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

Noise Study Report

Segment 4: State Road 400 (SR 400)/Interstate 4 (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), Florida

July 2016

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1.0 Summary of Project

The Florida Department of Transportation (FDOT) is conducting an update/reevaluation of 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 I-4 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 [Financial Project Number (FPN) 201210 (December 1998)] and from CR 532 (Polk/Osceola County Line) to West of SR 528 (Beachline Expressway) [FPN 242526 and 242483 (December 1999)] and Final Environmental Impact Statement (FEIS) for I-4 from SR 528 (Beachline Expressway) to SR 472 [FPN 242486, 242592 and 242703 (August 2002, Record of Decision Pending)].

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, which began construction in early 2015, is reconstruction to include new express lanes, of the section of I-4 which extends from west of SR 435 (Kirkman Road) to east of SR 434. For analysis purposes, 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)

Since no Record of Decision has been issued by the Federal Highway Administration (FHWA) for Segments 2, 3 and 4, the current PD&E BtU study for these three segments will update the original PD&E study. This noise study report was prepared for Segment 4 of the SR 400 (I-4) Beyond the Ultimate (BtU) PD&E Reevaluation Study and contains detailed engineering information that fulfills the purpose and need for the State Road 400 (SR 400)/Interstate 4 (I-4), from East of SR 15-600 / US 17-92 (Seminole/Volusia County Line) to ½ Mile East of SR 472, PD&E study.

The purpose of this report is to document changes in support of the PD&E update for the I-4 BtU Segment 4 portion of the FEIS for I-4 from SR 528 (Beachline Expressway) to SR 472 (FPN 242486-1, 242592-1 and 242703-1, August 2002, Record of Decision Pending). This update includes environmental analysis of the original design concept, which showed six general use lanes (GULs) and two high occupancy vehicle (HOV) lanes (6+2), to the current proposed design, which includes six GULs and four express lanes (EL) 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 ten (10) mile segment of I-4 which extends from east of US 17/92 to east of SR 472, from Milepost 0.086 to 10.227 in Volusia County (herein referred to as I-4, Segment 4) and as shown in **Figure 1**. Although, the interstate is a designated east-west corridor, the alignment follows a southwest to northeast orientation through the limits of Segment 4. The study area in this section from east of US 17/92 to east of SR 472 includes the interchanges at Dirksen Drive/Debary Avenue, Saxon Boulevard and SR 472/Howland Boulevard. A new interchange with I-4 providing direct access only to the express lanes is proposed to be constructed about halfway between Saxon Boulevard and SR 472, with the Rhode Island Avenue extension.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. The existing typical section of the I-4 mainline consists of three 12-foot travel lanes in each direction. The outside and inside shoulders are 12 feet wide with 10 feet paved. The median width varies from 37 feet to 375 feet and the existing right of way (ROW) varies from 300 feet to 630 feet. The typical section in the proposed condition will have three 12-foot general use travel lanes with a 10-foot inside and 12-foot outside shoulder and two 12-foot express lanes with a 4-foot inside and 10-foot outside shoulder, in each direction. A barrier wall between adjacent 10-foot shoulders will separate the express lanes from the general use lanes. A 44' transit corridor will be provided in the median for the entire length of Segment 4 and, auxiliary lanes in both the eastbound and westbound directions will be provided in some areas. The I-4 proposed typical section IS shown in **Figure 2A**.

1.2 Purpose and Need

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

I-4 serves as the primary corridor in the movement of people and freight between major population, employment and activity centers in the Central Florida region. When the entire Interstate was fully opened in the early 1960's, it was designed to serve intrastate and interstate travel by providing a critical link between the east and west coasts of Central Florida. Although this role continues to be a crucial transportation function of I-4, the highway also serves large volumes of local and commuter traffic with shorter trip distances. Today, the highway serves as the primary link between hotel/resort complexes and tourist attractions such as Walt Disney World, Universal Studios, Sea World, the International Drive Resort Area and downtown Orlando. Since I-4 is the only north-south limited access facility that is centrally located between the predominant employment centers and the major suburbs to the north, it has become the primary commuting corridor in the Central Florida metropolitan area.

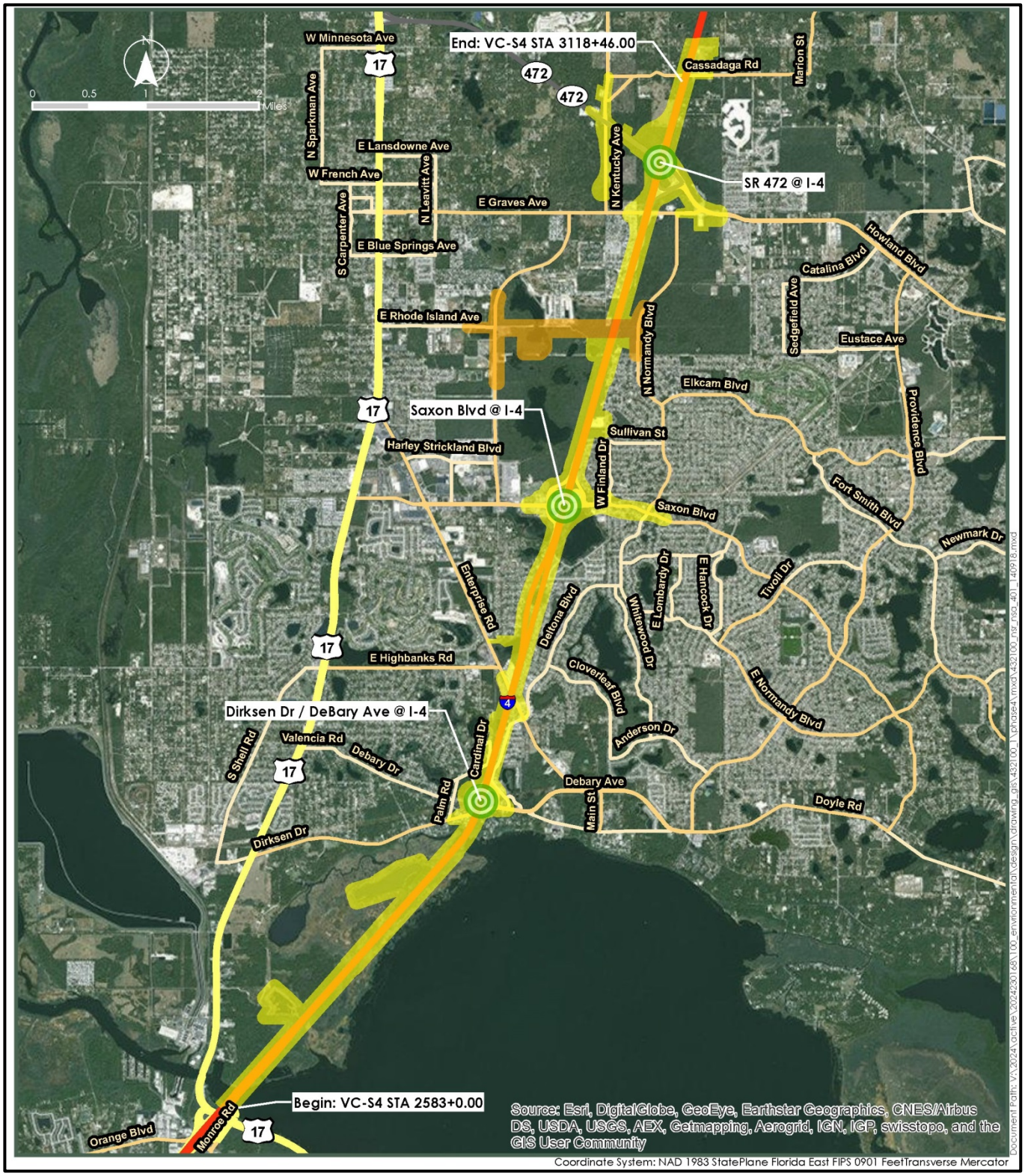


Figure 1 - Project Location Map

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.

The PD&E update involves revising the original design concept showing 6 GULs + 2 HOV lanes, as recommended in the FEIS for I-4 from SR 528 to SR 472 (FPN No. 242486, 242592& 242703, August 2002, Record of Decision Pending), to the current proposed design of 6 GUL + 4 EL. 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 HOV Lanes. The original I-4 PD&E Studies involved physical separation between the general use lanes and the HOV lanes on I-4, with demand management in the HOV lanes. The original demand management strategy was to control the use of the lanes by requiring a minimum number of occupants per vehicle to maintain an acceptable level of service (Level of Service D). This update 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 in 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 Central Florida 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.

RHODE ISLAND AVENUE

An extension to Rhode Island Avenue is being proposed as part of the SR 400 (I-4) PD&E reevaluation project. The limits of improvement extend approximately 1 ¼ miles from the existing east end of Rhode Island Avenue at Veterans Memorial Parkway in Orange City to Normandy Boulevard in Deltona. The current proposed extension follows the same alignment proposed in plans that were completed by Volusia County in 2009. The County has purchased right of way for the previously proposed alignment. Any additional parcels will be acquired under the I-4 Beyond the Ultimate project. The proposed typical section consists of a four-lane urban roadway divided by a 22-foot landscaped median, with two 12-foot travel lanes and a 4-foot bike lane in each direction. Eight-foot wide sidewalks, which will be separated from the bike lane by a landscaped buffer, will be provided on both sides of the roadway. The proposed direct connect interchange at I-4 will provide direct access from the I-4 eastbound express lanes to Rhode Island Avenue and from Rhode Island Avenue to the I-4 westbound express lanes. The Rhode Island Avenue extension and interchange improvements are intended to increase

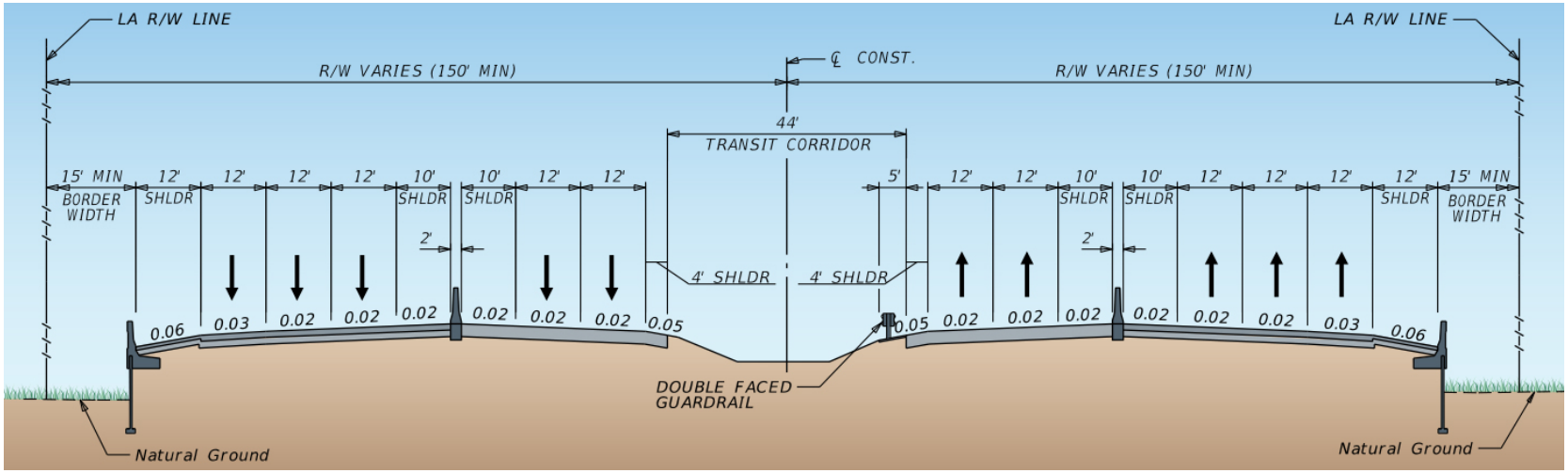


Figure 2A - I -4, Segment 4 Proposed Typical Section

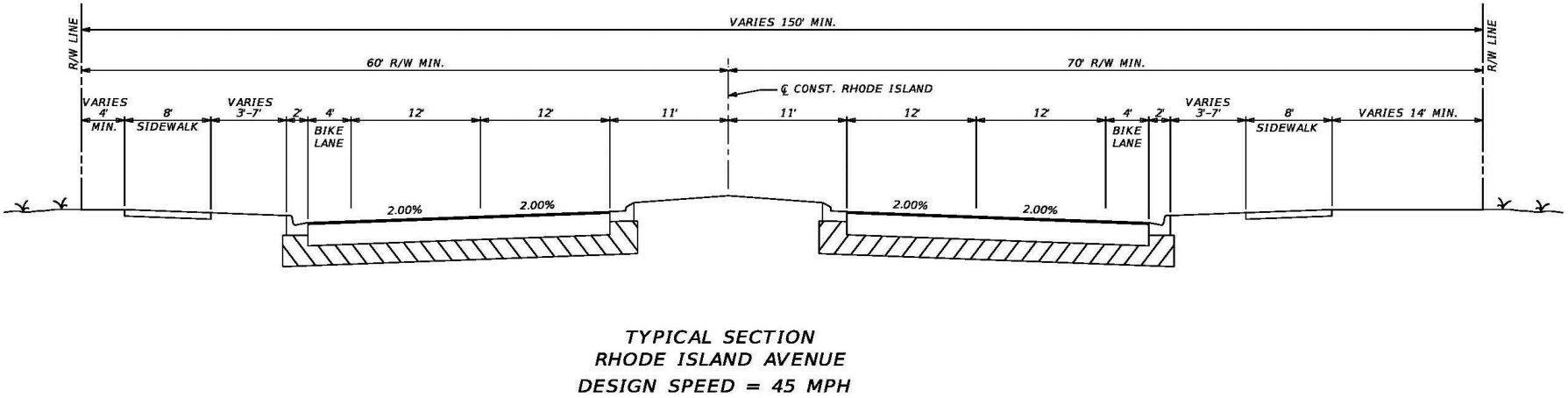


Figure 2B - Rhode Island Avenue, Proposed Typical Section

connectivity in this region by providing access between I-4 and US 17-92 (S. Volusia Avenue) to the west and Normandy Boulevard to the east. **Figure 2B** illustrates the proposed typical section for the Rhode Island Avenue extension.

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) within the project area, and if noise impacts will occur. If future design-year noise levels at noise sensitive receptors approach, meet, or exceed the Noise Abatement Criteria established by Federal Highway Administration (FHWA) in 23 CFR 772 or increase 15 dB(A) over existing noise levels as a direct result of the transportation improvement project, noise abatement must be considered. The FHWA's 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 natural lands and Residential with some Commercial and Services along adjacent roads. Undeveloped natural areas are located between the St. Johns River and Padgett Creek, north of Saxon Boulevard on both sides of the right-of-way, along the majority of the SR 472 interchange, and various other small isolated patches throughout the corridor. In the southern portion of the project area, Gemini Springs County Park is located to the west of I-4 and Lake Monroe is located to the east of I-4. Several smaller lakes are located adjacent to the proposed project limits. The proposed right-of-way for the Rhode Island Avenue extension consists primarily of xeric oak and sand pine with some residential areas along the west side of the corridor. Categorization of land uses under the Florida Land Use Cover Forms and Classification System (FLUCFCS) include the following (See Land Use and Habitat Coverage Maps in Figure A, **Appendix I**):

Residential (1000-1300) – This range of land use codes consists of areas containing low, medium, and high density residential housing. These areas are found primarily in the central portion of the project corridor on both sides of the right-of way from Dirksen Drive and Debary Avenue to Saxon Boulevard. This land use was also observed north of Saxon Boulevard on the east side of the right-of-way, and south of Graves Avenue on the west side of the right-of-way. Several developments are located to the north of the proposed Rhode Island Avenue extension. The majority of dwellings along the project corridor consist of single family homes. The most densely populated areas are the Orange City RV Resort and an area of homes along Deltona Boulevard.

Commercial and Services (1400) – This land use was observed primarily around the interchanges with Dirksen Drive/Debary Avenue, and Saxon Boulevard and along Deltona Boulevard and Enterprise Road. 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 Deltona Boulevard and Enterprise Road. It consists of shopping centers, and other service/retail oriented businesses along the adjacent roadways.

Professional Services (1430) – Medical offices, dental offices, veterinary offices, and other professional offices are located along the corridor, primarily along Deltona Boulevard and Enterprise Road.

Tourist Services (1450) – Two hotels were identified along the project corridor, one at the interchange with Dirksen Drive/Debary Avenue, and one at the interchange with Saxon Boulevard.

Cemeteries (1480) – Two cemeteries were identified along the project corridor, one along Enterprise Road to the east of I-4, and one along Saxon Boulevard to the west of I-4.

Other Light Industrial (1550) – Two small light industrial facilities were identified along the project corridor. One was along Enterprise Road to the east of I-4, and the other was along Graves Avenue to the east of I-4.

Institutional (1700) – This land use consists of schools and institutions such as Deltona Middle School, several places of worship along Deltona Boulevard, and a fire station along Diamond Street.

Parks and Zoos (1850) – This land use consists of recreational facilities that are either parks or zoos. Lake Monroe Park to the west of I-4 along the St. Johns River, PFC Emory L. Bennett Veteran's Memorial Park west of Veteran's Memorial Parkway, and Bill Keller Park west of I-4 near Debary Drive were identified within the corridor.

Community Recreational Facilities (1860) – This land use is represented by Bill Keller Park, which is a recreational sports facility located off of Colomba Road, west of the right-of-way.

Open Land (1900) – This land use consists of undeveloped land within urban areas and inactive land with street patterns but without structures. Several small areas of this land use were observed along the central portion of the project corridor.

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. A large swath of land on the western side of I-4 just north of the SR 472 interchange has been converted to improved pasture.

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 in one small patch of land on the western side of I-4 just north of the Enterprise Road overpass. 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 and portions of the Rhode Island Avenue extension.

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 a small area to the north and south of Graves Avenue, on the west side of I-4.

Pine Flatwoods (4110) – This land use consists of natural pine flatwoods. It was observed along a thin strip of land along Florida Avenue, west of the right-of-way and several other small patches along the project corridor.

Longleaf Pine - Xeric Oak (4120) – This land use is described as being dominated by longleaf pine and has a mid-story canopy of blue-jack oak, turkey oak, post oak, and other dry site tolerant oaks and hardwoods. It was observed in a small area to the southwest of the Graves Avenue overpass.

Sand Pine (4130) – This land use consists of upland forest communities dominated by sand pine. It was observed along the majority of the project corridor on both sides of the right-of-way north of Saxon Boulevard, within the proposed right-of-way for the Rhode Island Avenue extension east of I-4, and in other small isolated patches south of Saxon Boulevard.

Xeric Oak (4210) – This land use consists of upland oak communities which occupy similar habitat as the Longleaf Pine – Xeric Oak community except that the pines, if present, are not the dominant species. The vegetation typically consists of a mid-story canopy of blue-jack oak, turkey oak, post oak, and other dry site tolerant oaks and hardwoods. It was observed along portions of the proposed Rhode Island Avenue extension, including Pond Site A.

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 a large portion of the northern portion of the corridor, especially around the SR 472 interchange and areas on the west side of I-4 to the north of Saxon Boulevard. Other smaller areas of this land use were observed in isolated patches between Dirksen Drive/Debary Avenue and Saxon Boulevard.

Coniferous Plantations (4410) – This land use consists almost exclusively of pine forests artificially generated by planting seedling stock or seeds. Two small isolated patches of this land use were identified to the west of the right-of-way near Debary Bayou.

Streams and Waterways (5100) – This land use designates rivers, creeks, canals, and other linear water bodies. The St. Johns River resumes its course at the mouth of Lake Monroe, approximately where I-4 crosses from Seminole County to Volusia County over a bridge. I-4 also crosses Padgett Creek, which is a small tributary to Lake Monroe.

Lakes (5200) – This land use designates inland water bodies which are not classified as reservoirs. Lake Monroe is a large lake located to the east of I-4 at the southern portion of the corridor. Several other named lakes, including Lake Gleason, Lake Emerald, and Trout Lake are located near the right-of-way. Several other smaller lakes are located along the project corridor, including one that is directly adjacent to the west of the right-of-way, south of Saxon Boulevard and one along the south part of the proposed right-of-way for the Rhode Island Avenue extension.

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. One reservoir is located within the median, south of Saxon Boulevard.

Bay Swamps (6110) – This land use is composed of dominant trees such as loblolly bay, sweetbay magnolia, swamp bay, with slash pine and loblolly pine as an associated component at times. Large gallberry, fetterbush, wax myrtle and titi are included in the understory vegetation. One isolated patch was observed to the west of the project corridor north of the St. Johns River.

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 along the southern portion of the project corridor between the St. Johns River and the Dirksen Drive/Debary Avenue interchange.

Cypress (6210) – Dominant vegetation consists of cypress and was observed in low areas bordering Lake Monroe and the St. Johns River.

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 west of I-4 near the St. Johns River and in several patches within and adjacent to the Dirksen Drive/Debary Avenue interchange.

Wetland Scrub (6310) – This land use is defined as being associated with topographic depressions and poorly drained soil with a mix of wetland species without a dominant species. This habitat type was observed in a narrow strip of land on both sides of I-4 between the St. Johns River and the Dirksen Drive/Debary Avenue interchange and in several other isolated patches.

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, they can be found adjacent to the roadway in several places between the St. Johns River and Saxon Boulevard. Smaller isolated patches of this habitat type also occur in several areas near lakes throughout 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. Multiple patches of this habitat type were observed along the project corridor, usually near or adjacent to waterways.

Disturbed Lands (7400) – This land use is defined as those areas which have been changed due primarily to human activities other than mining. An area of exposed sand which is used for driving off-road vehicles was observed east of I-4 just south of the Graves Avenue overpass. This land use may also be used to describe some earthen berms surrounding reservoirs in this project corridor.

Rural Land in Transition without Positive Indicators of Intended Activity (7410) – This land use was observed in one area to the east of I-4, just south of Graves Avenue.

Railroads (8120) – This land use designates all railroad facilities and lines. A railroad bridge crosses the St. Johns River to the west of I-4, and the railroad line extends to the north, away from the right-of-way.

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 radio tower and an associated building were observed east of I-4 along Lake Monroe.

Electrical Power Facilities (8310) – This land use designates power plants, including the FPL Sanford Plant along the St. Johns River and the Duke Energy Florida Turner Plant #B off of Debary Avenue.

Electrical Power Transmission Lines (8320) – There are electrical power transmission lines that cross the St. Johns River just west of I-4. There are also lines that cross I-4 at the Dirksen Drive/Debary Avenue and Saxon Boulevard interchanges.

Water Supply Plants (8330) – There is a water supply plant east of I-4 to the north of Firwood Drive, off of Normandy Boulevard.

Surface Water Collection Basins (8370) – This land use consists of areas used to collect excess stormwater runoff. They are found near roadways and within interchanges.

2.0 Methods

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 input 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 July 25, 2013. 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 a one-hour period is considered the Level Equivalent (Leq), 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 (10:00 – 11:30) and afternoon (1:00 – 3:00), periods of non-peak traffic activity along the project corridor.

