no** sites predicted to be impacted.

Noise Sensitive Area B

This area represents Activity Category B and E and has **20** sites predicted to be impacted.

Noise Sensitive Area C

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

Noise Sensitive Area D

This area represents Activity Category B, C, and E and has **no** sites predicted to be impacted.

Noise Sensitive Area E

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

Noise Sensitive Area F

This area represents activity Category B,C and E and has **no** sites predicted to be impacted.

Noise Sensitive Area G

This area represents Activity Category C and E and has **no** sites predicted to be impacted.

Noise Sensitive Area H

This area represents Activity Category E and has n**o** sites predicted to be impacted.

Noise Sensitive Area I

This area represents Activity Category C and E and has **no** sites predicted to be impacted.

Noise Sensitive Area J

This area represents Activity Category C and E and has **2** sites predicted to be impacted.

Noise Sensitive Area K

This area represents Activity Category E and has **no** sites predicted to be impacted.

Noise Sensitive Area L

This area represents Activity Category E and has **3** sites predicted to be impacted.

Noise Sensitive Area M

This area represents Activity Category B and C and has **3** sites predicted to be impacted.

Noise Sensitive Area N

This area represents Activity Category C and E and has **4** sites predicted to be impacted.

Noise Sensitive Area O

This area represents Activity Category B and has **no** sites predicted to be impacted.

Noise Sensitive Area P

This area represents Activity Category B, C, and E and has **12** sites predicted to be impacted.

Noise Sensitive Area Q

This area represents Activity Category B and has **56** 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. The complete set of results for all TNM runs for potential noise sensitive sites can be found in **Appendix II**.

Table 5. Noise Sensitive Areas

Noise Sensitive Area	Activity Category	Number of Impacted Sites
A	**C**	**0**
B	**B, E**	**20**
C	**B, C, E**	**1**
D	**B, C, E**	**0**
E	**B, C, E**	**1**
F	**B, C, E**	**0**
G	**C, E**	**0**
H	**E**	**0**
I	**C, E**	**0**
J	**C, E**	**2**
K	**E**	**0**
L	**E**	**3**
M	**B, C**	**3**
N	**C, E**	**4**
O	**B**	**0**
P	**B, C, E**	**12**
Q	**B**	**56**

5.0 Noise Abatement

The FHWA requires that various noise abatement measures be considered for a proposed project when the predicted noise levels exceed noise abatement criteria, or, will increase substantially over existing levels. If none of the potential receptors 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. 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. Such measures may be considered in the future if noise levels resulting from the proposed project approach or exceed the abatement criteria. 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 dBA 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 dBA reduction or greater.

When a noise abatement measure such as a sound barrier is determined to be feasible, the reasonableness is then evaluated. This implies ‘common sense’ and ‘good judgment’ were applied in a decision related to noise abatement. 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 dBA 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. 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 where approximately 1,400 square feet of noise barrier is provided per benefited receptor. A benefited receptor is defined as a noise sensitive site that will obtain a minimum of 5 dBA 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.

One Noise Barrier was deemed reasonable and feasible during the original PD&E study completed for this segment. Additional 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 barrier-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 shoulder mounted barriers were limited to 14 feet (or 8 feet for sections of roadway on structure). The optimal barrier design for each analysis (See Figure B, Noise Barrier Analysis Maps in **Appendix I)** is described below and detailed in **Table 6**.

Noise Sensitive Area A

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area B

Barriers were modeled at the Tuscana Resort Orlando within Noise Sensitive Area B. Ground-mounted barriers were modeled along the right-of-way adjacent to westbound I-4, and shoulder mounted barriers were modeled at the edge of the shoulder as a barrier-mounted wall. The best case scenario for the Ground Mounted Barrier was for a 619-foot long, 22-foot high wall at a total cost of $408,693 that provided an insertion loss of 5 dBA or greater to 11 receptors for an average cost of $37,154 per benefited receptor. The 14-foot tall shoulder mounted barrier did not provide an insertion loss of at least 5dBA for any receptor. The 22-foot tall barrier cost average is less than the $42,000 per benefited receptor threshold set forth in Chapter 17 of the PD&E Manual and is therefore cost reasonable.

Noise Sensitive Area C

No noise barriers were modeled for this area as only a single receptor was predicted to be impacted by the project.

Noise Sensitive Area D

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area E

No noise barriers were modeled for this area as only a single receptor was predicted to be impacted by the project.

Noise Sensitive Area F

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area G

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area H

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area I

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area J

Barriers were modeled for the Hawks Landing Golf Course in Noise Sensitive Area J. No barriers that were modeled provided an insertion loss of at least 5 dBA for the receptors. The proposed roadway typical section at this location has an elevated section for the General Use Lanes with the express lanes located at grade (as depicted in **Figure 1.4**). Barriers were modeled at the edge of the right-of-way up to 22-feet high, though the elevated section of the General Use Lanes is proposed at 26 feet 6 inches above grade. It is likely that the height of the barriers is not sufficient to provide abatement at this location. An 8-foot high barrier located at the edge of shoulder on the elevated General Use Lanes does not provide any insertion loss to the receptors. In addition, TNM 2.5 does not allow a barrier to be modeled beneath an elevated roadway, so it is not possible to simulate a shoulder-mounted barrier adjacent to the Express Lanes in conjunction with a shoulder mounted barrier adjacent to the elevated General Use Lanes. No barriers provide the necessary abatement in Noise Sensitive Area J.

Noise Sensitive Area K

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area L

No noise barriers were modeled for this area as the receptors predicted to be impacted at this location are separated by SR 535. The receptors are also subject to noise from SR 535 at this location. Barriers of sufficient height or length to provide the necessary abatement could not feasibly be constructed in this area due to the highway overpass at SR 535 and the location of the impacted receivers on both sides of SR 535 west of I-4. SR 535 is an 8-lane divided roadway at this location with both on and off-ramps to I-4 located between the receivers and I-4 (see sheet 8 of Figure B).

Noise Sensitive Area M

Barriers were modeled for The Commons at Little Lake Bryan in Noise Sensitive Area M. Neither the ground-mounted barrier along the right-of-way nor the shoulder-mounted barrier provided an insertion loss of at least 5 dBA for the receptors. The westbound General Use Lanes are proposed to be elevated at this location (as depicted in **Figure 1.5**), and Vineland Avenue runs parallel to I-4 between the receptors and the proposed barriers. It is likely that a combination of the elevated travel lanes and the distance from the barriers to the noise receptors makes it unlikely for the barriers to provide abatement at this location. No barriers provide the necessary abatement in Noise Sensitive Area M.

Noise Sensitive Area N

Barriers were modeled for the hotel pools and waterpark at the Clarion Hotel located within Noise Sensitive Area N. No barriers that were modeled provided an insertion loss of at least 5 dBA for the receptors. The proposed roadway typical section at this location has an elevated section for the westbound General Use Lanes with the express lanes located at grade (as depicted in **Figure 1.5**). Barriers were modeled at the edge of the right-of-way up to 22-feet high, though the elevated section of the General Use Lanes is proposed at 26 feet 6 inches above grade. It is likely that the height of the barriers is not sufficient to provide abatement at this location. An 8-foot high barrier located at the edge of shoulder on the elevated General Use Lanes does not provide any insertion loss to the receptors. No barriers provide the necessary abatement in Noise Sensitive Area N.

Noise Sensitive Area O

No noise barriers were modeled for this area as no receptors were predicted to be impacted by the project.

Noise Sensitive Area P

Barriers were modeled for the Integra Cove Apartments located within Noise Sensitive Area P. Barriers were modeled along the right-of-way, on the shoulder of the eastbound travel lanes, and on the shoulder of the off-ramp from eastbound I-4 to Central Florida Parkway. The best case scenario was for a 489-foot long, 22-foot tall ground-mounted barrier at a total cost of $322,524. This barrier provided an insertion loss of at least 5 dBA for 10 receptors at an average cost of $32,252 per benefited receptor, and is therefore cost reasonable.

Noise Sensitive Area Q

Barriers were modeled for the Altis Sand Lake Apartments located within Noise Sensitive Area Q. Barriers were modeled along the right-of-way adjacent to the on ramp to westbound I-4 from Central Florida Parkway and along the shoulder of the westbound travel lanes. The shoulder barrier was broken up into two separate barriers (with overlapping coverage) due to the elevated proposed on ramp to westbound I-4 from Central Florida Parkway. Both the ground mounted barriers and the shoulder-mounted barriers provided abatement, and both were deemed cost reasonable. The best case scenario for the ground-mounted barrier was a for 1,223-foot long, 18-foot tall barrier with a total cost of $660,326. This barrier provided an insertion loss of at least 5 dBA for 86 receptors at an average cost of $7,678 per benefited receptor. The best case scenario for the shoulder mounted barrier was a configuration with a 979-foot long, 14-foot tall shoulder mounted barrier and a 598-foot long, 14-foot tall shoulder mounted barrier at a total cost of $662,424. This barrier combination provided an insertion loss of at least 5 dBA for 86 receptors at an average cost of $7,702 per benefited receptor. Both barrier options are well below the $42,000 cost per benefited receptor threshold and are therefore cost reasonable.

Table 6 – 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 (dBA)	Cost ($30.00 per square foot)	Average Cost per Benefited Receptor	Comment
NSA B	Barrier-mounted	BW B1	I-4 Westbound Shoulder	14	471	20	0	0	0	2.0	$197,679		does not provide > 5dBA
	ground	BW B2	I-4 Westbound ROW	22	471	20	6	0	6	7.7	$310,557	$51,759	not cost reasonable
	ground	BW B3	I-4 Westbound ROW	22	619	20	10	1	11	7.3	$408,693	$37,154	**cost reasonable**
	ground		I-4 Westbound ROW	20	619	20	8	1	9	7.1	$371,539	$41,282	**cost reasonable**
	ground		I-4 Westbound ROW	18	619	20	6	0	6	6.75	$334,385	$55,730	not cost reasonable
NSA J	ground	BW J1	I-4 Eastbound ROW	22	1,247	2	0	0	0	3.0	$823,122		does not provide > 5dBA
NSA M	Barrier-mounted	BW M1	I-4 Eastbound Shoulder	14	1,601	4	0	0	0	1.5	$672,413		does not provide > 5dBA
	ground	BW M2	I-4 Eastbound ROW	22	1,640	4	0	0	0	2.3	$1,082,363		does not provide > 5dBA
NSA N	Barrier-mounted	BW N1	I-4 Westbound Elevated Shoulder	8	1,666	3	0	0	0	0	$399,817		does not provide > 5dBA
	ground	BW N2	I-4 Westbound ROW	22	1,535	3	0	0	0	2.5	$1,013,327		does not provide > 5dBA
NSA P	Barrier-mounted	BW P1	I-4 Eastbound Shoulder	14	476	12	0	0	0	3.3	$199,794		does not provide > 5dBA
	Barrier-mounted	BW P2	I-4 Eastbound off-ramp to CFP Shoulder	14	718	12	6	0	6	5.75	$301,684	$50,280	does not meet design goal not cost reasonable
	ground	BW P3	I-4 Eastbound ROW	22	489	12	8	2	10	7.3	$322,524	$32,252	**cost reasonable**
	ground		I-4 Eastbound ROW	20	489	12	6	0	6	7.75	$293,204	$48,867	not cost reasonable
	ground		I-4 Eastbound	18	489	12	6	0	6	7.1	$263,883	$43,980	not cost reasonable
NSA Q	Barrier-mounted	BW Q1	I-4 Westbound Shoulder	14	979 598	56	56	30	86	6.5	$662,424	$7,702	**cost reasonable**
	ground	BW Q2	I-4 Westbound ROW	22	1,223	56	56	30	86	8.0	$807,065	$9,384	**cost reasonable**
	ground		I-4 Westbound ROW	20	1,223	56	56	30	86	7.5	$733,695	$8,531	**cost reasonable**
	ground		I-4 Westbound ROW	18	1,223	56	56	30	86	6.8	$660,326	$7,678	**cost reasonable**
	ground		I-4 Westbound ROW	16	1,223	56	26	18	44	7.5	$586,956	$13,340	**cost reasonable**

6.0 Conclusions

Based upon the analysis conducted, three noise barriers are recommended for further consideration and public input for this segment of the project: For the Tuscana Resort Orlando within Noise Sensitive Area B, a 22-foot tall, 619-foot long ground mounted barrier provides the best noise abatement and meets the requirements as reasonable and feasible. For the Integra Cove Apartments within Noise Sensitive Area P, a 22-foot tall, 489-foot long ground mounted barrier provides the best noise abatement and meets the requirements as reasonable and feasible. For the Altis Sand Lake Apartments within Noise Sensitive Area Q, an 18-foot tall, 1,223-foot long ground mounted barrier provides the best noise abatement and meets the requirements as reasonable and feasible.

7.0 Commitments

FDOT is committed to the construction of feasible noise abatement measures contingent upon the following conditions:

- Reasonable cost analysis indicates that the economic cost of the barriers will not exceed the cost-reasonable criterion.
- Community input regarding desires, types, heights, and locations (if applicable).
- Consideration of preferences regarding compatibility with adjacent land uses, particularly as addressed by officials having jurisdiction over such land uses; and,
- Consideration of safety and engineering aspects as related to the roadway user and the adjacent property owner.

8.0 Construction Noise and Vibration

Construction activities for any of the proposed improvements will have temporary noise impacts for those residents and travelers 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. 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

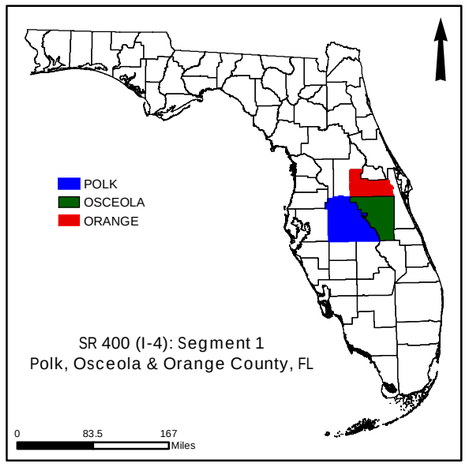
SR 400 (I-4) BEYOND THE ULTIMATE
PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY

SEGMENT 1

FDOT FM NO. 432100-1-22-01

NOISE STUDY REPORT
(NSR)

POLK, OSCEOLA & ORANGE COUNTIES
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 5



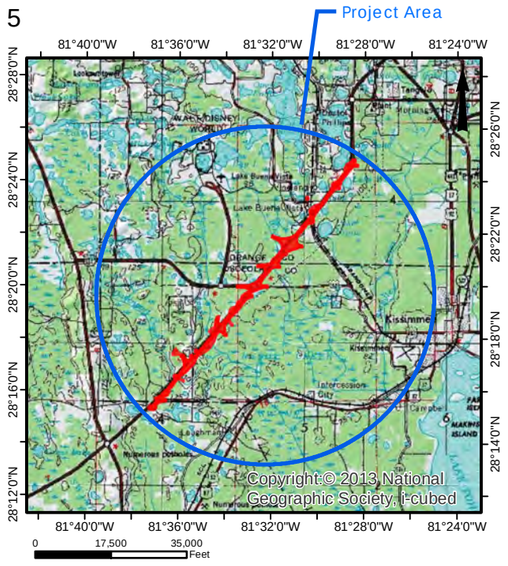


FIGURE NO.	SHEET NO.	TITLE
Figure A	Sheets 1-5	Land Use and Habitat Coverage Map
Figure B	Sheets 1-10	Noise Barrier Analysis Map

PROJECT DETAILS

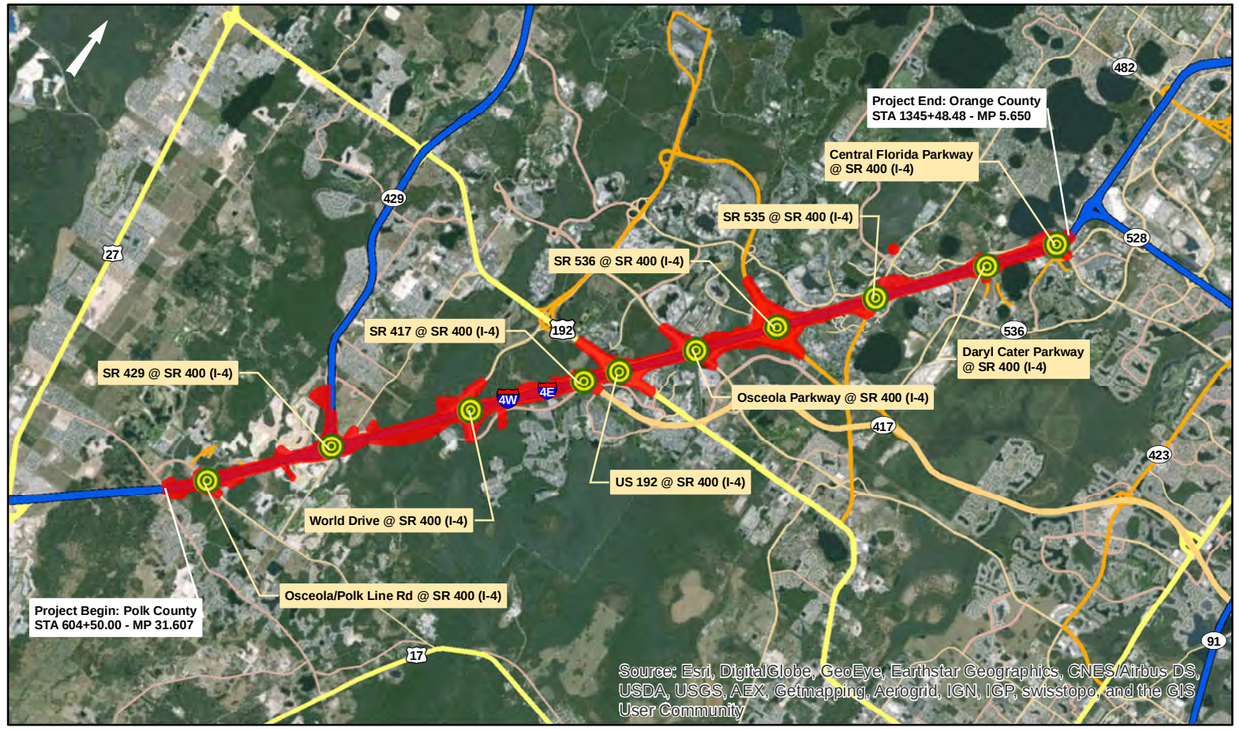
NOISE STUDY REPORT:
Segment 1 - Report Maps

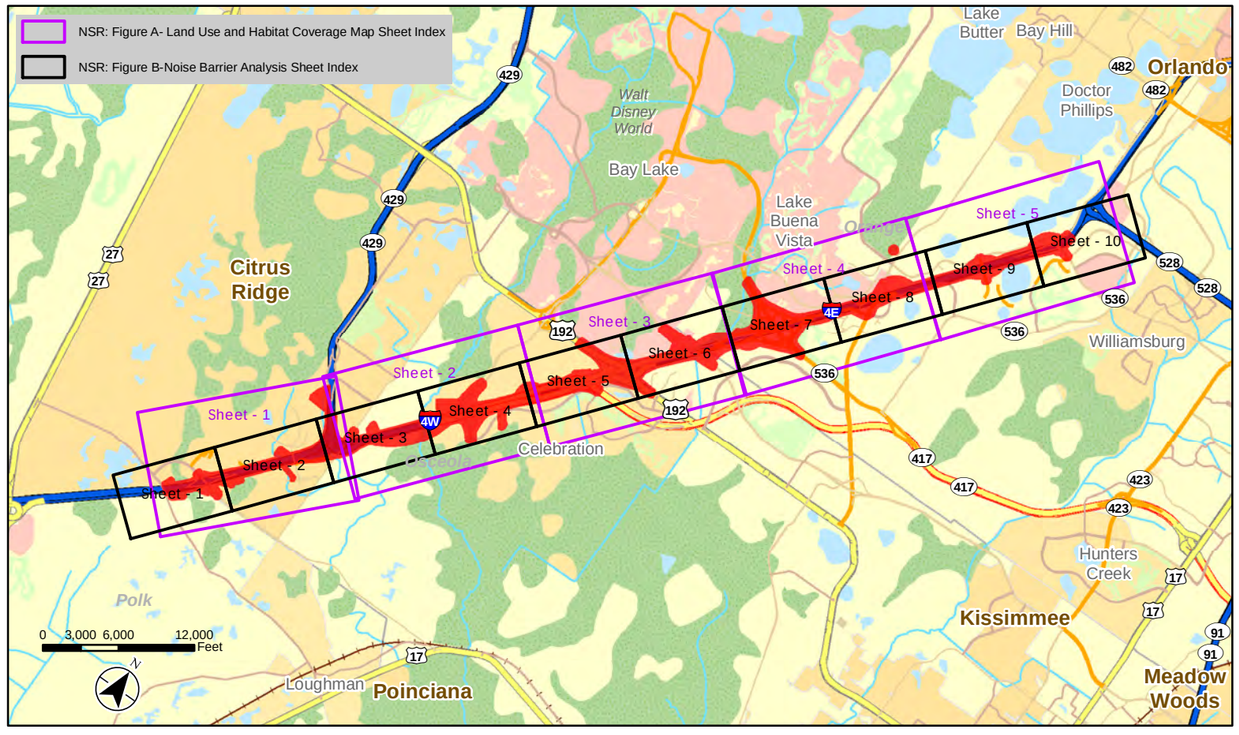
SR 400 (I-4) from West of SR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway

16320 Polk County
Begin: STA 604+50.00 - MP 31.607
End: STA 626+39.92 - MP 32.022

92130 Osceola County
Begin: STA 626.392 - MP 0.00
End: STA 11042+95 - MP 7.885

75280 Orange County
Begin: STA 1042+95 - MP 0.00
End: STA 1345.48.48 - MP 5.650





STN No. 2024230168

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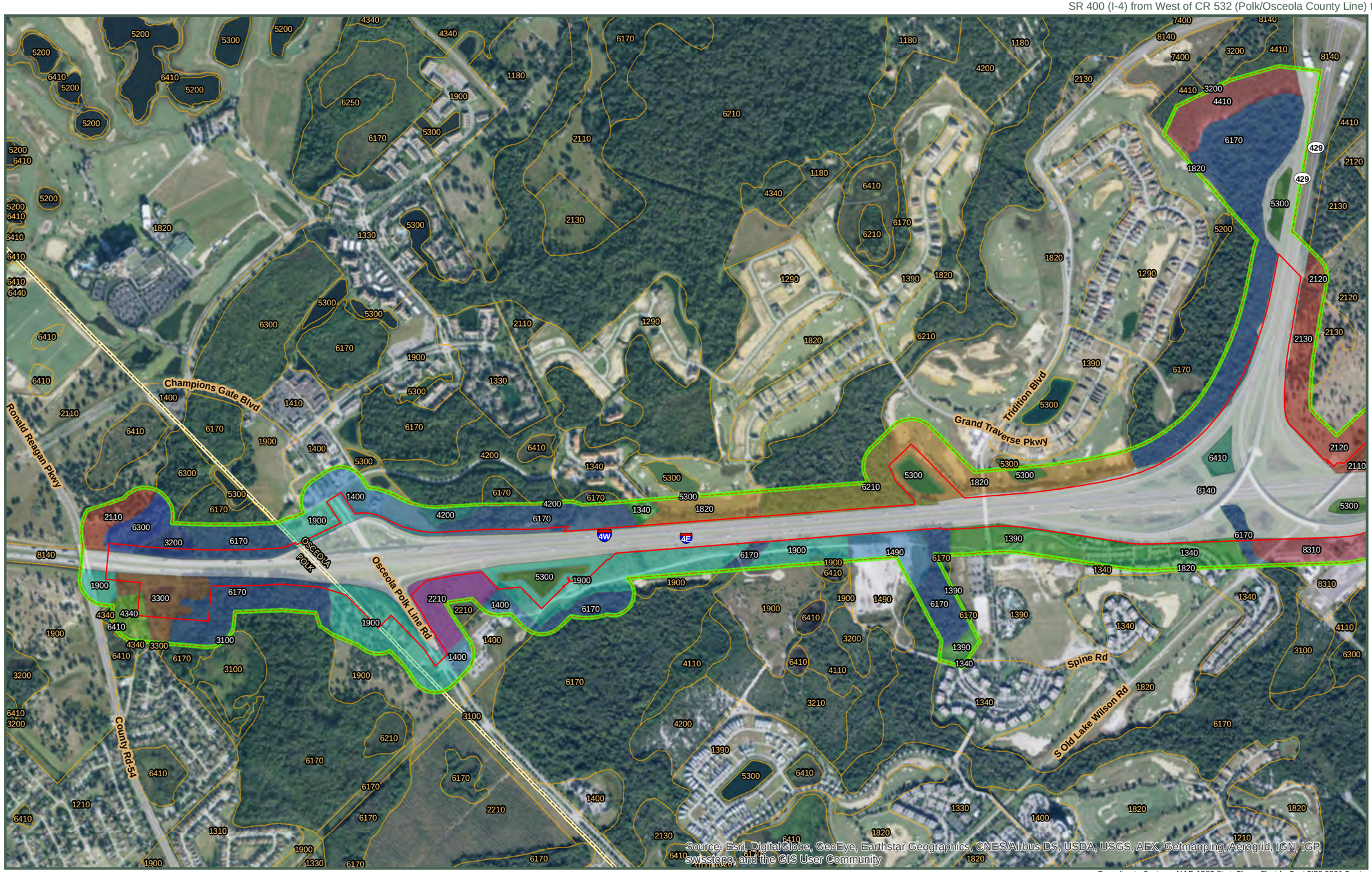
LAND USE AND HABITAT MAPS

NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Land Use and Habitat Coverage

- 1100 RESIDENTIAL, LOW DENSITY
- 1300 RESIDENTIAL, HIGH DENSITY
- 1400 COMMERCIAL AND SERVICES
- 1700 INSTITUTIONAL
- 1800 RECREATIONAL
- 1900 OPEN LAND
- 2100 PASTURES
- 2200 TREE CROPS
- 3100 HERBACEOUS
- 3200 UPLAND SHRUB AND BRUSHLAND
- 3300 MIXED RANGELAND
- 4100 UPLAND CONIFEROUS FORESTS
- 4200 UPLAND HARDWOOD FORESTS
- 4300 UPLAND MIXED CONIFEROUS - HARDWOOD
- 4400 TREE PLANTATION
- 5100 STREAMS & WATERWAYS
- 5200 LAKES
- 5300 RESERVOIRS
- 6100 WETLAND HARDWOODS FORESTS
- 6200 WETLAND CONIFEROUS FORESTS
- 6300 WETLAND FORESTED MIXED
- 6400 FRESHWATER MARSHES
- 7400 DISTURBED LAND
- 8140 ROADS AND HIGHWAYS
- 8300 ELECTRICAL POWER FACILITIES
- Land Use and Habitat County Coverage

Title:
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 8/31/2015
Technical Review by: mDrauer 8/31/2015
Independent Review by: jMoore 8/31/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 575 1,150 2,300 Feet

Figure A - Sheet 1 of 5: Land Use and Habitat Coverage

1 " = 1,150 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 432100-1-22-01

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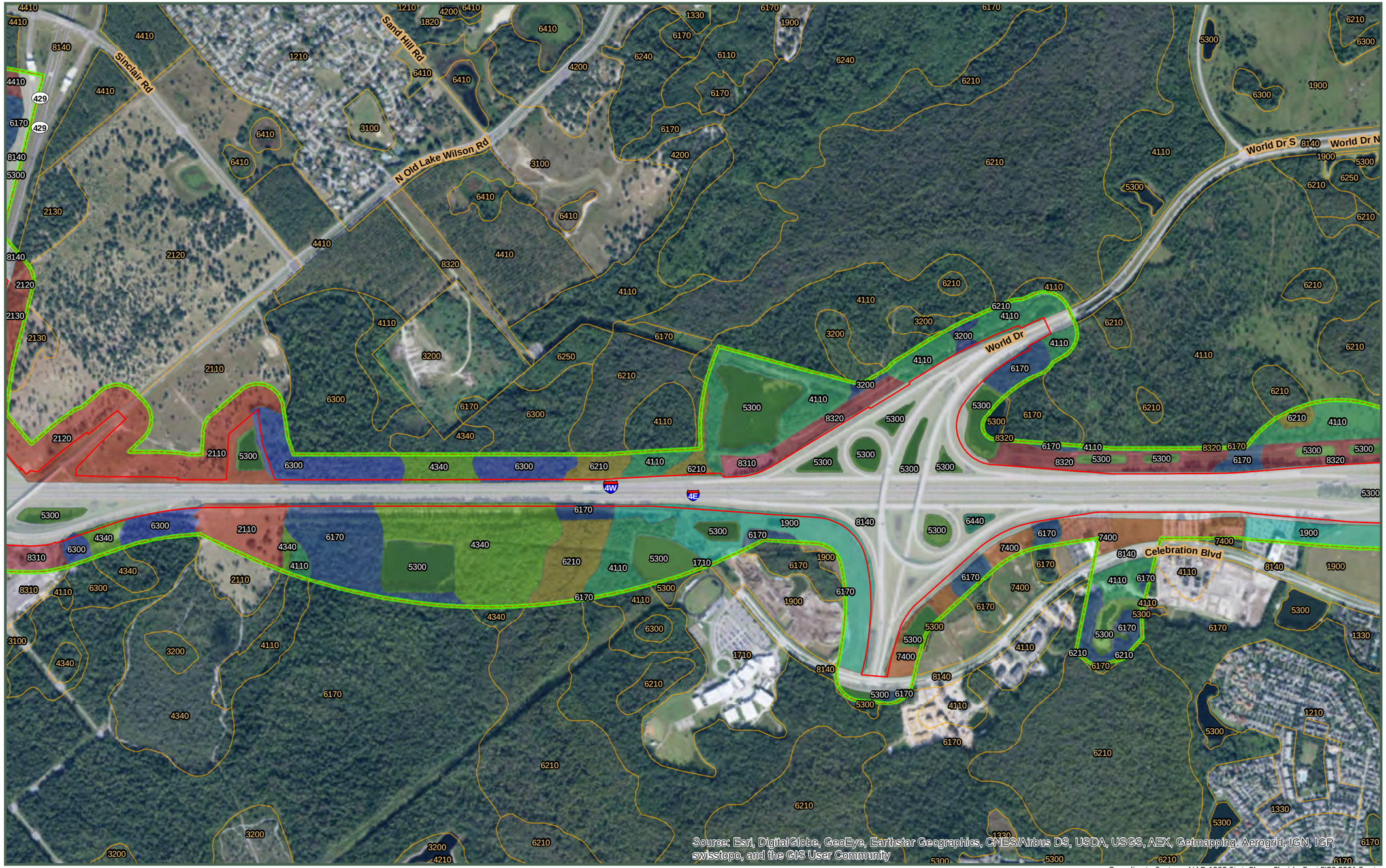
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Land Use and Habitat Coverage

- 1100 RESIDENTIAL, LOW DENSITY
- 1300 RESIDENTIAL, HIGH DENSITY
- 1400 COMMERCIAL AND SERVICES
- 1700 INSTITUTIONAL
- 1800 RECREATIONAL
- 1900 OPEN LAND
- 2100 PASTURES
- 2200 TREE CROPS
- 3100 HERBACEOUS
- 3200 UPLAND SHRUB AND BRUSHLAND
- 3300 MIXED RANGELAND
- 4100 UPLAND CONIFEROUS FORESTS
- 4200 UPLAND HARDWOOD FORESTS
- 4300 UPLAND MIXED CONIFEROUS - HARDWOOD
- 4400 TREE PLANTATION
- 5100 STREAMS & WATERWAYS
- 5200 LAKES
- 5300 RESERVOIRS
- 6100 WETLAND HARDWOODS FORESTS
- 6200 WETLAND CONIFEROUS FORESTS
- 6300 WETLAND FORESTED MIXED
- 6400 FRESHWATER MARSHES
- 7400 DISTURBED LAND
- 8140 ROADS AND HIGHWAYS
- 8300 ELECTRICAL POWER FACILITIES
- Land Use and Habitat County Coverage

Title:
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 8/31/2015
Technical Review by: mDrauer 8/31/2015
Independent Review by: jMoore 8/31/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 575 1,150 2,300 Feet

Figure A - Sheet 2 of 5: Land Use and Habitat Coverage

1 " = 1,150 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 432100-1-22-01

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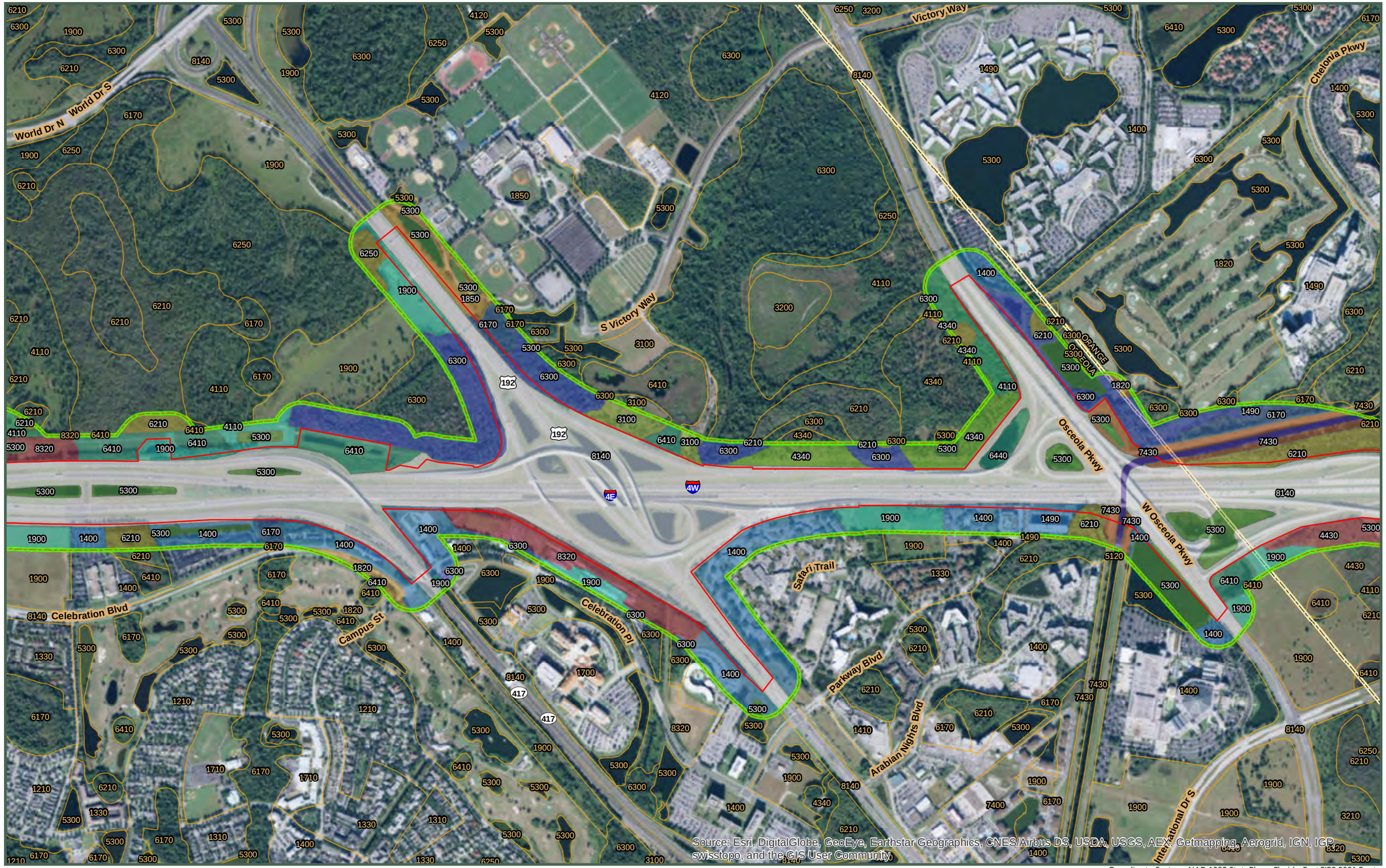
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Land Use and Habitat Coverage

- 1100 RESIDENTIAL, LOW DENSITY
- 1300 RESIDENTIAL, HIGH DENSITY
- 1400 COMMERCIAL AND SERVICES
- 1700 INSTITUTIONAL
- 1800 RECREATIONAL
- 1900 OPEN LAND
- 2100 PASTURES
- 2200 TREE CROPS
- 3100 HERBACEOUS
- 3200 UPLAND SHRUB AND BRUSHLAND
- 3300 MIXED RANGELAND
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- 4200 UPLAND HARDWOOD FORESTS
- 4300 UPLAND MIXED CONIFEROUS - HARDWOOD
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- 5200 LAKES
- 5300 RESERVOIRS
- 6100 WETLAND HARDWOODS FORESTS
- 6200 WETLAND CONIFEROUS FORESTS
- 6300 WETLAND FORESTED MIXED
- 6400 FRESHWATER MARSHES
- 7400 DISTURBED LAND
- 8140 ROADS AND HIGHWAYS
- 8300 ELECTRICAL POWER FACILITIES
- Land Use and Habitat County Coverage

Title:
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 8/31/2015
Technical Review by: mDrauer 8/31/2015
Independent Review by: jMoore 8/31/2015

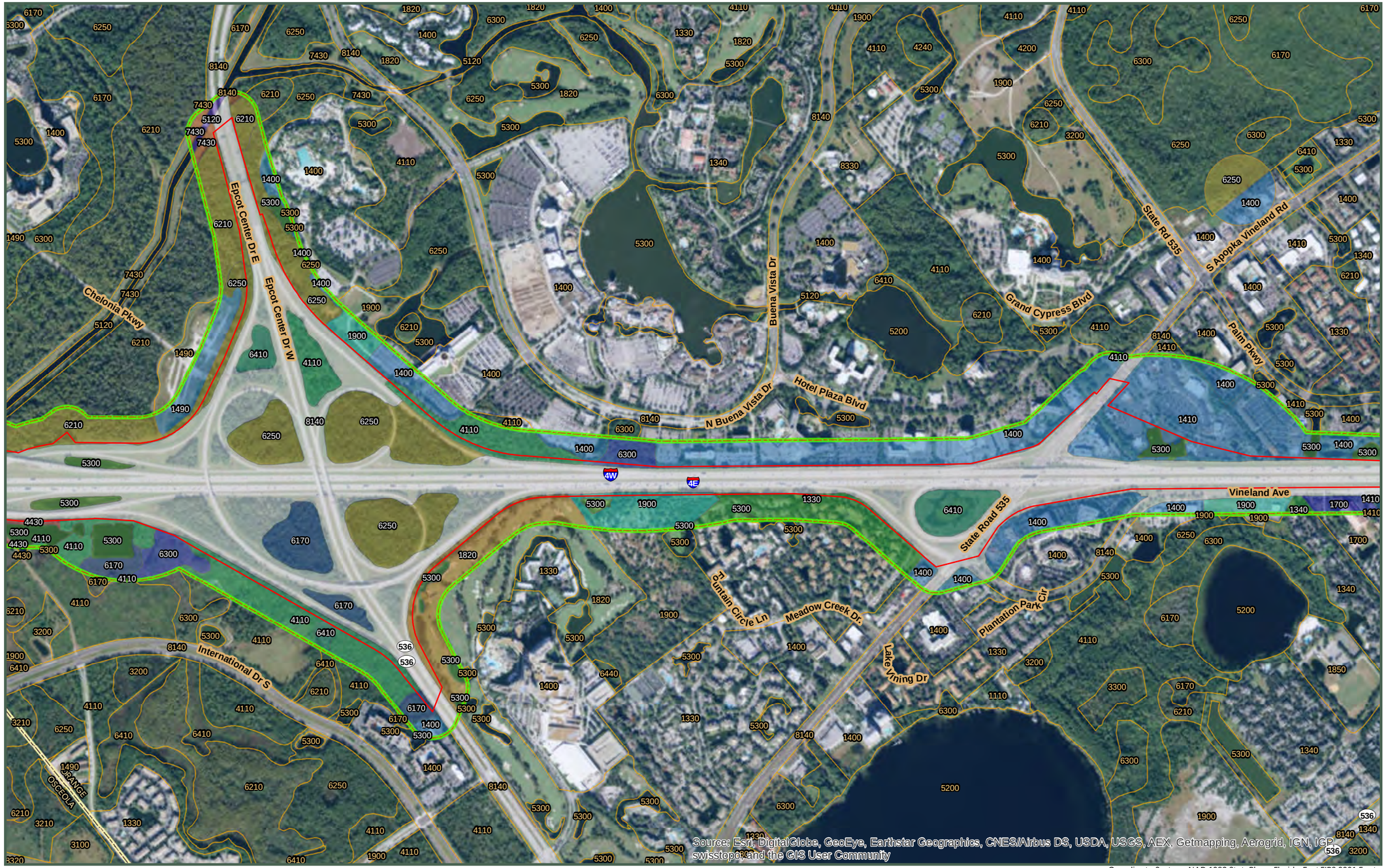
Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 575 1,150 2,300 Feet

Figure A - Sheet 3 of 5: Land Use and Habitat Coverage

NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Land Use and Habitat Coverage

- 1100 RESIDENTIAL, LOW DENSITY
- 1300 RESIDENTIAL, HIGH DENSITY
- 1400 COMMERCIAL AND SERVICES
- 1700 INSTITUTIONAL
- 1800 RECREATIONAL
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- 2200 TREE CROPS
- 3100 HERBACEOUS
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- 4200 UPLAND HARDWOOD FORESTS
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- 5100 STREAMS & WATERWAYS
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- 6300 WETLAND FORESTED MIXED
- 6400 FRESHWATER MARSHES
- 7400 DISTURBED LAND
- 8140 ROADS AND HIGHWAYS
- 8300 ELECTRICAL POWER FACILITIES
- Land Use and Habitat County Coverage

Title:
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 8/31/2015
Technical Review by: mDrauer 8/31/2015
Independent Review by: jMoore 8/31/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 575 1,150 2,300 Feet

Figure A - Sheet 4 of 5: Land Use and Habitat Coverage

1 " = 1,150 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 432100-1-22-01

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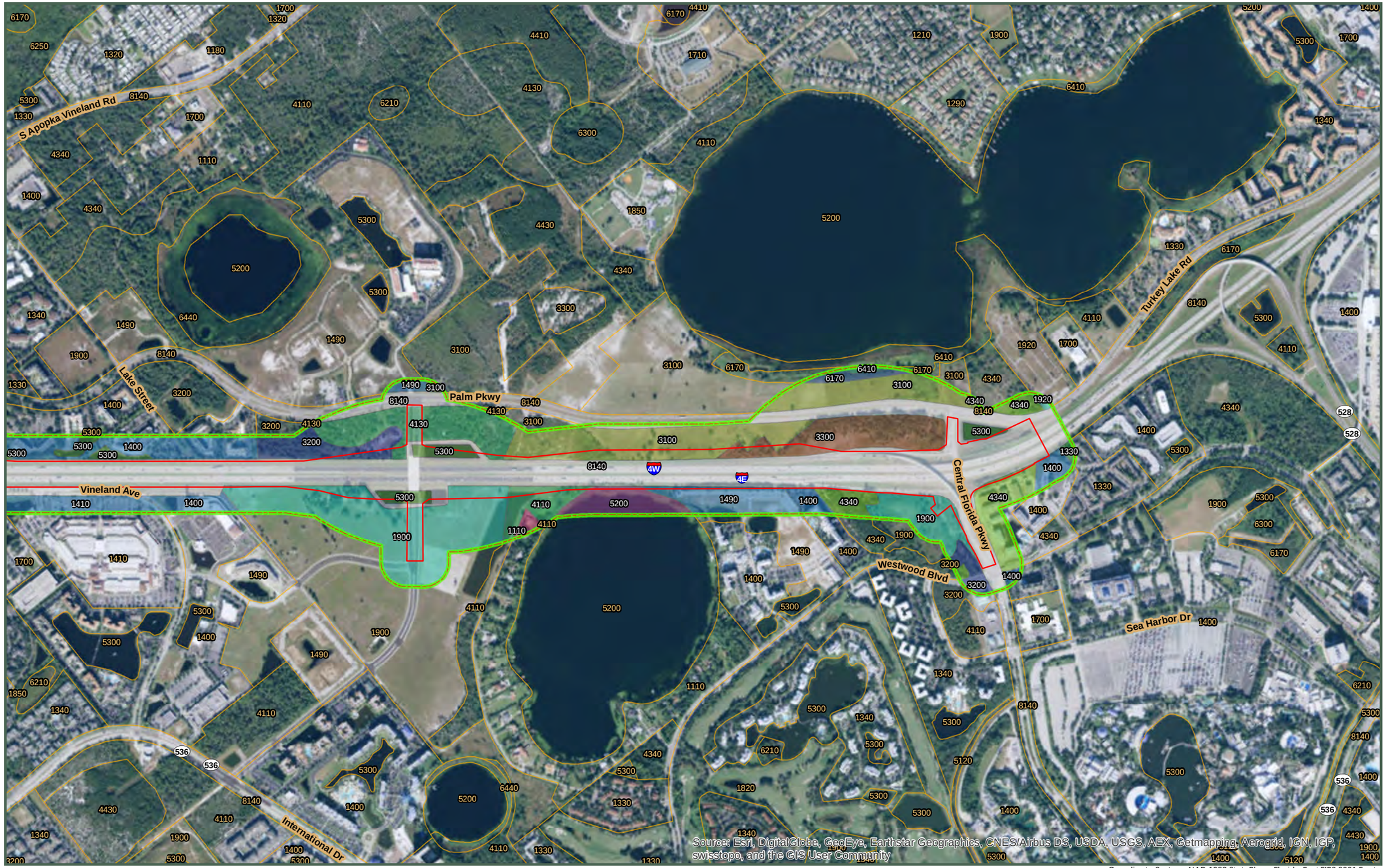
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits

Land Use and Habitat Coverage

- 1100 RESIDENTIAL, LOW DENSITY
- 1300 RESIDENTIAL, HIGH DENSITY
- 1400 COMMERCIAL AND SERVICES
- 1700 INSTITUTIONAL
- 1800 RECREATIONAL
- 1900 OPEN LAND
- 2100 PASTURES
- 2200 TREE CROPS
- 3100 HERBACEOUS
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- 6300 WETLAND FORESTED MIXED
- 6400 FRESHWATER MARSHES
- 7400 DISTURBED LAND
- 8140 ROADS AND HIGHWAYS
- 8300 ELECTRICAL POWER FACILITIES
- Land Use and Habitat County Coverage

Title:
NOISE STUDY REPORT: Segment 1 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 8/31/2015
Technical Review by: mDrauer 8/31/2015
Independent Review by: jMoore 8/31/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 575 1,150 2,300 Feet

Figure A - Sheet 5 of 5: Land Use and Habitat Coverage

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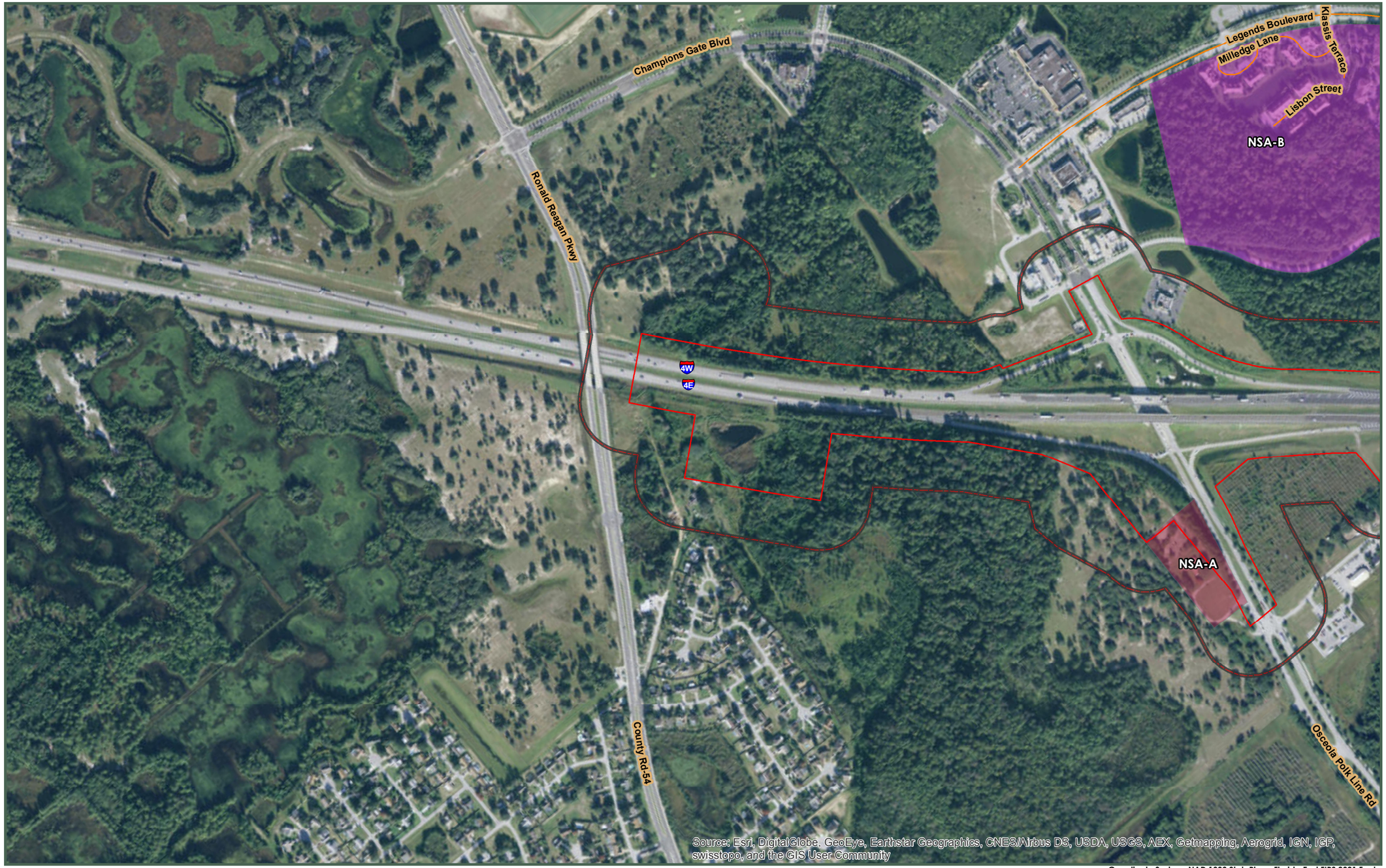
BARRIER ANALYSIS MAPS

NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

SR 400 (I-4) from West of CR 532 (Polk/Osceola County Line) to West of SR 528 Beachline Expressway



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:

NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 1 of 10: Noise Barrier Analysis Map

1 " = 600 '

SR 400 (I-4) Project Development and Environment (PD&E) Study | FM No. 432100-1-22-01

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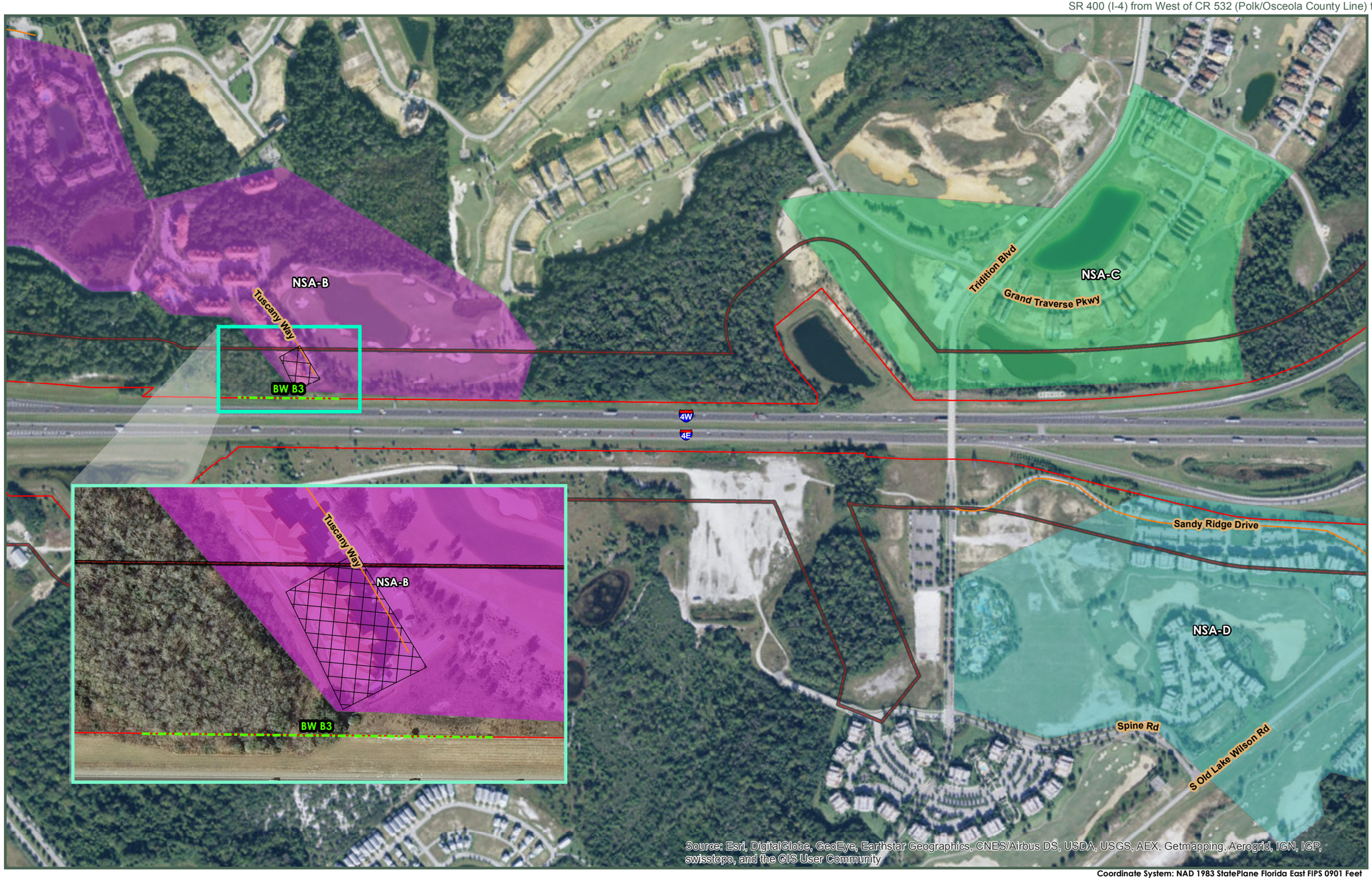

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Figure B - Sheet 2 of 10: Noise Barrier Analysis Map

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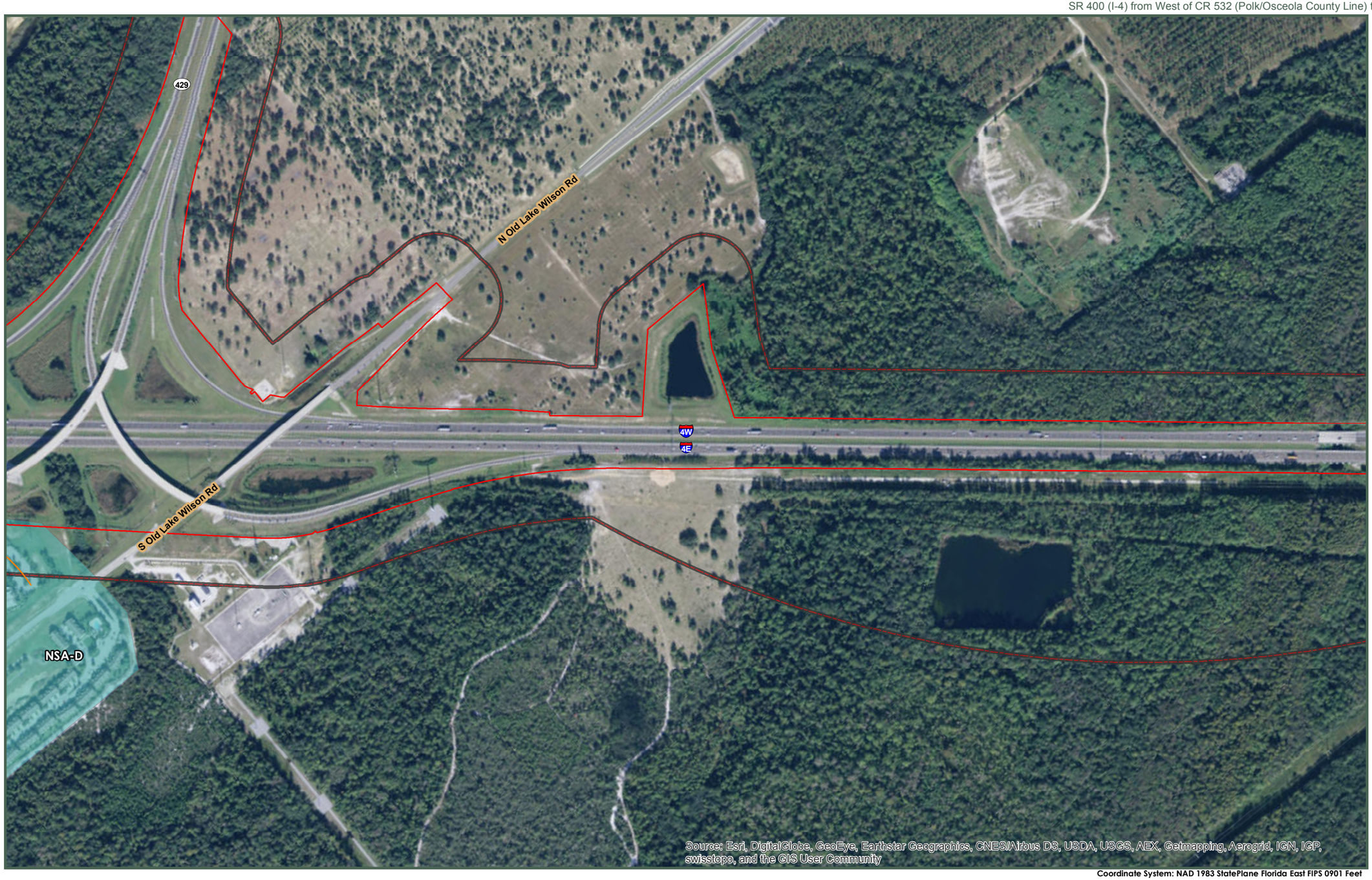

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
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End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 3 of 10: Noise Barrier Analysis Map

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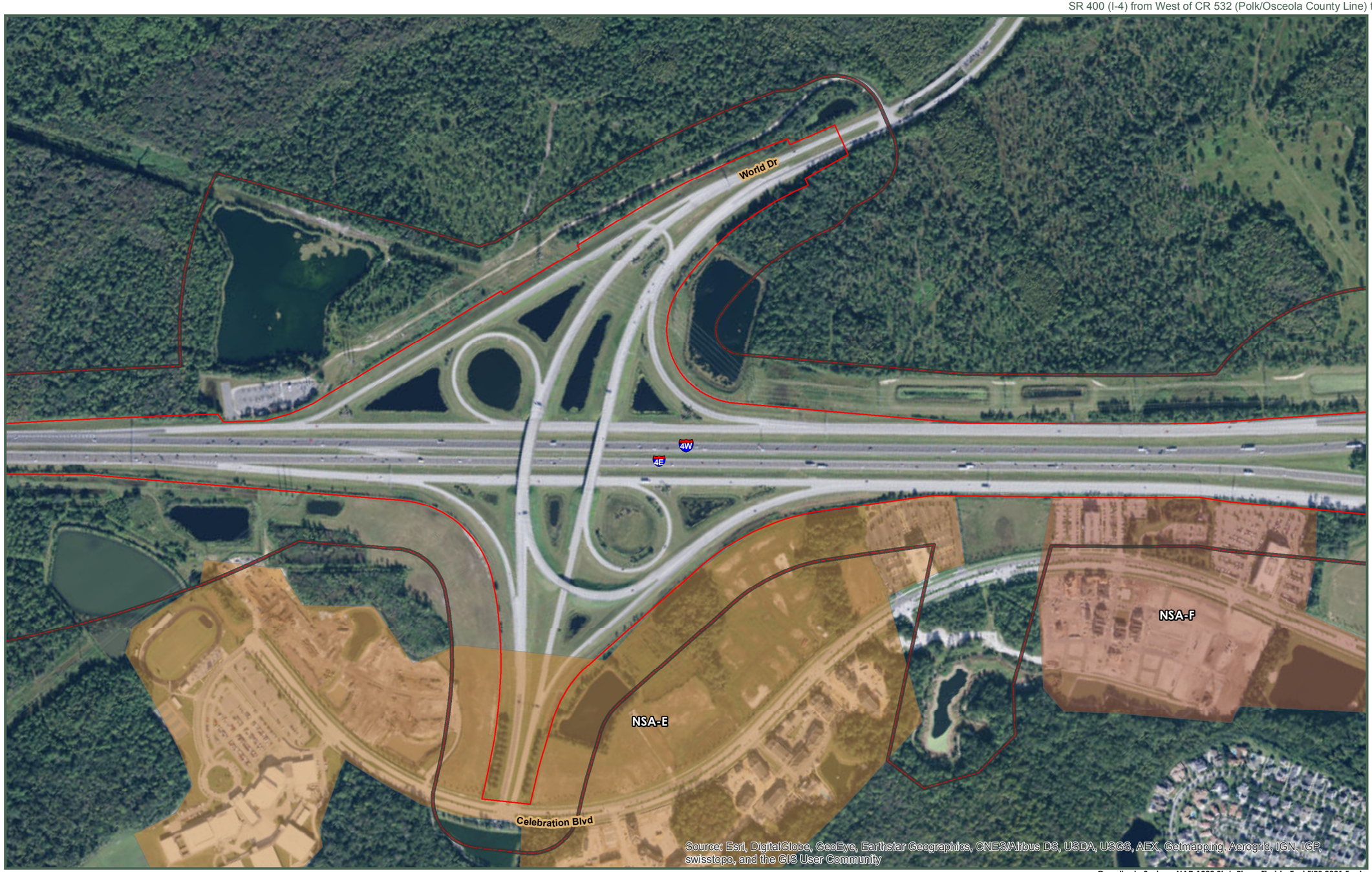

Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
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Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 4 of 10: Noise Barrier Analysis Map

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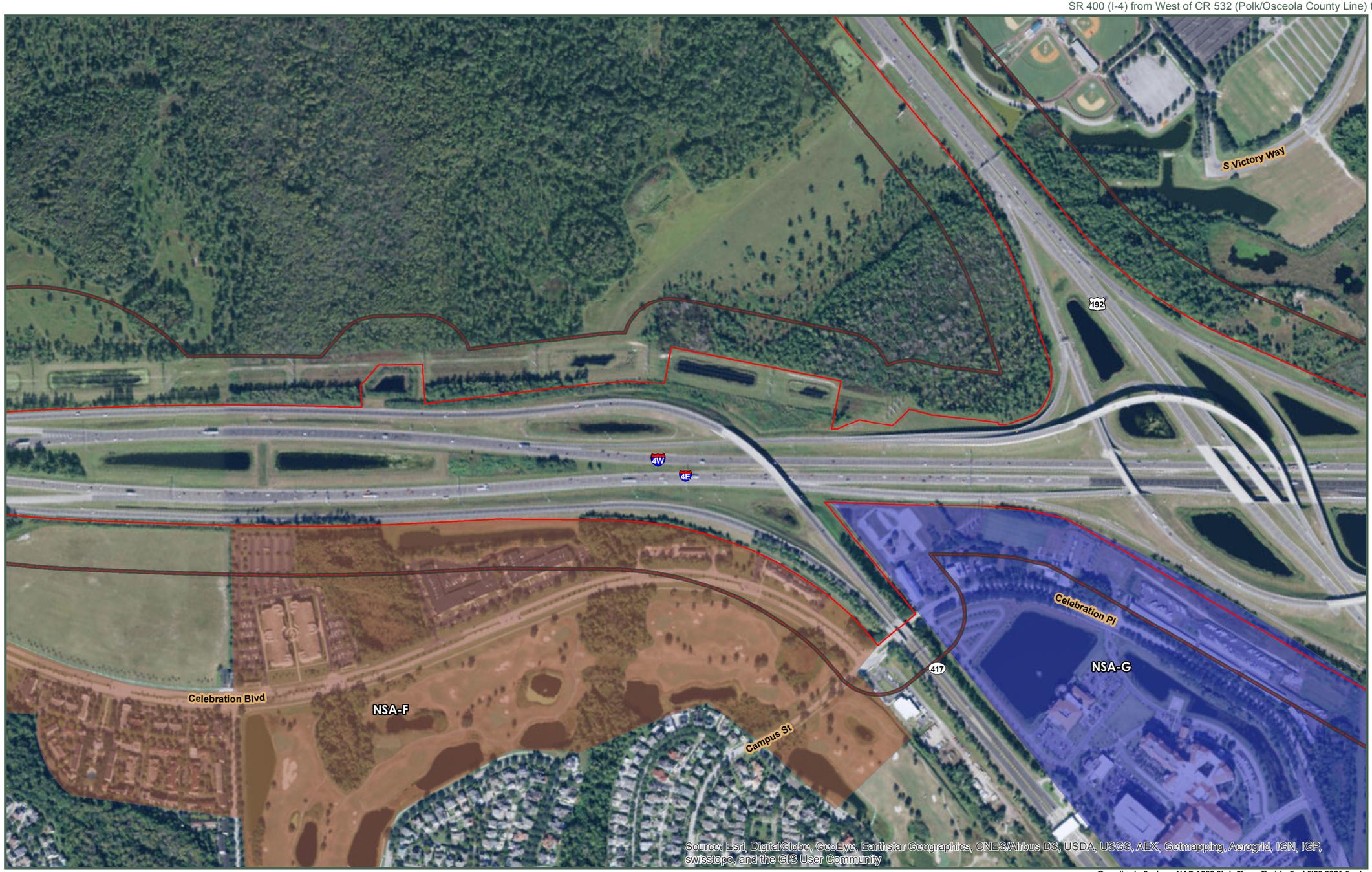


Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

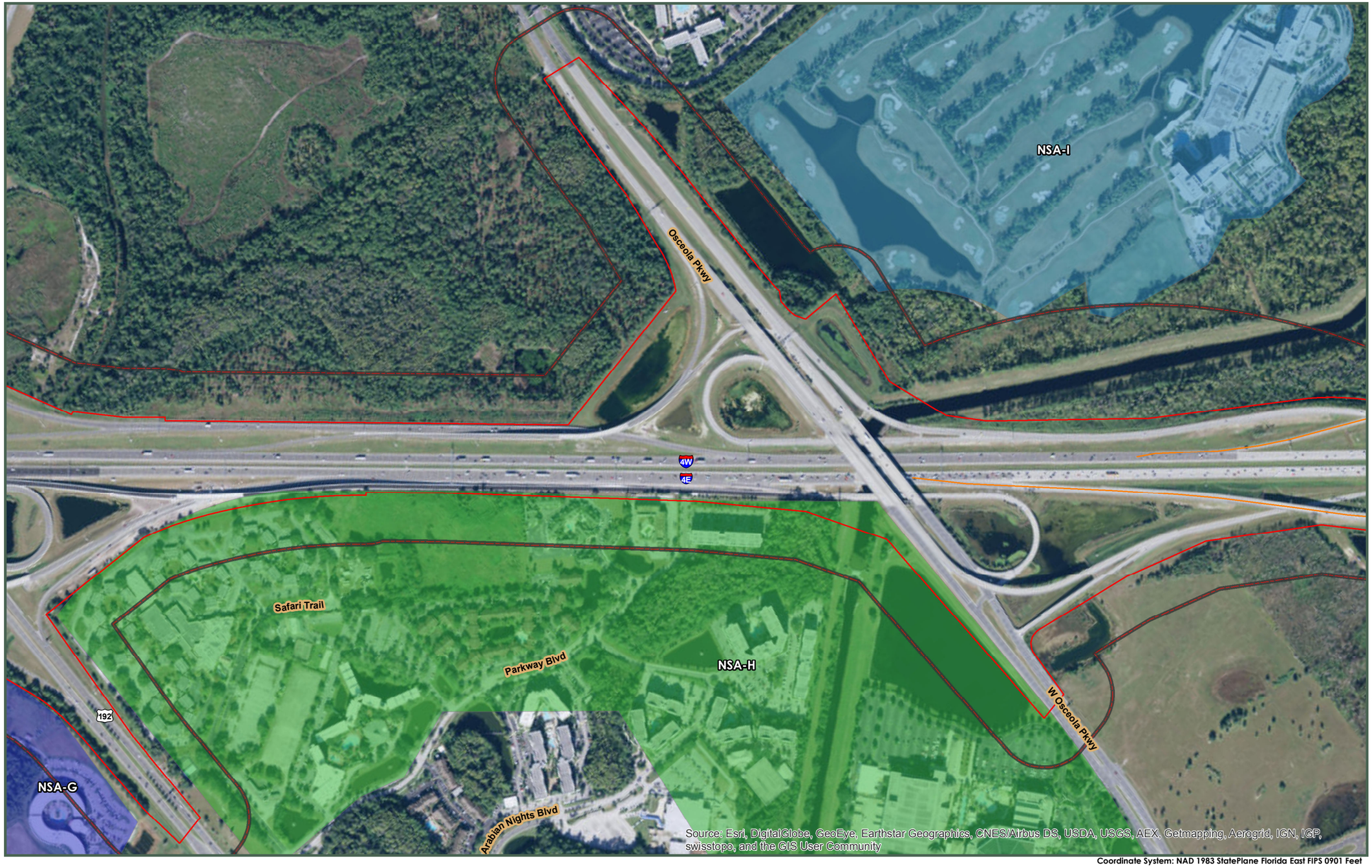
92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 5 of 10: Noise Barrier Analysis Map