The location was on the west side of westbound I-4 south of Saxon Boulevard at the eastern end of Brokenshire Drive within the right of way near the fence. The location provided clear sight lines to observe traffic on I-4. The right-of-way adjacent to I-4 is mown grass, vegetation along the fence 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 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 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 ambient 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]		Evaluation location	Description of activity category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67	66	Exterior	Residential
C[2]	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.

E[2]	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
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** below.

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. Eight (8) noise sensitive areas that have the potential to be impacted by the project were identified and shown on Noise Sensitive Areas map **Figure 3**. The potential noise-sensitive sites identified for this segment consist of hotels, Bill Keller Park, the Deltona Memorial Gardens Cemetery, multi-family residences at the Riverside Condominiums, and single-family residences along both sides of the roadway including the Rhode Island Extension. The Volusia County Building Department was contacted for all approved building permits within the developments along the project corridor. The properties identified during this search were all modeled as existing receptors in the TNM runs. The noise sensitive areas within the study area present several different types of sites to model within TNM: multi-family buildings with external balconies were modeled using several points to represent similar receptors at different locations in the building, while single family residences were modeled using a point to represent each site. Hotels with no external balconies were represented only by areas of common outdoor usage (pools, outdoor recreation areas). 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. There are no additional noise-sensitive sites such as active golf courses, libraries, or other areas that require quiet conditions within the study area. Following is a description of each Noise Sensitive Area:

Noise Sensitive Area A

This area is located west of I-4 to the north and south of Dirksen Drive. This noise sensitive area includes the Riverside Condominiums, Hampton Inn, Bill Keller Park, and single family homes on both the east and west side of I-4.

Noise Sensitive Area B

This area is located east of I-4 from just south of Debary Avenue to Enterprise Road. This noise sensitive area includes single family homes, the Travelodge Hotel, the V Music Academy, La Petite Academy, and some commercial and medical offices.

Noise Sensitive Area C

This area is located east of I-4 from north of Enterprise Road to just north of Haversham Road. This noise sensitive area is comprised of single family homes. An existing noise barrier is present at this location.

Noise Sensitive Area D

This area is located west of I-4 from north of Enterprise Road to Florida Avenue. This noise sensitive area is comprised of single family homes.

Noise Sensitive Area E

This area is located west of I-4, both south and north of Saxon Boulevard. This noise sensitive area is comprised of the Holiday Inn Express, the Deltona Memorial Gardens Cemetery, and some commercial businesses.

Noise Sensitive Area F

This area is located east of I-4 to the north of Saxon Boulevard. This noise sensitive area is comprised of single family homes. An existing noise barrier is present at this location.

Noise Sensitive Area G

This area is located west of I-4 to the south of Graves Avenue. This noise sensitive area is comprised of single family homes and the Orange City RV Resort. An existing noise barrier is present at this location.

Noise Sensitive Area H

This area is located east of I-4 to the north of SR 472 (Howland Boulevard). This noise sensitive site is comprised of single family homes.

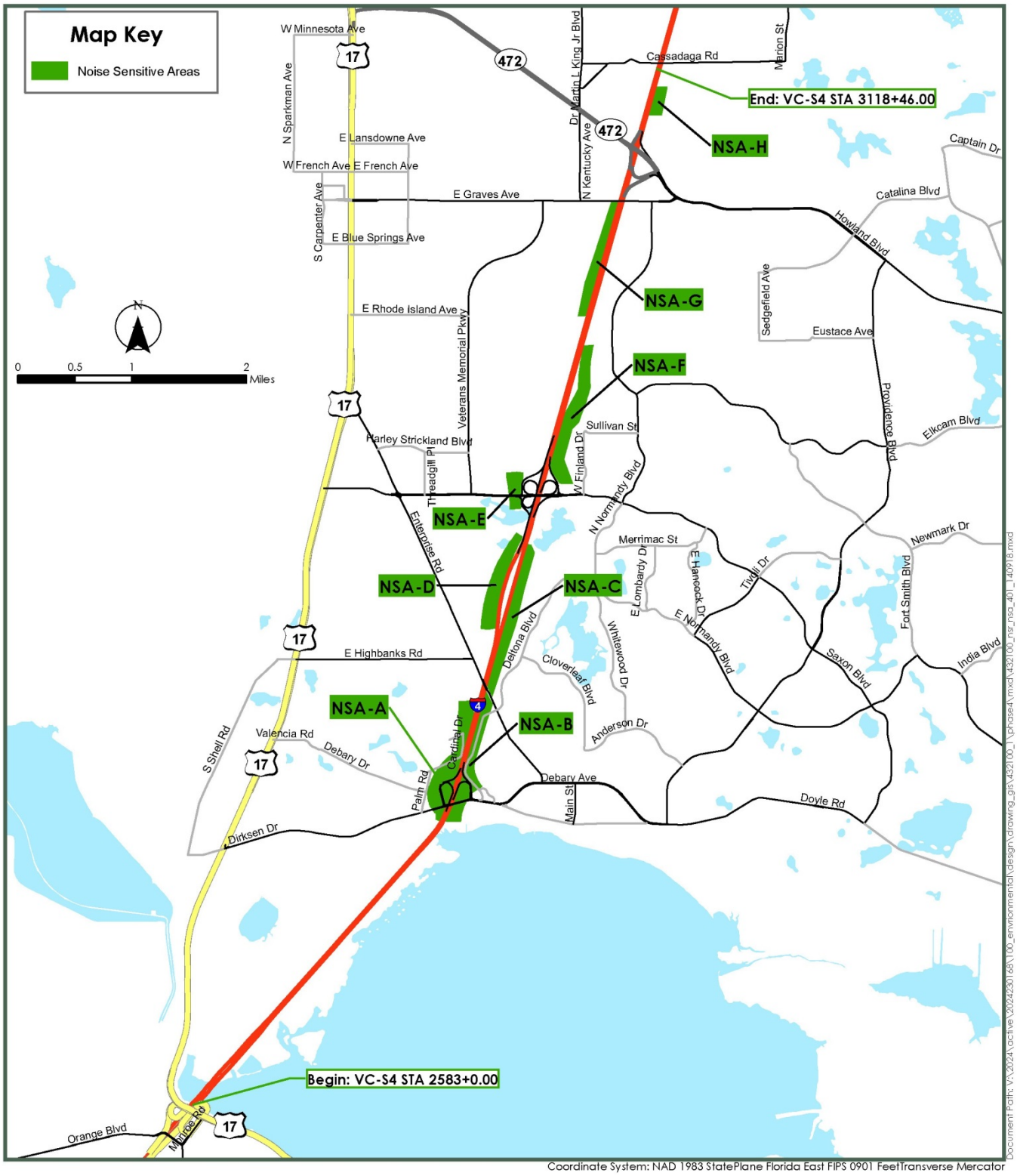


Figure 3 – Noise Sensitive Areas

4.0 Predicted Noise Levels

4.1 Model Validation and Background Noise Levels

The TNM model was validated at the field sampling location along I-4 Westbound. 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 AM	**73.9**	**73.3**	**0.6**	**3**	**YES**
Location 1 PM	**72.8**	**72.7**	**0.1**	**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.

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.

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**

Noise Sensitive Area A

This area represents activity Categories B, C, and E, and has **61** sites predicted to be impacted.

Noise Sensitive Area B

This area represents activity Categories B, C, and E, and has **21** sites predicted to be impacted.

Noise Sensitive Area C

This area represents activity Category B and has **95** sites predicted to be impacted. This area has an existing barrier constructed north of Enterprise Road along West Embassy Drive and West Evans Circle averaging 18 feet in height.

Noise Sensitive Area D

This area represents activity Category B and has **43** sites predicted to be impacted.

Noise Sensitive Area E

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

Noise Sensitive Area F

This area represents activity Category B and has **62** sites predicted to be impacted. This area has an existing barrier constructed north of Saxon Boulevard along Parkton Drive averaging 18 feet in height.

Noise Sensitive Area G

This area represents activity Category B and has **115** sites predicted to be impacted. This area has an existing noise barrier along Pineview Drive averaging 18 feet in height.

Noise Sensitive Area H

This area represents activity Category B and has **2** 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 66 dBA 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 III**.

TABLE 5. Noise Sensitive Areas

Noise Sensitive Area	Activity Category	Number of Impacted Sites
A	**B, C, E**	**61**
B	**B, C, E**	**21**
C	**B**	**95**
D	**B**	**43**
E	**C, E**	**0**
F	**B**	**62**
G	**B**	**115**
H	**B**	**2**

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 cannot truly alter the existing alignment without substantial changes to the surrounding land uses. Alignment selection cannot viably provide noise abatement for this project.

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.

Two Noise Barriers were deemed reasonable and feasible during the original PD&E study completed for this segment though a total of three noise barriers were constructed during subsequent projects conducted after the PD&E was completed. One noise barrier approximately 5,000 feet long averaging 18 feet in height was constructed along I-4 Eastbound from just north of Enterprise Road to West Evans Circle (Noise Sensitive Area C). A second noise barrier approximately 4,100 feet long averaging 18 feet in height was constructed along I-4 Westbound from Pineview Drive to south of Graves Avenue (Noise Sensitive Area G). The third noise barrier approximately 2,500 feet long averaging 18 feet in height was constructed along I-4 Eastbound from north of Saxon Boulevard to Sullivan Street (Noise Sensitive Area F). 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 roadway shoulder. For the ground-mounted barriers, barrier heights were analyzed from 14 feet to 22 feet tall, while the heights of the shoulder mounted barriers were limited to 14 feet. The optimal barrier design for each analysis (**See Barrier Analysis Maps in Appendix I)** is described below and detailed in **Table 6**.

Noise Sensitive Area A

Noise barriers were modeled at two locations for Noise Sensitive Area A; at the Riverside Apartments (BRA A1) and adjacent to the residences along Cardinal Drive (BRA A2). Barriers were modeled along the edge of shoulder for the Riverside Apartments as the roadway is on structure in this location, and along the edge of shoulder for Cardinal Drive as the outside edge of the shoulder of the proposed off-ramp is less than 10 feet from the edge of Right-of-Way. For the BRA 1 location, an 898 foot-long, 14-foot tall shoulder mounted barrier provided an insertion loss of greater than 5 dBA to 73 receptors at a total cost of $377,057, for an average cost of $5,165 per benefited receptor. The best case scenario for the BRA 2 was a 1,594 foot-long, 14 foot-tall, shoulder mounted barrier that provided an insertion loss of greater than 5 dBA to 7 receptors at a total cost of $669,569, for an average cost of $95,653 per benefited receptor. The BRA 1 barrier is less than the $42,000 per benefited receptor threshold and is therefore cost reasonable. The BRA 2 barrier exceeds the cost per benefited receptor threshold and is therefore not cost reasonable.

Noise Sensitive Area B

BRA B was modeled along the edge of the roadway just south of Enterprise Road nearest the residential area at Alley 632 off of Deltona Boulevard. A 994 foot-long, 14-foot tall shoulder mounted barrier provided an insertion loss of greater than 5 dBA to 6 receptors at a total cost of $417,517 for an average cost of $69,586 per benefited receptor. This barrier exceeds the cost per benefited receptor threshold and is therefore not reasonable and feasible.

Noise Sensitive Area C

An existing noise barrier (BRA C1 / C2) provides abatement within this Noise Sensitive Area along West Embassy Drive and West Evans Circle and is predicted to continue providing abatement to the residences currently receiving a benefit. TNM

modeling of this barrier in the proposed project condition indicates that it will be sufficient to provide abatement if left in place. Additional receptors along Kettering Road and Haversham Road north of this barrier are predicted to be impacted by the project. BRA C3 was modeled at the edge of the right-of-way as an extension of the existing barrier in this area. A 1,266 foot-long, 16-foot tall ground mounted barrier provides an insertion loss of greater than 5 dBA to 20 impacted receptors, as well as four additional receptors not predicted to be impacted for a total of 24 benefited receptors. The total cost is $607,719 for an average cost of $25,322 per benefited receptor, which is below the threshold cost and therefore cost reasonable.

Noise Sensitive Area D

BRA D was modeled both along the edge of the shoulder and at the right-of-way for this noise sensitive area along I-4 Westbound south of Saxon Boulevard. The best case scenario was for a 4,819 foot-long, 22-foot high ground mounted barrier that provides an insertion loss of greater than 5 dBA to 64 receptors at a total cost of $3,180,370 for an average cost of $49,693 per benefited receptor. This cost exceeds the $42,000 threshold per benefited receptor and is therefore not cost reasonable.

Noise Sensitive Area E

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

Noise Sensitive Area F

An existing noise barrier (BRA F1) provides abatement within this Noise Sensitive Area along Eastbound I-4 from north of Saxon Boulevard along West Parkton Drive and is predicted to continue providing abatement to the residences currently receiving a benefit. TNM modeling of this barrier in the proposed project condition indicates that it will be sufficient to provide abatement if left in place. Residences to the north of this barrier along Galveston Avenue and West Firwood Drive are predicted to be impacted by the project. Both a shoulder mounted and ground mounted barrier was modeled in this area. The best case scenario for BRA F2 is provided by a 1,822 foot-long, 14-foot tall shoulder mounted barrier which provides an insertion loss of greater than 5 dBA for 17 receptors at a total cost of $765,358, for an average cost of $45,021 per benefited receptor. This cost exceeds the $42,000 threshold and therefore is not cost reasonable.

Noise Sensitive Area G

An existing noise barrier (BRA G) provides abatement within this Noise Sensitive Area along westbound I-4 on Pineview Drive and Countryside Drive and is predicted to continue providing abatement to the residences currently receiving a benefit. TNM modeling of this barrier in the proposed project condition indicates that it will be sufficient to provide abatement if left in place. No additional receptors are predicted to be impacted by the project.

Noise Sensitive Area H

BRA H was modeled along the edge of the I-4 Eastbound right-of-way just south of Cassadaga Road. The best case scenario for this barrier was provided by a 1,422 foot-long, 14-foot tall ground mounted barrier providing an insertion loss of greater than 5 dBA to 3 receptors, at a total cost of $597,420, for an average cost of $199,140 per benefited receptor, which is above the $42,000 cost threshold and therefore not 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 A	Barrier Mounted	BRA A1	I-4 WB Shoulder	8	898	50	4	0	4	5.7	$215,461	$53,865	not cost reasonable
	Barrier Mounted	BRA A1	I-4 WB Shoulder	14	898	50	44	29	73	7.2	$377,057	$5,165	**Cost Reasonable**
	Barrier Mounted	BRA A2	I-4 WB Shoulder	8	1,594	11	3	0	3	5.8	382,611	$127,537	not cost reasonable
	Barrier Mounted	BRA A2	I-4 WB Shoulder	14	1,594	11	7	0	7	7.7	$669,569	$95,653	not cost reasonable
NSA B	Barrier Mounted	BRA B	I-4 EB Shoulder	8	994	17	4	0	4	6.4	$238,581	$59,645	not cost reasonable
	Barrier Mounted	BRA B	I-4 EB Shoulder	14	994	17	6	0	6	8.7	$417,517	$69,586	not cost reasonable
NSA C	Ground Mounted	BRA C3	I-4 EB ROW	14	1,266	21	8	0	8	6.5	$531,754	$66,469	not cost reasonable
	Ground Mounted	BRA C3	I-4 EB ROW	16	1,266	21	20	4	24	6.8	$607,719	$25,322	**Cost Reasonable**
	Ground Mounted	BRA C3	I-4 EB ROW	18	1,266	21	20	4	24	7.2	$683,684	$28,487	**Cost Reasonable**
NSA D	Barrier Mounted	BRA D	I-4 WB Shoulder	14	4,819	43	8	0	8	6.5	$2,023,872	$252,984	not cost reasonable
	Ground Mounted	BRA D	I-4 WB ROW	16	4,819	43	16	0	16	6.3	$2,312,996	$144,562	not cost reasonable
	Ground Mounted	BRA D	I-4 WB ROW	18	4,819	43	29	6	35	6.5	$2,602,121	$74,346	not cost reasonable
	Ground Mounted	BRA D	I-4 WB ROW	20	4,819	43	35	13	48	7.0	$2,891,246	$60,234	not cost reasonable
	Ground Mounted	BRA D	I-4 WB ROW	22	4,819	43	42	22	64	7.4	$3,180,370	$49,693	not cost reasonable
NSA F	Barrier Mounted	BRA F2	I-4 EB Shoulder	14	1,822	18	15	2	17	6.8	$765,358	$45,021	not cost reasonable
	Ground Mounted	BRA F2	I-4 EB ROW	16	1,822	18	16	2	18	7.5	$874,695	$48,594	not cost reasonable
	Ground Mounted	BRA F2	I-4 EB ROW	18	1,822	18	16	4	20	7.8	$984,032	$49,201	not cost reasonable
	Ground Mounted	BRA F2	I-4 EB ROW	20	1,822	18	16	4	20	8.3	$1,093,368	$54,668	not cost reasonable
	Ground Mounted	BRA F2	I-4 EB ROW	22	1,822	18	16	4	20	8.7	$1,202,705	$60,135	not cost reasonable
NSA H	Ground Mounted	BRA H	I-4 EB ROW	14	1,422	2	2	1	3	7.5	$597,420	$199,140	not cost reasonable
	Ground Mounted	BRA H	I-4 EB ROW	16	1,422	2	2	1	3	8.0	$682,765	$227,588	not cost reasonable

6.0 Conclusions

Based upon the analysis conducted, two noise barriers are recommended for further consideration and public input for this segment of the project: For Noise Sensitive Area A, a 14-foot tall, 898-foot long shoulder mounted barrier (BRA A1) provides the best noise abatement and meets the requirements as reasonable and feasible. For Noise Sensitive Area C, at Kettering Road, a 16-foot tall, 1,266-foot long ground mounted barrier (BRA C3) provides the best noise abatement and meets the requirements as reasonable and feasible. The existing barriers BRA C1/C2, BRA F1, and BRA G will all provide sufficient abatement and meet the requirements as reasonable and feasible for the proposed project.

7.0 Commitments

FDOT is committed to the construction of feasible and reasonable noise abatement measures at the noise impacted location described the conclusion in **Section 6.0** and shown in Table 6 and the on the Noise Study Maps in **Figure B** contingent upon the following conditions:

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

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

APPENDICES

APPENDIX I

Project Maps and Figures

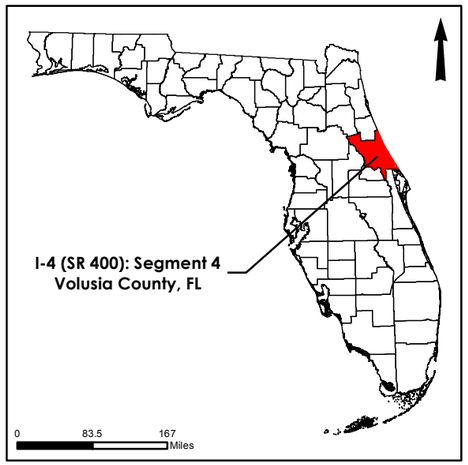
I-4 (SR 400) PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY
BEYOND THE ULTIMATE

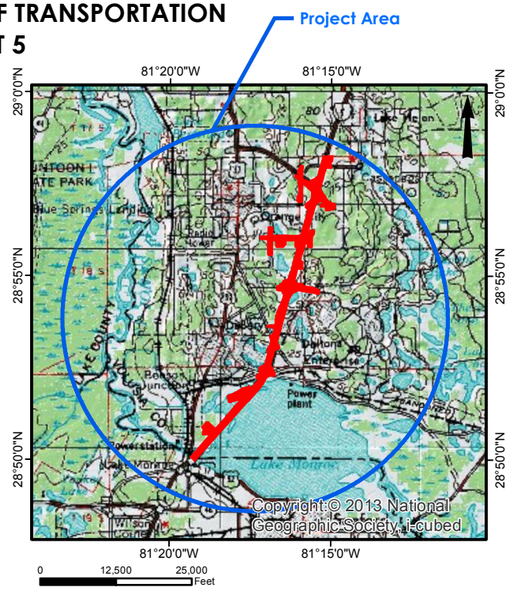
SEGMENT 4

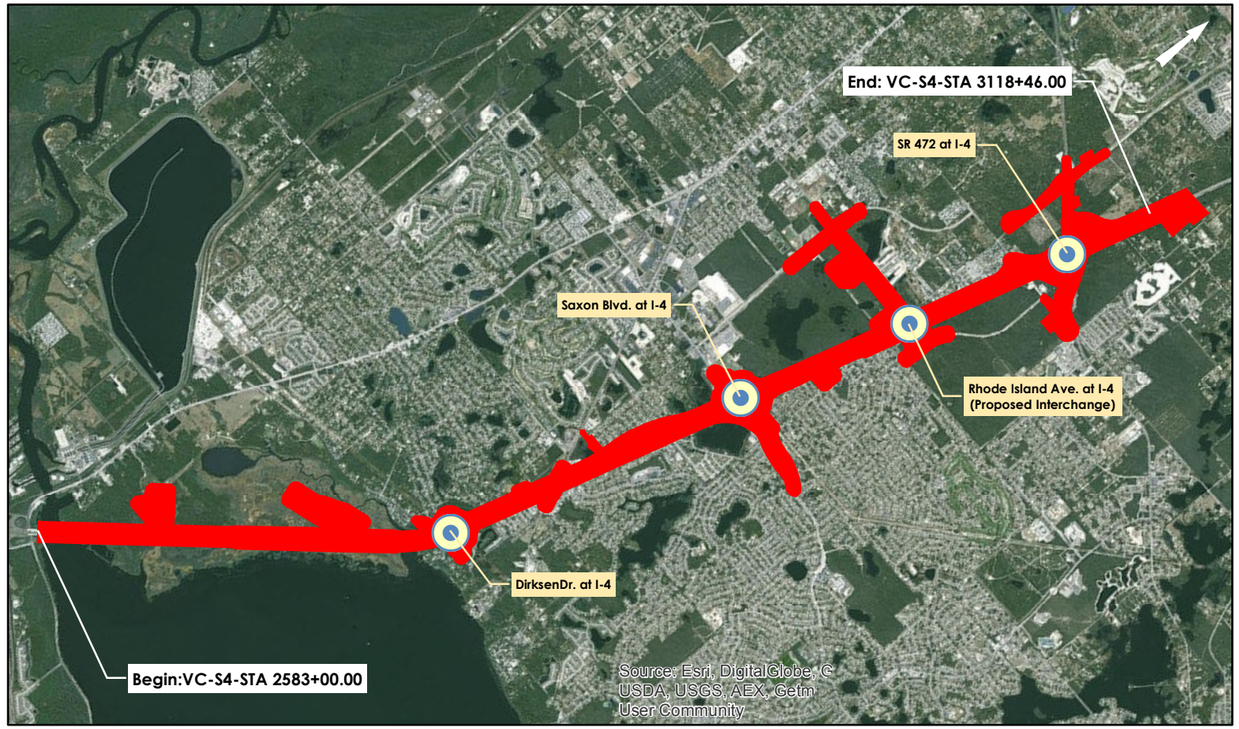
FDOT FM NO. 432100-1-22-01

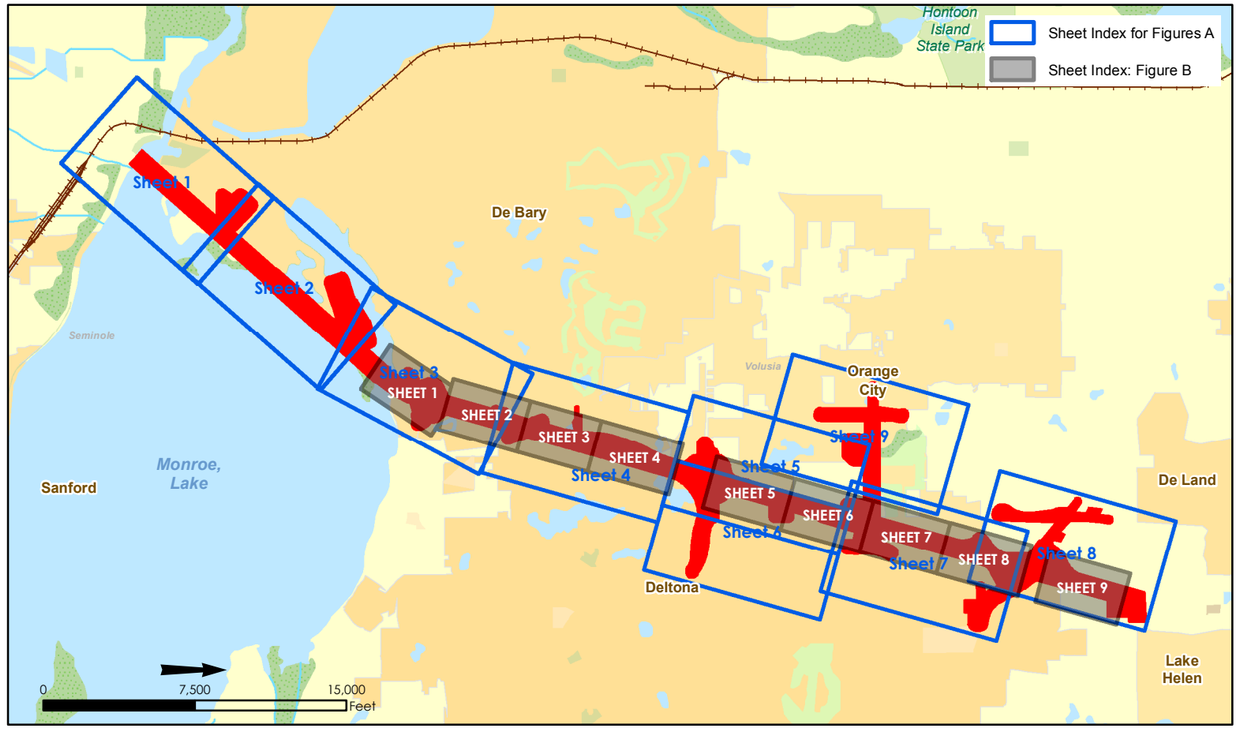
NOISE STUDY REPORT

VOLUSIA COUNTY
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 5









MAP SHEET INDEX

FIGURE NO.	SHEET NO.	TITLE
Figure A	Sheets 1-5	Land Use and Habitat Coverage Map
Figure B	Sheets 1-9	Noise Barrier Analysis Map

PROJECT DETAILS

NOISE STUDY REPORT:
Segment 4 - Report Maps

Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Notes:
Abbreviations:
(R) = Recommended; (ALT) = Alternative; SV = Stormwater Vault
LD = Low Density; MD= Medium Density; HD = High Density
STA = Station; VC = Volusia County

STN No. 2024230168

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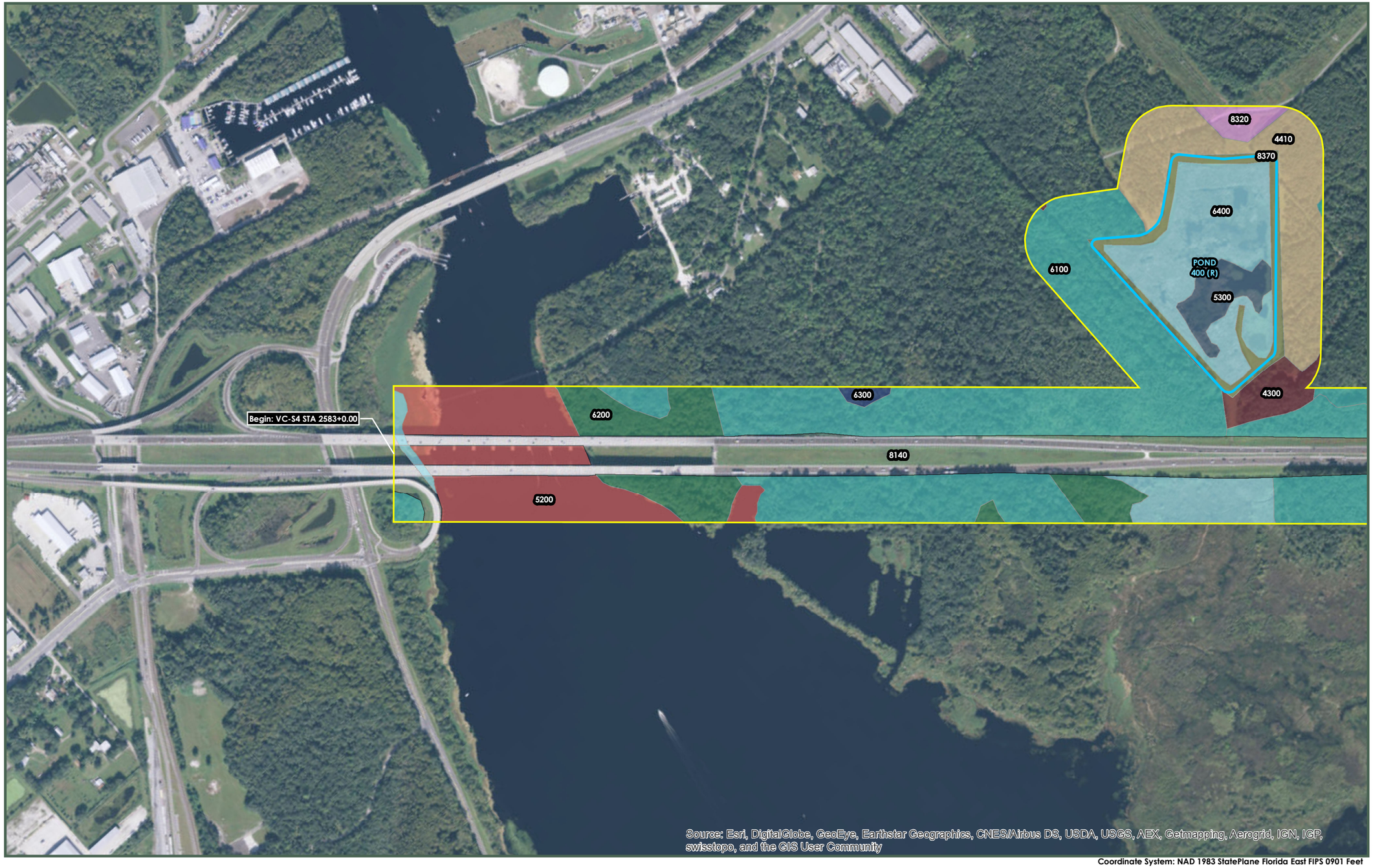
FIGURE A

Land Use and Habitat Coverage Maps



Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
- 1800: Recreational
- 1900: Open Land
- 2100: Pasture and Crop Land
- 3100: Herbaceous
- 3200: Shrub and Brushland
- 3300: Mixed Rangeland
- 4100: Upland Coniferous Forests
- 4200: Upland Hardwood Forests
- 4300: Upland Hardwoods Forests
- 4410: Pine plantation
- 5100: Streams and waterways
- 5200: Lakes
- 5300: Reservoirs
- 6100: Wetland Hardwood Forests
- 6200: Wetland Coniferous Forests
- 6300: Wetland Forested Mixed
- 6400: Vegetated Non-Forested Wetlands
- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

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

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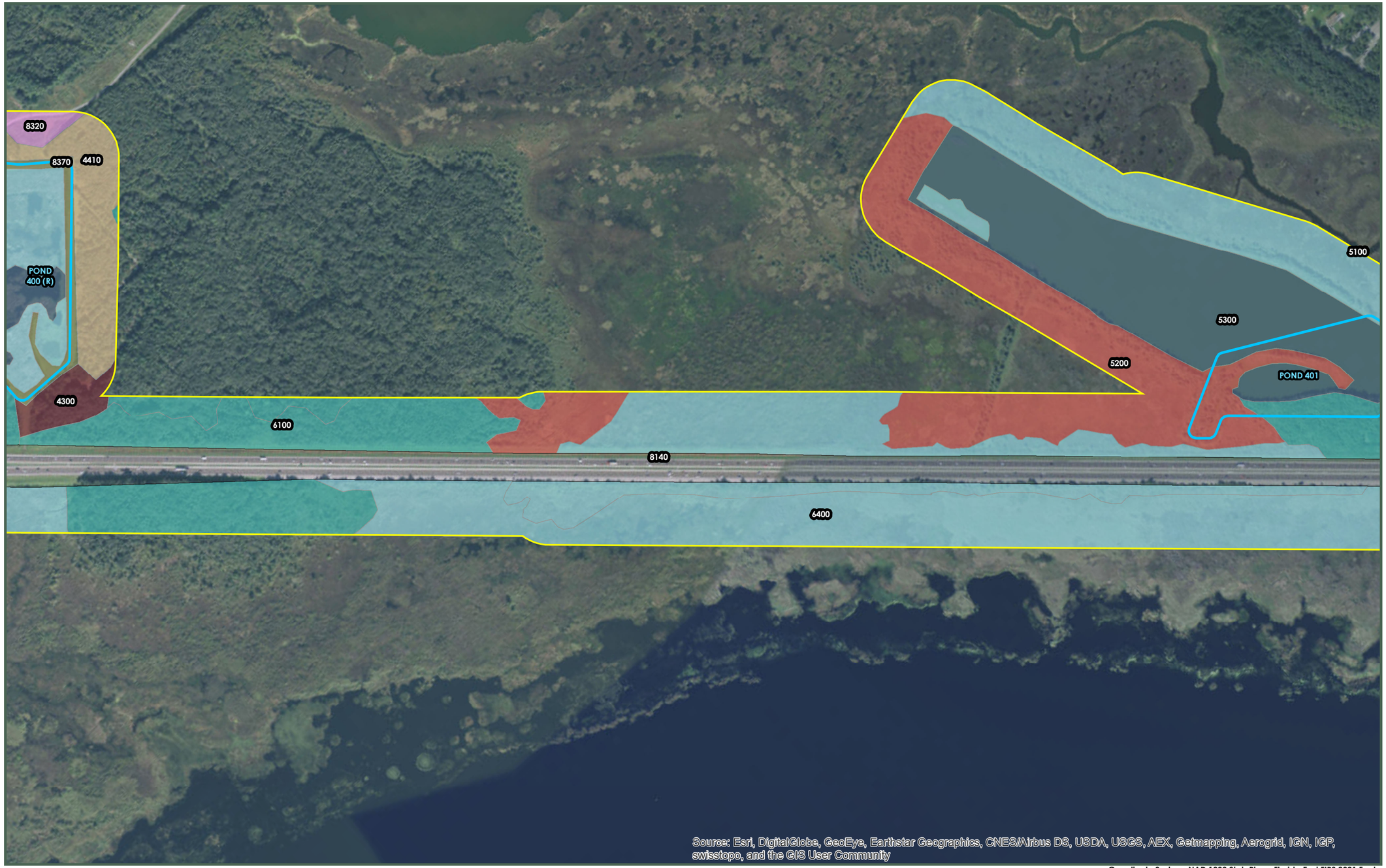

Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
- 1800: Recreational
- 1900: Open Land
- 2100: Pasture and Crop Land
- 3100: Herbaceous
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- 6400: Vegetated Non-Forested Wetlands
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- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

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

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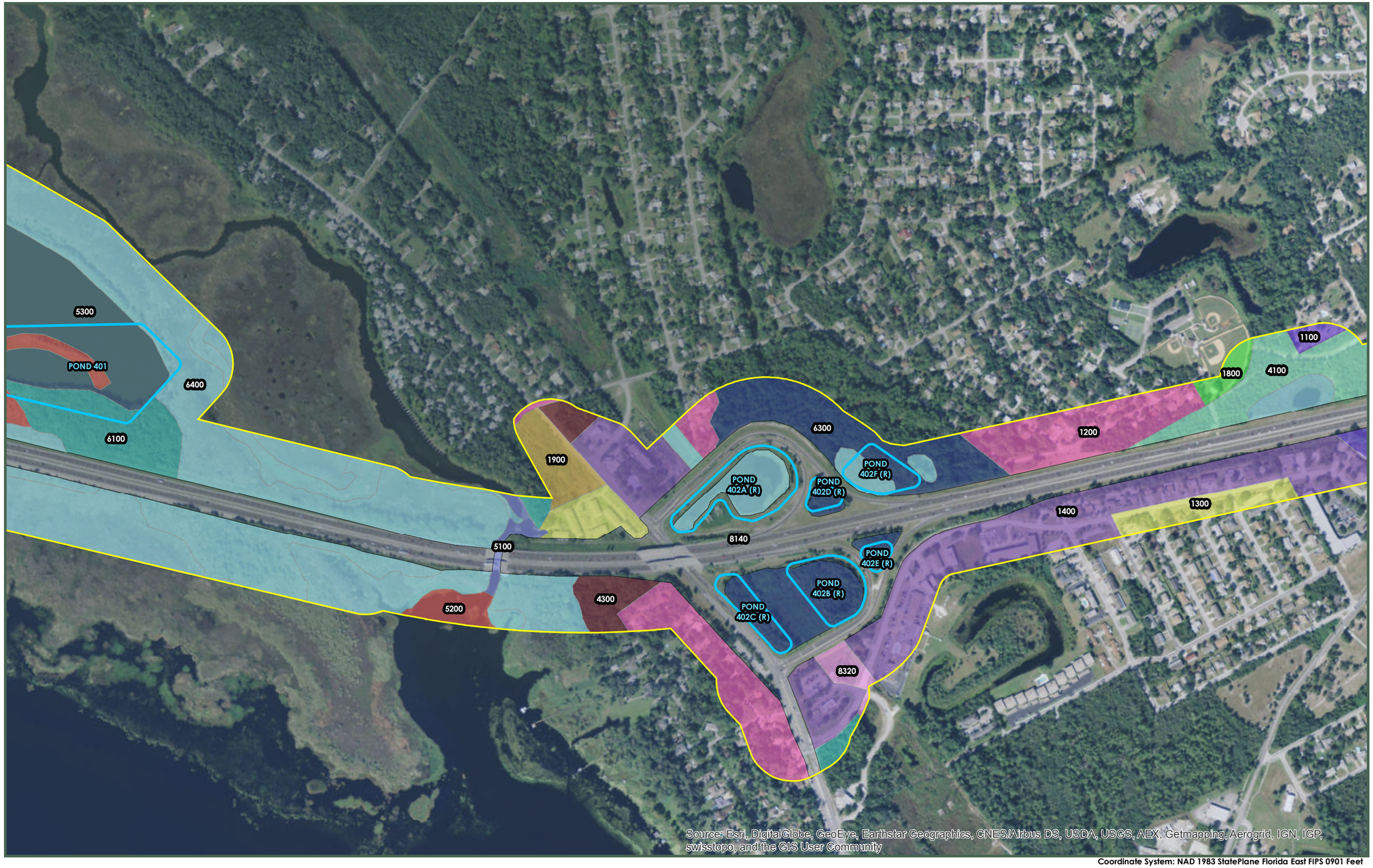

Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
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- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

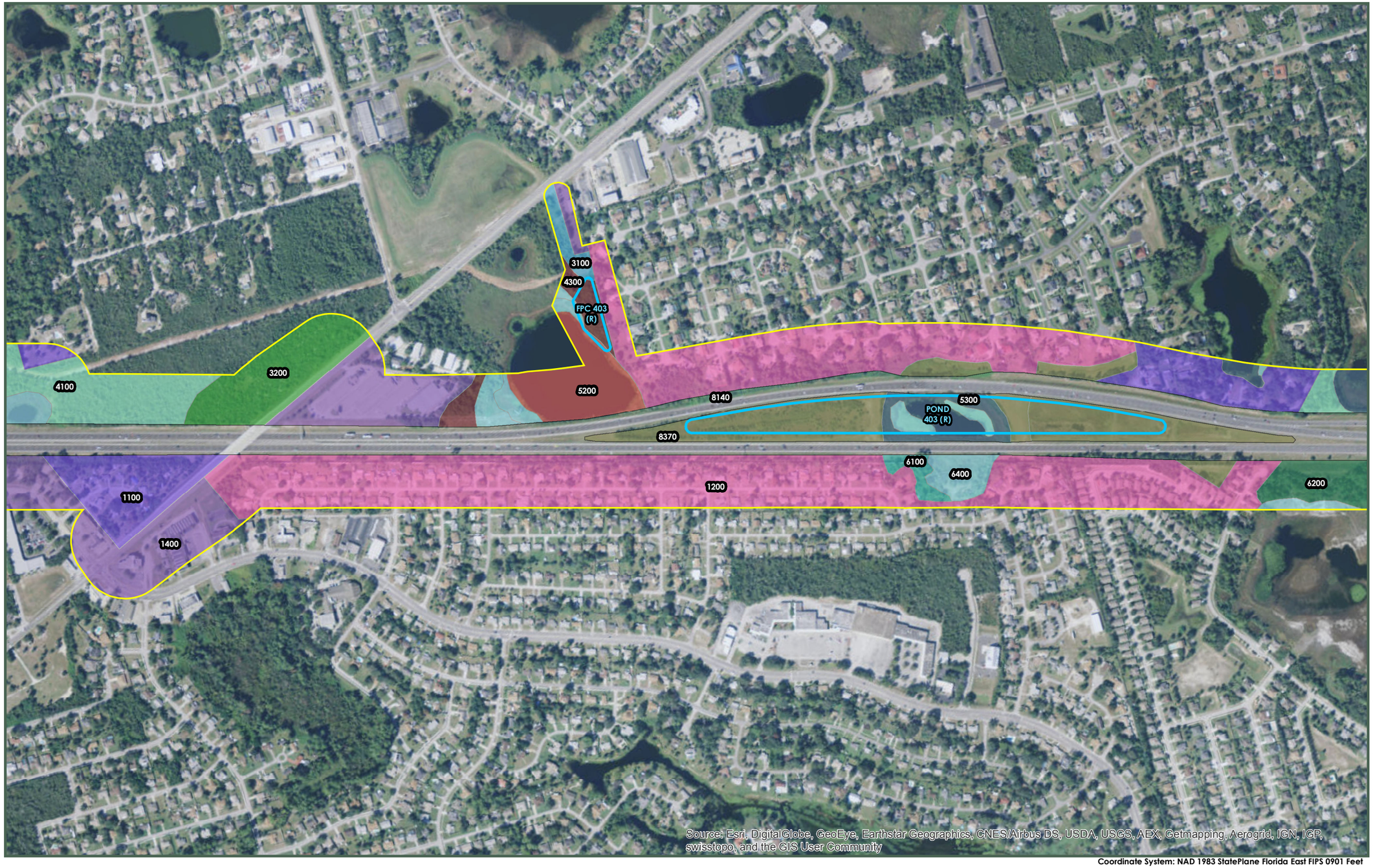
Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

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

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

SR 400 (I-4) from East of SR 15/600 US 17/92 (Seminole/Volusia County Line) to 1/2 mile East of SR 472 - Volusia County (79110)



Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
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- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

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

1 " = 650 '

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

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Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
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- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

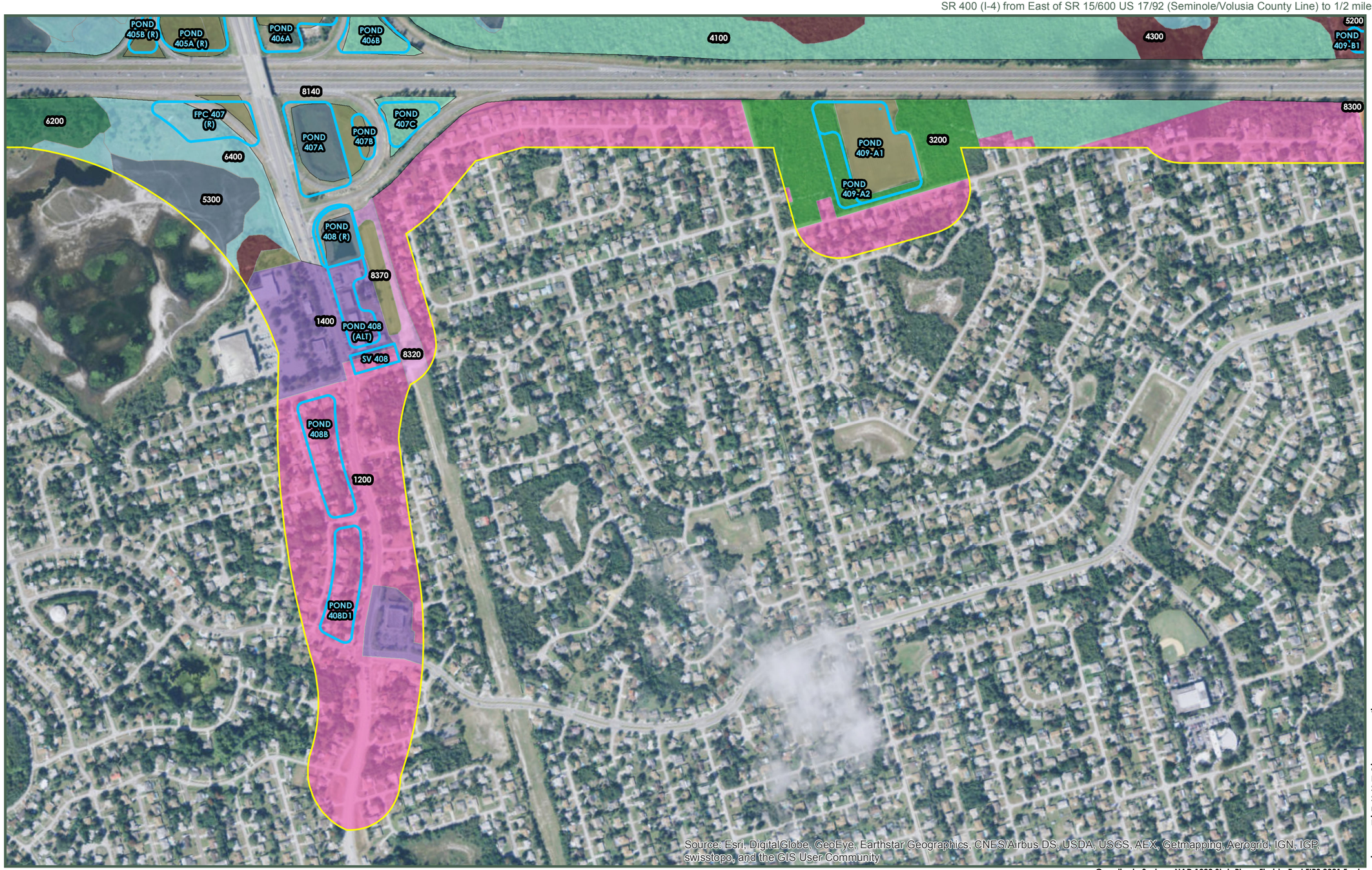
Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