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Figure B - Sheet 6 of 10: Noise Barrier Analysis Map

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Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 7 of 10: Noise Barrier Analysis Map

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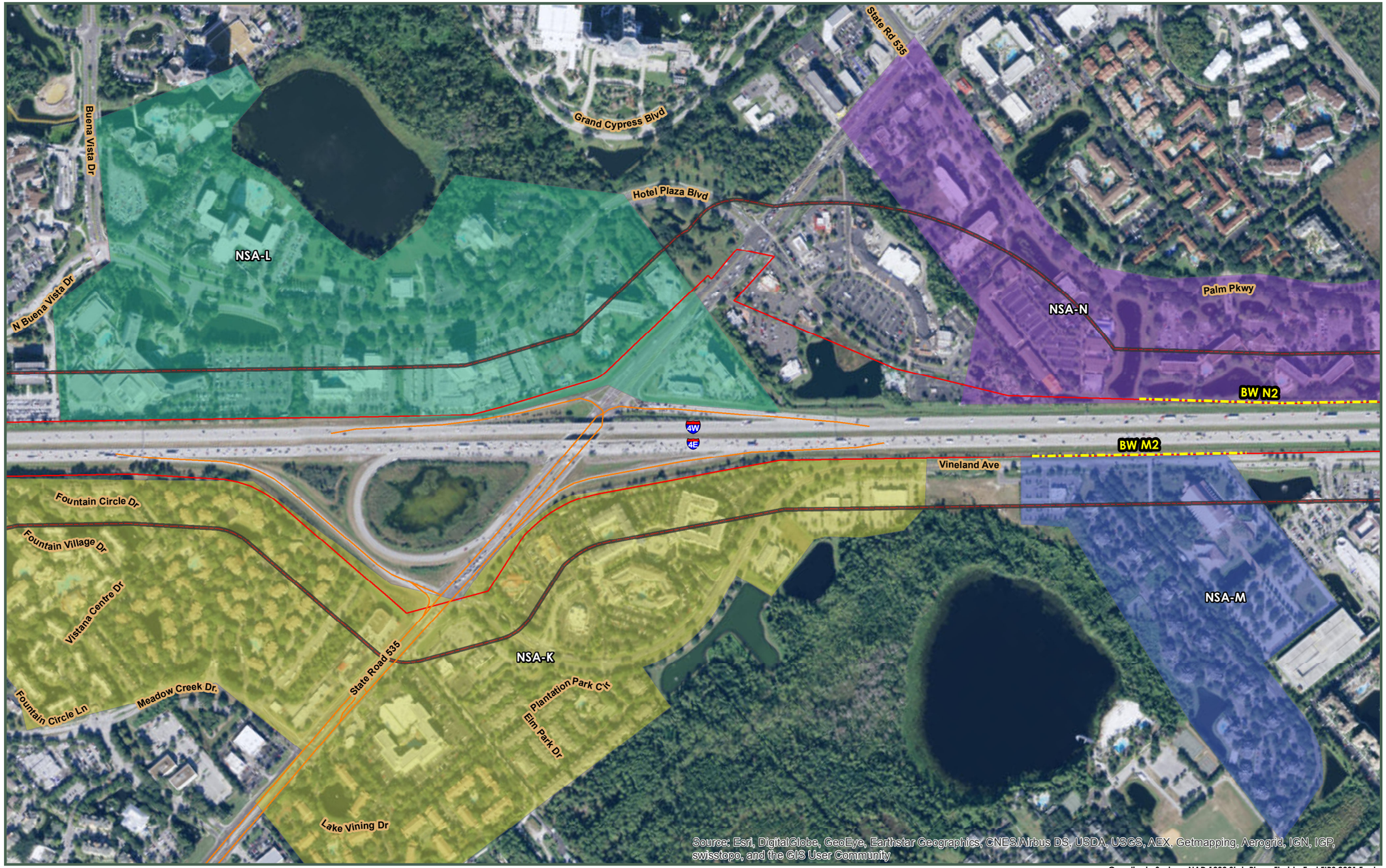


Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

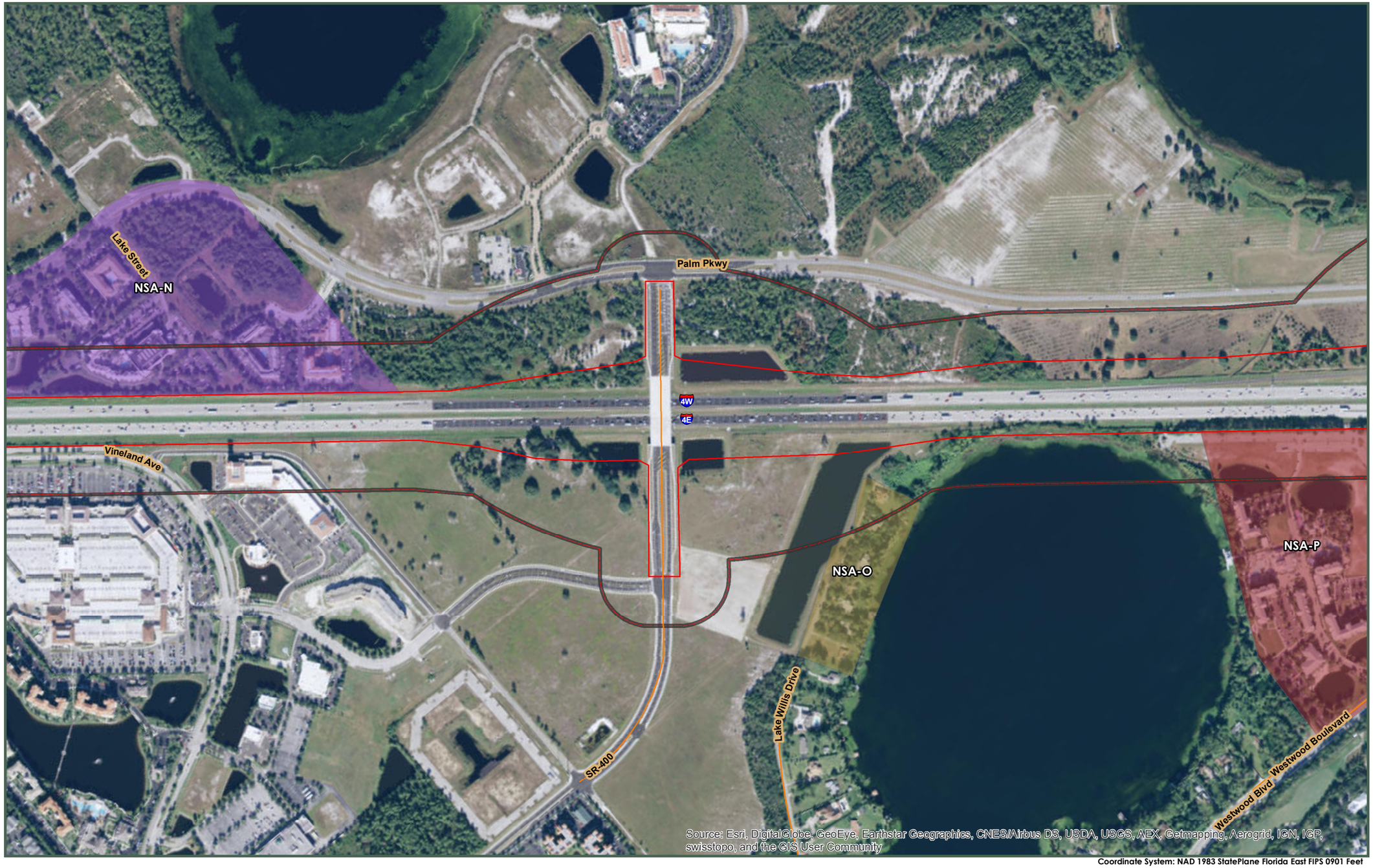
Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Figure B - Sheet 8 of 10: Noise Barrier Analysis Map



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

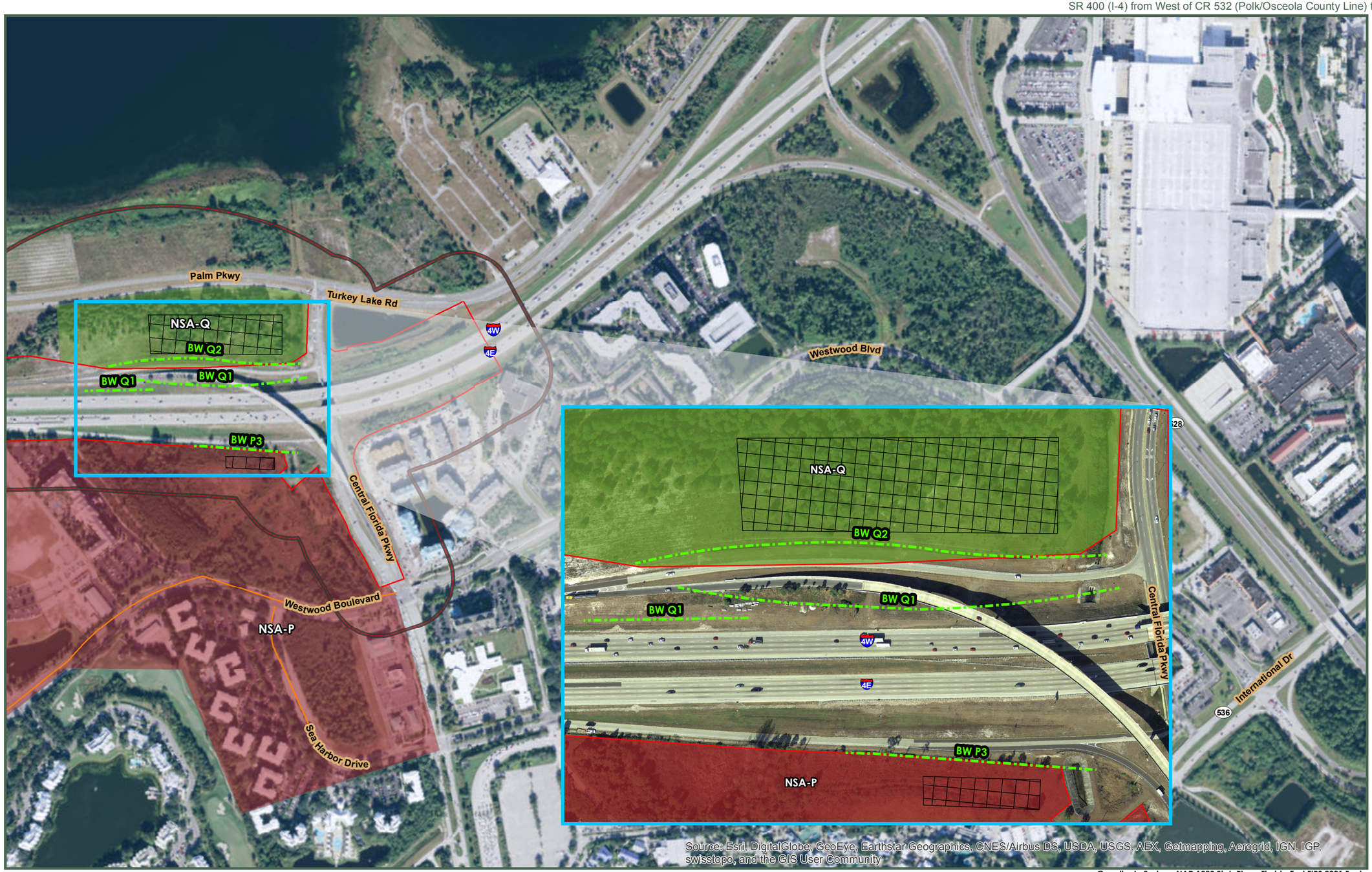
92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 9 of 10: Noise Barrier Analysis Map



Map Key

- SR 400 (I-4) Beyond the Ultimate R/W (05/12/15)
- SR 400 (I-4) Beyond the Ultimate PD&E Study Limits
- Benifited Receiver Area

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- NSA-I
- NSA-J
- NSA-K
- NSA-L
- NSA-M
- NSA-N
- NSA-O
- NSA-P
- NSA-Q

Barrier Walls

- Barrier Wall (Cost Reasonable)
- Barrier Wall (Not Cost Reasonable)

Title:
NOISE STUDY REPORT: Segment 1 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 (I-4) Beyond the Ultimate PD&E Study
Segment 4: SR 400 (I-4) from W. of CR 532 to W. of SR 528 Beachline Expressway

Project Location:

92130 Osceola County	75280 Orange County
Begin: STA 626.392 - MP 0.00	STA 1042+95 - MP 0.00
End: STA 11042+95 - MP 7.885	STA 1345.48.48 - MP 5.650

Prepared by: mLeonard 9/9/2015
Technical Review by: mDrauer 9/9/2015
Independent Review by: jMoore 9/9/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 300 600 1,200 Feet

Figure B - Sheet 10 of 10: Noise Barrier Analysis Map

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APPENDIX II

TNM RESULTS

Stantec
M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Reunion Area
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Oak Hill Baptist Cemetary	3	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
Oak Hill Baptist Church	5	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
Tuscana Pool	7	1	0.0	53.1	66	53.1	10	----	52.9	0.2	8	-7.8
Toscana 1st A	9	1	0.0	71.7	66	71.7	10	Snd Lvl	63.7	8.0	8	0.0
Toscana 2nd A	10	1	0.0	75.2	66	75.2	10	Snd Lvl	70.9	4.3	8	-3.7
Toscana 3rd A	11	1	0.0	76.2	66	76.2	10	Snd Lvl	75.7	0.5	8	-7.5
Toscana 1st B	12	1	0.0	71.9	66	71.9	10	Snd Lvl	64.8	7.1	8	-0.9
Toscana 2nd B	13	1	0.0	73.7	66	73.7	10	Snd Lvl	69.5	4.2	8	-3.8
Toscana 3rd B	14	1	0.0	75.1	66	75.1	10	Snd Lvl	74.7	0.4	8	-7.6
Toscana 1st C	15	1	0.0	67.4	66	67.4	10	Snd Lvl	63.3	4.1	8	-3.9
Toscana 2nd C	16	1	0.0	68.2	66	68.2	10	Snd Lvl	65.3	2.9	8	-5.1
Toscana 3rd C	17	1	0.0	70.6	66	70.6	10	Snd Lvl	69.8	0.8	8	-7.2
Toscana 1st D	18	1	0.0	67.1	66	67.1	10	Snd Lvl	61.8	5.3	8	-2.7
Toscana 2nd D	19	1	0.0	71.4	66	71.4	10	Snd Lvl	67.2	4.2	8	-3.8
Toscana 3rd D	20	1	0.0	73.1	66	73.1	10	Snd Lvl	72.2	0.9	8	-7.1
Toscana 1st E	21	1	0.0	62.2	66	62.2	10	----	59.6	2.6	8	-5.4
Toscana 2nd E	22	1	0.0	66.6	66	66.6	10	Snd Lvl	63.7	2.9	8	-5.1
Toscana 3rd E	23	1	0.0	68.7	66	68.7	10	Snd Lvl	67.8	0.9	8	-7.1
Toscana 1st F	24	1	0.0	62.5	66	62.5	10	----	60.1	2.4	8	-5.6
Toscana 2nd F	25	1	0.0	64.1	66	64.1	10	----	61.5	2.6	8	-5.4
Toscana 3rd F	26	1	0.0	66.6	66	66.6	10	Snd Lvl	65.4	1.2	8	-6.8
Toscana 2 1st A	28	1	0.0	61.0	66	61.0	10	----	59.2	1.8	8	-6.2
Toscana 2 2nd A	29	1	0.0	61.7	66	61.7	10	----	59.6	2.1	8	-5.9

Toscana 2 3rd A	30	1	0.0	63.5	66	63.5	10	----	61.9	1.6	8	-6.4
Toscana 2 1st B	31	1	0.0	61.8	66	61.8	10	----	59.2	2.6	8	-5.4
Toscana 2 2nd B	32	1	0.0	65.0	66	65.0	10	----	62.9	2.1	8	-5.9
Toscana 2 3rd B	33	1	0.0	67.7	66	67.7	10	Snd Lvl	66.5	1.2	8	-6.8
Toscana 2 1st C	34	1	0.0	60.0	66	60.0	10	----	57.9	2.1	8	-5.9
Toscana 2 2nd C	35	1	0.0	62.9	66	62.9	10	----	61.1	1.8	8	-6.2
Toscana 2 3rd C	36	1	0.0	66.4	66	66.4	10	Snd Lvl	65.4	1.0	8	-7.0
Toscana 2 1st D	37	1	0.0	59.4	66	59.4	10	----	57.9	1.5	8	-6.5
Toscana 2 2nd D	38	1	0.0	60.4	66	60.4	10	----	58.6	1.8	8	-6.2
Toscana 2 3rd D	39	1	0.0	62.9	66	62.9	10	----	61.3	1.6	8	-6.4
Toscana 2 1st E	40	1	0.0	58.0	66	58.0	10	----	56.9	1.1	8	-6.9
Toscana 2 2nd E	41	1	0.0	58.9	66	58.9	10	----	57.4	1.5	8	-6.5
Toscana 2 3rd E	42	1	0.0	63.1	66	63.1	10	----	61.5	1.6	8	-6.4
Toscana 2 1st F	43	1	0.0	57.5	66	57.5	10	----	55.5	2.0	8	-6.0
Toscana 2 2nd F	44	1	0.0	60.9	66	60.9	10	----	59.6	1.3	8	-6.7
Toscana 2 3rd F	45	1	0.0	64.8	66	64.8	10	----	63.9	0.9	8	-7.1
Tee Box	47	1	0.0	64.1	66	64.1	10	----	64.0	0.1	8	-7.9
Reunion Pool	49	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Reunion Green	51	1	0.0	62.2	66	62.2	10	----	62.2	0.0	8	-8.0
965 Golden Bear	53	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
961 Golden Bear	55	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
955 Golden Bear	56	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0
921 Golden Bear	58	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
915 Golden Bear	59	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
905 Golden Bear	60	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
875 Golden Bear	61	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
861 Golden Bear	62	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
855 Golden Bear	63	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
Reunion Green	65	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
Sandy RIdge	69	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
Sandy Ridge	70	1	0.0	61.5	66	61.5	10	----	61.5	0.0	8	-8.0
Sandy RIdge	71	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
Sandy Ridge	72	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
Sandy Ridge	73	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
Sandy Ridge	74	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
Sandy Ridge	75	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
Sandy Ridge	76	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
Toscana 1st N	78	1	0.0	64.2	66	64.2	10	----	61.5	2.7	8	-5.3
Toscana 2nd N	79	1	0.0	65.5	66	65.5	10	----	62.9	2.6	8	-5.4
Toscana 3rd N	80	1	0.0	68.0	66	68.0	10	Snd Lvl	67.1	0.9	8	-7.1
Toscana 1st S	81	1	0.0	63.7	66	63.7	10	----	60.6	3.1	8	-4.9

Toscana 2nd S	82	1	0.0	68.3	66	68.3	10	Snd Lvl	64.8	3.5	8	-4.5
Toscana 3rd S	83	1	0.0	70.5	66	70.5	10	Snd Lvl	69.5	1.0	8	-7.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	66	0.0	1.5	8.0
All Impacted	21	0.0	2.6	8.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 BtU Segment 1 Celebration
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
Receiver69	69	1	0.0	51.5	66	51.5	10	----	51.5	0.0	8	-8.0
Celeb Golf	71	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
Celeb Golf	73	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0
Celeb Community Church	75	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Quest Playground	77	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
Spring Lake 1	79	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
Spring Lake 2	80	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
Spring Lake 3	81	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
Creation Kids Village	83	1	0.0	62.3	66	62.3	10	----	62.3	0.0	8	-8.0
Radison Pool	85	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
Preserve 1st	87	1	0.0	62.1	66	62.1	10	----	60.3	1.8	8	-6.2
Preserve 1st	88	1	0.0	62.0	66	62.0	10	----	60.2	1.8	8	-6.2
Preserve 2nd	89	1	0.0	63.8	66	63.8	10	----	62.8	1.0	8	-7.0
Preserve 2nd	90	1	0.0	63.7	66	63.7	10	----	62.7	1.0	8	-7.0
Preserve 3rd	91	1	0.0	65.1	66	65.1	10	----	64.8	0.3	8	-7.7
Preserve 3rd	92	1	0.0	65.1	66	65.1	10	----	64.7	0.4	8	-7.6
Preserve 2 1st	94	1	0.0	57.2	66	57.2	10	----	55.5	1.7	8	-6.3
Preserve 2 1st	95	1	0.0	56.4	66	56.4	10	----	54.8	1.6	8	-6.4
Preserve 2 1st	96	1	0.0	56.1	66	56.1	10	----	54.5	1.6	8	-6.4
Preserve 2 1st	97	1	0.0	55.1	66	55.1	10	----	53.4	1.7	8	-6.3
Preserve 2 2nd	98	2	0.0	58.8	66	58.8	10	----	57.4	1.4	8	-6.6
Presreve 2 2nd	99	2	0.0	57.1	66	57.1	10	----	55.8	1.3	8	-6.7
AViva 1st	101	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0

Aviva 1st	102	1	0.0	58.4	66	58.4	10	----	58.3	0.1	8	-7.9
Aviva 1st	103	1	0.0	57.1	66	57.1	10	----	57.1	0.0	8	-8.0
Aviva 1st	104	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0
Aviva 2nd	105	1	0.0	57.0	66	57.0	10	----	57.0	0.0	8	-8.0
Aviva 2nd	106	1	0.0	57.6	66	57.6	10	----	57.6	0.0	8	-8.0
Aviva 2nd	107	1	0.0	58.3	66	58.3	10	----	58.2	0.1	8	-7.9
Aviva 2nd	108	1	0.0	59.2	66	59.2	10	----	59.1	0.1	8	-7.9