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



Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
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- 8320: Power Transmission Lines
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- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure A - Sheet 6 of 5: Land Use and Habitat Coverage Map

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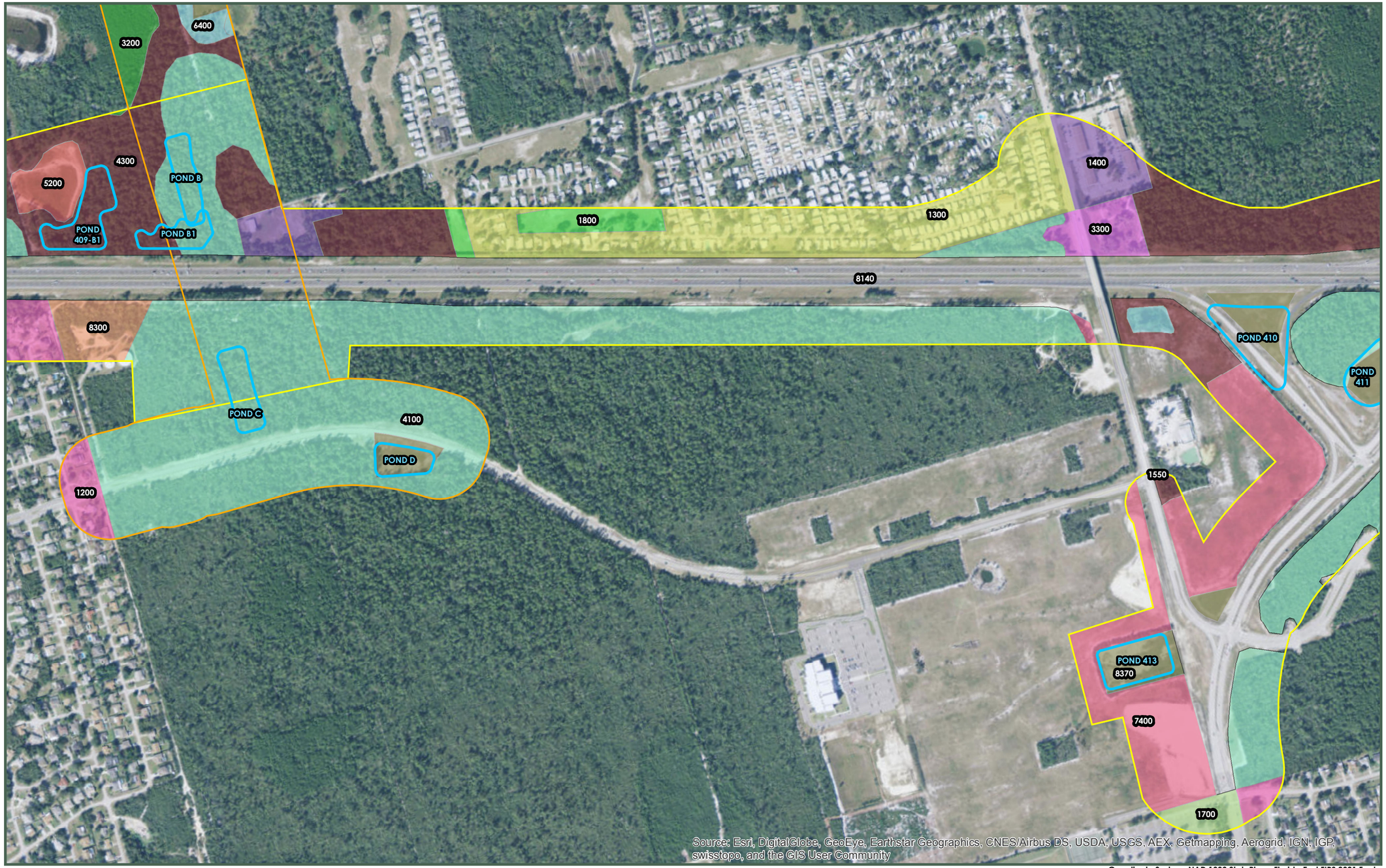

Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
- 1800: Recreational
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- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:
NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

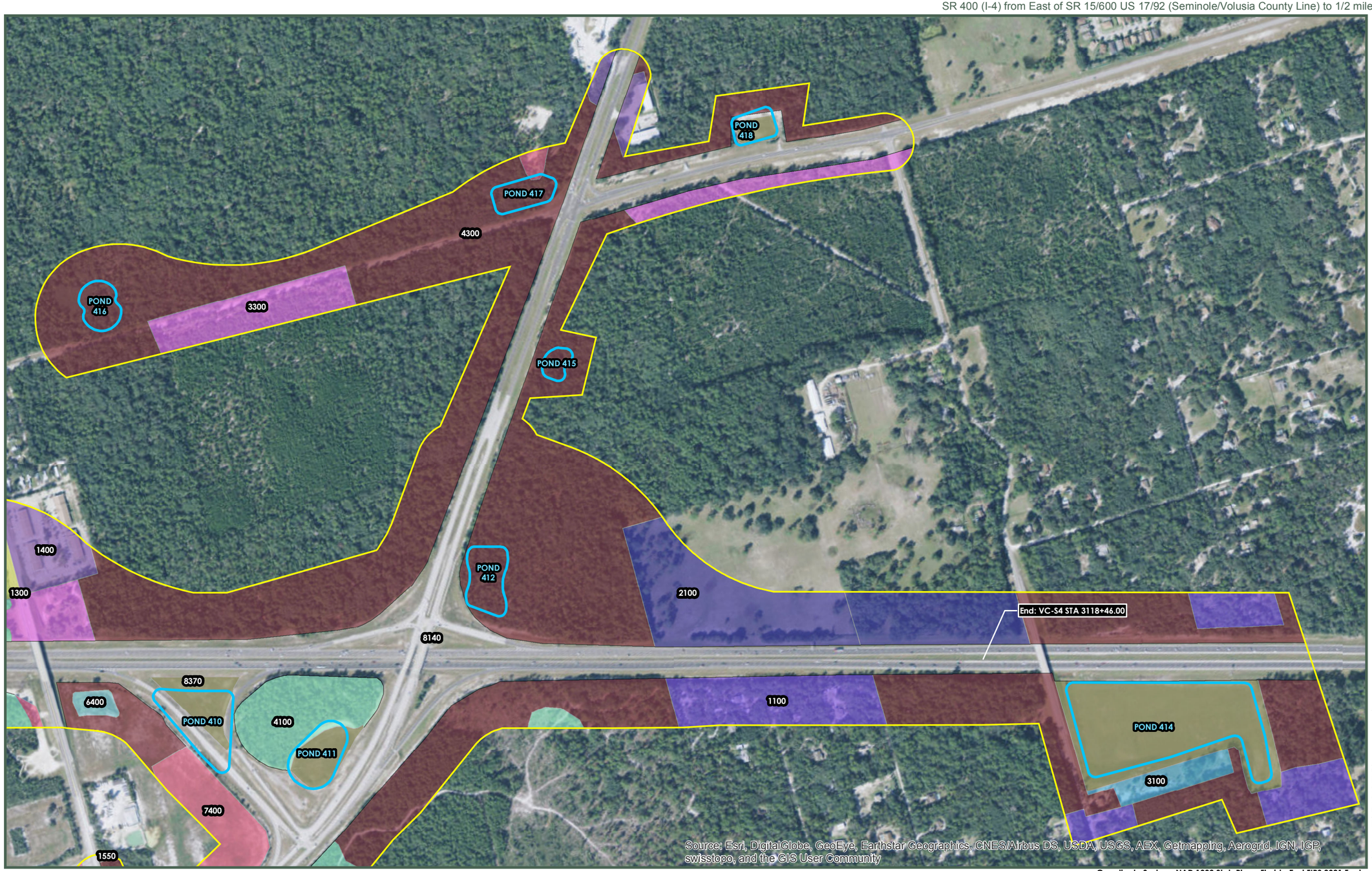
Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure A - Sheet 7 of 5: Land Use and Habitat Coverage Map



Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
- 1700: Institutional
- 1800: Recreational
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- 6400: Vegetated Non-Forested Wetlands
- 7400: Disturbed Lands
- 8140: Roads and Highways
- 8320: Power Transmission Lines
- 8330: Water Supply Plants
- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure A - Sheet 8 of 5: Land Use and Habitat Coverage Map

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Map Key

Segment 4 PD&E Limits

- SR 400 (I-4) Beyond the Ultimate-Segment 4 Study Area
- Rhode Island Ave (Extension)
- Proposed Ponds (12/10/15)

LAND USE & HABITAT COVER

- 1100: Residential, LD
- 1200: Residential, MD
- 1300: Residential,HD
- 1400: Commercial and Services
- 1480: Cemeteries
- 1550: Other Light Industrial
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- 8350: Solid Waste Disposal
- 8370: Surface water collection basins

Title:

NOISE STUDY REPORT: Segment 4 - Land Use and Habitat Coverage Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 2015/01/05
Technical Review by: mDrauer 2015/01/05
Independent Review by: jMoore 2015/01/05

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 650 1,300 Feet

Figure A - Sheet 9 of 5: Land Use and Habitat Coverage Map

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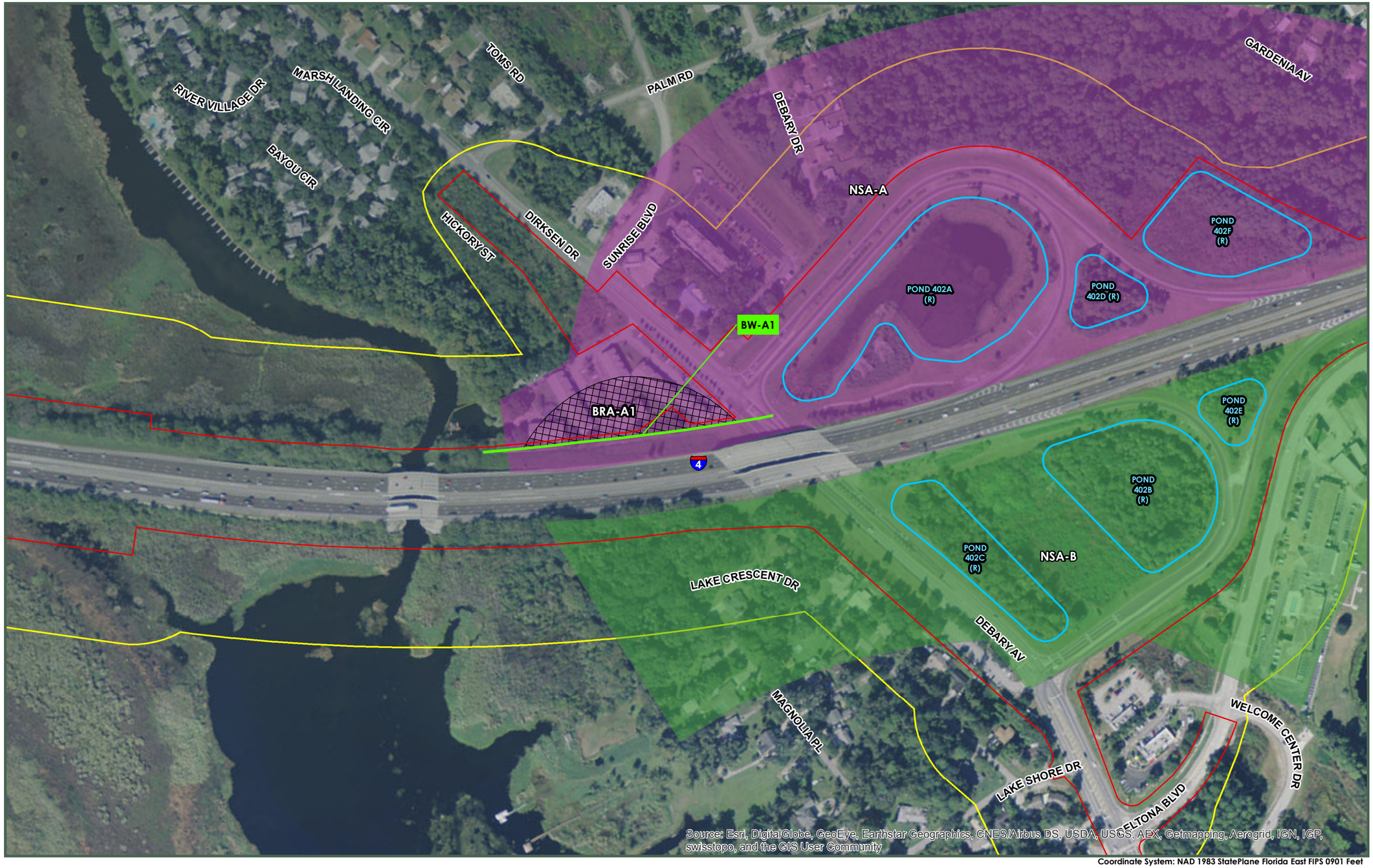
FIGURE B

Noise Barrier Analysis Maps

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

SR 400 (I-4) from East of SR 15/600 US 17/92 (Seminole/Volusia County Line) to 1/2 mile East of SR 472 - Volusia County (79110)



Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Title:

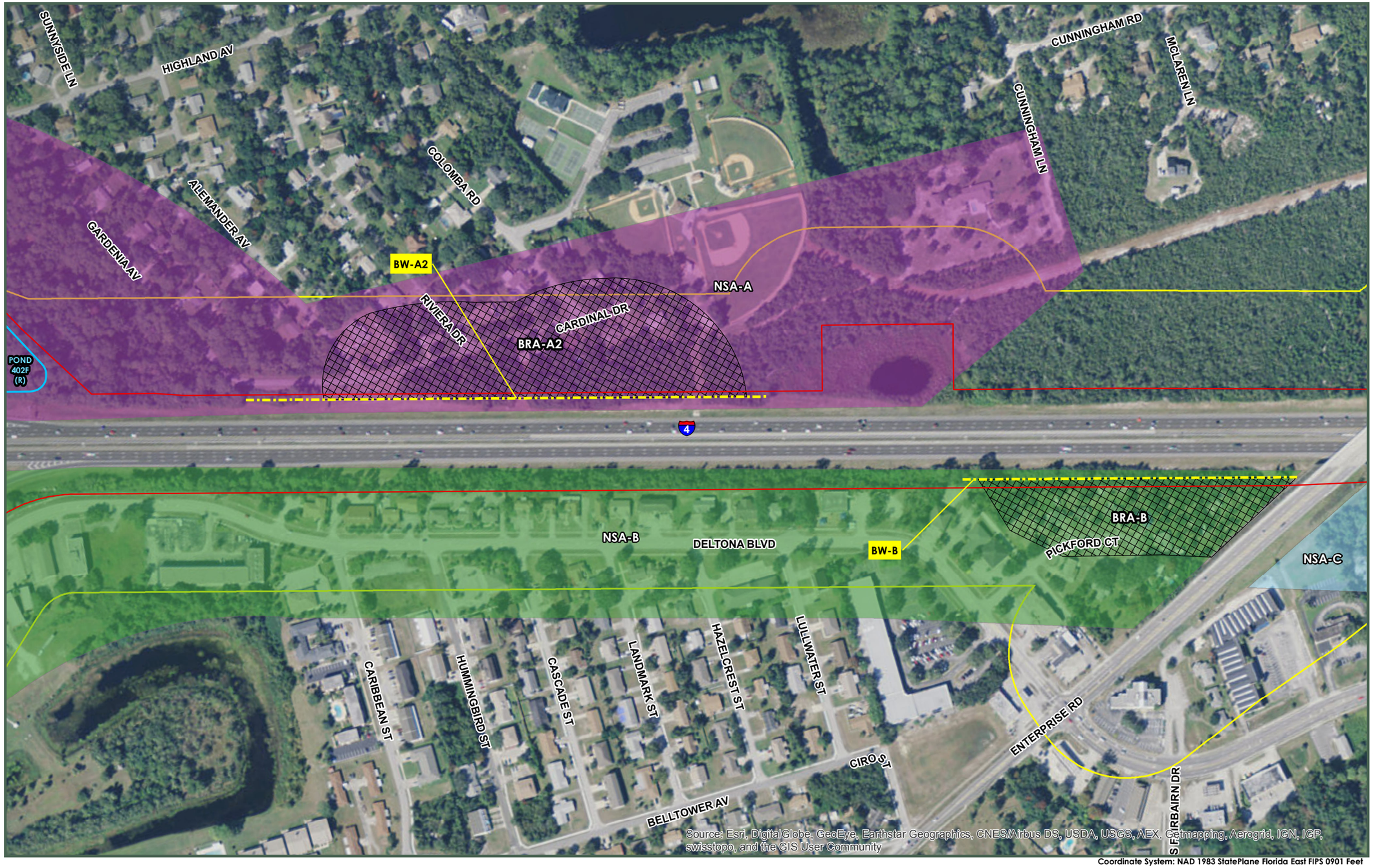
NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Figure B- Sheet 1 of 9: Noise Barrier Analysis Map



Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

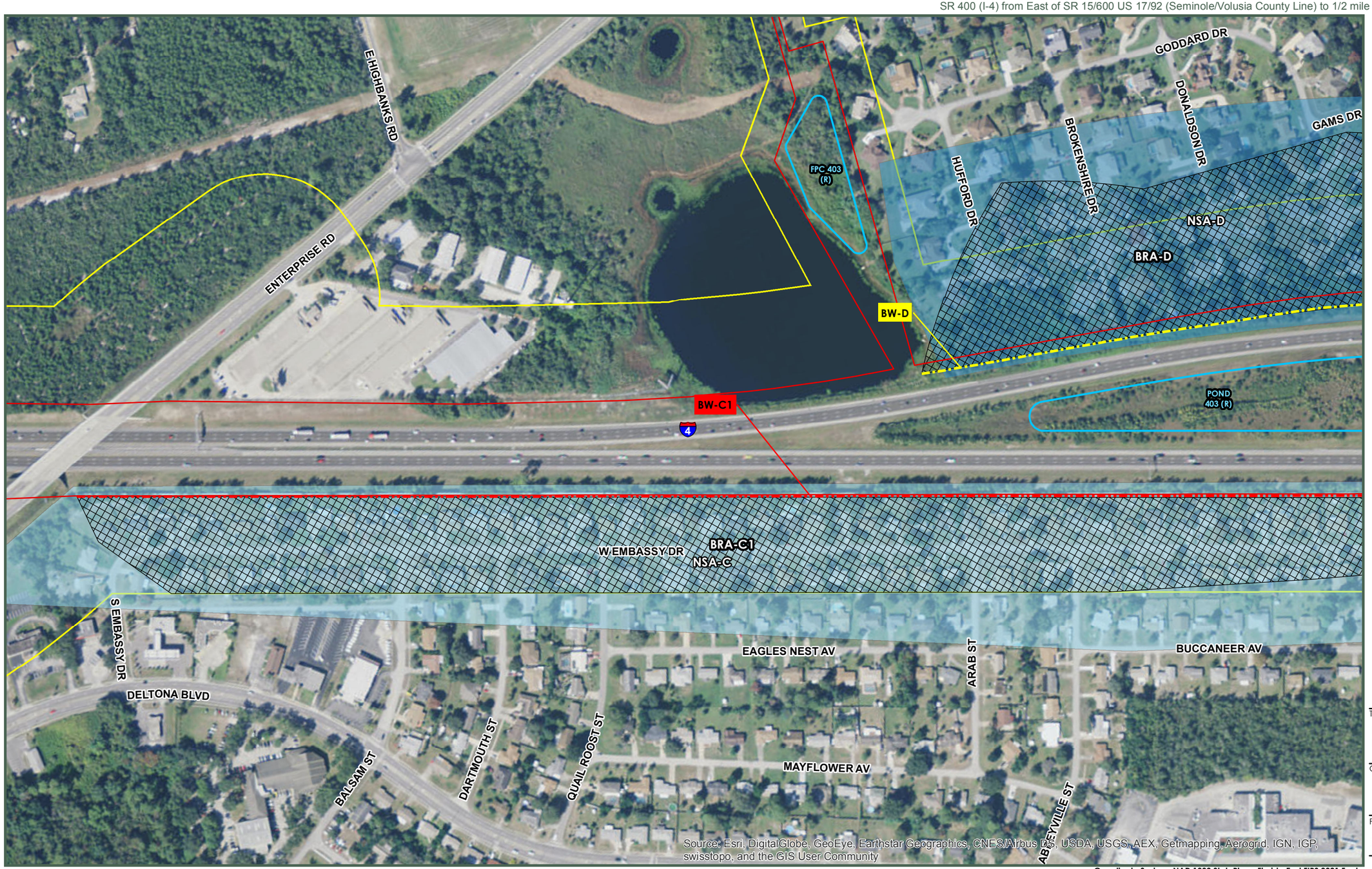
Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Figure B- Sheet 2 of 9: Noise Barrier Analysis Map



Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Figure B- Sheet 3 of 9: Noise Barrier Analysis Map

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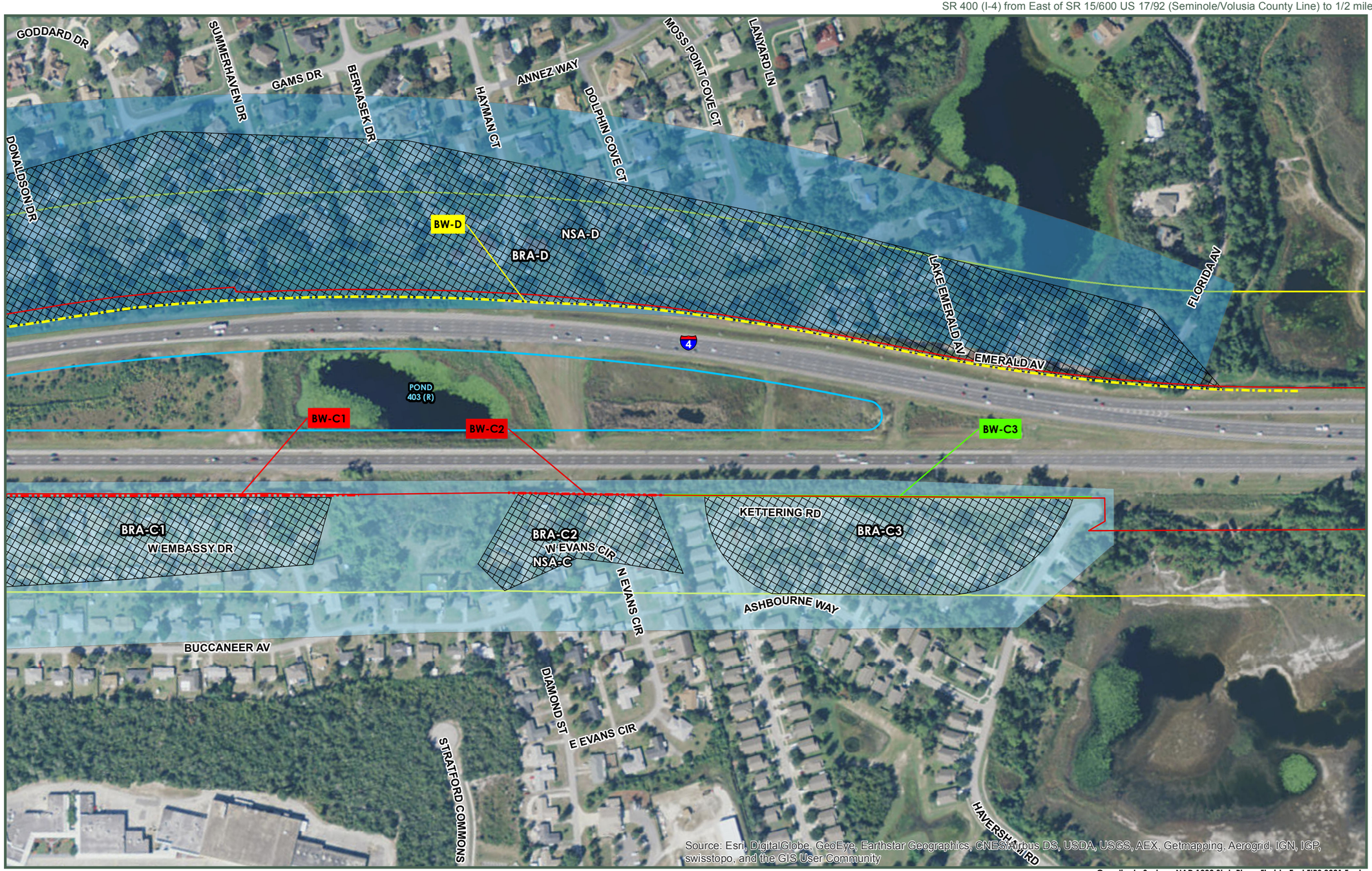

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Figure B- Sheet 4 of 9: Noise Barrier Analysis Map

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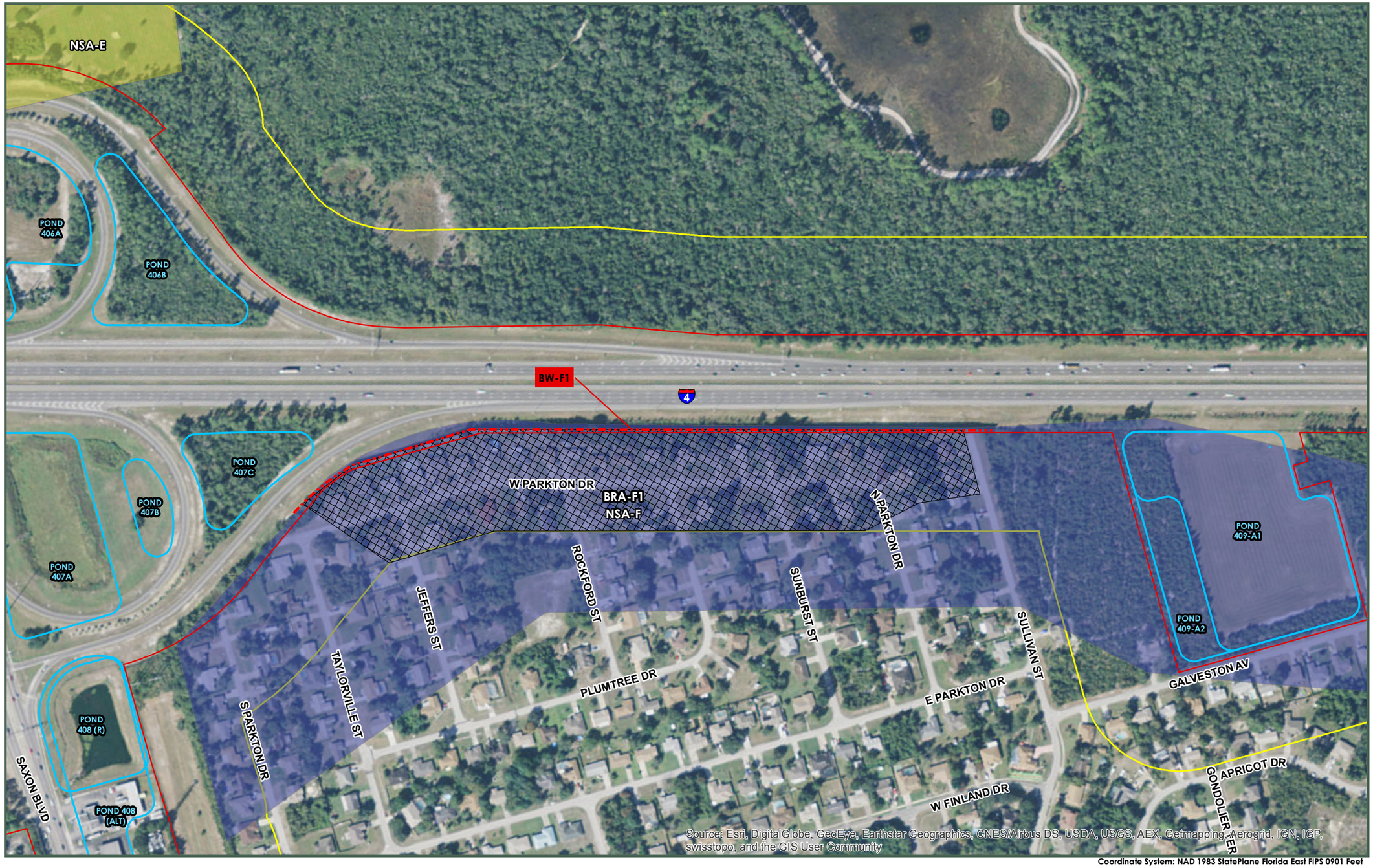

Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Figure B- Sheet 5 of 9: Noise Barrier Analysis Map

Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Figure B- Sheet 6 of 9: Noise Barrier Analysis Map

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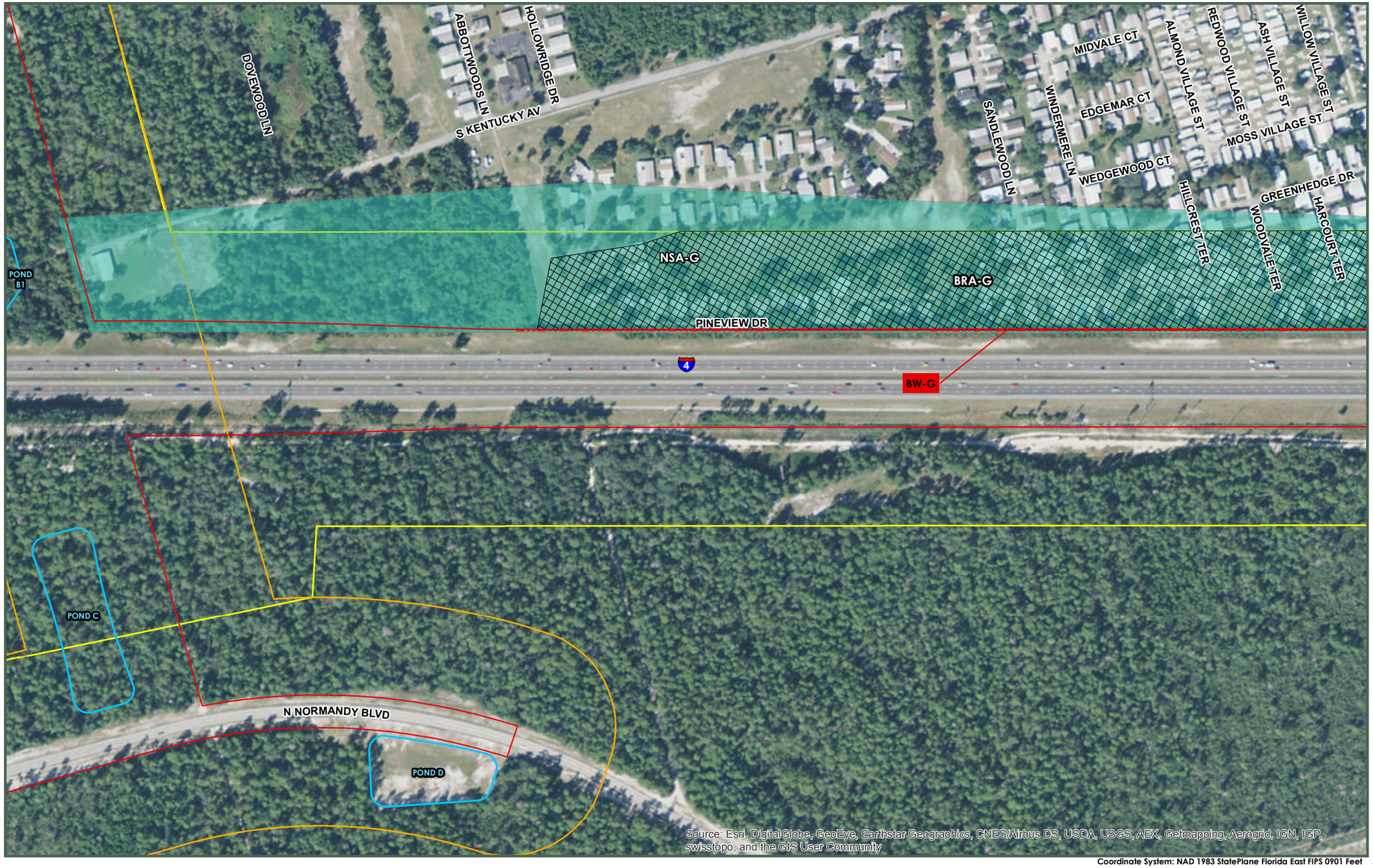
NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

SR 400 (I-4) from East of SR 15/600 US 17/92 (Seminole/Volusia County Line) to 1/2 mile East of SR 472 - Volusia County (79110)



Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Figure B- Sheet 7 of 9: Noise Barrier Analysis Map

1 " = 300 '

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

202423068

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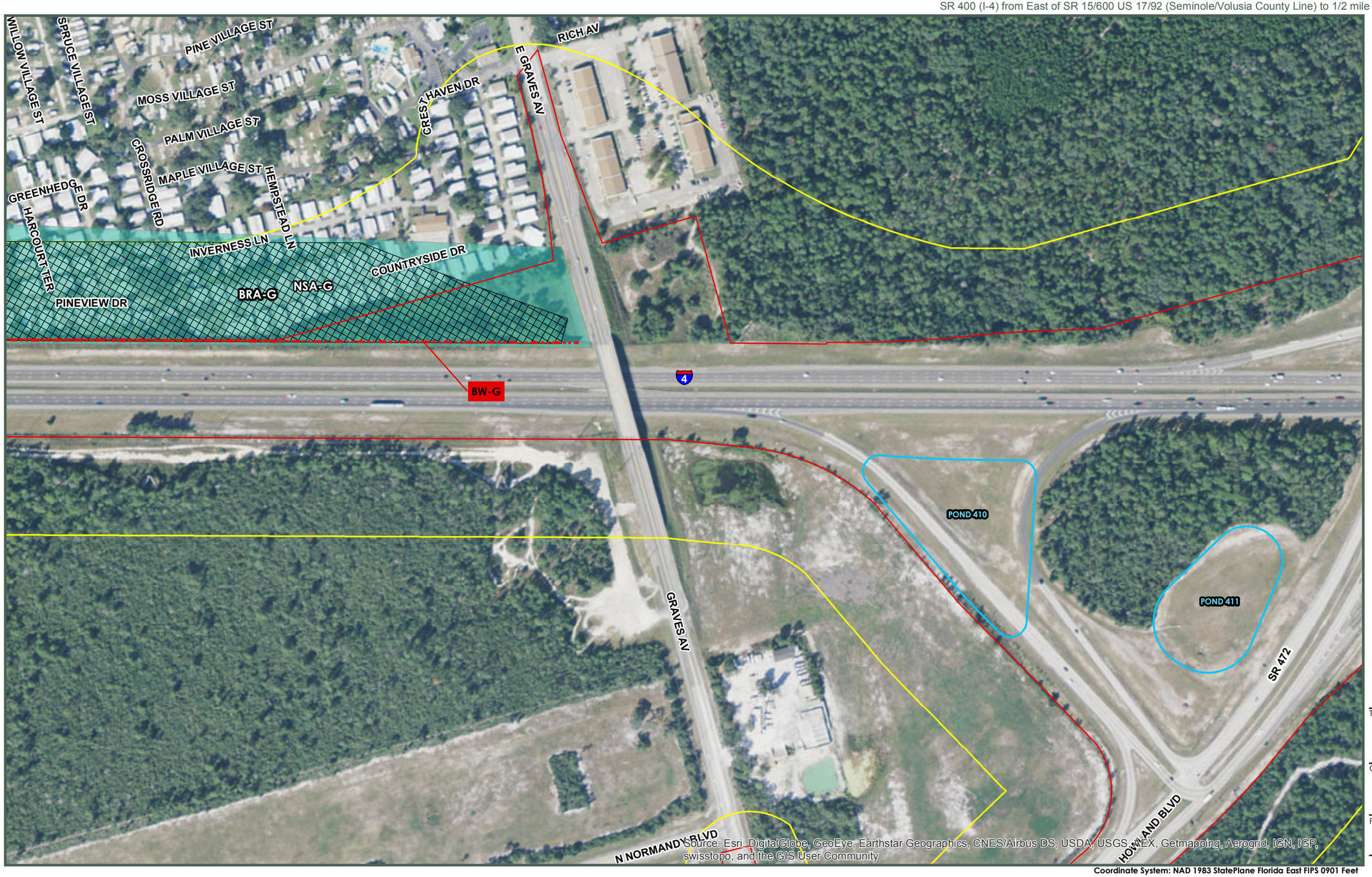

Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Figure B- Sheet 8 of 9: Noise Barrier Analysis Map

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Map Key

SR 400 (I-4) PD&E Limits

- SR 400 (I-4) Beyond the Ultimate- Segment 4 Study Area
- Rhode Island Ave (Extension)
- I-4 Beyond the Ultimate- Segment 4 R/W (12/10/15)
- Proposed Ponds (12/10/15)

Barrier Walls

- Existing Walls
- Proposed Walls (Cost Reasonable)
- Modeled Walls (Not Cost Reasonable)

Noise Sensitive Areas (NSA)

- NSA-A
- NSA-B
- NSA-C
- NSA-D
- NSA-E
- NSA-F
- NSA-G
- NSA-H
- Benefited Receiver Areas

Title:

NOISE STUDY REPORT: Segment 4 - Noise Barrier Analysis Map

Client/Project:
Florida Department of Transportation- D5
SR 400 Project Development & Environment Study
Segment 4: SR 400 E. of SR 15/600 US 17/92 to 1/2 mile E of SR 472

Project Location:
79110 Volusia County
STA 2583+0.00(Begin) - MP 0.086
STA 3118+46.00 (End) - MP 10.227

Prepared by: mLeonard 12/16/2015
Technical Review by: mDrauer 12/16/2015
Independent Review by: jMoore 12/16/2015

Coordinate System: NAD 1983 StatePlane Florida East FIPS 0901 Feet

0 75 150 300 Feet

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

APPENDIX II

TNM RESULTS

Stantec
M. Drauer

7 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
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
Riverside	1	2	0.0	64.2	66	64.2	10	----	63.8	0.4	8	-7.6
Receiver2	2	2	0.0	70.8	66	70.8	10	Snd Lvl	66.2	4.6	8	-3.4
Receiver3	3	2	0.0	63.7	66	63.7	10	----	63.4	0.3	8	-7.7
Receiver4	4	2	0.0	70.5	66	70.5	10	Snd Lvl	65.7	4.8	8	-3.2
Receiver5	5	2	0.0	62.8	66	62.8	10	----	63.0	-0.2	8	-8.2
Receiver6	6	2	0.0	67.3	66	67.3	10	Snd Lvl	65.1	2.2	8	-5.8
Receiver7	7	2	0.0	62.2	66	62.2	10	----	57.8	4.4	8	-3.6
Receiver8	8	2	0.0	66.0	66	66.0	10	Snd Lvl	61.2	4.8	8	-3.2
Receiver9	9	2	0.0	62.1	66	62.1	10	----	58.1	4.0	8	-4.0
Receiver10	10	2	0.0	66.0	66	66.0	10	Snd Lvl	61.8	4.2	8	-3.8
Receiver11	11	2	0.0	62.6	66	62.6	10	----	59.3	3.3	8	-4.7
Receiver12	12	2	0.0	66.7	66	66.7	10	Snd Lvl	64.0	2.7	8	-5.3
Receiver14	14	2	0.0	68.5	66	68.5	10	Snd Lvl	62.4	6.1	8	-1.9
Receiver15	15	2	0.0	70.2	66	70.2	10	Snd Lvl	65.6	4.6	8	-3.4
Receiver16	16	2	0.0	66.4	66	66.4	10	Snd Lvl	62.7	3.7	8	-4.3
Receiver17	17	2	0.0	69.6	66	69.6	10	Snd Lvl	66.4	3.2	8	-4.8
Receiver18	18	2	0.0	65.6	66	65.6	10	----	63.1	2.5	8	-5.5
Receiver19	19	2	0.0	69.7	66	69.7	10	Snd Lvl	65.7	4.0	8	-4.0
Receiver20	20	2	0.0	65.8	66	65.8	10	----	63.7	2.1	8	-5.9
Receiver21	21	2	0.0	68.1	66	68.1	10	Snd Lvl	65.0	3.1	8	-4.9
Receiver22	22	2	0.0	63.0	66	63.0	10	----	59.9	3.1	8	-4.9
Receiver23	23	2	0.0	66.0	66	66.0	10	Snd Lvl	61.7	4.3	8	-3.7
Receiver24	24	2	0.0	63.3	66	63.3	10	----	60.4	2.9	8	-5.1

Receiver25	25	2	0.0	66.9	66	66.9	10	Snd Lvl	62.8	4.1	8	-3.9
Receiver26	26	2	0.0	63.8	66	63.8	10	----	60.9	2.9	8	-5.1
Receiver27	27	2	0.0	67.1	66	67.1	10	Snd Lvl	63.7	3.4	8	-4.6
Receiver28	28	2	0.0	65.3	66	65.3	10	----	61.5	3.8	8	-4.2
Receiver29	29	2	0.0	68.4	66	68.4	10	Snd Lvl	64.6	3.8	8	-4.2
Receiver31	31	2	0.0	68.3	66	68.3	10	Snd Lvl	63.5	4.8	8	-3.2
Receiver32	32	2	0.0	72.7	66	72.7	10	Snd Lvl	67.2	5.5	8	-2.5
Receiver33	33	2	0.0	69.5	66	69.5	10	Snd Lvl	63.9	5.6	8	-2.4
Receiver34	34	2	0.0	72.5	66	72.5	10	Snd Lvl	68.3	4.2	8	-3.8
Receiver35	35	2	0.0	69.8	66	69.8	10	Snd Lvl	66.2	3.6	8	-4.4
Receiver36	36	2	0.0	71.6	66	71.6	10	Snd Lvl	67.7	3.9	8	-4.1
Receiver37	37	2	0.0	62.5	66	62.5	10	----	58.7	3.8	8	-4.2
Receiver38	38	2	0.0	65.4	66	65.4	10	----	61.5	3.9	8	-4.1
Receiver39	39	2	0.0	63.2	66	63.2	10	----	59.1	4.1	8	-3.9
Receiver40	40	2	0.0	66.0	66	66.0	10	Snd Lvl	62.1	3.9	8	-4.1
Receiver41	41	2	0.0	64.4	66	64.4	10	----	60.5	3.9	8	-4.1
Receiver42	42	2	0.0	69.5	66	69.5	10	Snd Lvl	65.6	3.9	8	-4.1
Receiver44	44	2	0.0	63.5	66	63.5	10	----	60.7	2.8	8	-5.2
Receiver45	45	2	0.0	66.8	66	66.8	10	Snd Lvl	62.5	4.3	8	-3.7
Receiver46	46	2	0.0	62.8	66	62.8	10	----	60.2	2.6	8	-5.4
Receiver47	47	2	0.0	65.7	66	65.7	10	----	61.8	3.9	8	-4.1
Receiver48	48	2	0.0	61.0	66	61.0	10	----	58.9	2.1	8	-5.9
Receiver49	49	2	0.0	62.8	66	62.8	10	----	60.1	2.7	8	-5.3
Receiver50	50	2	0.0	60.5	66	60.5	10	----	57.8	2.7	8	-5.3
Riverside 2nd	51	2	0.0	63.7	66	63.7	10	----	59.7	4.0	8	-4.0
pool	53	1	0.0	63.6	66	63.6	10	----	61.0	2.6	8	-5.4
Hampton Inn Pool	55	1	0.0	57.0	66	57.0	10	----	56.2	0.8	8	-7.2
Debary Drive 1	57	1	0.0	60.8	66	60.8	10	----	60.0	0.8	8	-7.2
Debary Drive 2	58	1	0.0	59.9	66	59.9	10	----	59.1	0.8	8	-7.2
Debary Drive 3	59	1	0.0	59.3	66	59.3	10	----	58.4	0.9	8	-7.1
Debary Drive 4	60	1	0.0	58.6	66	58.6	10	----	57.8	0.8	8	-7.2
Receiver62	62	1	0.0	67.3	66	67.3	10	Snd Lvl	65.8	1.5	8	-6.5
Receiver63	63	1	0.0	66.7	66	66.7	10	Snd Lvl	65.4	1.3	8	-6.7
Receiver65	65	1	0.0	65.9	66	65.9	10	----	64.9	1.0	8	-7.0
Receiver66	66	1	0.0	66.3	66	66.3	10	Snd Lvl	63.7	2.6	8	-5.4
Receiver67	67	1	0.0	64.6	66	64.6	10	----	62.5	2.1	8	-5.9
Receiver68	68	1	0.0	64.1	66	64.1	10	----	62.3	1.8	8	-6.2
Receiver69	69	1	0.0	63.4	66	63.4	10	----	62.0	1.4	8	-6.6
Receiver70	70	1	0.0	62.5	66	62.5	10	----	60.7	1.8	8	-6.2
Receiver71	71	1	0.0	63.1	66	63.1	10	----	61.2	1.9	8	-6.1
Receiver72	72	1	0.0	63.7	66	63.7	10	----	61.5	2.2	8	-5.8