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	32	0.0	0.5	1.8
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Waldorf Golf Club	1	1	0.0	50.3	66	50.3	10	----	50.3	0.0	7	-7.0
Waldorf 1st Green	3	1	0.0	55.4	66	55.4	10	----	55.4	0.0	7	-7.0
World Center Pool	5	1	0.0	59.5	66	59.5	10	----	59.5	0.0	7	-7.0
Hawk's Landing green	7	1	0.0	56.5	66	56.5	10	----	56.5	0.0	7	-7.0
Hawk's Landing green	8	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	7	-7.0
Hawk's Landing green	10	1	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	7	-7.0
Vistana	12	1	0.0	64.7	66	64.7	10	----	64.7	0.0	7	-7.0
Vistana 2	13	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Vistana 3	14	1	0.0	63.5	66	63.5	10	----	63.5	0.0	7	-7.0
Hilton Pool	16	1	0.0	56.8	66	56.8	10	----	56.8	0.0	7	-7.0
Holiday Inn Pool	18	1	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Fairfield Pool	20	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Royal Plaza Tennis	22	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	7	-7.0
Double Tree Pool	24	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	7	-7.0
radisson pool	26	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	7	-7.0
Courtyard pool	28	1	0.0	65.5	66	65.5	10	----	65.5	0.0	7	-7.0
Pirates Cove	30	1	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	7	-7.0
Mary Queen of the Universe	32	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	7	-7.0
Clarion Pool	34	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	7	-7.0
Clarion Water Park	36	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	7	-7.0
Quality Suites pool	38	1	0.0	65.0	66	65.0	10	----	65.0	0.0	7	-7.0
Embassy Suites pool	40	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	7	-7.0
Hilton Garden Pool	42	1	0.0	65.8	66	65.8	10	----	65.8	0.0	7	-7.0

7484 Lake Willis	44	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
7476 Lake Willis	45	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
7468 Lake Willis	46	1	0.0	59.6	66	59.6	10	----	59.6	0.0	7	-7.0
Residence Inn Pool	48	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Marriott Vacation Club Water Park	50	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Integra Cove	52	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra Cove	53	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra Cove	54	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra Cove	55	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 1st	57	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 1st	58	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
INtega 1st	60	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 1st	61	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 2	63	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 2	64	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 2	65	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 2	66	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 3	68	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Integra 3	69	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	71	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	73	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	74	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	75	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	76	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	77	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	78	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	79	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	80	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	81	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	83	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	84	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	85	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	86	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	87	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	88	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	89	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	90	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	91	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
Altis Sand Lake	92	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	7	0.0
little lake bryan	94	1	0.0	65.4	66	65.4	10	----	65.4	0.0	7	-7.0
little lake bryan	95	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	7	-7.0

little lake bryan 2nd	96	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	7	-7.0
littlelake bryan 2nd	98	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	74	0.0	0.0	0.0
All Impacted	13	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

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28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
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
Waldorf Golf Club	1	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Waldorf 1st Green	3	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
World Center Pool	5	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hawk's Landing green	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hawk's Landing green	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hawk's Landing green	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Vistana	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Vistana 2	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Vistana 3	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hilton Pool	16	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Holiday Inn Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fairfield Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Royal Plaza Tennis	22	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Double Tree Pool	24	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
radisson pool	26	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Courtyard pool	28	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Pirates Cove	30	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Mary Queen of the Universe	32	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Clarion Pool	34	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Clarion Water Park	36	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Suites pool	38	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Embassy Suites pool	40	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hilton Garden Pool	42	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0

7484 Lake Willis	44	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
7476 Lake Willis	45	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
7468 Lake Willis	46	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Residence Inn Pool	48	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Marriott Vacation Club Water Park	50	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra Cove	52	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra Cove	53	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra Cove	54	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra Cove	55	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 1st	57	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 1st	58	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
INtega 1st	60	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 1st	61	2	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 2	63	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 2	64	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 2	65	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 2	66	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 3	68	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 3	69	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	71	2	0.0	70.0	66	70.0	10	Snd Lvl	62.1	7.9	8	-0.1
Altis Sand Lake	75	2	0.0	67.5	66	67.5	10	Snd Lvl	60.2	7.3	8	-0.7
Altis Sand Lake	76	2	0.0	67.1	66	67.1	10	Snd Lvl	60.0	7.1	8	-0.9
Altis Sand Lake	79	2	0.0	64.3	66	64.3	10	----	57.3	7.0	8	-1.0
Altis Sand Lake	80	2	0.0	63.9	66	63.9	10	----	56.9	7.0	8	-1.0
Altis 3 1st	83	2	0.0	67.4	66	67.4	10	Snd Lvl	60.2	7.2	8	-0.8
Altis 3 1st	84	2	0.0	67.7	66	67.7	10	Snd Lvl	60.5	7.2	8	-0.8
Altis 3 1st	85	2	0.0	67.7	66	67.7	10	Snd Lvl	60.5	7.2	8	-0.8
Altis 3 1st	86	2	0.0	67.9	66	67.9	10	Snd Lvl	60.6	7.3	8	-0.7
Altis 3 1st	87	2	0.0	68.0	66	68.0	10	Snd Lvl	60.6	7.4	8	-0.6
little lake bryan	94	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
little lake bryan	95	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
little lake bryan	96	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis 2 1st	98	2	0.0	61.7	66	61.7	10	----	55.1	6.6	8	-1.4
Altis 2 2nd	99	2	0.0	72.1	66	72.1	10	Snd Lvl	65.8	6.3	8	-1.7
Altis 2 2nd	100	2	0.0	69.8	66	69.8	10	Snd Lvl	64.0	5.8	8	-2.2
Altis 2 2nd	96	2	0.0	69.1	66	69.1	10	Snd Lvl	63.5	5.6	8	-2.4
Altis 2 2nd	101	2	0.0	66.7	66	66.7	10	Snd Lvl	61.2	5.5	8	-2.5
Altis 2 2nd	102	2	0.0	66.2	66	66.2	10	Snd Lvl	60.7	5.5	8	-2.5
Altis 2 2nd	104	2	0.0	64.0	66	64.0	10	----	58.8	5.2	8	-2.8
Altis 3 1st	106	2	0.0	68.1	66	68.1	10	Snd Lvl	60.5	7.6	8	-0.4
Altis 3 2nd	108	2	0.0	70.2	66	70.2	10	Snd Lvl	64.4	5.8	8	-2.2

Altis 3 2nd	109	2	0.0	70.0	66	70.0	10	Snd Lvl	64.4	5.6	8	-2.4
Altis 3 1st	106	2	0.0	67.9	66	67.9	10	Snd Lvl	60.6	7.3	8	-0.7
Alts 3 2nd	110	2	0.0	69.9	66	69.9	10	Snd Lvl	64.2	5.7	8	-2.3
Altis 3 2nd	111	2	0.0	69.9	66	69.9	10	Snd Lvl	64.2	5.7	8	-2.3
Altis 3 2nd	113	2	0.0	69.6	66	69.6	10	Snd Lvl	64.0	5.6	8	-2.4
Altis Pool	115	1	0.0	69.6	66	69.6	10	Snd Lvl	62.1	7.5	8	-0.5
Altis tot lot	117	1	0.0	71.3	66	71.3	10	Snd Lvl	63.0	8.3	8	0.3
Altis 4 1st	119	2	0.0	68.9	66	68.9	10	Snd Lvl	60.4	8.5	8	0.5
Altis 4 2nd	120	2	0.0	71.1	66	71.1	10	Snd Lvl	64.7	6.4	8	-1.6
Altis 3 2nd	113	2	0.0	67.8	66	67.8	10	Snd Lvl	61.9	5.9	8	-2.1
Altis 4 1st	121	2	0.0	65.1	66	65.1	10	----	57.9	7.2	8	-0.8
Altis 4 1st	122	2	0.0	63.2	66	63.2	10	----	56.3	6.9	8	-1.1
Altis 4 2nd	124	2	0.0	64.9	66	64.9	10	----	59.6	5.3	8	-2.7
Altis 5 1st	127	2	0.0	69.6	66	69.6	10	Snd Lvl	62.6	7.0	8	-1.0
Altis 5 1st	128	2	0.0	64.4	66	64.4	10	----	57.4	7.0	8	-1.0
Altis 5 1st	129	2	0.0	64.0	66	64.0	10	----	57.3	6.7	8	-1.3
Altis 5 1st	130	2	0.0	62.5	66	62.5	10	----	56.5	6.0	8	-2.0
Altis 5 1st	131	2	0.0	62.1	66	62.1	10	----	55.9	6.2	8	-1.8
Altis 5 2nd	132	2	0.0	63.2	66	63.2	10	----	58.1	5.1	8	-2.9
Altis 5 2nd	133	2	0.0	63.6	66	63.6	10	----	58.2	5.4	8	-2.6
Alt 5 2nd	134	2	0.0	64.9	66	64.9	10	----	59.5	5.4	8	-2.6
Altis 4 2nd	124	2	0.0	65.7	66	65.7	10	----	60.1	5.6	8	-2.4
Altis 5 2nd	135	2	0.0	66.7	66	66.7	10	Snd Lvl	60.9	5.8	8	-2.2
Altis 5 2nd	136	2	0.0	67.3	66	67.3	10	Snd Lvl	60.8	6.5	8	-1.5
Altis 5 2nd	138	2	0.0	70.8	66	70.8	10	Snd Lvl	64.0	6.8	8	-1.2

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	139	0.0	3.2	8.5
All Impacted	56	5.5	6.7	8.5
All that meet NR Goal	3	8.3	8.4	8.5

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28 August 2015
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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
Waldorf Golf Club	1	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Waldorf 1st Green	3	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
World Center Pool	5	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hawk's Landing green	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hawk's Landing green	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hawk's Landing green	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Vistana	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Vistana 2	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Vistana 3	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hilton Pool	16	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Holiday Inn Pool	18	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Fairfield Pool	20	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Royal Plaza Tennis	22	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Double Tree Pool	24	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
radisson pool	26	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Courtyard pool	28	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Pirates Cove	30	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Mary Queen of the Universe	32	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Clarion Pool	34	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Clarion Water Park	36	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Quality Suites pool	38	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Embassy Suites pool	40	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Hilton Garden Pool	42	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0

7484 Lake Willis	44	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
7476 Lake Willis	45	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
7468 Lake Willis	46	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Residence Inn Pool	48	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Marriott Vacation Club Water Park	50	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra Cove	52	1	0.0	70.5	66	70.5	10	Snd Lvl	62.9	7.6	8	-0.4
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	59.2	3.2	8	-4.8
Integra Cove	54	1	0.0	70.6	66	70.6	10	Snd Lvl	63.7	6.9	8	-1.1
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	62.8	0.4	8	-7.6
Integra 1st	57	1	0.0	73.2	66	73.2	10	Snd Lvl	70.8	2.4	8	-5.6
Integra 1st	58	1	0.0	73.1	66	73.1	10	Snd Lvl	71.3	1.8	8	-6.2
INtega 1st	60	1	0.0	64.8	66	64.8	10	----	61.7	3.1	8	-4.9
Integra 1st	61	1	0.0	64.9	66	64.9	10	----	61.5	3.4	8	-4.6
Integra 2	63	1	0.0	63.4	66	63.4	10	----	62.2	1.2	8	-6.8
Integra 2	64	1	0.0	64.1	66	64.1	10	----	62.9	1.2	8	-6.8
Integra 2	65	1	0.0	61.9	66	61.9	10	----	61.0	0.9	8	-7.1
Integra 2	66	1	0.0	58.8	66	58.8	10	----	57.4	1.4	8	-6.6
Integra 3	68	1	0.0	65.1	66	65.1	10	----	62.8	2.3	8	-5.7
Integra 3	69	1	0.0	64.3	66	64.3	10	----	62.3	2.0	8	-6.0
Altis Sand Lake	71	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	73	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	74	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	75	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	76	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	77	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	78	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	79	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	80	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	81	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	83	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	84	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	85	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	86	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	87	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	88	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	89	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	90	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	91	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Altis Sand Lake	92	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
little lake bryan	94	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
little lake bryan	95	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0

little lake bryan	96	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Integra 2nd	98	1	0.0	71.8	66	71.8	10	Snd Lvl	64.4	7.4	8	-0.6
Integra 2nd	99	1	0.0	71.9	66	71.9	10	Snd Lvl	64.7	7.2	8	-0.8
Integra 2nd	100	1	0.0	71.6	66	71.6	10	Snd Lvl	65.2	6.4	8	-1.6
Integra 2nd	101	1	0.0	71.6	66	71.6	10	Snd Lvl	64.3	7.3	8	-0.7
Integra 3rd	102	1	0.0	73.5	66	73.5	10	Snd Lvl	72.9	0.6	8	-7.4
Integra 3rd	103	1	0.0	73.6	66	73.6	10	Snd Lvl	73.1	0.5	8	-7.5
Integra 3rd	104	1	0.0	73.6	66	73.6	10	Snd Lvl	73.3	0.3	8	-7.7
Integra 3rd	105	1	0.0	73.6	66	73.6	10	Snd Lvl	73.4	0.2	8	-7.8

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	73	0.0	0.9	7.6
All Impacted	12	0.2	4.0	7.6
All that meet NR Goal	0	0.0	0.0	0.0

BARRIER ANALYSIS

Stantec 28 August 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: BM 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	$
Barrier3	W	14.00	14.00	14.00	471	6589				197679
									Total Cost:	197679

Stantec
M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: BM 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
Tuscana Pool	7	1	0.0	53.1	66	53.1	10	----	53.0	0.1	8	-7.9
Toscana 1st A	9	1	0.0	71.7	66	71.7	10	Snd Lvl	67.1	4.6	8	-3.4
Toscana 2nd A	10	1	0.0	74.5	66	74.5	10	Snd Lvl	71.2	3.3	8	-4.7
Toscana 3rd A	11	1	0.0	75.8	66	75.8	10	Snd Lvl	74.8	1.0	8	-7.0
Toscana 1st B	12	1	0.0	71.8	66	71.8	10	Snd Lvl	67.4	4.4	8	-3.6
Toscana 2nd B	13	1	0.0	73.5	66	73.5	10	Snd Lvl	70.4	3.1	8	-4.9
Toscana 3rd B	14	1	0.0	74.4	66	74.4	10	Snd Lvl	73.3	1.1	8	-6.9
Toscana 1st C	15	1	0.0	68.7	66	68.7	10	Snd Lvl	65.7	3.0	8	-5.0
Toscana 2nd C	16	1	0.0	69.8	66	69.8	10	Snd Lvl	67.4	2.4	8	-5.6
Toscana 3rd C	17	1	0.0	71.4	66	71.4	10	Snd Lvl	70.6	0.8	8	-7.2
Toscana 1st D	18	1	0.0	67.6	66	67.6	10	Snd Lvl	64.2	3.4	8	-4.6
Toscana 2nd D	19	1	0.0	72.1	66	72.1	10	Snd Lvl	68.8	3.3	8	-4.7
Toscana 3rd D	20	1	0.0	73.2	66	73.2	10	Snd Lvl	71.9	1.3	8	-6.7
Toscana 1st E	21	1	0.0	61.5	66	61.5	10	----	59.6	1.9	8	-6.1
Toscana 2nd E	22	1	0.0	65.4	66	65.4	10	----	63.5	1.9	8	-6.1
Toscana 3rd E	23	1	0.0	68.2	66	68.2	10	Snd Lvl	67.5	0.7	8	-7.3
Toscana 1st F	24	1	0.0	63.1	66	63.1	10	----	61.7	1.4	8	-6.6
Toscana 2nd F	25	1	0.0	63.8	66	63.8	10	----	62.2	1.6	8	-6.4
Toscana 3rd F	26	1	0.0	66.4	66	66.4	10	Snd Lvl	65.6	0.8	8	-7.2
Toscana 2 1st A	28	1	0.0	61.1	66	61.1	10	----	60.2	0.9	8	-7.1
Toscana 2 2nd A	29	1	0.0	61.4	66	61.4	10	----	60.1	1.3	8	-6.7
Toscana 2 3rd A	30	1	0.0	63.3	66	63.3	10	----	62.2	1.1	8	-6.9
Toscana 2 1st B	31	1	0.0	61.8	66	61.8	10	----	59.5	2.3	8	-5.7

Toscana 2 2nd B	32	1	0.0	65.0	66	65.0	10	----	63.6	1.4	8	-6.6
Toscana 2 3rd B	33	1	0.0	67.7	66	67.7	10	Snd Lvl	67.1	0.6	8	-7.4
Toscana 2 1st C	34	1	0.0	59.7	66	59.7	10	----	58.2	1.5	8	-6.5
Toscana 2 2nd C	35	1	0.0	62.7	66	62.7	10	----	61.5	1.2	8	-6.8
Toscana 2 3rd C	36	1	0.0	66.3	66	66.3	10	Snd Lvl	65.8	0.5	8	-7.5
Toscana 2 1st D	37	1	0.0	59.3	66	59.3	10	----	58.6	0.7	8	-7.3
Toscana 2 2nd D	38	1	0.0	60.3	66	60.3	10	----	59.2	1.1	8	-6.9
Toscana 2 3rd D	39	1	0.0	62.7	66	62.7	10	----	61.6	1.1	8	-6.9
Toscana 2 1st E	40	1	0.0	58.1	66	58.1	10	----	57.5	0.6	8	-7.4
Toscana 2 2nd E	41	1	0.0	58.9	66	58.9	10	----	58.0	0.9	8	-7.1
Toscana 2 3rd E	42	1	0.0	63.2	66	63.2	10	----	62.0	1.2	8	-6.8
Toscana 2 1st F	43	1	0.0	57.4	66	57.4	10	----	55.7	1.7	8	-6.3
Toscana 2 2nd F	44	1	0.0	60.9	66	60.9	10	----	60.1	0.8	8	-7.2
Toscana 2 3rd F	45	1	0.0	64.7	66	64.7	10	----	64.2	0.5	8	-7.5
Tuscana 1st N	78	1	0.0	64.3	66	64.3	10	----	62.8	1.5	8	-6.5
Toscana 2nd N	79	1	0.0	65.8	66	65.8	10	----	64.0	1.8	8	-6.2
Toscana 3rd N	80	1	0.0	68.3	66	68.3	10	Snd Lvl	67.6	0.7	8	-7.3
Toscana 1st S	81	1	0.0	64.1	66	64.1	10	----	61.5	2.6	8	-5.4
Toscana 2nd S	82	1	0.0	68.3	66	68.3	10	Snd Lvl	66.1	2.2	8	-5.8
Toscana 3rd S	83	1	0.0	70.7	66	70.7	10	Snd Lvl	69.7	1.0	8	-7.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	43	0.1	1.6	4.6
All Impacted	19	0.5	2.0	4.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 28 August 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 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	$
Barrier1	W	22.00	22.00	22.00	471	10352				310557
									Total Cost:	310557

Stantec
M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 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		Increase over existing		Type Impact	With Barrier 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
Tuscana Pool	7	1	0.0	53.1	66	53.1	10	----	52.9	0.2	8	-7.8
Toscana 1st A	9	1	0.0	71.7	66	71.7	10	Snd Lvl	61.9	9.8	8	1.8
Toscana 2nd A	10	1	0.0	75.2	66	75.2	10	Snd Lvl	66.8	8.4	8	0.4
Toscana 3rd A	11	1	0.0	76.2	66	76.2	10	Snd Lvl	73.6	2.6	8	-5.4
Toscana 1st B	12	1	0.0	72.0	66	72.0	10	Snd Lvl	64.2	7.8	8	-0.2
Toscana 2nd B	13	1	0.0	73.7	66	73.7	10	Snd Lvl	66.3	7.4	8	-0.6
Toscana 3rd B	14	1	0.0	75.0	66	75.0	10	Snd Lvl	72.2	2.8	8	-5.2
Toscana 1st C	15	1	0.0	67.3	66	67.3	10	Snd Lvl	62.8	4.5	8	-3.5
Toscana 2nd C	16	1	0.0	68.5	66	68.5	10	Snd Lvl	63.6	4.9	8	-3.1
Toscana 3rd C	17	1	0.0	70.7	66	70.7	10	Snd Lvl	67.0	3.7	8	-4.3
Toscana 1st D	18	1	0.0	67.1	66	67.1	10	Snd Lvl	60.0	7.1	8	-0.9
Toscana 2nd D	19	1	0.0	71.4	66	71.4	10	Snd Lvl	65.1	6.3	8	-1.7
Toscana 3rd D	20	1	0.0	73.0	66	73.0	10	Snd Lvl	69.8	3.2	8	-4.8
Toscana 1st E	21	1	0.0	62.2	66	62.2	10	----	58.2	4.0	8	-4.0
Toscana 2nd E	22	1	0.0	66.4	66	66.4	10	Snd Lvl	62.8	3.6	8	-4.4
Toscana 3rd E	23	1	0.0	68.8	66	68.8	10	Snd Lvl	65.7	3.1	8	-4.9
Toscana 1st F	24	1	0.0	62.3	66	62.3	10	----	59.9	2.4	8	-5.6
Toscana 2nd F	25	1	0.0	63.9	66	63.9	10	----	60.8	3.1	8	-4.9
Toscana 3rd F	26	1	0.0	66.5	66	66.5	10	Snd Lvl	63.6	2.9	8	-5.1
Toscana 2 1st A	28	1	0.0	61.1	66	61.1	10	----	59.1	2.0	8	-6.0
Toscana 2 2nd A	29	1	0.0	61.5	66	61.5	10	----	59.0	2.5	8	-5.5
Toscana 2 3rd A	30	1	0.0	63.4	66	63.4	10	----	60.8	2.6	8	-5.4
Toscana 2 1st B	31	1	0.0	61.7	66	61.7	10	----	57.6	4.1	8	-3.9

Toscana 2 2nd B	32	1	0.0	65.0	66	65.0	10	----	62.0	3.0	8	-5.0
Toscana 2 3rd B	33	1	0.0	67.7	66	67.7	10	Snd Lvl	65.3	2.4	8	-5.6
Toscana 2 1st C	34	1	0.0	59.9	66	59.9	10	----	56.6	3.3	8	-4.7
Toscana 2 2nd C	35	1	0.0	62.8	66	62.8	10	----	60.4	2.4	8	-5.6
Toscana 2 3rd C	36	1	0.0	66.4	66	66.4	10	Snd Lvl	64.3	2.1	8	-5.9
Toscana 2 1st D	37	1	0.0	59.3	66	59.3	10	----	57.7	1.6	8	-6.4
Toscana 2 2nd D	38	1	0.0	60.3	66	60.3	10	----	58.2	2.1	8	-5.9
Toscana 2 3rd D	39	1	0.0	62.7	66	62.7	10	----	60.4	2.3	8	-5.7
Toscana 2 1st E	40	1	0.0	58.1	66	58.1	10	----	56.9	1.2	8	-6.8
Toscana 2 2nd E	41	1	0.0	58.9	66	58.9	10	----	57.1	1.8	8	-6.2
Toscana 2 3rd E	42	1	0.0	63.2	66	63.2	10	----	61.0	2.2	8	-5.8
Toscana 2 1st F	43	1	0.0	57.5	66	57.5	10	----	54.4	3.1	8	-4.9
Toscana 2 2nd F	44	1	0.0	61.0	66	61.0	10	----	59.1	1.9	8	-6.1
Toscana 2 3rd F	45	1	0.0	64.6	66	64.6	10	----	63.1	1.5	8	-6.5
Toscana 1st N	78	1	0.0	64.3	66	64.3	10	----	61.1	3.2	8	-4.8
Toscana 2nd N	79	1	0.0	65.5	66	65.5	10	----	61.8	3.7	8	-4.3
Toscana 3rd N	80	1	0.0	67.9	66	67.9	10	Snd Lvl	64.4	3.5	8	-4.5
Toscana 1st S	81	1	0.0	63.7	66	63.7	10	----	58.8	4.9	8	-3.1
Toscana 2nd S	82	1	0.0	68.2	66	68.2	10	Snd Lvl	63.7	4.5	8	-3.5
Toscana 3rd S	83	1	0.0	70.4	66	70.4	10	Snd Lvl	66.9	3.5	8	-4.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	43	0.2	3.6	9.8
All Impacted	20	2.1	4.7	9.8
All that meet NR Goal	2	8.4	9.1	9.8

Stantec 28 August 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 22L

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	$
Barrier1	W	22.00	22.00	22.00	619	13623				408693
									Total Cost:	408693

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M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 22L
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
Tuscana Pool	7	1	0.0	53.1	66	53.1	10	----	52.8	0.3	8	-7.7
Toscana 1st A	9	1	0.0	71.7	66	71.7	10	Snd Lvl	61.3	10.4	8	2.4
Toscana 2nd A	10	1	0.0	75.2	66	75.2	10	Snd Lvl	65.8	9.4	8	1.4
Toscana 3rd A	11	1	0.0	76.2	66	76.2	10	Snd Lvl	73.6	2.6	8	-5.4
Toscana 1st B	12	1	0.0	71.9	66	71.9	10	Snd Lvl	63.4	8.5	8	0.5
Toscana 2nd B	13	1	0.0	73.7	66	73.7	10	Snd Lvl	65.5	8.2	8	0.2
Toscana 3rd B	14	1	0.0	75.1	66	75.1	10	Snd Lvl	72.1	3.0	8	-5.0
Toscana 1st C	15	1	0.0	67.4	66	67.4	10	Snd Lvl	62.1	5.3	8	-2.7
Toscana 2nd C	16	1	0.0	68.2	66	68.2	10	Snd Lvl	62.9	5.3	8	-2.7
Toscana 3rd C	17	1	0.0	70.6	66	70.6	10	Snd Lvl	66.7	3.9	8	-4.1
Toscana 1st D	18	1	0.0	67.1	66	67.1	10	Snd Lvl	59.1	8.0	8	0.0
Toscana 2nd D	19	1	0.0	71.4	66	71.4	10	Snd Lvl	63.6	7.8	8	-0.2
Toscana 3rd D	20	1	0.0	73.1	66	73.1	10	Snd Lvl	69.5	3.6	8	-4.4
Toscana 1st E	21	1	0.0	62.2	66	62.2	10	----	57.3	4.9	8	-3.1
Toscana 2nd E	22	1	0.0	66.6	66	66.6	10	Snd Lvl	61.2	5.4	8	-2.6
Toscana 3rd E	23	1	0.0	68.7	66	68.7	10	Snd Lvl	64.6	4.1	8	-3.9
Toscana 1st F	24	1	0.0	62.5	66	62.5	10	----	59.2	3.3	8	-4.7
Toscana 2nd F	25	1	0.0	64.1	66	64.1	10	----	60.0	4.1	8	-3.9
Toscana 3rd F	26	1	0.0	66.6	66	66.6	10	Snd Lvl	62.9	3.7	8	-4.3
Toscana 2 1st A	28	1	0.0	61.0	66	61.0	10	----	58.4	2.6	8	-5.4
Toscana 2 2nd A	29	1	0.0	61.7	66	61.7	10	----	58.3	3.4	8	-4.6
Toscana 2 3rd A	30	1	0.0	63.5	66	63.5	10	----	60.3	3.2	8	-4.8
Toscana 2 1st B	31	1	0.0	61.8	66	61.8	10	----	57.1	4.7	8	-3.3

Toscana 2 2nd B	32	1	0.0	65.0	66	65.0	10	----	60.8	4.2	8	-3.8
Toscana 2 3rd B	33	1	0.0	67.7	66	67.7	10	Snd Lvl	64.2	3.5	8	-4.5
Toscana 2 1st C	34	1	0.0	60.0	66	60.0	10	----	56.1	3.9	8	-4.1
Toscana 2 2nd C	35	1	0.0	62.9	66	62.9	10	----	59.3	3.6	8	-4.4
Toscana 2 3rd C	36	1	0.0	66.4	66	66.4	10	Snd Lvl	63.6	2.8	8	-5.2
Toscana 2 1st D	37	1	0.0	59.4	66	59.4	10	----	57.3	2.1	8	-5.9
Toscana 2 2nd D	38	1	0.0	60.4	66	60.4	10	----	57.6	2.8	8	-5.2
Toscana 2 3rd D	39	1	0.0	62.9	66	62.9	10	----	59.8	3.1	8	-4.9
Toscana 2 1st E	40	1	0.0	58.0	66	58.0	10	----	56.4	1.6	8	-6.4
Toscana 2 2nd E	41	1	0.0	58.9	66	58.9	10	----	56.5	2.4	8	-5.6
Toscana 2 3rd E	42	1	0.0	63.1	66	63.1	10	----	60.1	3.0	8	-5.0
Toscana 2 1st F	43	1	0.0	57.5	66	57.5	10	----	53.9	3.6	8	-4.4
Toscana 2 2nd F	44	1	0.0	60.9	66	60.9	10	----	58.2	2.7	8	-5.3
Toscana 2 3rd F	45	1	0.0	64.8	66	64.8	10	----	62.7	2.1	8	-5.9
Toscana 1st N	78	1	0.0	64.2	66	64.2	10	----	60.4	3.8	8	-4.2
Toscana 2nd N	79	1	0.0	65.5	66	65.5	10	----	60.9	4.6	8	-3.4
Toscana 3rd N	80	1	0.0	68.0	66	68.0	10	Snd Lvl	64.0	4.0	8	-4.0
Toscana 1st S	81	1	0.0	63.7	66	63.7	10	----	58.1	5.6	8	-2.4
Toscana 2nd S	82	1	0.0	68.3	66	68.3	10	Snd Lvl	62.1	6.2	8	-1.8
Toscana 3rd S	83	1	0.0	70.5	66	70.5	10	Snd Lvl	66.1	4.4	8	-3.6

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	43	0.3	4.3	10.4
All Impacted	20	2.6	5.5	10.4
All that meet NR Goal	5	8.0	8.9	10.4

Stantec
M. Drauer

28 August 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 20L

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	$
Barrier1	W	20.00	20.00	20.00	619	12385				371539
									Total Cost:	371539

Stantec
M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 20L
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
Tuscana Pool	7	1	0.0	53.1	66	53.1	10	----	52.8	0.3	8	-7.7
Toscana 1st A	9	1	0.0	71.7	66	71.7	10	Snd Lvl	61.9	9.8	8	1.8
Toscana 2nd A	10	1	0.0	75.2	66	75.2	10	Snd Lvl	67.0	8.2	8	0.2
Toscana 3rd A	11	1	0.0	76.2	66	76.2	10	Snd Lvl	74.3	1.9	8	-6.1
Toscana 1st B	12	1	0.0	71.9	66	71.9	10	Snd Lvl	63.7	8.2	8	0.2
Toscana 2nd B	13	1	0.0	73.7	66	73.7	10	Snd Lvl	66.4	7.3	8	-0.7
Toscana 3rd B	14	1	0.0	75.1	66	75.1	10	Snd Lvl	73.3	1.8	8	-6.2
Toscana 1st C	15	1	0.0	67.4	66	67.4	10	Snd Lvl	62.3	5.1	8	-2.9
Toscana 2nd C	16	1	0.0	68.2	66	68.2	10	Snd Lvl	63.3	4.9	8	-3.1
Toscana 3rd C	17	1	0.0	70.6	66	70.6	10	Snd Lvl	68.1	2.5	8	-5.5
Toscana 1st D	18	1	0.0	67.1	66	67.1	10	Snd Lvl	59.7	7.4	8	-0.6
Toscana 2nd D	19	1	0.0	71.4	66	71.4	10	Snd Lvl	64.5	6.9	8	-1.1
Toscana 3rd D	20	1	0.0	73.1	66	73.1	10	Snd Lvl	70.6	2.5	8	-5.5
Toscana 1st E	21	1	0.0	62.2	66	62.2	10	----	57.7	4.5	8	-3.5
Toscana 2nd E	22	1	0.0	66.6	66	66.6	10	Snd Lvl	61.8	4.8	8	-3.2
Toscana 3rd E	23	1	0.0	68.7	66	68.7	10	Snd Lvl	65.5	3.2	8	-4.8
Toscana 1st F	24	1	0.0	62.5	66	62.5	10	----	59.4	3.1	8	-4.9
Toscana 2nd F	25	1	0.0	64.1	66	64.1	10	----	60.3	3.8	8	-4.2
Toscana 3rd F	26	1	0.0	66.6	66	66.6	10	Snd Lvl	63.6	3.0	8	-5.0
Toscana 2 1st A	28	1	0.0	61.0	66	61.0	10	----	58.5	2.5	8	-5.5
Toscana 2 2nd A	29	1	0.0	61.7	66	61.7	10	----	58.6	3.1	8	-4.9
Toscana 2 3rd A	30	1	0.0	63.5	66	63.5	10	----	60.8	2.7	8	-5.3
Toscana 2 1st B	31	1	0.0	61.8	66	61.8	10	----	57.4	4.4	8	-3.6

Toscana 2 2nd B	32	1	0.0	65.0	66	65.0	10	----	61.3	3.7	8	-4.3
Toscana 2 3rd B	33	1	0.0	67.7	66	67.7	10	Snd Lvl	64.8	2.9	8	-5.1
Toscana 2 1st C	34	1	0.0	60.0	66	60.0	10	----	56.4	3.6	8	-4.4
Toscana 2 2nd C	35	1	0.0	62.9	66	62.9	10	----	59.7	3.2	8	-4.8
Toscana 2 3rd C	36	1	0.0	66.4	66	66.4	10	Snd Lvl	64.0	2.4	8	-5.6
Toscana 2 1st D	37	1	0.0	59.4	66	59.4	10	----	57.4	2.0	8	-6.0
Toscana 2 2nd D	38	1	0.0	60.4	66	60.4	10	----	57.8	2.6	8	-5.4
Toscana 2 3rd D	39	1	0.0	62.9	66	62.9	10	----	60.3	2.6	8	-5.4
Toscana 2 1st E	40	1	0.0	58.0	66	58.0	10	----	56.4	1.6	8	-6.4
Toscana 2 2nd E	41	1	0.0	58.9	66	58.9	10	----	56.7	2.2	8	-5.8
Toscana 2 3rd E	42	1	0.0	63.1	66	63.1	10	----	60.6	2.5	8	-5.5
Toscana 2 1st F	43	1	0.0	57.5	66	57.5	10	----	54.2	3.3	8	-4.7
Toscana 2 2nd F	44	1	0.0	60.9	66	60.9	10	----	58.5	2.4	8	-5.6
Toscana 2 3rd F	45	1	0.0	64.8	66	64.8	10	----	63.1	1.7	8	-6.3
Toscana 1st N	78	1	0.0	64.2	66	64.2	10	----	60.6	3.6	8	-4.4
Toscana 2nd N	79	1	0.0	65.5	66	65.5	10	----	61.3	4.2	8	-3.8
Toscana 3rd N	80	1	0.0	68.0	66	68.0	10	Snd Lvl	64.9	3.1	8	-4.9
Toscana 1st S	81	1	0.0	63.7	66	63.7	10	----	58.5	5.2	8	-2.8
Toscana 2nd S	82	1	0.0	68.3	66	68.3	10	Snd Lvl	62.8	5.5	8	-2.5
Toscana 3rd S	83	1	0.0	70.5	66	70.5	10	Snd Lvl	67.6	2.9	8	-5.1

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	43	0.3	3.8	9.8
All Impacted	20	1.8	4.7	9.8
All that meet NR Goal	3	8.2	8.7	9.8

Stantec 28 August 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 18L

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	$
Barrier1	W	18.00	18.00	18.00	619	11146				334385
									Total Cost:	334385

Stantec
M. Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: Segment 1 Toscana
BARRIER DESIGN: 18L
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
Tuscana Pool	7	1	0.0	53.1	66	53.1	10	----	52.8	0.3	8	-7.7
Toscana 1st A	9	1	0.0	71.7	66	71.7	10	Snd Lvl	62.7	9.0	8	1.0
Toscana 2nd A	10	1	0.0	75.2	66	75.2	10	Snd Lvl	69.1	6.1	8	-1.9
Toscana 3rd A	11	1	0.0	76.2	66	76.2	10	Snd Lvl	75.0	1.2	8	-6.8
Toscana 1st B	12	1	0.0	71.9	66	71.9	10	Snd Lvl	64.2	7.7	8	-0.3
Toscana 2nd B	13	1	0.0	73.7	66	73.7	10	Snd Lvl	68.1	5.6	8	-2.4
Toscana 3rd B	14	1	0.0	75.1	66	75.1	10	Snd Lvl	73.6	1.5	8	-6.5
Toscana 1st C	15	1	0.0	67.4	66	67.4	10	Snd Lvl	62.6	4.8	8	-3.2
Toscana 2nd C	16	1	0.0	68.2	66	68.2	10	Snd Lvl	64.3	3.9	8	-4.1
Toscana 3rd C	17	1	0.0	70.6	66	70.6	10	Snd Lvl	69.1	1.5	8	-6.5
Toscana 1st D	18	1	0.0	67.1	66	67.1	10	Snd Lvl	60.4	6.7	8	-1.3
Toscana 2nd D	19	1	0.0	71.4	66	71.4	10	Snd Lvl	66.0	5.4	8	-2.6
Toscana 3rd D	20	1	0.0	73.1	66	73.1	10	Snd Lvl	71.6	1.5	8	-6.5
Toscana 1st E	21	1	0.0	62.2	66	62.2	10	----	58.3	3.9	8	-4.1
Toscana 2nd E	22	1	0.0	66.6	66	66.6	10	Snd Lvl	62.8	3.8	8	-4.2
Toscana 3rd E	23	1	0.0	68.7	66	68.7	10	Snd Lvl	66.8	1.9	8	-6.1
Toscana 1st F	24	1	0.0	62.5	66	62.5	10	----	59.6	2.9	8	-5.1
Toscana 2nd F	25	1	0.0	64.1	66	64.1	10	----	60.9	3.2	8	-4.8
Toscana 3rd F	26	1	0.0	66.6	66	66.6	10	Snd Lvl	64.4	2.2	8	-5.8
Toscana 2 1st A	28	1	0.0	61.0	66	61.0	10	----	58.7	2.3	8	-5.7
Toscana 2 2nd A	29	1	0.0	61.7	66	61.7	10	----	59.1	2.6	8	-5.4
Toscana 2 3rd A	30	1	0.0	63.5	66	63.5	10	----	61.2	2.3	8	-5.7
Toscana 2 1st B	31	1	0.0	61.8	66	61.8	10	----	58.0	3.8	8	-4.2

Toscana 2 2nd B	32	1	0.0	65.0	66	65.0	10	----	62.1	2.9	8	-5.1
Toscana 2 3rd B	33	1	0.0	67.7	66	67.7	10	Snd Lvl	65.6	2.1	8	-5.9
Toscana 2 1st C	34	1	0.0	60.0	66	60.0	10	----	57.0	3.0	8	-5.0
Toscana 2 2nd C	35	1	0.0	62.9	66	62.9	10	----	60.5	2.4	8	-5.6
Toscana 2 3rd C	36	1	0.0	66.4	66	66.4	10	Snd Lvl	64.6	1.8	8	-6.2
Toscana 2 1st D	37	1	0.0	59.4	66	59.4	10	----	57.6	1.8	8	-6.2
Toscana 2 2nd D	38	1	0.0	60.4	66	60.4	10	----	58.2	2.2	8	-5.8
Toscana 2 3rd D	39	1	0.0	62.9	66	62.9	10	----	60.7	2.2	8	-5.8
Toscana 2 1st E	40	1	0.0	58.0	66	58.0	10	----	56.6	1.4	8	-6.6
Toscana 2 2nd E	41	1	0.0	58.9	66	58.9	10	----	57.1	1.8	8	-6.2
Toscana 2 3rd E	42	1	0.0	63.1	66	63.1	10	----	60.9	2.2	8	-5.8
Toscana 2 1st F	43	1	0.0	57.5	66	57.5	10	----	54.8	2.7	8	-5.3
Toscana 2 2nd F	44	1	0.0	60.9	66	60.9	10	----	59.1	1.8	8	-6.2
Toscana 2 3rd F	45	1	0.0	64.8	66	64.8	10	----	63.4	1.4	8	-6.6
Toscana 1st N	78	1	0.0	64.2	66	64.2	10	----	60.9	3.3	8	-4.7
Toscana 2nd N	79	1	0.0	65.5	66	65.5	10	----	62.1	3.4	8	-4.6
Toscana 3rd N	80	1	0.0	68.0	66	68.0	10	Snd Lvl	66.2	1.8	8	-6.2
Toscana 1st S	81	1	0.0	63.7	66	63.7	10	----	59.1	4.6	8	-3.4
Toscana 2nd S	82	1	0.0	68.3	66	68.3	10	Snd Lvl	63.9	4.4	8	-3.6
Toscana 3rd S	83	1	0.0	70.5	66	70.5	10	Snd Lvl	68.6	1.9	8	-6.1

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	43	0.3	3.1	9.0
All Impacted	20	1.2	3.7	9.0
All that meet NR Goal	1	9.0	9.0	9.0

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU Hawks Landing
BARRIER DESIGN: Hawks 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	1247	19954				598634
									Total Cost:	598634

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU Hawks Landing
BARRIER DESIGN: Hawks 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 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
World Center Pool	5	1	0.0	59.1	66	59.1	10	----	58.8	0.3	7	-6.7
Hawk's Landing green	8	1	0.0	67.2	66	67.2	10	Snd Lvl	65.9	1.3	7	-5.7
Hawk's Landing green	10	1	0.0	72.0	66	72.0	10	Snd Lvl	70.8	1.2	7	-5.8

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.3	0.9	1.3
All Impacted	2	1.2	1.2	1.3
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU Hawks Landing
BARRIER DESIGN: Hawks 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	1247	27437				823122
									Total Cost:	823122

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU Hawks Landing
BARRIER DESIGN: Hawks 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	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
World Center Pool	5	1	0.0	59.1	66	59.1	10	----	58.9	0.2	7	-6.8
Hawk's Landing green	8	1	0.0	67.2	66	67.2	10	Snd Lvl	64.6	2.6	7	-4.4
Hawk's Landing green	10	1	0.0	72.0	66	72.0	10	Snd Lvl	68.5	3.5	7	-3.5

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.2	2.1	3.5
All Impacted	2	2.6	3.0	3.5
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 26 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: LLB BM

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	$
Barrier3	W	14.00	14.00	14.00	1601	22414				672413
									Total Cost:	672413

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: LLB BM
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
Pirates Cove	30	1	0.0	72.5	66	72.5	10	Snd Lvl	72.5	0.0	7	-7.0
Mary Queen of the Universe	32	1	0.0	67.7	66	67.7	10	Snd Lvl	66.3	1.4	7	-5.6
Clarion Pool	34	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	7	-7.0
little lake bryan	94	1	0.0	65.3	66	65.3	10	----	63.5	1.8	7	-5.2
little lake bryan	95	1	0.0	67.3	66	67.3	10	Snd Lvl	65.5	1.8	7	-5.2
little lake bryan 2nd	96	1	0.0	68.6	66	68.6	10	Snd Lvl	67.2	1.4	7	-5.6
littlelake bryan 2nd	98	1	0.0	66.7	66	66.7	10	Snd Lvl	65.2	1.5	7	-5.5

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	1.1	1.8
All Impacted	6	0.0	1.0	1.8
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

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TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: LLB GM

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	$
Barrier6	W	16.00	16.00	16.00	1640	26239				787173
									Total Cost:	787173

Stantec
M Drauer

26 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: LLB GM
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
Mary Queen of the Universe	32	1	0.0	67.9	66	67.9	10	Snd Lvl	66.7	1.2	7	-5.8
little lake bryan	94	1	0.0	65.5	66	65.5	10	----	63.8	1.7	7	-5.3
little lake bryan	95	1	0.0	67.6	66	67.6	10	Snd Lvl	65.8	1.8	7	-5.2
little lake bryan 2nd	96	1	0.0	68.8	66	68.8	10	Snd Lvl	67.4	1.4	7	-5.6
littlelake bryan 2nd	98	1	0.0	66.9	66	66.9	10	Snd Lvl	65.5	1.4	7	-5.6

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	5	1.2	1.5	1.8
All Impacted	4	1.2	1.5	1.8
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 26 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: LLB GM 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	$
Barrier6	W	22.00	22.00	22.00	1640	36079				1082363
									Total Cost:	1082363

Stantec
M Drauer

26 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: LLB GM 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
Mary Queen of the Universe	32	1	0.0	67.9	66	67.9	10	Snd Lvl	66.1	1.8	7	-5.2
little lake bryan	94	1	0.0	65.5	66	65.5	10	----	63.2	2.3	7	-4.7
little lake bryan	95	1	0.0	67.6	66	67.6	10	Snd Lvl	64.5	3.1	7	-3.9
little lake bryan 2nd	96	1	0.0	68.8	66	68.8	10	Snd Lvl	66.9	1.9	7	-5.1
littlelake bryan 2nd	98	1	0.0	66.9	66	66.9	10	Snd Lvl	64.9	2.0	7	-5.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	5	1.8	2.2	3.1
All Impacted	4	1.8	2.2	3.1
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: 8' elevated section

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	$
Barrier6	W	8.00	8.00	8.00	1666	13327				399817
									Total Cost:	399817

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: 8' elevated section
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
Mary Queen of the Universe	32	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	7	-7.0
Clarion Pool	34	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	7	-7.0
Clarion Water Park	36	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

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M Drauer

26 August 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground

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	$
Barrier7	W	16.00	16.00	16.00	1535	24566				736965
									Total Cost:	736965

Stantec
M Drauer

26 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground
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
Mary Queen of the Universe	32	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	7	-7.0
Clarion Pool	34	1	0.0	71.0	66	71.0	10	Snd Lvl	69.6	1.4	7	-5.6
Clarion Water Park	36	1	0.0	71.7	66	71.7	10	Snd Lvl	70.0	1.7	7	-5.3

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	1.0	1.7
All Impacted	3	0.0	1.0	1.7
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

26 August 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS

PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground 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	$
Barrier7	W	18.00	18.00	18.00	1535	27636				829086
									Total Cost:	829086

Stantec
M Drauer

26 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground 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	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
Mary Queen of the Universe	32	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	7	-7.0
Clarion Pool	34	1	0.0	71.0	66	71.0	10	Snd Lvl	69.5	1.5	7	-5.5
Clarion Water Park	36	1	0.0	71.7	66	71.7	10	Snd Lvl	69.9	1.8	7	-5.2