Receiver73	73	1	0.0	65.5	66	65.5	10	----	62.7	2.8	8	-5.2
Receiver74	74	1	0.0	68.2	66	68.2	10	Snd Lvl	64.8	3.4	8	-4.6
Receiver76	76	1	0.0	67.2	66	67.2	10	Snd Lvl	64.1	3.1	8	-4.9
Receiver77	77	1	0.0	65.9	66	65.9	10	----	63.5	2.4	8	-5.6
Receiver78	78	1	0.0	63.8	66	63.8	10	----	61.1	2.7	8	-5.3
Receiver79	79	1	0.0	65.5	66	65.5	10	----	62.6	2.9	8	-5.1
Receiver80	80	1	0.0	72.8	66	72.8	10	Snd Lvl	67.8	5.0	8	-3.0
Receiver81	81	1	0.0	74.4	66	74.4	10	Snd Lvl	68.6	5.8	8	-2.2
Receiver82	82	1	0.0	75.7	66	75.7	10	Snd Lvl	69.1	6.6	8	-1.4
Receiver83	83	1	0.0	72.5	66	72.5	10	Snd Lvl	67.8	4.7	8	-3.3
Bill Frederick	55	1	0.0	71.4	66	71.4	10	Snd Lvl	67.6	3.8	8	-4.2
Receiver84	84	1	0.0	64.3	66	64.3	10	----	61.6	2.7	8	-5.3
Bill Frederick 6	85	1	0.0	66.1	66	66.1	10	Snd Lvl	64.0	2.1	8	-5.9
Bill Frederick 5	86	1	0.0	62.4	66	62.4	10	----	60.2	2.2	8	-5.8
Bill Frederick 4	87	1	0.0	61.9	66	61.9	10	----	60.2	1.7	8	-6.3
Bill Frederick 3	88	1	0.0	63.8	66	63.8	10	----	62.3	1.5	8	-6.5
Bill Frederick 2	89	1	0.0	61.2	66	61.2	10	----	60.0	1.2	8	-6.8
Bill Frederick 1	91	1	0.0	62.9	66	62.9	10	----	62.0	0.9	8	-7.1
Receiver93	93	1	0.0	63.7	66	63.7	10	----	63.5	0.2	8	-7.8

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	131	-0.2	3.0	6.6
All Impacted	61	1.3	4.0	6.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I - 4 PD&E NSA B
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
Lake Crescent 3	1	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	8	-8.0
Magnolia Place 1	3	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Lake Crescent 1	4	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
Lake Crescent 4	5	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
Lake Crescent 5	6	1	0.0	64.5	66	64.5	10	----	64.4	0.1	8	-7.9
Lake Crescent 6	7	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
Lake Crescent 2	8	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
Magnolia Place 3	9	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
Magnolia Place 2	10	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
Magnolia Place	11	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
BW pool	13	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
Receiver15	15	1	0.0	73.0	66	73.0	10	Snd Lvl	68.7	4.3	8	-3.7
Receiver16	16	1	0.0	75.9	66	75.9	10	Snd Lvl	69.7	6.2	8	-1.8
Receiver17	17	1	0.0	76.8	66	76.8	10	Snd Lvl	70.1	6.7	8	-1.3
Receiver18	18	1	0.0	76.0	66	76.0	10	Snd Lvl	69.5	6.5	8	-1.5
Receiver19	19	1	0.0	75.8	66	75.8	10	Snd Lvl	69.6	6.2	8	-1.8
Receiver20	20	1	0.0	71.9	66	71.9	10	Snd Lvl	67.7	4.2	8	-3.8
Receiver21	21	1	0.0	67.8	66	67.8	10	Snd Lvl	64.9	2.9	8	-5.1
Receiver22	22	1	0.0	67.5	66	67.5	10	Snd Lvl	64.5	3.0	8	-5.0
La Petite	23	1	0.0	76.7	66	76.7	10	Snd Lvl	76.6	0.1	8	-7.9
V Music	25	1	0.0	76.7	66	76.7	10	Snd Lvl	76.7	0.0	8	-8.0
pool	27	1	0.0	61.6	66	61.6	10	----	61.4	0.2	8	-7.8
Receiver30	30	1	0.0	67.5	66	67.5	10	Snd Lvl	67.4	0.1	8	-7.9

Receiver31	31	1	0.0	66.5	66	66.5	10	Snd Lvl	66.3	0.2	8	-7.8
Receiver32	32	1	0.0	66.1	66	66.1	10	Snd Lvl	65.9	0.2	8	-7.8
Receiver33	33	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
Receiver34	34	1	0.0	66.1	66	66.1	10	Snd Lvl	66.0	0.1	8	-7.9
Receiver35	35	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
Receiver37	37	1	0.0	60.5	66	60.5	10	----	59.7	0.8	8	-7.2
Receiver38	38	1	0.0	60.5	66	60.5	10	----	59.7	0.8	8	-7.2
Receiver40	40	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
Receiver41	41	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
Receiver42	42	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
Receiver43	43	1	0.0	67.7	66	67.7	10	Snd Lvl	67.6	0.1	8	-7.9

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	34	0.0	1.3	6.7
All Impacted	21	0.0	1.9	6.7
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
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
Receiver1	1	1	0.0	66.8	66	66.8	10	Snd Lvl	65.5	1.3	8	-6.7
Receiver2	2	1	0.0	71.3	66	71.3	10	Snd Lvl	68.8	2.5	8	-5.5
Receiver3	3	1	0.0	75.1	66	75.1	10	Snd Lvl	69.3	5.8	8	-2.2
Receiver4	4	1	0.0	76.4	66	76.4	10	Snd Lvl	66.9	9.5	8	1.5
Receiver5	5	1	0.0	76.5	66	76.5	10	Snd Lvl	65.8	10.7	8	2.7
Receiver6	6	1	0.0	76.4	66	76.4	10	Snd Lvl	65.3	11.1	8	3.1
Receiver7	7	1	0.0	76.5	66	76.5	10	Snd Lvl	65.1	11.4	8	3.4
Receiver8	8	1	0.0	76.3	66	76.3	10	Snd Lvl	65.2	11.1	8	3.1
Receiver9	9	1	0.0	76.7	66	76.7	10	Snd Lvl	65.2	11.5	8	3.5
Receiver10	10	1	0.0	76.4	66	76.4	10	Snd Lvl	65.1	11.3	8	3.3
Receiver11	11	1	0.0	76.5	66	76.5	10	Snd Lvl	65.1	11.4	8	3.4
Receiver12	12	1	0.0	76.4	66	76.4	10	Snd Lvl	64.8	11.6	8	3.6
Receiver13	13	1	0.0	76.2	66	76.2	10	Snd Lvl	64.7	11.5	8	3.5
Receiver14	14	1	0.0	66.4	66	66.4	10	Snd Lvl	62.3	4.1	8	-3.9
Receiver15	15	1	0.0	66.6	66	66.6	10	Snd Lvl	62.1	4.5	8	-3.5
Receiver16	16	1	0.0	66.8	66	66.8	10	Snd Lvl	61.9	4.9	8	-3.1
Receiver17	17	1	0.0	66.7	66	66.7	10	Snd Lvl	61.4	5.3	8	-2.7
Receiver18	18	1	0.0	66.6	66	66.6	10	Snd Lvl	61.2	5.4	8	-2.6
Receiver19	19	1	0.0	66.4	66	66.4	10	Snd Lvl	60.8	5.6	8	-2.4
Receiver20	20	1	0.0	66.7	66	66.7	10	Snd Lvl	60.7	6.0	8	-2.0
Receiver21	21	1	0.0	66.6	66	66.6	10	Snd Lvl	60.5	6.1	8	-1.9
Receiver22	22	1	0.0	66.4	66	66.4	10	Snd Lvl	60.3	6.1	8	-1.9
Receiver23	23	1	0.0	66.1	66	66.1	10	Snd Lvl	60.1	6.0	8	-2.0

Receiver25	25	1	0.0	76.1	66	76.1	10	Snd Lvl	64.5	11.6	8	3.6
Receiver26	26	1	0.0	76.1	66	76.1	10	Snd Lvl	64.5	11.6	8	3.6
Receiver27	27	1	0.0	76.1	66	76.1	10	Snd Lvl	64.2	11.9	8	3.9
Receiver28	28	1	0.0	76.2	66	76.2	10	Snd Lvl	64.2	12.0	8	4.0
Receiver29	29	1	0.0	76.4	66	76.4	10	Snd Lvl	64.0	12.4	8	4.4
Receiver30	30	1	0.0	76.2	66	76.2	10	Snd Lvl	63.9	12.3	8	4.3
Receiver31	31	1	0.0	75.9	66	75.9	10	Snd Lvl	63.9	12.0	8	4.0
Receiver32	32	1	0.0	76.5	66	76.5	10	Snd Lvl	64.0	12.5	8	4.5
Receiver33	33	1	0.0	76.8	66	76.8	10	Snd Lvl	64.1	12.7	8	4.7
Receiver34	34	1	0.0	63.8	66	63.8	10	----	59.7	4.1	8	-3.9
Receiver35	35	1	0.0	62.8	66	62.8	10	----	59.6	3.2	8	-4.8
Receiver36	36	1	0.0	62.5	66	62.5	10	----	59.4	3.1	8	-4.9
Receiver37	37	1	0.0	61.7	66	61.7	10	----	58.4	3.3	8	-4.7
Receiver38	38	1	0.0	61.9	66	61.9	10	----	58.5	3.4	8	-4.6
Receiver39	39	1	0.0	62.5	66	62.5	10	----	59.9	2.6	8	-5.4
Receiver40	40	1	0.0	62.5	66	62.5	10	----	60.0	2.5	8	-5.5
Receiver41	41	1	0.0	61.9	66	61.9	10	----	59.4	2.5	8	-5.5
Receiver42	42	1	0.0	61.0	66	61.0	10	----	58.4	2.6	8	-5.4
Receiver43	43	1	0.0	61.2	66	61.2	10	----	58.6	2.6	8	-5.4
Receiver44	44	1	0.0	61.6	66	61.6	10	----	59.2	2.4	8	-5.6
Receiver45	45	1	0.0	77.9	66	77.9	10	Snd Lvl	64.3	13.6	8	5.6
Receiver46	46	1	0.0	76.5	66	76.5	10	Snd Lvl	64.0	12.5	8	4.5
Receiver47	47	1	0.0	76.6	66	76.6	10	Snd Lvl	64.0	12.6	8	4.6
Receiver48	48	1	0.0	76.0	66	76.0	10	Snd Lvl	63.8	12.2	8	4.2
Receiver49	49	1	0.0	75.9	66	75.9	10	Snd Lvl	63.7	12.2	8	4.2
Receiver50	50	1	0.0	75.9	66	75.9	10	Snd Lvl	63.7	12.2	8	4.2
Receiver51	51	1	0.0	76.6	66	76.6	10	Snd Lvl	63.9	12.7	8	4.7
Receiver52	52	1	0.0	77.0	66	77.0	10	Snd Lvl	63.9	13.1	8	5.1
Receiver53	53	1	0.0	76.2	66	76.2	10	Snd Lvl	63.7	12.5	8	4.5
Receiver54	54	1	0.0	76.3	66	76.3	10	Snd Lvl	63.7	12.6	8	4.6
Receiver55	55	1	0.0	76.5	66	76.5	10	Snd Lvl	63.7	12.8	8	4.8
Receiver56	56	1	0.0	76.5	66	76.5	10	Snd Lvl	63.9	12.6	8	4.6
Receiver57	57	1	0.0	76.8	66	76.8	10	Snd Lvl	64.2	12.6	8	4.6
Receiver58	58	1	0.0	76.6	66	76.6	10	Snd Lvl	64.1	12.5	8	4.5
Receiver59	59	1	0.0	76.6	66	76.6	10	Snd Lvl	64.3	12.3	8	4.3
Receiver60	60	1	0.0	77.0	66	77.0	10	Snd Lvl	64.6	12.4	8	4.4
Receiver61	61	1	0.0	77.1	66	77.1	10	Snd Lvl	64.9	12.2	8	4.2
Receiver62	62	1	0.0	76.9	66	76.9	10	Snd Lvl	64.7	12.2	8	4.2
Receiver63	63	1	0.0	61.6	66	61.6	10	----	59.3	2.3	8	-5.7
Receiver64	64	1	0.0	61.6	66	61.6	10	----	59.2	2.4	8	-5.6
Receiver65	65	1	0.0	61.5	66	61.5	10	----	59.2	2.3	8	-5.7

Receiver66	66	1	0.0	61.4	66	61.4	10	----	59.1	2.3	8	-5.7
Receiver67	67	1	0.0	61.4	66	61.4	10	----	59.1	2.3	8	-5.7
Receiver68	68	1	0.0	61.3	66	61.3	10	----	59.0	2.3	8	-5.7
Receiver69	69	1	0.0	61.2	66	61.2	10	----	59.0	2.2	8	-5.8
Receiver70	70	1	0.0	61.1	66	61.1	10	----	58.9	2.2	8	-5.8
Receiver71	71	1	0.0	61.0	66	61.0	10	----	58.9	2.1	8	-5.9
Receiver72	72	1	0.0	61.0	66	61.0	10	----	58.8	2.2	8	-5.8
Receiver73	73	1	0.0	63.7	66	63.7	10	----	59.4	4.3	8	-3.7
Receiver74	74	1	0.0	63.8	66	63.8	10	----	59.6	4.2	8	-3.8
Receiver75	75	1	0.0	64.2	66	64.2	10	----	59.3	4.9	8	-3.1
Receiver76	76	1	0.0	64.1	66	64.1	10	----	59.2	4.9	8	-3.1
Receiver77	77	1	0.0	64.3	66	64.3	10	----	59.3	5.0	8	-3.0
Receiver78	78	1	0.0	64.3	66	64.3	10	----	59.3	5.0	8	-3.0
Receiver79	79	1	0.0	63.9	66	63.9	10	----	59.0	4.9	8	-3.1
Receiver80	80	1	0.0	63.8	66	63.8	10	----	59.0	4.8	8	-3.2
Receiver81	81	1	0.0	63.8	66	63.8	10	----	59.1	4.7	8	-3.3
Receiver82	82	1	0.0	63.6	66	63.6	10	----	58.9	4.7	8	-3.3
Receiver83	83	1	0.0	63.7	66	63.7	10	----	59.1	4.6	8	-3.4
Receiver84	84	1	0.0	63.7	66	63.7	10	----	59.2	4.5	8	-3.5
Receiver85	85	1	0.0	63.5	66	63.5	10	----	59.3	4.2	8	-3.8
Receiver86	86	1	0.0	63.8	66	63.8	10	----	59.7	4.1	8	-3.9
Receiver87	87	1	0.0	77.0	66	77.0	10	Snd Lvl	64.7	12.3	8	4.3
Receiver88	88	1	0.0	77.2	66	77.2	10	Snd Lvl	64.8	12.4	8	4.4
Receiver89	89	1	0.0	78.1	66	78.1	10	Snd Lvl	65.1	13.0	8	5.0
Receiver90	90	1	0.0	77.9	66	77.9	10	Snd Lvl	64.9	13.0	8	5.0
Receiver91	91	1	0.0	77.2	66	77.2	10	Snd Lvl	64.6	12.6	8	4.6
Receiver92	92	1	0.0	77.4	66	77.4	10	Snd Lvl	64.7	12.7	8	4.7
Receiver93	93	1	0.0	76.8	66	76.8	10	Snd Lvl	64.4	12.4	8	4.4
Receiver94	94	1	0.0	76.1	66	76.1	10	Snd Lvl	64.2	11.9	8	3.9
Receiver95	95	1	0.0	76.8	66	76.8	10	Snd Lvl	64.4	12.4	8	4.4
Receiver96	96	1	0.0	76.5	66	76.5	10	Snd Lvl	64.3	12.2	8	4.2
Receiver97	97	1	0.0	76.4	66	76.4	10	Snd Lvl	64.4	12.0	8	4.0
Receiver98	98	1	0.0	76.7	66	76.7	10	Snd Lvl	64.9	11.8	8	3.8
Receiver99	99	1	0.0	76.8	66	76.8	10	Snd Lvl	65.1	11.7	8	3.7
Receiver100	100	1	0.0	77.2	66	77.2	10	Snd Lvl	65.6	11.6	8	3.6
Receiver101	101	1	0.0	64.2	66	64.2	10	----	60.2	4.0	8	-4.0
Receiver102	102	1	0.0	64.0	66	64.0	10	----	60.3	3.7	8	-4.3
Receiver103	103	1	0.0	77.4	66	77.4	10	Snd Lvl	66.0	11.4	8	3.4
Receiver104	104	1	0.0	73.0	66	73.0	10	Snd Lvl	67.2	5.8	8	-2.2
Receiver105	105	1	0.0	66.7	66	66.7	10	Snd Lvl	63.9	2.8	8	-5.2
Receiver106	106	1	0.0	64.6	66	64.6	10	----	62.6	2.0	8	-6.0

Receiver107	107	1	0.0	65.2	66	65.2	10	----	63.6	1.6	8	-6.4
Receiver108	108	1	0.0	65.3	66	65.3	10	----	64.1	1.2	8	-6.8
Receiver109	109	1	0.0	65.3	66	65.3	10	----	64.0	1.3	8	-6.7
Receiver110	110	1	0.0	65.1	66	65.1	10	----	63.7	1.4	8	-6.6
Receiver111	111	1	0.0	65.1	66	65.1	10	----	63.5	1.6	8	-6.4
Receiver112	112	1	0.0	67.7	66	67.7	10	Snd Lvl	65.9	1.8	8	-6.2
Receiver113	113	1	0.0	73.8	66	73.8	10	Snd Lvl	69.7	4.1	8	-3.9
Receiver114	114	1	0.0	76.4	66	76.4	10	Snd Lvl	67.8	8.6	8	0.6
Receiver115	115	1	0.0	76.8	66	76.8	10	Snd Lvl	66.1	10.7	8	2.7
Receiver116	116	1	0.0	77.9	66	77.9	10	Snd Lvl	65.3	12.6	8	4.6
Receiver117	117	1	0.0	77.3	66	77.3	10	Snd Lvl	64.9	12.4	8	4.4
Receiver118	118	1	0.0	70.0	66	70.0	10	Snd Lvl	61.5	8.5	8	0.5
Receiver119	119	1	0.0	65.5	66	65.5	10	----	60.1	5.4	8	-2.6
Receiver120	120	1	0.0	63.3	66	63.3	10	----	58.9	4.4	8	-3.6
Receiver121	121	1	0.0	63.8	66	63.8	10	----	60.8	3.0	8	-5.0
Receiver122	122	1	0.0	63.8	66	63.8	10	----	60.4	3.4	8	-4.6
Receiver123	123	1	0.0	75.2	66	75.2	10	Snd Lvl	64.2	11.0	8	3.0
Receiver124	124	1	0.0	69.6	66	69.6	10	Snd Lvl	61.9	7.7	8	-0.3
Receiver125	125	1	0.0	66.3	66	66.3	10	Snd Lvl	60.7	5.6	8	-2.4
Receiver126	126	1	0.0	64.7	66	64.7	10	----	59.7	5.0	8	-3.0
Receiver127	127	1	0.0	63.5	66	63.5	10	----	58.7	4.8	8	-3.2
Receiver128	128	1	0.0	62.2	66	62.2	10	----	58.1	4.1	8	-3.9
Receiver129	129	1	0.0	69.3	66	69.3	10	Snd Lvl	62.2	7.1	8	-0.9
Receiver130	130	1	0.0	67.7	66	67.7	10	Snd Lvl	61.9	5.8	8	-2.2
Receiver131	131	1	0.0	68.3	66	68.3	10	Snd Lvl	62.3	6.0	8	-2.0
Receiver132	132	1	0.0	67.5	66	67.5	10	Snd Lvl	62.1	5.4	8	-2.6
Receiver133	133	1	0.0	67.5	66	67.5	10	Snd Lvl	62.2	5.3	8	-2.7
Receiver134	134	1	0.0	66.7	66	66.7	10	Snd Lvl	61.8	4.9	8	-3.1
Receiver135	135	1	0.0	66.1	66	66.1	10	Snd Lvl	61.6	4.5	8	-3.5
Receiver136	136	1	0.0	65.3	66	65.3	10	----	61.1	4.2	8	-3.8
Receiver137	137	1	0.0	64.3	66	64.3	10	----	60.5	3.8	8	-4.2
Receiver138	138	1	0.0	63.5	66	63.5	10	----	60.1	3.4	8	-4.6
Receiver139	139	1	0.0	63.0	66	63.0	10	----	60.3	2.7	8	-5.3
Receiver140	140	1	0.0	66.5	66	66.5	10	Snd Lvl	61.0	5.5	8	-2.5
Receiver141	141	1	0.0	65.7	66	65.7	10	----	60.9	4.8	8	-3.2
Receiver142	142	1	0.0	64.5	66	64.5	10	----	60.6	3.9	8	-4.1
Receiver143	143	1	0.0	64.5	66	64.5	10	----	60.7	3.8	8	-4.2
Receiver144	144	1	0.0	63.5	66	63.5	10	----	60.4	3.1	8	-4.9
Receiver145	145	1	0.0	63.6	66	63.6	10	----	60.2	3.4	8	-4.6
Receiver146	146	1	0.0	63.1	66	63.1	10	----	60.1	3.0	8	-5.0
Receiver147	147	1	0.0	62.3	66	62.3	10	----	59.6	2.7	8	-5.3

Receiver148	148	1	0.0	61.6	66	61.6	10	----	59.6	2.0	8	-6.0
Receiver149	149	1	0.0	77.3	66	77.3	10	Snd Lvl	67.5	9.8	8	1.8
Receiver150	150	1	0.0	75.1	66	75.1	10	Snd Lvl	66.8	8.3	8	0.3
Receiver151	151	1	0.0	73.4	66	73.4	10	Snd Lvl	66.2	7.2	8	-0.8
Receiver152	152	1	0.0	72.1	66	72.1	10	Snd Lvl	65.6	6.5	8	-1.5
Receiver153	153	1	0.0	70.9	66	70.9	10	Snd Lvl	65.0	5.9	8	-2.1
Receiver154	154	1	0.0	69.9	66	69.9	10	Snd Lvl	64.6	5.3	8	-2.7
Receiver155	155	1	0.0	68.5	66	68.5	10	Snd Lvl	65.0	3.5	8	-4.5
Receiver156	156	1	0.0	72.1	66	72.1	10	Snd Lvl	65.6	6.5	8	-1.5
Receiver157	157	1	0.0	74.6	66	74.6	10	Snd Lvl	67.5	7.1	8	-0.9
Receiver158	158	1	0.0	77.7	66	77.7	10	Snd Lvl	70.4	7.3	8	-0.7

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	157	1.2	7.0	13.6
All Impacted	95	1.3	9.4	13.6
All that meet NR Goal	60	8.3	11.9	13.6