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	1.1	1.8
All Impacted	3	0.0	1.1	1.8
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

27 August 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground 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	$
Barrier7	W	20.00	20.00	20.00	1535	30707				921207
									Total Cost:	921207

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground 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	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
Mary Queen of the Universe	32	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	7	-7.0
Clarion Pool	34	1	0.0	71.0	66	71.0	10	Snd Lvl	69.3	1.7	7	-5.3
Clarion Water Park	36	1	0.0	71.7	66	71.7	10	Snd Lvl	69.9	1.8	7	-5.2

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	1.2	1.8
All Impacted	3	0.0	1.2	1.8
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground 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	$
Barrier7	W	22.00	22.00	22.00	1535	33778				1013327
									Total Cost:	1013327

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Clarion Ground 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	With Barrier Noise Reduction Calculated	With Barrier Noise Reduction Goal	With Barrier Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Mary Queen of the Universe	32	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	7	-7.0
Clarion Pool	34	1	0.0	71.0	66	71.0	10	Snd Lvl	68.4	2.6	7	-4.4
Clarion Water Park	36	1	0.0	71.7	66	71.7	10	Snd Lvl	69.3	2.4	7	-4.6

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	0.0	1.7	2.6
All Impacted	3	0.0	1.7	2.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra BM 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	$
Barrier1	W	14.00	14.00	14.00	476	6660				199794
									Total Cost:	199794

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra BM 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
Integra 2	63	1	0.0	63.4	66	63.4	10	----	61.9	1.5	8	-6.5
Integra 2	64	1	0.0	64.0	66	64.0	10	----	62.5	1.5	8	-6.5
Integra 2	65	1	0.0	61.8	66	61.8	10	----	60.5	1.3	8	-6.7
Integra 2	66	1	0.0	58.7	66	58.7	10	----	57.1	1.6	8	-6.4
Integra 3	68	1	0.0	65.0	66	65.0	10	----	63.5	1.5	8	-6.5
Integra 3	69	1	0.0	64.2	66	64.2	10	----	63.0	1.2	8	-6.8
Integra Cove	52	1	0.0	70.3	66	70.3	10	Snd Lvl	66.6	3.7	8	-4.3
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	60.2	2.2	8	-5.8
Integra Cove	54	1	0.0	70.5	66	70.5	10	Snd Lvl	67.1	3.4	8	-4.6
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	61.6	1.6	8	-6.4
Integra 1st	57	1	0.0	72.9	66	72.9	10	Snd Lvl	69.5	3.4	8	-4.6
Integra 1st	58	1	0.0	72.9	66	72.9	10	Snd Lvl	69.6	3.3	8	-4.7
INtega 1st	60	1	0.0	64.7	66	64.7	10	----	61.7	3.0	8	-5.0
Integra 1st	61	1	0.0	64.8	66	64.8	10	----	61.7	3.1	8	-4.9
Integra 2nd	98	1	0.0	71.4	66	71.4	10	Snd Lvl	67.7	3.7	8	-4.3
Integra 2nd	99	1	0.0	71.6	66	71.6	10	Snd Lvl	67.9	3.7	8	-4.3
Integra 2nd	100	1	0.0	71.4	66	71.4	10	Snd Lvl	68.0	3.4	8	-4.6
Integra 2nd	101	1	0.0	71.3	66	71.3	10	Snd Lvl	67.5	3.8	8	-4.2
Integra 3rd	102	1	0.0	73.2	66	73.2	10	Snd Lvl	70.2	3.0	8	-5.0
Integra 3rd	103	1	0.0	73.3	66	73.3	10	Snd Lvl	70.3	3.0	8	-5.0
Integra 3rd	104	1	0.0	73.3	66	73.3	10	Snd Lvl	70.4	2.9	8	-5.1
Integra 3rd	105	1	0.0	73.3	66	73.3	10	Snd Lvl	70.6	2.7	8	-5.3

Dwelling Units	# DUs	Noise Reduction

		Min	Avg	Max
		dB	dB	dB
All Selected	22	1.2	2.7	3.8
All Impacted	12	2.7	3.3	3.8
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

27 August 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra BM out 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	$
Barrier2	W	14.00	14.00	14.00	718	10056				301684
									Total Cost:	301684

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra BM out 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
Integra Cove	52	1	0.0	70.5	66	70.5	10	Snd Lvl	64.0	6.5	8	-1.5
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	59.6	2.8	8	-5.2
Integra Cove	54	1	0.0	70.5	66	70.5	10	Snd Lvl	64.4	6.1	8	-1.9
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	62.2	1.0	8	-7.0
Integra 1st	57	1	0.0	73.1	66	73.1	10	Snd Lvl	72.2	0.9	8	-7.1
Integra 1st	58	1	0.0	73.0	66	73.0	10	Snd Lvl	72.3	0.7	8	-7.3
INtega 1st	60	1	0.0	64.7	66	64.7	10	----	62.9	1.8	8	-6.2
Integra 1st	61	1	0.0	64.8	66	64.8	10	----	62.9	1.9	8	-6.1
Integra 2	63	1	0.0	63.5	66	63.5	10	----	61.7	1.8	8	-6.2
Integra 2	64	1	0.0	64.1	66	64.1	10	----	62.3	1.8	8	-6.2
Integra 2	65	1	0.0	61.9	66	61.9	10	----	60.5	1.4	8	-6.6
Integra 2	66	1	0.0	58.8	66	58.8	10	----	57.9	0.9	8	-7.1
Integra 3	68	1	0.0	65.1	66	65.1	10	----	62.4	2.7	8	-5.3
Integra 3	69	1	0.0	64.3	66	64.3	10	----	61.9	2.4	8	-5.6
Integra 2nd	98	1	0.0	71.7	66	71.7	10	Snd Lvl	66.0	5.7	8	-2.3
Integra 2nd	99	1	0.0	71.8	66	71.8	10	Snd Lvl	66.2	5.6	8	-2.4
Integra 2nd	100	1	0.0	71.5	66	71.5	10	Snd Lvl	66.5	5.0	8	-3.0
Integra 2nd	101	1	0.0	71.5	66	71.5	10	Snd Lvl	65.9	5.6	8	-2.4
Integra 3rd	102	1	0.0	73.4	66	73.4	10	Snd Lvl	73.3	0.1	8	-7.9
Integra 3rd	103	1	0.0	73.4	66	73.4	10	Snd Lvl	73.4	0.0	8	-8.0
Integra 3rd	104	1	0.0	73.5	66	73.5	10	Snd Lvl	73.5	0.0	8	-8.0
Integra 3rd	105	1	0.0	73.4	66	73.4	10	Snd Lvl	73.5	-0.1	8	-8.1

Dwelling Units	# DUs	Noise Reduction

		Min	Avg	Max
		dB	dB	dB
All Selected	22	-0.1	2.5	6.5
All Impacted	12	-0.1	3.0	6.5
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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	$
Barrier4	W	18.00	18.00	18.00	489	8796				263883
									Total Cost:	263883

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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
Integra Cove	52	1	0.0	70.5	66	70.5	10	Snd Lvl	62.9	7.6	8	-0.4
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	59.2	3.2	8	-4.8
Integra Cove	54	1	0.0	70.6	66	70.6	10	Snd Lvl	63.7	6.9	8	-1.1
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	62.8	0.4	8	-7.6
Integra 1st	57	1	0.0	73.2	66	73.2	10	Snd Lvl	70.8	2.4	8	-5.6
Integra 1st	58	1	0.0	73.1	66	73.1	10	Snd Lvl	71.3	1.8	8	-6.2
INtega 1st	60	1	0.0	64.8	66	64.8	10	----	61.7	3.1	8	-4.9
Integra 1st	61	1	0.0	64.9	66	64.9	10	----	61.5	3.4	8	-4.6
Integra 2	63	1	0.0	63.4	66	63.4	10	----	62.2	1.2	8	-6.8
Integra 2	64	1	0.0	64.1	66	64.1	10	----	62.9	1.2	8	-6.8
Integra 2	65	1	0.0	61.9	66	61.9	10	----	61.0	0.9	8	-7.1
Integra 2	66	1	0.0	58.8	66	58.8	10	----	57.4	1.4	8	-6.6
Integra 3	68	1	0.0	65.1	66	65.1	10	----	62.8	2.3	8	-5.7
Integra 3	69	1	0.0	64.3	66	64.3	10	----	62.3	2.0	8	-6.0
Integra 2nd	98	1	0.0	71.8	66	71.8	10	Snd Lvl	64.4	7.4	8	-0.6
Integra 2nd	99	1	0.0	71.9	66	71.9	10	Snd Lvl	64.7	7.2	8	-0.8
Integra 2nd	100	1	0.0	71.6	66	71.6	10	Snd Lvl	65.2	6.4	8	-1.6
Integra 2nd	101	1	0.0	71.6	66	71.6	10	Snd Lvl	64.3	7.3	8	-0.7
Integra 3rd	102	1	0.0	73.5	66	73.5	10	Snd Lvl	72.9	0.6	8	-7.4
Integra 3rd	103	1	0.0	73.6	66	73.6	10	Snd Lvl	73.1	0.5	8	-7.5
Integra 3rd	104	1	0.0	73.6	66	73.6	10	Snd Lvl	73.3	0.3	8	-7.7
Integra 3rd	105	1	0.0	73.6	66	73.6	10	Snd Lvl	73.4	0.2	8	-7.8

Dwelling Units	# DUs	Noise Reduction

		Min	Avg	Max
		dB	dB	dB
All Selected	22	0.2	3.1	7.6
All Impacted	12	0.2	4.0	7.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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	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
Integra Cove	52	1	0.0	70.5	66	70.5	10	Snd Lvl	62.4	8.1	8	0.1
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	59.0	3.4	8	-4.6
Integra Cove	54	1	0.0	70.6	66	70.6	10	Snd Lvl	63.3	7.3	8	-0.7
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	62.6	0.6	8	-7.4
Integra 1st	57	1	0.0	73.2	66	73.2	10	Snd Lvl	68.9	4.3	8	-3.7
Integra 1st	58	1	0.0	73.1	66	73.1	10	Snd Lvl	69.4	3.7	8	-4.3
INtega 1st	60	1	0.0	64.8	66	64.8	10	----	60.3	4.5	8	-3.5
Integra 1st	61	1	0.0	64.9	66	64.9	10	----	60.1	4.8	8	-3.2
Integra 2	63	1	0.0	63.4	66	63.4	10	----	62.1	1.3	8	-6.7
Integra 2	64	1	0.0	64.1	66	64.1	10	----	62.9	1.2	8	-6.8
Integra 2	65	1	0.0	61.9	66	61.9	10	----	60.9	1.0	8	-7.0
Integra 2	66	1	0.0	58.8	66	58.8	10	----	57.3	1.5	8	-6.5
Integra 3	68	1	0.0	65.1	66	65.1	10	----	62.7	2.4	8	-5.6
Integra 3	69	1	0.0	64.3	66	64.3	10	----	62.2	2.1	8	-5.9
Integra 2nd	98	1	0.0	71.8	66	71.8	10	Snd Lvl	63.6	8.2	8	0.2
Integra 2nd	99	1	0.0	71.9	66	71.9	10	Snd Lvl	64.0	7.9	8	-0.1
Integra 2nd	100	1	0.0	71.6	66	71.6	10	Snd Lvl	64.6	7.0	8	-1.0
Integra 2nd	101	1	0.0	71.6	66	71.6	10	Snd Lvl	63.6	8.0	8	0.0
Integra 3rd	102	1	0.0	73.5	66	73.5	10	Snd Lvl	71.9	1.6	8	-6.4
Integra 3rd	103	1	0.0	73.6	66	73.6	10	Snd Lvl	72.2	1.4	8	-6.6
Integra 3rd	104	1	0.0	73.6	66	73.6	10	Snd Lvl	72.5	1.1	8	-6.9
Integra 3rd	105	1	0.0	73.6	66	73.6	10	Snd Lvl	72.8	0.8	8	-7.2

Dwelling Units	# DUs	Noise Reduction

		Min	Avg	Max
		dB	dB	dB
All Selected	22	0.6	3.7	8.2
All Impacted	12	0.8	4.9	8.2
All that meet NR Goal	3	8.0	8.1	8.2

Stantec 28 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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	$
Barrier4	W	20.00	20.00	20.00	489	9773				293204
									Total Cost:	293204

Stantec
M Drauer

28 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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	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
Integra Cove	52	1	0.0	70.5	66	70.5	10	Snd Lvl	62.4	8.1	8	0.1
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	59.0	3.4	8	-4.6
Integra Cove	54	1	0.0	70.6	66	70.6	10	Snd Lvl	63.3	7.3	8	-0.7
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	62.6	0.6	8	-7.4
Integra 1st	57	1	0.0	73.2	66	73.2	10	Snd Lvl	68.9	4.3	8	-3.7
Integra 1st	58	1	0.0	73.1	66	73.1	10	Snd Lvl	69.4	3.7	8	-4.3
INtega 1st	60	1	0.0	64.8	66	64.8	10	----	60.3	4.5	8	-3.5
Integra 1st	61	1	0.0	64.9	66	64.9	10	----	60.1	4.8	8	-3.2
Integra 2	63	1	0.0	63.4	66	63.4	10	----	62.1	1.3	8	-6.7
Integra 2	64	1	0.0	64.1	66	64.1	10	----	62.9	1.2	8	-6.8
Integra 2	65	1	0.0	61.9	66	61.9	10	----	60.9	1.0	8	-7.0
Integra 2	66	1	0.0	58.8	66	58.8	10	----	57.3	1.5	8	-6.5
Integra 3	68	1	0.0	65.1	66	65.1	10	----	62.7	2.4	8	-5.6
Integra 3	69	1	0.0	64.3	66	64.3	10	----	62.2	2.1	8	-5.9
Integra 2nd	98	1	0.0	71.8	66	71.8	10	Snd Lvl	63.6	8.2	8	0.2
Integra 2nd	99	1	0.0	71.9	66	71.9	10	Snd Lvl	64.0	7.9	8	-0.1
Integra 2nd	100	1	0.0	71.6	66	71.6	10	Snd Lvl	64.6	7.0	8	-1.0
Integra 2nd	101	1	0.0	71.6	66	71.6	10	Snd Lvl	63.6	8.0	8	0.0
Integra 3rd	102	1	0.0	73.5	66	73.5	10	Snd Lvl	71.9	1.6	8	-6.4
Integra 3rd	103	1	0.0	73.6	66	73.6	10	Snd Lvl	72.2	1.4	8	-6.6
Integra 3rd	104	1	0.0	73.6	66	73.6	10	Snd Lvl	72.5	1.1	8	-6.9
Integra 3rd	105	1	0.0	73.6	66	73.6	10	Snd Lvl	72.8	0.8	8	-7.2

Dwelling Units	# DUs	Noise Reduction

		Min	Avg	Max
		dB	dB	dB
All Selected	22	0.6	3.7	8.2
All Impacted	12	0.8	4.9	8.2
All that meet NR Goal	3	8.0	8.1	8.2

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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	$
Barrier4	W	22.00	22.00	22.00	489	10751				322524
									Total Cost:	322524

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Integra GM 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	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
Integra Cove	52	1	0.0	70.5	66	70.5	10	Snd Lvl	62.0	8.5	8	0.5
Integra Cove	53	1	0.0	62.4	66	62.4	10	----	58.9	3.5	8	-4.5
Integra Cove	54	1	0.0	70.6	66	70.6	10	Snd Lvl	63.0	7.6	8	-0.4
Integra Cove	55	1	0.0	63.2	66	63.2	10	----	62.5	0.7	8	-7.3
Integra 1st	57	1	0.0	73.2	66	73.2	10	Snd Lvl	66.9	6.3	8	-1.7
Integra 1st	58	1	0.0	73.1	66	73.1	10	Snd Lvl	67.4	5.7	8	-2.3
INtega 1st	60	1	0.0	64.8	66	64.8	10	----	59.4	5.4	8	-2.6
Integra 1st	61	1	0.0	64.9	66	64.9	10	----	59.2	5.7	8	-2.3
Integra 2	63	1	0.0	63.4	66	63.4	10	----	62.0	1.4	8	-6.6
Integra 2	64	1	0.0	64.1	66	64.1	10	----	62.8	1.3	8	-6.7
Integra 2	65	1	0.0	61.9	66	61.9	10	----	60.9	1.0	8	-7.0
Integra 2	66	1	0.0	58.8	66	58.8	10	----	57.2	1.6	8	-6.4
Integra 3	68	1	0.0	65.1	66	65.1	10	----	62.6	2.5	8	-5.5
Integra 3	69	1	0.0	64.3	66	64.3	10	----	62.1	2.2	8	-5.8
Integra 2nd	98	1	0.0	71.8	66	71.8	10	Snd Lvl	63.0	8.8	8	0.8
Integra 2nd	99	1	0.0	71.9	66	71.9	10	Snd Lvl	63.4	8.5	8	0.5
Integra 2nd	100	1	0.0	71.6	66	71.6	10	Snd Lvl	64.1	7.5	8	-0.5
Integra 2nd	101	1	0.0	71.6	66	71.6	10	Snd Lvl	63.0	8.6	8	0.6
Integra 3rd	102	1	0.0	73.5	66	73.5	10	Snd Lvl	70.4	3.1	8	-4.9
Integra 3rd	103	1	0.0	73.6	66	73.6	10	Snd Lvl	70.8	2.8	8	-5.2
Integra 3rd	104	1	0.0	73.6	66	73.6	10	Snd Lvl	71.2	2.4	8	-5.6
Integra 3rd	105	1	0.0	73.6	66	73.6	10	Snd Lvl	71.7	1.9	8	-6.1

Dwelling Units	# DUs	Noise Reduction

		Min	Avg	Max
		dB	dB	dB
All Selected	22	0.7	4.4	8.8
All Impacted	12	1.9	6.0	8.8
All that meet NR Goal	4	8.5	8.6	8.8

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis 14' BM

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	$
Barrier5	W	14.00	14.00	14.00	598	8368				251037
Barrier3	W	14.00	14.00	14.00	979	13713				411387
									Total Cost:	662424

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis 14' BM
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
Altis Sand Lake	71	2	0.0	70.0	66	70.0	10	Snd Lvl	62.1	7.9	8	-0.1
Altis Sand Lake	75	2	0.0	67.5	66	67.5	10	Snd Lvl	60.2	7.3	8	-0.7
Altis Sand Lake	76	2	0.0	67.1	66	67.1	10	Snd Lvl	60.0	7.1	8	-0.9
Altis Sand Lake	79	2	0.0	64.3	66	64.3	10	----	57.3	7.0	8	-1.0
Altis Sand Lake	80	2	0.0	63.9	66	63.9	10	----	56.9	7.0	8	-1.0
Altis 3 1st	83	2	0.0	67.4	66	67.4	10	Snd Lvl	60.2	7.2	8	-0.8
Altis 3 1st	84	2	0.0	67.7	66	67.7	10	Snd Lvl	60.5	7.2	8	-0.8
Altis 3 1st	85	2	0.0	67.7	66	67.7	10	Snd Lvl	60.5	7.2	8	-0.8
Altis 3 1st	86	2	0.0	67.9	66	67.9	10	Snd Lvl	60.6	7.3	8	-0.7
Altis 3 1st	87	2	0.0	68.0	66	68.0	10	Snd Lvl	60.6	7.4	8	-0.6
Altis 2 1st	98	2	0.0	61.7	66	61.7	10	----	55.1	6.6	8	-1.4
Altis 2 2nd	99	2	0.0	72.1	66	72.1	10	Snd Lvl	65.8	6.3	8	-1.7
Altis 2 2nd	100	2	0.0	69.8	66	69.8	10	Snd Lvl	64.0	5.8	8	-2.2
Altis 2 2nd	96	2	0.0	69.1	66	69.1	10	Snd Lvl	63.5	5.6	8	-2.4
Altis 2 2nd	101	2	0.0	66.7	66	66.7	10	Snd Lvl	61.2	5.5	8	-2.5
Altis 2 2nd	102	2	0.0	66.2	66	66.2	10	Snd Lvl	60.7	5.5	8	-2.5
Altis 2 2nd	104	2	0.0	64.0	66	64.0	10	----	58.8	5.2	8	-2.8
Altis 3 1st	106	2	0.0	68.1	66	68.1	10	Snd Lvl	60.5	7.6	8	-0.4
Altis 3 2nd	108	2	0.0	70.2	66	70.2	10	Snd Lvl	64.4	5.8	8	-2.2
Altis 3 2nd	109	2	0.0	70.0	66	70.0	10	Snd Lvl	64.4	5.6	8	-2.4
Altis 3 1st	106	2	0.0	67.9	66	67.9	10	Snd Lvl	60.6	7.3	8	-0.7
Alts 3 2nd	110	2	0.0	69.9	66	69.9	10	Snd Lvl	64.2	5.7	8	-2.3
Altis 3 2nd	111	2	0.0	69.9	66	69.9	10	Snd Lvl	64.2	5.7	8	-2.3

Altis 3 2nd	113	2	0.0	69.6	66	69.6	10	Snd Lvl	64.0	5.6	8	-2.4
Altis Pool	115	1	0.0	69.6	66	69.6	10	Snd Lvl	62.1	7.5	8	-0.5
Altis tot lot	117	1	0.0	71.3	66	71.3	10	Snd Lvl	63.0	8.3	8	0.3
Altis 4 1st	119	2	0.0	68.9	66	68.9	10	Snd Lvl	60.4	8.5	8	0.5
Altis 4 2nd	120	2	0.0	71.1	66	71.1	10	Snd Lvl	64.7	6.4	8	-1.6
Altis 3 2nd	113	2	0.0	67.8	66	67.8	10	Snd Lvl	61.9	5.9	8	-2.1
Altis 4 1st	121	2	0.0	65.1	66	65.1	10	----	57.9	7.2	8	-0.8
Altis 4 1st	122	2	0.0	63.2	66	63.2	10	----	56.3	6.9	8	-1.1
Altis 4 2nd	124	2	0.0	64.9	66	64.9	10	----	59.6	5.3	8	-2.7
Altis 5 1st	127	2	0.0	69.6	66	69.6	10	Snd Lvl	62.6	7.0	8	-1.0
Altis 5 1st	128	2	0.0	64.4	66	64.4	10	----	57.4	7.0	8	-1.0
Altis 5 1st	129	2	0.0	64.0	66	64.0	10	----	57.3	6.7	8	-1.3
Altis 5 1st	130	2	0.0	62.5	66	62.5	10	----	56.5	6.0	8	-2.0
Altis 5 1st	131	2	0.0	62.1	66	62.1	10	----	55.9	6.2	8	-1.8
Altis 5 2nd	132	2	0.0	63.2	66	63.2	10	----	58.1	5.1	8	-2.9
Altis 5 2nd	133	2	0.0	63.6	66	63.6	10	----	58.2	5.4	8	-2.6
Alt 5 2nd	134	2	0.0	64.9	66	64.9	10	----	59.5	5.4	8	-2.6
Altis 4 2nd	124	2	0.0	65.7	66	65.7	10	----	60.1	5.6	8	-2.4
Altis 5 2nd	135	2	0.0	66.7	66	66.7	10	Snd Lvl	60.9	5.8	8	-2.2
Altis 5 2nd	136	2	0.0	67.3	66	67.3	10	Snd Lvl	60.8	6.5	8	-1.5
Altis 5 2nd	138	2	0.0	70.8	66	70.8	10	Snd Lvl	64.0	6.8	8	-1.2