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
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
Receiver1	1	1	0.0	71.1	66	71.1	10	Snd Lvl	65.1	6.0	8	-2.0
Receiver2	2	1	0.0	70.4	66	70.4	10	Snd Lvl	64.7	5.7	8	-2.3
Receiver3	3	1	0.0	66.2	66	66.2	10	Snd Lvl	62.9	3.3	8	-4.7
Receiver4	4	1	0.0	65.5	66	65.5	10	----	61.6	3.9	8	-4.1
Receiver5	5	1	0.0	64.0	66	64.0	10	----	61.2	2.8	8	-5.2
Receiver6	6	1	0.0	63.8	66	63.8	10	----	60.2	3.6	8	-4.4
Receiver7	7	1	0.0	73.4	66	73.4	10	Snd Lvl	66.9	6.5	8	-1.5
Receiver8	8	1	0.0	67.3	66	67.3	10	Snd Lvl	63.2	4.1	8	-3.9
Receiver9	9	1	0.0	65.3	66	65.3	10	----	61.4	3.9	8	-4.1
Receiver10	10	1	0.0	65.0	66	65.0	10	----	61.4	3.6	8	-4.4
Receiver11	11	1	0.0	67.4	66	67.4	10	Snd Lvl	63.6	3.8	8	-4.2
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	67.4	6.3	8	-1.7
Receiver13	13	1	0.0	73.1	66	73.1	10	Snd Lvl	67.1	6.0	8	-2.0
Receiver14	14	1	0.0	72.5	66	72.5	10	Snd Lvl	66.9	5.6	8	-2.4
Receiver15	15	1	0.0	66.8	66	66.8	10	Snd Lvl	63.1	3.7	8	-4.3
Receiver16	16	1	0.0	64.7	66	64.7	10	----	61.2	3.5	8	-4.5
Receiver17	17	1	0.0	64.7	66	64.7	10	----	61.4	3.3	8	-4.7
Receiver18	18	1	0.0	67.2	66	67.2	10	Snd Lvl	63.8	3.4	8	-4.6
Receiver19	19	1	0.0	72.3	66	72.3	10	Snd Lvl	67.0	5.3	8	-2.7
Receiver20	20	1	0.0	66.5	66	66.5	10	Snd Lvl	63.3	3.2	8	-4.8
Receiver21	21	1	0.0	64.4	66	64.4	10	----	61.2	3.2	8	-4.8
Receiver23	23	1	0.0	73.8	66	73.8	10	Snd Lvl	68.3	5.5	8	-2.5
Receiver24	24	1	0.0	68.5	66	68.5	10	Snd Lvl	65.0	3.5	8	-4.5

Receiver25	25	1	0.0	65.0	66	65.0	10	----	62.3	2.7	8	-5.3
Receiver26	26	1	0.0	63.4	66	63.4	10	----	60.4	3.0	8	-5.0
Receiver27	27	1	0.0	63.0	66	63.0	10	----	60.1	2.9	8	-5.1
Receiver28	28	1	0.0	64.8	66	64.8	10	----	62.0	2.8	8	-5.2
Receiver29	29	1	0.0	67.3	66	67.3	10	Snd Lvl	64.4	2.9	8	-5.1
Receiver30	30	1	0.0	71.2	66	71.2	10	Snd Lvl	66.9	4.3	8	-3.7
Receiver31	31	1	0.0	70.3	66	70.3	10	Snd Lvl	66.6	3.7	8	-4.3
Receiver32	32	1	0.0	66.0	66	66.0	10	Snd Lvl	63.5	2.5	8	-5.5
Receiver33	33	1	0.0	64.0	66	64.0	10	----	61.5	2.5	8	-5.5
Receiver34	34	1	0.0	63.6	66	63.6	10	----	61.1	2.5	8	-5.5
Receiver35	35	1	0.0	65.2	66	65.2	10	----	62.9	2.3	8	-5.7
Receiver36	36	1	0.0	68.7	66	68.7	10	Snd Lvl	65.8	2.9	8	-5.1
Receiver37	37	1	0.0	72.2	66	72.2	10	Snd Lvl	68.7	3.5	8	-4.5
Receiver38	38	1	0.0	66.3	66	66.3	10	Snd Lvl	64.6	1.7	8	-6.3
Receiver39	39	1	0.0	64.1	66	64.1	10	----	62.1	2.0	8	-6.0
Receiver40	40	1	0.0	62.6	66	62.6	10	----	60.4	2.2	8	-5.8
Receiver41	41	1	0.0	62.1	66	62.1	10	----	60.0	2.1	8	-5.9
Receiver42	42	1	0.0	63.6	66	63.6	10	----	61.6	2.0	8	-6.0
Receiver43	43	1	0.0	65.4	66	65.4	10	----	63.7	1.7	8	-6.3
Receiver44	44	1	0.0	68.8	66	68.8	10	Snd Lvl	66.8	2.0	8	-6.0
Receiver45	45	1	0.0	75.6	66	75.6	10	Snd Lvl	71.9	3.7	8	-4.3
Receiver46	46	1	0.0	74.3	66	74.3	10	Snd Lvl	71.4	2.9	8	-5.1
Receiver47	47	1	0.0	68.4	66	68.4	10	Snd Lvl	67.0	1.4	8	-6.6
Receiver48	48	1	0.0	65.2	66	65.2	10	----	63.9	1.3	8	-6.7
Receiver49	49	1	0.0	63.6	66	63.6	10	----	61.9	1.7	8	-6.3
Receiver50	50	1	0.0	63.8	66	63.8	10	----	62.4	1.4	8	-6.6
Receiver51	51	1	0.0	65.4	66	65.4	10	----	64.5	0.9	8	-7.1
Receiver52	52	1	0.0	69.0	66	69.0	10	Snd Lvl	67.5	1.5	8	-6.5
Receiver53	53	1	0.0	73.9	66	73.9	10	Snd Lvl	71.6	2.3	8	-5.7
Receiver54	54	1	0.0	73.7	66	73.7	10	Snd Lvl	72.0	1.7	8	-6.3
Receiver55	55	1	0.0	67.4	66	67.4	10	Snd Lvl	66.7	0.7	8	-7.3
Receiver56	56	1	0.0	65.1	66	65.1	10	----	64.3	0.8	8	-7.2
Receiver57	57	1	0.0	63.3	66	63.3	10	----	61.9	1.4	8	-6.6
Receiver58	58	1	0.0	62.5	66	62.5	10	----	60.9	1.6	8	-6.4
Receiver59	59	1	0.0	63.9	66	63.9	10	----	62.7	1.2	8	-6.8
Receiver60	60	1	0.0	65.8	66	65.8	10	----	65.3	0.5	8	-7.5
Receiver61	61	1	0.0	69.3	66	69.3	10	Snd Lvl	68.2	1.1	8	-6.9
Receiver62	62	1	0.0	71.8	66	71.8	10	Snd Lvl	70.0	1.8	8	-6.2
Receiver63	63	1	0.0	68.3	66	68.3	10	Snd Lvl	67.4	0.9	8	-7.1
Receiver64	64	1	0.0	64.9	66	64.9	10	----	63.8	1.1	8	-6.9
Receiver65	65	1	0.0	63.4	66	63.4	10	----	61.9	1.5	8	-6.5

Receiver66	66	1	0.0	61.8	66	61.8	10	----	59.8	2.0	8	-6.0
Receiver67	67	1	0.0	63.3	66	63.3	10	----	61.2	2.1	8	-5.9
Receiver68	68	1	0.0	64.9	66	64.9	10	----	62.9	2.0	8	-6.0
Receiver69	69	1	0.0	66.3	66	66.3	10	Snd Lvl	64.6	1.7	8	-6.3
Receiver70	70	1	0.0	70.8	66	70.8	10	Snd Lvl	68.1	2.7	8	-5.3
Receiver71	71	1	0.0	69.4	66	69.4	10	Snd Lvl	67.5	1.9	8	-6.1
Receiver72	72	1	0.0	73.4	66	73.4	10	Snd Lvl	70.5	2.9	8	-5.1
Receiver73	73	1	0.0	72.0	66	72.0	10	Snd Lvl	69.4	2.6	8	-5.4
Receiver74	74	1	0.0	72.6	66	72.6	10	Snd Lvl	70.2	2.4	8	-5.6
Receiver75	75	1	0.0	74.6	66	74.6	10	Snd Lvl	72.7	1.9	8	-6.1
Receiver76	76	1	0.0	71.3	66	71.3	10	Snd Lvl	67.5	3.8	8	-4.2
Receiver77	77	1	0.0	72.2	66	72.2	10	Snd Lvl	68.0	4.2	8	-3.8
Receiver78	78	1	0.0	68.5	66	68.5	10	Snd Lvl	64.9	3.6	8	-4.4

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	77	0.5	2.8	6.5
All Impacted	43	0.7	3.3	6.5
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: NSA E
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
Holiday Inn Express Pool	1	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
Receiver3	3	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
Receiver4	4	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
Receiver5	5	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
Receiver6	6	1	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
Receiver7	7	1	0.0	56.4	66	56.4	10	----	56.4	0.0	8	-8.0
Receiver8	8	1	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0

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

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
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
Receiver1	1	1	0.0	60.6	66	60.6	10	----	59.9	0.7	8	-7.3
Receiver2	2	1	0.0	59.5	66	59.5	10	----	58.7	0.8	8	-7.2
Receiver3	3	1	0.0	63.4	66	63.4	10	----	60.4	3.0	8	-5.0
Receiver4	4	1	0.0	65.0	66	65.0	10	----	59.4	5.6	8	-2.4
Receiver5	5	1	0.0	63.3	66	63.3	10	----	59.7	3.6	8	-4.4
Receiver6	6	1	0.0	62.0	66	62.0	10	----	59.1	2.9	8	-5.1
Receiver7	7	1	0.0	61.6	66	61.6	10	----	59.4	2.2	8	-5.8
Receiver8	8	1	0.0	68.5	66	68.5	10	Snd Lvl	60.3	8.2	8	0.2
Receiver9	9	1	0.0	70.4	66	70.4	10	Snd Lvl	61.5	8.9	8	0.9
Receiver10	10	1	0.0	71.3	66	71.3	10	Snd Lvl	62.4	8.9	8	0.9
Receiver11	11	1	0.0	72.0	66	72.0	10	Snd Lvl	63.0	9.0	8	1.0
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	63.4	10.3	8	2.3
Receiver13	13	1	0.0	75.6	66	75.6	10	Snd Lvl	64.4	11.2	8	3.2
Receiver14	14	1	0.0	65.9	66	65.9	10	----	60.3	5.6	8	-2.4
Receiver15	15	1	0.0	66.4	66	66.4	10	Snd Lvl	60.7	5.7	8	-2.3
Receiver16	16	1	0.0	64.5	66	64.5	10	----	59.5	5.0	8	-3.0
Receiver17	17	1	0.0	64.0	66	64.0	10	----	59.3	4.7	8	-3.3
Receiver18	18	1	0.0	62.8	66	62.8	10	----	58.7	4.1	8	-3.9
Receiver19	19	1	0.0	63.2	66	63.2	10	----	58.8	4.4	8	-3.6
Receiver21	21	1	0.0	66.6	66	66.6	10	Snd Lvl	61.2	5.4	8	-2.6
Receiver22	22	1	0.0	67.0	66	67.0	10	Snd Lvl	61.5	5.5	8	-2.5
Receiver23	23	1	0.0	67.1	66	67.1	10	Snd Lvl	61.4	5.7	8	-2.3
Receiver24	24	1	0.0	67.1	66	67.1	10	Snd Lvl	61.6	5.5	8	-2.5

Receiver25	25	1	0.0	67.1	66	67.1	10	Snd Lvl	61.7	5.4	8	-2.6
Receiver26	26	1	0.0	65.2	66	65.2	10	----	59.9	5.3	8	-2.7
Receiver27	27	1	0.0	76.8	66	76.8	10	Snd Lvl	65.0	11.8	8	3.8
Receiver28	28	1	0.0	78.6	66	78.6	10	Snd Lvl	66.0	12.6	8	4.6
Receiver29	29	1	0.0	78.1	66	78.1	10	Snd Lvl	66.2	11.9	8	3.9
Receiver30	30	1	0.0	78.2	66	78.2	10	Snd Lvl	66.0	12.2	8	4.2
Receiver31	31	1	0.0	78.1	66	78.1	10	Snd Lvl	65.6	12.5	8	4.5
Receiver32	32	1	0.0	78.0	66	78.0	10	Snd Lvl	65.2	12.8	8	4.8
Receiver33	33	1	0.0	77.1	66	77.1	10	Snd Lvl	64.8	12.3	8	4.3
Receiver34	34	1	0.0	77.5	66	77.5	10	Snd Lvl	64.5	13.0	8	5.0
Receiver35	35	1	0.0	77.6	66	77.6	10	Snd Lvl	64.1	13.5	8	5.5
Receiver36	36	1	0.0	77.1	66	77.1	10	Snd Lvl	64.2	12.9	8	4.9
Receiver37	37	1	0.0	76.5	66	76.5	10	Snd Lvl	64.1	12.4	8	4.4
Receiver38	38	1	0.0	76.3	66	76.3	10	Snd Lvl	64.1	12.2	8	4.2
Receiver39	39	1	0.0	77.1	66	77.1	10	Snd Lvl	64.6	12.5	8	4.5
Receiver40	40	1	0.0	77.0	66	77.0	10	Snd Lvl	64.6	12.4	8	4.4
Receiver41	41	1	0.0	76.4	66	76.4	10	Snd Lvl	64.7	11.7	8	3.7
Receiver42	42	1	0.0	67.6	66	67.6	10	Snd Lvl	61.5	6.1	8	-1.9
Receiver43	43	1	0.0	67.8	66	67.8	10	Snd Lvl	61.6	6.2	8	-1.8
Receiver44	44	1	0.0	66.5	66	66.5	10	Snd Lvl	60.4	6.1	8	-1.9
Receiver45	45	1	0.0	66.3	66	66.3	10	Snd Lvl	60.2	6.1	8	-1.9
Receiver46	46	1	0.0	68.0	66	68.0	10	Snd Lvl	61.3	6.7	8	-1.3
Receiver47	47	1	0.0	67.8	66	67.8	10	Snd Lvl	61.1	6.7	8	-1.3
Receiver48	48	1	0.0	65.9	66	65.9	10	----	59.9	6.0	8	-2.0
Receiver49	49	1	0.0	65.2	66	65.2	10	----	59.4	5.8	8	-2.2
Receiver50	50	1	0.0	67.9	66	67.9	10	Snd Lvl	61.6	6.3	8	-1.7
Receiver51	51	1	0.0	67.3	66	67.3	10	Snd Lvl	61.7	5.6	8	-2.4
Receiver52	52	1	0.0	65.8	66	65.8	10	----	60.8	5.0	8	-3.0
Receiver53	53	1	0.0	66.4	66	66.4	10	Snd Lvl	60.8	5.6	8	-2.4
Receiver54	54	1	0.0	64.9	66	64.9	10	----	59.9	5.0	8	-3.0
Receiver55	55	1	0.0	76.7	66	76.7	10	Snd Lvl	64.6	12.1	8	4.1
Receiver56	56	1	0.0	72.2	66	72.2	10	Snd Lvl	63.9	8.3	8	0.3
Receiver57	57	1	0.0	75.0	66	75.0	10	Snd Lvl	65.1	9.9	8	1.9
Receiver58	58	1	0.0	71.2	66	71.2	10	Snd Lvl	65.1	6.1	8	-1.9
Receiver59	59	1	0.0	68.1	66	68.1	10	Snd Lvl	63.9	4.2	8	-3.8
Receiver60	60	1	0.0	66.5	66	66.5	10	Snd Lvl	63.0	3.5	8	-4.5
Receiver61	61	1	0.0	68.4	66	68.4	10	Snd Lvl	62.9	5.5	8	-2.5
Receiver62	62	1	0.0	66.4	66	66.4	10	Snd Lvl	62.1	4.3	8	-3.7
Receiver63	63	1	0.0	72.5	66	72.5	10	Snd Lvl	64.7	7.8	8	-0.2
Receiver64	64	1	0.0	71.1	66	71.1	10	Snd Lvl	63.8	7.3	8	-0.7
Receiver65	65	1	0.0	70.1	66	70.1	10	Snd Lvl	63.0	7.1	8	-0.9

Receiver66	66	1	0.0	68.4	66	68.4	10	Snd Lvl	62.1	6.3	8	-1.7
Receiver67	67	1	0.0	67.4	66	67.4	10	Snd Lvl	61.5	5.9	8	-2.1
Receiver68	68	1	0.0	65.9	66	65.9	10	----	61.3	4.6	8	-3.4
Receiver69	69	1	0.0	62.8	66	62.8	10	----	59.3	3.5	8	-4.5
Receiver70	70	1	0.0	62.1	66	62.1	10	----	59.1	3.0	8	-5.0
Galveston 3	71	1	0.0	65.6	66	65.6	10	----	65.2	0.4	8	-7.6
Galveston 2	72	1	0.0	64.6	66	64.6	10	----	64.3	0.3	8	-7.7
Galveston	73	1	0.0	63.5	66	63.5	10	----	63.3	0.2	8	-7.8
Receiver75	75	1	0.0	71.3	66	71.3	10	Snd Lvl	65.7	5.6	8	-2.4
Receiver76	76	1	0.0	68.0	66	68.0	10	Snd Lvl	64.9	3.1	8	-4.9
Receiver77	77	1	0.0	66.3	66	66.3	10	Snd Lvl	63.4	2.9	8	-5.1
Receiver78	78	1	0.0	72.7	66	72.7	10	Snd Lvl	65.3	7.4	8	-0.6
Receiver79	79	1	0.0	72.8	66	72.8	10	Snd Lvl	64.5	8.3	8	0.3
Receiver82	82	1	0.0	72.4	66	72.4	10	Snd Lvl	63.9	8.5	8	0.5
Receiver83	83	1	0.0	72.3	66	72.3	10	Snd Lvl	64.0	8.3	8	0.3
Receiver84	84	1	0.0	72.4	66	72.4	10	Snd Lvl	63.9	8.5	8	0.5
Receiver85	85	1	0.0	72.4	66	72.4	10	Snd Lvl	63.8	8.6	8	0.6
Receiver87	87	1	0.0	66.0	66	66.0	10	Snd Lvl	61.1	4.9	8	-3.1
Receiver88	88	1	0.0	65.9	66	65.9	10	----	61.5	4.4	8	-3.6
Receiver89	89	1	0.0	64.8	66	64.8	10	----	60.3	4.5	8	-3.5
Receiver90	90	1	0.0	64.3	66	64.3	10	----	60.3	4.0	8	-4.0
Receiver91	91	1	0.0	66.5	66	66.5	10	Snd Lvl	60.9	5.6	8	-2.4
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	60.5	5.5	8	-2.5
Receiver92	92	1	0.0	64.7	66	64.7	10	----	59.5	5.2	8	-2.8
Receiver93	93	1	0.0	62.7	66	62.7	10	----	56.8	5.9	8	-2.1
Receiver96	96	1	0.0	66.0	66	66.0	10	Snd Lvl	60.1	5.9	8	-2.1

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	90	0.2	6.8	13.5
All Impacted	62	2.9	8.1	13.5
All that meet NR Goal	29	8.2	10.9	13.5

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA G
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
Receiver1	1	5	0.0	66.7	66	66.7	10	Snd Lvl	64.0	2.7	8	-5.3
Receiver2	2	5	0.0	67.7	66	67.7	10	Snd Lvl	64.5	3.2	8	-4.8
Receiver3	3	5	0.0	69.1	66	69.1	10	Snd Lvl	63.7	5.4	8	-2.6
Receiver4	4	5	0.0	73.2	66	73.2	10	Snd Lvl	64.2	9.0	8	1.0
Receiver5	5	5	0.0	80.1	66	80.1	10	Snd Lvl	68.2	11.9	8	3.9
Receiver6	6	5	0.0	80.1	66	80.1	10	Snd Lvl	66.2	13.9	8	5.9
Receiver7	7	5	0.0	80.4	66	80.4	10	Snd Lvl	64.1	16.3	8	8.3
Receiver8	8	5	0.0	80.6	66	80.6	10	Snd Lvl	64.1	16.5	8	8.5
Receiver9	9	5	0.0	80.3	66	80.3	10	Snd Lvl	64.5	15.8	8	7.8
Receiver10	10	5	0.0	80.2	66	80.2	10	Snd Lvl	64.3	15.9	8	7.9
Receiver11	11	5	0.0	80.4	66	80.4	10	Snd Lvl	64.4	16.0	8	8.0
Receiver12	12	5	0.0	75.3	66	75.3	10	Snd Lvl	64.1	11.2	8	3.2
Receiver13	13	5	0.0	76.2	66	76.2	10	Snd Lvl	64.7	11.5	8	3.5
Receiver14	14	5	0.0	78.3	66	78.3	10	Snd Lvl	68.8	9.5	8	1.5
Receiver15	15	5	0.0	68.9	66	68.9	10	Snd Lvl	66.8	2.1	8	-5.9
Receiver16	16	5	0.0	65.6	66	65.6	10	----	64.1	1.5	8	-6.5
Receiver17	17	5	0.0	68.9	66	68.9	10	Snd Lvl	61.5	7.4	8	-0.6
Receiver18	18	5	0.0	63.7	66	63.7	10	----	57.7	6.0	8	-2.0
Receiver19	19	5	0.0	62.8	66	62.8	10	----	57.2	5.6	8	-2.4
Receiver20	20	5	0.0	68.1	66	68.1	10	Snd Lvl	60.8	7.3	8	-0.7
Receiver21	21	5	0.0	70.4	66	70.4	10	Snd Lvl	62.0	8.4	8	0.4
Receiver22	22	5	0.0	70.1	66	70.1	10	Snd Lvl	61.9	8.2	8	0.2
Receiver23	23	5	0.0	70.2	66	70.2	10	Snd Lvl	62.6	7.6	8	-0.4

Receiver24	24	5	0.0	71.8	66	71.8	10	Snd Lvl	64.0	7.8	8	-0.2
Receiver25	25	5	0.0	68.3	66	68.3	10	Snd Lvl	62.3	6.0	8	-2.0
Receiver26	26	5	0.0	66.7	66	66.7	10	Snd Lvl	61.8	4.9	8	-3.1
Receiver27	27	5	0.0	65.9	66	65.9	10	----	62.4	3.5	8	-4.5

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	135	1.5	8.7	16.5
All Impacted	115	2.1	9.5	16.5
All that meet NR Goal	65	8.2	12.6	16.5

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA H
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
Receiver1	1	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver2	2	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver3	3	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver4	4	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver5	5	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver6	6	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver7	7	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver8	8	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver9	9	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver10	10	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver11	11	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver12	12	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver13	13	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver14	14	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver15	15	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver16	16	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver17	17	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver18	18	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver19	19	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver20	20	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver21	21	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver22	22	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver23	23	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0