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	86	5.1	6.5	8.5
All Impacted	56	5.5	6.7	8.5
All that meet NR Goal	3	8.3	8.4	8.5

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM

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	$
Barrier7	W	16.00	16.00	16.00	1223	19565				586956
									Total Cost:	586956

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM
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
Altis Sand Lake	71	2	0.0	70.1	66	70.1	10	Snd Lvl	61.1	9.0	8	1.0
Altis Sand Lake	75	2	0.0	67.5	66	67.5	10	Snd Lvl	60.0	7.5	8	-0.5
Altis Sand Lake	76	2	0.0	67.1	66	67.1	10	Snd Lvl	59.9	7.2	8	-0.8
Altis Sand Lake	79	2	0.0	64.3	66	64.3	10	----	57.5	6.8	8	-1.2
Altis Sand Lake	80	2	0.0	63.9	66	63.9	10	----	57.2	6.7	8	-1.3
Altis 3 1st	83	2	0.0	67.4	66	67.4	10	Snd Lvl	60.3	7.1	8	-0.9
Altis 3 1st	84	2	0.0	67.6	66	67.6	10	Snd Lvl	60.5	7.1	8	-0.9
Altis 3 1st	85	2	0.0	67.7	66	67.7	10	Snd Lvl	60.6	7.1	8	-0.9
Altis 3 1st	86	2	0.0	67.9	66	67.9	10	Snd Lvl	60.7	7.2	8	-0.8
Altis 3 1st	87	2	0.0	67.9	66	67.9	10	Snd Lvl	60.7	7.2	8	-0.8
Altis 2 1st	98	2	0.0	61.6	66	61.6	10	----	55.6	6.0	8	-2.0
Altis 2 2nd	99	2	0.0	72.3	66	72.3	10	Snd Lvl	69.5	2.8	8	-5.2
Altis 2 2nd	100	2	0.0	70.2	66	70.2	10	Snd Lvl	65.8	4.4	8	-3.6
Altis 2 2nd	96	2	0.0	69.4	66	69.4	10	Snd Lvl	65.0	4.4	8	-3.6
Altis 2 2nd	101	2	0.0	67.0	66	67.0	10	Snd Lvl	62.2	4.8	8	-3.2
Altis 2 2nd	102	2	0.0	66.5	66	66.5	10	Snd Lvl	61.6	4.9	8	-3.1
Altis 2 2nd	104	2	0.0	64.2	66	64.2	10	----	59.6	4.6	8	-3.4
Altis 3 1st	106	2	0.0	68.0	66	68.0	10	Snd Lvl	60.7	7.3	8	-0.7
Altis 3 2nd	108	2	0.0	70.5	66	70.5	10	Snd Lvl	66.4	4.1	8	-3.9
Altis 3 2nd	109	2	0.0	70.5	66	70.5	10	Snd Lvl	66.2	4.3	8	-3.7
Altis 3 1st	106	2	0.0	67.9	66	67.9	10	Snd Lvl	60.7	7.2	8	-0.8
Alts 3 2nd	110	2	0.0	70.3	66	70.3	10	Snd Lvl	65.9	4.4	8	-3.6
Altis 3 2nd	111	2	0.0	70.3	66	70.3	10	Snd Lvl	65.7	4.6	8	-3.4

Altis 3 2nd	113	2	0.0	70.0	66	70.0	10	Snd Lvl	65.5	4.5	8	-3.5
Altis Pool	115	1	0.0	69.7	66	69.7	10	Snd Lvl	61.6	8.1	8	0.1
Altis tot lot	117	1	0.0	71.4	66	71.4	10	Snd Lvl	61.6	9.8	8	1.8
Altis 4 1st	119	2	0.0	68.9	66	68.9	10	Snd Lvl	60.4	8.5	8	0.5
Altis 4 2nd	120	2	0.0	71.5	66	71.5	10	Snd Lvl	67.8	3.7	8	-4.3
Altis 3 2nd	113	2	0.0	68.1	66	68.1	10	Snd Lvl	63.4	4.7	8	-3.3
Altis 4 1st	121	2	0.0	65.1	66	65.1	10	----	58.1	7.0	8	-1.0
Altis 4 1st	122	2	0.0	63.2	66	63.2	10	----	57.0	6.2	8	-1.8
Altis 4 2nd	124	2	0.0	65.2	66	65.2	10	----	60.7	4.5	8	-3.5
Altis 5 1st	127	2	0.0	69.5	66	69.5	10	Snd Lvl	62.2	7.3	8	-0.7
Altis 5 1st	128	2	0.0	64.4	66	64.4	10	----	57.4	7.0	8	-1.0
Altis 5 1st	129	2	0.0	64.0	66	64.0	10	----	57.4	6.6	8	-1.4
Altis 5 1st	130	2	0.0	62.5	66	62.5	10	----	56.9	5.6	8	-2.4
Altis 5 1st	131	2	0.0	62.1	66	62.1	10	----	56.4	5.7	8	-2.3
Altis 5 2nd	132	2	0.0	63.2	66	63.2	10	----	59.0	4.2	8	-3.8
Altis 5 2nd	133	2	0.0	63.7	66	63.7	10	----	59.1	4.6	8	-3.4
Alt 5 2nd	134	2	0.0	65.0	66	65.0	10	----	60.4	4.6	8	-3.4
Altis 4 2nd	124	2	0.0	65.8	66	65.8	10	----	61.0	4.8	8	-3.2
Altis 5 2nd	135	2	0.0	66.8	66	66.8	10	Snd Lvl	62.2	4.6	8	-3.4
Altis 5 2nd	136	2	0.0	67.4	66	67.4	10	Snd Lvl	62.6	4.8	8	-3.2
Altis 5 2nd	138	2	0.0	71.2	66	71.2	10	Snd Lvl	67.2	4.0	8	-4.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	86	2.8	5.9	9.8
All Impacted	56	2.8	6.0	9.8
All that meet NR Goal	6	8.1	8.9	9.8

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM 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
Altis Sand Lake	71	2	0.0	70.1	66	70.1	10	Snd Lvl	60.5	9.6	8	1.6
Altis Sand Lake	75	2	0.0	67.5	66	67.5	10	Snd Lvl	59.5	8.0	8	0.0
Altis Sand Lake	76	2	0.0	67.1	66	67.1	10	Snd Lvl	59.4	7.7	8	-0.3
Altis Sand Lake	79	2	0.0	64.3	66	64.3	10	----	57.0	7.3	8	-0.7
Altis Sand Lake	80	2	0.0	63.9	66	63.9	10	----	56.7	7.2	8	-0.8
Altis 3 1st	83	2	0.0	67.4	66	67.4	10	Snd Lvl	59.8	7.6	8	-0.4
Altis 3 1st	84	2	0.0	67.6	66	67.6	10	Snd Lvl	60.0	7.6	8	-0.4
Altis 3 1st	85	2	0.0	67.7	66	67.7	10	Snd Lvl	60.0	7.7	8	-0.3
Altis 3 1st	86	2	0.0	67.9	66	67.9	10	Snd Lvl	60.2	7.7	8	-0.3
Altis 3 1st	87	2	0.0	67.9	66	67.9	10	Snd Lvl	60.2	7.7	8	-0.3
Altis 2 1st	98	2	0.0	61.6	66	61.6	10	----	55.2	6.4	8	-1.6
Altis 2 2nd	99	2	0.0	72.3	66	72.3	10	Snd Lvl	66.7	5.6	8	-2.4
Altis 2 2nd	100	2	0.0	70.2	66	70.2	10	Snd Lvl	64.0	6.2	8	-1.8
Altis 2 2nd	96	2	0.0	69.4	66	69.4	10	Snd Lvl	63.5	5.9	8	-2.1
Altis 2 2nd	101	2	0.0	67.0	66	67.0	10	Snd Lvl	60.9	6.1	8	-1.9
Altis 2 2nd	102	2	0.0	66.5	66	66.5	10	Snd Lvl	60.3	6.2	8	-1.8
Altis 2 2nd	104	2	0.0	64.2	66	64.2	10	----	58.4	5.8	8	-2.2
Altis 3 1st	106	2	0.0	68.0	66	68.0	10	Snd Lvl	60.1	7.9	8	-0.1
Altis 3 2nd	108	2	0.0	70.5	66	70.5	10	Snd Lvl	64.5	6.0	8	-2.0
Altis 3 2nd	109	2	0.0	70.5	66	70.5	10	Snd Lvl	64.5	6.0	8	-2.0
Altis 3 1st	106	2	0.0	67.9	66	67.9	10	Snd Lvl	60.1	7.8	8	-0.2
Alts 3 2nd	110	2	0.0	70.3	66	70.3	10	Snd Lvl	64.3	6.0	8	-2.0
Altis 3 2nd	111	2	0.0	70.3	66	70.3	10	Snd Lvl	64.1	6.2	8	-1.8

Altis 3 2nd	113	2	0.0	70.0	66	70.0	10	Snd Lvl	63.9	6.1	8	-1.9
Altis Pool	115	1	0.0	69.7	66	69.7	10	Snd Lvl	61.1	8.6	8	0.6
Altis tot lot	117	1	0.0	71.4	66	71.4	10	Snd Lvl	61.1	10.3	8	2.3
Altis 4 1st	119	2	0.0	68.9	66	68.9	10	Snd Lvl	59.8	9.1	8	1.1
Altis 4 2nd	120	2	0.0	71.5	66	71.5	10	Snd Lvl	65.6	5.9	8	-2.1
Altis 3 2nd	113	2	0.0	68.1	66	68.1	10	Snd Lvl	61.8	6.3	8	-1.7
Altis 4 1st	121	2	0.0	65.1	66	65.1	10	----	57.6	7.5	8	-0.5
Altis 4 1st	122	2	0.0	63.2	66	63.2	10	----	56.5	6.7	8	-1.3
Altis 4 2nd	124	2	0.0	65.2	66	65.2	10	----	59.5	5.7	8	-2.3
Altis 5 1st	127	2	0.0	69.5	66	69.5	10	Snd Lvl	61.8	7.7	8	-0.3
Altis 5 1st	128	2	0.0	64.4	66	64.4	10	----	57.0	7.4	8	-0.6
Altis 5 1st	129	2	0.0	64.0	66	64.0	10	----	57.1	6.9	8	-1.1
Altis 5 1st	130	2	0.0	62.5	66	62.5	10	----	56.6	5.9	8	-2.1
Altis 5 1st	131	2	0.0	62.1	66	62.1	10	----	56.2	5.9	8	-2.1
Altis 5 2nd	132	2	0.0	63.2	66	63.2	10	----	58.2	5.0	8	-3.0
Altis 5 2nd	133	2	0.0	63.7	66	63.7	10	----	58.3	5.4	8	-2.6
Alt 5 2nd	134	2	0.0	65.0	66	65.0	10	----	59.6	5.4	8	-2.6
Altis 4 2nd	124	2	0.0	65.8	66	65.8	10	----	60.1	5.7	8	-2.3
Altis 5 2nd	135	2	0.0	66.8	66	66.8	10	Snd Lvl	61.2	5.6	8	-2.4
Altis 5 2nd	136	2	0.0	67.4	66	67.4	10	Snd Lvl	61.2	6.2	8	-1.8
Altis 5 2nd	138	2	0.0	71.2	66	71.2	10	Snd Lvl	65.0	6.2	8	-1.8

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	86	5.0	6.8	10.3
All Impacted	56	5.6	7.1	10.3
All that meet NR Goal	8	8.0	9.1	10.3

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RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM 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	$
Barrier7	W	20.00	20.00	20.00	1223	24457				733695
									Total Cost:	733695

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27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM 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	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
Altis Sand Lake	71	2	0.0	70.1	66	70.1	10	Snd Lvl	60.0	10.1	8	2.1
Altis Sand Lake	75	2	0.0	67.5	66	67.5	10	Snd Lvl	59.0	8.5	8	0.5
Altis Sand Lake	76	2	0.0	67.1	66	67.1	10	Snd Lvl	58.9	8.2	8	0.2
Altis Sand Lake	79	2	0.0	64.3	66	64.3	10	----	56.6	7.7	8	-0.3
Altis Sand Lake	80	2	0.0	63.9	66	63.9	10	----	56.2	7.7	8	-0.3
Altis 3 1st	83	2	0.0	67.4	66	67.4	10	Snd Lvl	59.3	8.1	8	0.1
Altis 3 1st	84	2	0.0	67.6	66	67.6	10	Snd Lvl	59.5	8.1	8	0.1
Altis 3 1st	85	2	0.0	67.7	66	67.7	10	Snd Lvl	59.5	8.2	8	0.2
Altis 3 1st	86	2	0.0	67.9	66	67.9	10	Snd Lvl	59.7	8.2	8	0.2
Altis 3 1st	87	2	0.0	67.9	66	67.9	10	Snd Lvl	59.6	8.3	8	0.3
Altis 2 1st	98	2	0.0	61.6	66	61.6	10	----	54.8	6.8	8	-1.2
Altis 2 2nd	99	2	0.0	72.3	66	72.3	10	Snd Lvl	65.0	7.3	8	-0.7
Altis 2 2nd	100	2	0.0	70.2	66	70.2	10	Snd Lvl	63.0	7.2	8	-0.8
Altis 2 2nd	96	2	0.0	69.4	66	69.4	10	Snd Lvl	62.5	6.9	8	-1.1
Altis 2 2nd	101	2	0.0	67.0	66	67.0	10	Snd Lvl	60.1	6.9	8	-1.1
Altis 2 2nd	102	2	0.0	66.5	66	66.5	10	Snd Lvl	59.5	7.0	8	-1.0
Altis 2 2nd	104	2	0.0	64.2	66	64.2	10	----	57.8	6.4	8	-1.6
Altis 3 1st	106	2	0.0	68.0	66	68.0	10	Snd Lvl	59.6	8.4	8	0.4
Altis 3 2nd	108	2	0.0	70.5	66	70.5	10	Snd Lvl	63.5	7.0	8	-1.0
Altis 3 2nd	109	2	0.0	70.5	66	70.5	10	Snd Lvl	63.4	7.1	8	-0.9
Altis 3 1st	106	2	0.0	67.9	66	67.9	10	Snd Lvl	59.6	8.3	8	0.3
Alts 3 2nd	110	2	0.0	70.3	66	70.3	10	Snd Lvl	63.2	7.1	8	-0.9
Altis 3 2nd	111	2	0.0	70.3	66	70.3	10	Snd Lvl	63.1	7.2	8	-0.8

Altis 3 2nd	113	2	0.0	70.0	66	70.0	10	Snd Lvl	63.0	7.0	8	-1.0
Altis Pool	115	1	0.0	69.7	66	69.7	10	Snd Lvl	60.6	9.1	8	1.1
Altis tot lot	117	1	0.0	71.4	66	71.4	10	Snd Lvl	60.5	10.9	8	2.9
Altis 4 1st	119	2	0.0	68.9	66	68.9	10	Snd Lvl	59.3	9.6	8	1.6
Altis 4 2nd	120	2	0.0	71.5	66	71.5	10	Snd Lvl	64.0	7.5	8	-0.5
Altis 3 2nd	113	2	0.0	68.1	66	68.1	10	Snd Lvl	60.9	7.2	8	-0.8
Altis 4 1st	121	2	0.0	65.1	66	65.1	10	----	57.1	8.0	8	0.0
Altis 4 1st	122	2	0.0	63.2	66	63.2	10	----	56.1	7.1	8	-0.9
Altis 4 2nd	124	2	0.0	65.2	66	65.2	10	----	58.8	6.4	8	-1.6
Altis 5 1st	127	2	0.0	69.5	66	69.5	10	Snd Lvl	61.4	8.1	8	0.1
Altis 5 1st	128	2	0.0	64.4	66	64.4	10	----	56.7	7.7	8	-0.3
Altis 5 1st	129	2	0.0	64.0	66	64.0	10	----	56.7	7.3	8	-0.7
Altis 5 1st	130	2	0.0	62.5	66	62.5	10	----	56.4	6.1	8	-1.9
Altis 5 1st	131	2	0.0	62.1	66	62.1	10	----	55.9	6.2	8	-1.8
Altis 5 2nd	132	2	0.0	63.2	66	63.2	10	----	57.8	5.4	8	-2.6
Altis 5 2nd	133	2	0.0	63.7	66	63.7	10	----	57.8	5.9	8	-2.1
Alt 5 2nd	134	2	0.0	65.0	66	65.0	10	----	59.1	5.9	8	-2.1
Altis 4 2nd	124	2	0.0	65.8	66	65.8	10	----	59.7	6.1	8	-1.9
Altis 5 2nd	135	2	0.0	66.8	66	66.8	10	Snd Lvl	60.6	6.2	8	-1.8
Altis 5 2nd	136	2	0.0	67.4	66	67.4	10	Snd Lvl	60.5	6.9	8	-1.1
Altis 5 2nd	138	2	0.0	71.2	66	71.2	10	Snd Lvl	63.8	7.4	8	-0.6

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	86	5.4	7.5	10.9
All Impacted	56	6.2	7.9	10.9
All that meet NR Goal	28	8.0	8.7	10.9

Stantec 27 August 2015
M Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM 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	$
Barrier7	W	22.00	22.00	22.00	1223	26902				807065
									Total Cost:	807065

Stantec
M Drauer

27 August 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I-4 BtU 192 to CFP
BARRIER DESIGN: Altis GM 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
Altis Sand Lake	71	2	0.0	70.1	66	70.1	10	Snd Lvl	59.5	10.6	8	2.6
Altis Sand Lake	75	2	0.0	67.5	66	67.5	10	Snd Lvl	58.6	8.9	8	0.9
Altis Sand Lake	76	2	0.0	67.1	66	67.1	10	Snd Lvl	58.5	8.6	8	0.6
Altis Sand Lake	79	2	0.0	64.3	66	64.3	10	----	56.1	8.2	8	0.2
Altis Sand Lake	80	2	0.0	63.9	66	63.9	10	----	55.8	8.1	8	0.1
Altis 3 1st	83	2	0.0	67.4	66	67.4	10	Snd Lvl	58.8	8.6	8	0.6
Altis 3 1st	84	2	0.0	67.6	66	67.6	10	Snd Lvl	59.0	8.6	8	0.6
Altis 3 1st	85	2	0.0	67.7	66	67.7	10	Snd Lvl	59.0	8.7	8	0.7
Altis 3 1st	86	2	0.0	67.9	66	67.9	10	Snd Lvl	59.2	8.7	8	0.7
Altis 3 1st	87	2	0.0	67.9	66	67.9	10	Snd Lvl	59.2	8.7	8	0.7
Altis 2 1st	98	2	0.0	61.6	66	61.6	10	----	54.5	7.1	8	-0.9
Altis 2 2nd	99	2	0.0	72.3	66	72.3	10	Snd Lvl	63.8	8.5	8	0.5
Altis 2 2nd	100	2	0.0	70.2	66	70.2	10	Snd Lvl	62.2	8.0	8	0.0
Altis 2 2nd	96	2	0.0	69.4	66	69.4	10	Snd Lvl	61.7	7.7	8	-0.3
Altis 2 2nd	101	2	0.0	67.0	66	67.0	10	Snd Lvl	59.4	7.6	8	-0.4
Altis 2 2nd	102	2	0.0	66.5	66	66.5	10	Snd Lvl	58.9	7.6	8	-0.4
Altis 2 2nd	104	2	0.0	64.2	66	64.2	10	----	57.2	7.0	8	-1.0
Altis 3 1st	106	2	0.0	68.0	66	68.0	10	Snd Lvl	59.1	8.9	8	0.9
Altis 3 2nd	108	2	0.0	70.5	66	70.5	10	Snd Lvl	62.6	7.9	8	-0.1
Altis 3 2nd	109	2	0.0	70.5	66	70.5	10	Snd Lvl	62.5	8.0	8	0.0
Altis 3 1st	106	2	0.0	67.9	66	67.9	10	Snd Lvl	59.1	8.8	8	0.8
Alts 3 2nd	110	2	0.0	70.3	66	70.3	10	Snd Lvl	62.4	7.9	8	-0.1
Altis 3 2nd	111	2	0.0	70.3	66	70.3	10	Snd Lvl	62.3	8.0	8	0.0

Altis 3 2nd	113	2	0.0	70.0	66	70.0	10	Snd Lvl	62.2	7.8	8	-0.2
Altis Pool	115	1	0.0	69.7	66	69.7	10	Snd Lvl	60.2	9.5	8	1.5
Altis tot lot	117	1	0.0	71.4	66	71.4	10	Snd Lvl	60.2	11.2	8	3.2
Altis 4 1st	119	2	0.0	68.9	66	68.9	10	Snd Lvl	58.8	10.1	8	2.1
Altis 4 2nd	120	2	0.0	71.5	66	71.5	10	Snd Lvl	62.9	8.6	8	0.6
Altis 3 2nd	113	2	0.0	68.1	66	68.1	10	Snd Lvl	60.1	8.0	8	0.0
Altis 4 1st	121	2	0.0	65.1	66	65.1	10	----	56.6	8.5	8	0.5
Altis 4 1st	122	2	0.0	63.2	66	63.2	10	----	55.6	7.6	8	-0.4
Altis 4 2nd	124	2	0.0	65.2	66	65.2	10	----	58.1	7.1	8	-0.9
Altis 5 1st	127	2	0.0	69.5	66	69.5	10	Snd Lvl	61.1	8.4	8	0.4
Altis 5 1st	128	2	0.0	64.4	66	64.4	10	----	56.4	8.0	8	0.0
Altis 5 1st	129	2	0.0	64.0	66	64.0	10	----	56.5	7.5	8	-0.5
Altis 5 1st	130	2	0.0	62.5	66	62.5	10	----	56.2	6.3	8	-1.7
Altis 5 1st	131	2	0.0	62.1	66	62.1	10	----	55.7	6.4	8	-1.6
Altis 5 2nd	132	2	0.0	63.2	66	63.2	10	----	57.4	5.8	8	-2.2
Altis 5 2nd	133	2	0.0	63.7	66	63.7	10	----	57.5	6.2	8	-1.8
Alt 5 2nd	134	2	0.0	65.0	66	65.0	10	----	58.8	6.2	8	-1.8
Altis 4 2nd	124	2	0.0	65.8	66	65.8	10	----	59.3	6.5	8	-1.5
Altis 5 2nd	135	2	0.0	66.8	66	66.8	10	Snd Lvl	60.2	6.6	8	-1.4
Altis 5 2nd	136	2	0.0	67.4	66	67.4	10	Snd Lvl	60.0	7.4	8	-0.6
Altis 5 2nd	138	2	0.0	71.2	66	71.2	10	Snd Lvl	62.9	8.3	8	0.3

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	86	5.8	8.0	11.2
All Impacted	56	6.6	8.5	11.2
All that meet NR Goal	46	8.0	8.8	11.2