Receiver24	24	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver25	25	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver26	26	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver27	27	5	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver33	33	1	0.0	72.5	66	72.5	10	Snd Lvl	64.6	7.9	8	-0.1
Receiver34	34	1	0.0	64.2	66	64.2	10	----	60.4	3.8	8	-4.2
Receiver35	35	1	0.0	60.4	66	60.4	10	----	57.4	3.0	8	-5.0
Receiver37	37	1	0.0	69.3	66	69.3	10	Snd Lvl	60.3	9.0	8	1.0
Receiver38	38	1	0.0	58.0	66	58.0	10	----	54.9	3.1	8	-4.9
Receiver39	39	1	0.0	61.8	66	61.8	10	----	56.3	5.5	8	-2.5
Receiver41	41	1	0.0	55.5	66	55.5	10	----	51.5	4.0	8	-4.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	142	0.0	1.1	9.0
All Impacted	2	7.9	8.5	9.0
All that meet NR Goal	1	9.0	9.0	9.0

Barrier Analysis

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Riverside 8

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	$
Riverside	W	8.00	8.00	8.00	898	7182				215461
									Total Cost:	215461

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Riverside 8
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
Riverside	1	1	0.0	64.2	66	64.2	10	----	63.8	0.4	8	-7.6
Receiver2	2	1	0.0	70.8	66	70.8	10	Snd Lvl	66.2	4.6	8	-3.4
Receiver3	3	1	0.0	63.7	66	63.7	10	----	63.4	0.3	8	-7.7
Receiver4	4	1	0.0	70.5	66	70.5	10	Snd Lvl	65.7	4.8	8	-3.2
Receiver5	5	1	0.0	62.8	66	62.8	10	----	63.0	-0.2	8	-8.2
Receiver6	6	1	0.0	67.3	66	67.3	10	Snd Lvl	65.1	2.2	8	-5.8
Receiver7	7	1	0.0	62.2	66	62.2	10	----	57.8	4.4	8	-3.6
Receiver8	8	1	0.0	66.0	66	66.0	10	Snd Lvl	61.2	4.8	8	-3.2
Receiver9	9	1	0.0	62.1	66	62.1	10	----	58.1	4.0	8	-4.0
Receiver10	10	1	0.0	66.0	66	66.0	10	Snd Lvl	61.8	4.2	8	-3.8
Receiver11	11	1	0.0	62.6	66	62.6	10	----	59.4	3.2	8	-4.8
Receiver12	12	1	0.0	66.7	66	66.7	10	Snd Lvl	64.0	2.7	8	-5.3
Receiver14	14	1	0.0	68.5	66	68.5	10	Snd Lvl	62.4	6.1	8	-1.9
Receiver15	15	1	0.0	70.2	66	70.2	10	Snd Lvl	65.6	4.6	8	-3.4
Receiver16	16	1	0.0	66.4	66	66.4	10	Snd Lvl	62.7	3.7	8	-4.3
Receiver17	17	1	0.0	69.6	66	69.6	10	Snd Lvl	66.4	3.2	8	-4.8
Receiver18	18	1	0.0	65.6	66	65.6	10	----	63.1	2.5	8	-5.5
Receiver19	19	1	0.0	69.7	66	69.7	10	Snd Lvl	65.7	4.0	8	-4.0
Receiver20	20	1	0.0	65.8	66	65.8	10	----	63.7	2.1	8	-5.9
Receiver21	21	1	0.0	68.1	66	68.1	10	Snd Lvl	65.0	3.1	8	-4.9
Receiver22	22	1	0.0	63.0	66	63.0	10	----	59.9	3.1	8	-4.9
Receiver23	23	1	0.0	66.0	66	66.0	10	Snd Lvl	61.7	4.3	8	-3.7
Receiver24	24	1	0.0	63.3	66	63.3	10	----	60.4	2.9	8	-5.1

Receiver25	25	1	0.0	66.9	66	66.9	10	Snd Lvl	62.8	4.1	8	-3.9
Receiver26	26	1	0.0	63.8	66	63.8	10	----	60.9	2.9	8	-5.1
Receiver27	27	1	0.0	67.1	66	67.1	10	Snd Lvl	63.7	3.4	8	-4.6
Receiver28	28	1	0.0	65.3	66	65.3	10	----	61.5	3.8	8	-4.2
Receiver29	29	1	0.0	68.4	66	68.4	10	Snd Lvl	64.6	3.8	8	-4.2
Receiver31	31	1	0.0	68.3	66	68.3	10	Snd Lvl	63.5	4.8	8	-3.2
Receiver32	32	1	0.0	72.7	66	72.7	10	Snd Lvl	67.2	5.5	8	-2.5
Receiver33	33	1	0.0	69.5	66	69.5	10	Snd Lvl	63.9	5.6	8	-2.4
Receiver34	34	1	0.0	72.5	66	72.5	10	Snd Lvl	68.4	4.1	8	-3.9
Receiver35	35	1	0.0	69.8	66	69.8	10	Snd Lvl	66.2	3.6	8	-4.4
Receiver36	36	1	0.0	71.6	66	71.6	10	Snd Lvl	67.7	3.9	8	-4.1
Receiver37	37	1	0.0	62.5	66	62.5	10	----	58.7	3.8	8	-4.2
Receiver38	38	1	0.0	65.4	66	65.4	10	----	61.5	3.9	8	-4.1
Receiver39	39	1	0.0	63.2	66	63.2	10	----	59.1	4.1	8	-3.9
Receiver40	40	1	0.0	66.0	66	66.0	10	Snd Lvl	62.1	3.9	8	-4.1
Receiver41	41	1	0.0	64.4	66	64.4	10	----	60.5	3.9	8	-4.1
Receiver42	42	1	0.0	69.5	66	69.5	10	Snd Lvl	65.6	3.9	8	-4.1
Receiver44	44	1	0.0	63.5	66	63.5	10	----	60.8	2.7	8	-5.3
Receiver45	45	1	0.0	66.8	66	66.8	10	Snd Lvl	62.5	4.3	8	-3.7
Receiver46	46	1	0.0	62.8	66	62.8	10	----	60.2	2.6	8	-5.4
Receiver47	47	1	0.0	65.7	66	65.7	10	----	61.8	3.9	8	-4.1
Receiver48	48	1	0.0	61.0	66	61.0	10	----	59.0	2.0	8	-6.0
Receiver49	49	1	0.0	62.8	66	62.8	10	----	60.1	2.7	8	-5.3
Receiver50	50	1	0.0	60.5	66	60.5	10	----	57.9	2.6	8	-5.4
Riverside 2nd	51	1	0.0	63.7	66	63.7	10	----	59.7	4.0	8	-4.0
pool	53	1	0.0	63.6	66	63.6	10	----	61.0	2.6	8	-5.4

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	49	-0.2	3.5	6.1
All Impacted	25	2.2	4.1	6.1
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Riverside 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	$
Riverside	W	14.00	14.00	14.00	898	12569				377057
									Total Cost:	377057

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Riverside 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
Riverside	1	1	0.0	64.2	66	64.2	10	----	62.5	1.7	8	-6.3
Receiver2	2	1	0.0	70.8	66	70.8	10	Snd Lvl	64.4	6.4	8	-1.6
Receiver3	3	1	0.0	63.7	66	63.7	10	----	61.9	1.8	8	-6.2
Receiver4	4	1	0.0	70.5	66	70.5	10	Snd Lvl	63.8	6.7	8	-1.3
Receiver5	5	1	0.0	62.8	66	62.8	10	----	61.4	1.4	8	-6.6
Receiver6	6	1	0.0	67.3	66	67.3	10	Snd Lvl	63.3	4.0	8	-4.0
Receiver7	7	1	0.0	62.2	66	62.2	10	----	55.7	6.5	8	-1.5
Receiver8	8	1	0.0	66.0	66	66.0	10	Snd Lvl	58.8	7.2	8	-0.8
Receiver9	9	1	0.0	62.1	66	62.1	10	----	56.2	5.9	8	-2.1
Receiver10	10	1	0.0	66.0	66	66.0	10	Snd Lvl	59.7	6.3	8	-1.7
Receiver11	11	1	0.0	62.6	66	62.6	10	----	58.1	4.5	8	-3.5
Receiver12	12	1	0.0	66.7	66	66.7	10	Snd Lvl	63.0	3.7	8	-4.3
Receiver14	14	1	0.0	68.5	66	68.5	10	Snd Lvl	59.9	8.6	8	0.6
Receiver15	15	1	0.0	70.2	66	70.2	10	Snd Lvl	61.5	8.7	8	0.7
Receiver16	16	1	0.0	66.4	66	66.4	10	Snd Lvl	59.2	7.2	8	-0.8
Receiver17	17	1	0.0	69.6	66	69.6	10	Snd Lvl	63.8	5.8	8	-2.2
Receiver18	18	1	0.0	65.6	66	65.6	10	----	61.4	4.2	8	-3.8
Receiver19	19	1	0.0	69.7	66	69.7	10	Snd Lvl	63.7	6.0	8	-2.0
Receiver20	20	1	0.0	65.8	66	65.8	10	----	61.6	4.2	8	-3.8
Receiver21	21	1	0.0	68.1	66	68.1	10	Snd Lvl	63.5	4.6	8	-3.4
Receiver22	22	1	0.0	63.0	66	63.0	10	----	57.0	6.0	8	-2.0
Receiver23	23	1	0.0	66.0	66	66.0	10	Snd Lvl	59.4	6.6	8	-1.4
Receiver24	24	1	0.0	63.3	66	63.3	10	----	56.8	6.5	8	-1.5

Receiver25	25	1	0.0	66.9	66	66.9	10	Snd Lvl	60.1	6.8	8	-1.2
Receiver26	26	1	0.0	63.8	66	63.8	10	----	57.2	6.6	8	-1.4
Receiver27	27	1	0.0	67.1	66	67.1	10	Snd Lvl	60.1	7.0	8	-1.0
Receiver28	28	1	0.0	65.3	66	65.3	10	----	57.3	8.0	8	0.0
Receiver29	29	1	0.0	68.4	66	68.4	10	Snd Lvl	60.0	8.4	8	0.4
Receiver31	31	1	0.0	68.3	66	68.3	10	Snd Lvl	61.3	7.0	8	-1.0
Receiver32	32	1	0.0	72.7	66	72.7	10	Snd Lvl	63.8	8.9	8	0.9
Receiver33	33	1	0.0	69.5	66	69.5	10	Snd Lvl	61.2	8.3	8	0.3
Receiver34	34	1	0.0	72.5	66	72.5	10	Snd Lvl	63.8	8.7	8	0.7
Receiver35	35	1	0.0	69.8	66	69.8	10	Snd Lvl	61.0	8.8	8	0.8
Receiver36	36	1	0.0	71.6	66	71.6	10	Snd Lvl	63.3	8.3	8	0.3
Receiver37	37	1	0.0	62.5	66	62.5	10	----	55.4	7.1	8	-0.9
Receiver38	38	1	0.0	65.4	66	65.4	10	----	58.2	7.2	8	-0.8
Receiver39	39	1	0.0	63.2	66	63.2	10	----	55.7	7.5	8	-0.5
Receiver40	40	1	0.0	66.0	66	66.0	10	Snd Lvl	58.3	7.7	8	-0.3
Receiver41	41	1	0.0	64.4	66	64.4	10	----	56.5	7.9	8	-0.1
Receiver42	42	1	0.0	69.5	66	69.5	10	Snd Lvl	60.8	8.7	8	0.7
Receiver44	44	1	0.0	63.5	66	63.5	10	----	56.9	6.6	8	-1.4
Receiver45	45	1	0.0	66.8	66	66.8	10	Snd Lvl	59.4	7.4	8	-0.6
Receiver46	46	1	0.0	62.8	66	62.8	10	----	56.8	6.0	8	-2.0
Receiver47	47	1	0.0	65.7	66	65.7	10	----	59.4	6.3	8	-1.7
Receiver48	48	1	0.0	61.0	66	61.0	10	----	57.7	3.3	8	-4.7
Receiver49	49	1	0.0	62.8	66	62.8	10	----	58.7	4.1	8	-3.9
Receiver50	50	1	0.0	60.5	66	60.5	10	----	55.4	5.1	8	-2.9
Riverside 2nd	51	1	0.0	63.7	66	63.7	10	----	57.3	6.4	8	-1.6
pool	53	1	0.0	63.6	66	63.6	10	----	57.4	6.2	8	-1.8

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	49	1.4	6.3	8.9
All Impacted	25	3.7	7.1	8.9
All that meet NR Goal	10	8.0	8.5	8.9

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Cardinal Dr 8

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	$
Cardinal Drive	W	8.00	8.00	8.00	1594	12754				382611
									Total Cost:	382611

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Cardinal Dr 8

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
Receiver62	62	1	0.0	67.3	66	67.3	10	Snd Lvl	65.8	1.5	8	-6.5
Receiver63	63	1	0.0	66.7	66	66.7	10	Snd Lvl	65.4	1.3	8	-6.7
Receiver65	65	1	0.0	65.9	66	65.9	10	----	64.9	1.0	8	-7.0
Receiver66	66	1	0.0	66.3	66	66.3	10	Snd Lvl	63.7	2.6	8	-5.4
Receiver67	67	1	0.0	64.6	66	64.6	10	----	62.5	2.1	8	-5.9
Receiver68	68	1	0.0	64.1	66	64.1	10	----	62.3	1.8	8	-6.2
Receiver69	69	1	0.0	63.4	66	63.4	10	----	62.0	1.4	8	-6.6
Receiver70	70	1	0.0	62.5	66	62.5	10	----	60.8	1.7	8	-6.3
Receiver71	71	1	0.0	63.1	66	63.1	10	----	61.2	1.9	8	-6.1
Receiver72	72	1	0.0	63.7	66	63.7	10	----	61.5	2.2	8	-5.8
Receiver73	73	1	0.0	65.5	66	65.5	10	----	62.7	2.8	8	-5.2
Receiver74	74	1	0.0	68.2	66	68.2	10	Snd Lvl	64.8	3.4	8	-4.6
Receiver76	76	1	0.0	67.2	66	67.2	10	Snd Lvl	64.1	3.1	8	-4.9
Receiver77	77	1	0.0	65.9	66	65.9	10	----	63.5	2.4	8	-5.6
Receiver78	78	1	0.0	63.8	66	63.8	10	----	61.2	2.6	8	-5.4
Receiver79	79	1	0.0	65.5	66	65.5	10	----	62.6	2.9	8	-5.1
Receiver80	80	1	0.0	72.8	66	72.8	10	Snd Lvl	67.8	5.0	8	-3.0
Receiver81	81	1	0.0	74.4	66	74.4	10	Snd Lvl	68.6	5.8	8	-2.2
Receiver82	82	1	0.0	75.7	66	75.7	10	Snd Lvl	69.1	6.6	8	-1.4
Receiver83	83	1	0.0	72.5	66	72.5	10	Snd Lvl	67.8	4.7	8	-3.3
Bill Frederick	55	1	0.0	71.4	66	71.4	10	Snd Lvl	67.6	3.8	8	-4.2
Receiver84	84	1	0.0	64.3	66	64.3	10	----	61.6	2.7	8	-5.3
Bill Frederick 6	85	1	0.0	66.1	66	66.1	10	Snd Lvl	64.0	2.1	8	-5.9

Bill Frederick 5	86	1	0.0	62.4	66	62.4	10	----	60.2	2.2	8	-5.8
Bill Frederick 4	87	1	0.0	61.9	66	61.9	10	----	60.3	1.6	8	-6.4
Bill Frederick 3	88	1	0.0	63.8	66	63.8	10	----	62.3	1.5	8	-6.5
Bill Frederick 2	89	1	0.0	61.2	66	61.2	10	----	60.0	1.2	8	-6.8
Bill Frederick 1	91	1	0.0	62.9	66	62.9	10	----	62.0	0.9	8	-7.1
Receiver93	93	1	0.0	63.7	66	63.7	10	----	63.5	0.2	8	-7.8

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	29	0.2	2.5	6.6
All Impacted	11	1.3	3.6	6.6
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Cardinal Dr 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	$
Cardinal Drive	W	14.00	14.00	14.00	1594	22319				669569
									Total Cost:	669569

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: I-4 PD&E Segment 4 NSA A
BARRIER DESIGN: Cardinal Dr 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
Receiver62	62	1	0.0	67.3	66	67.3	10	Snd Lvl	65.5	1.8	8	-6.2
Receiver63	63	1	0.0	66.7	66	66.7	10	Snd Lvl	65.2	1.5	8	-6.5
Receiver65	65	1	0.0	65.9	66	65.9	10	----	64.8	1.1	8	-6.9
Receiver66	66	1	0.0	66.3	66	66.3	10	Snd Lvl	62.7	3.6	8	-4.4
Receiver67	67	1	0.0	64.6	66	64.6	10	----	62.1	2.5	8	-5.5
Receiver68	68	1	0.0	64.1	66	64.1	10	----	62.0	2.1	8	-5.9
Receiver69	69	1	0.0	63.4	66	63.4	10	----	61.8	1.6	8	-6.4
Receiver70	70	1	0.0	62.5	66	62.5	10	----	60.5	2.0	8	-6.0
Receiver71	71	1	0.0	63.1	66	63.1	10	----	60.7	2.4	8	-5.6
Receiver72	72	1	0.0	63.7	66	63.7	10	----	60.9	2.8	8	-5.2
Receiver73	73	1	0.0	65.5	66	65.5	10	----	61.6	3.9	8	-4.1
Receiver74	74	1	0.0	68.2	66	68.2	10	Snd Lvl	62.9	5.3	8	-2.7
Receiver76	76	1	0.0	67.2	66	67.2	10	Snd Lvl	61.9	5.3	8	-2.7
Receiver77	77	1	0.0	65.9	66	65.9	10	----	61.9	4.0	8	-4.0
Receiver78	78	1	0.0	63.8	66	63.8	10	----	59.9	3.9	8	-4.1
Receiver79	79	1	0.0	65.5	66	65.5	10	----	61.1	4.4	8	-3.6
Receiver80	80	1	0.0	72.8	66	72.8	10	Snd Lvl	64.3	8.5	8	0.5
Receiver81	81	1	0.0	74.4	66	74.4	10	Snd Lvl	64.6	9.8	8	1.8
Receiver82	82	1	0.0	75.7	66	75.7	10	Snd Lvl	64.8	10.9	8	2.9
Receiver83	83	1	0.0	72.5	66	72.5	10	Snd Lvl	64.8	7.7	8	-0.3
Bill Frederick	55	1	0.0	71.4	66	71.4	10	Snd Lvl	65.1	6.3	8	-1.7
Receiver84	84	1	0.0	64.3	66	64.3	10	----	60.2	4.1	8	-3.9
Bill Frederick 6	85	1	0.0	66.1	66	66.1	10	Snd Lvl	62.4	3.7	8	-4.3

Bill Frederick 5	86	1	0.0	62.4	66	62.4	10	----	59.4	3.0	8	-5.0
Bill Frederick 4	87	1	0.0	61.9	66	61.9	10	----	59.6	2.3	8	-5.7
Bill Frederick 3	88	1	0.0	63.8	66	63.8	10	----	61.8	2.0	8	-6.0
Bill Frederick 2	89	1	0.0	61.2	66	61.2	10	----	59.7	1.5	8	-6.5
Bill Frederick 1	91	1	0.0	62.9	66	62.9	10	----	61.7	1.2	8	-6.8
Receiver93	93	1	0.0	63.7	66	63.7	10	----	63.4	0.3	8	-7.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	29	0.3	3.8	10.9
All Impacted	11	1.5	5.9	10.9
All that meet NR Goal	3	8.5	9.7	10.9

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I - 4 PD&E NSA B
BARRIER DESIGN: NSA B 8

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	8.00	8.00	8.00	994	7953				238581
									Total Cost:	238581

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I - 4 PD&E NSA B
BARRIER DESIGN: NSA B 8

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
Receiver15	15	1	0.0	73.0	66	73.0	10	Snd Lvl	68.7	4.3	8	-3.7
Receiver16	16	1	0.0	75.9	66	75.9	10	Snd Lvl	69.7	6.2	8	-1.8
Receiver17	17	1	0.0	76.8	66	76.8	10	Snd Lvl	70.1	6.7	8	-1.3
Receiver18	18	1	0.0	76.0	66	76.0	10	Snd Lvl	69.5	6.5	8	-1.5
Receiver19	19	1	0.0	75.8	66	75.8	10	Snd Lvl	69.6	6.2	8	-1.8
Receiver20	20	1	0.0	71.9	66	71.9	10	Snd Lvl	67.7	4.2	8	-3.8
Receiver21	21	1	0.0	67.8	66	67.8	10	Snd Lvl	64.9	2.9	8	-5.1
Receiver22	22	1	0.0	67.5	66	67.5	10	Snd Lvl	64.5	3.0	8	-5.0
Receiver37	37	1	0.0	60.5	66	60.5	10	----	59.7	0.8	8	-7.2
Receiver38	38	1	0.0	60.5	66	60.5	10	----	59.7	0.8	8	-7.2

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.8	4.2	6.7
All Impacted	8	2.9	5.0	6.7
All that meet NR Goal	0	0.0	0.0	0.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I - 4 PD&E NSA B
BARRIER DESIGN: NSA B 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	994	13917				417517
									Total Cost:	417517

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU PD&E
RUN: I - 4 PD&E NSA B
BARRIER DESIGN: NSA B 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
Receiver15	15	1	0.0	73.0	66	73.0	10	Snd Lvl	66.8	6.2	8	-1.8
Receiver16	16	1	0.0	75.9	66	75.9	10	Snd Lvl	66.5	9.4	8	1.4
Receiver17	17	1	0.0	76.8	66	76.8	10	Snd Lvl	66.1	10.7	8	2.7
Receiver18	18	1	0.0	76.0	66	76.0	10	Snd Lvl	65.8	10.2	8	2.2
Receiver19	19	1	0.0	75.8	66	75.8	10	Snd Lvl	66.2	9.6	8	1.6
Receiver20	20	1	0.0	71.9	66	71.9	10	Snd Lvl	65.6	6.3	8	-1.7
Receiver21	21	1	0.0	67.8	66	67.8	10	Snd Lvl	63.4	4.4	8	-3.6
Receiver22	22	1	0.0	67.5	66	67.5	10	Snd Lvl	63.2	4.3	8	-3.7
Receiver37	37	1	0.0	60.5	66	60.5	10	----	58.6	1.9	8	-6.1
Receiver38	38	1	0.0	60.5	66	60.5	10	----	58.6	1.9	8	-6.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	1.9	6.5	10.7
All Impacted	8	4.3	7.6	10.7
All that meet NR Goal	4	9.4	10.0	10.7

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C new 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	$
Existing 2	W	14.00	14.00	14.00	1266	17725				531754
									Total Cost:	531754

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C new 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
Receiver123	123	1	0.0	75.2	66	75.2	10	Snd Lvl	65.2	10.0	8	2.0
Receiver124	124	1	0.0	69.6	66	69.6	10	Snd Lvl	62.8	6.8	8	-1.2
Receiver125	125	1	0.0	66.3	66	66.3	10	Snd Lvl	61.5	4.8	8	-3.2
Receiver126	126	1	0.0	64.7	66	64.7	10	----	60.5	4.2	8	-3.8
Receiver127	127	1	0.0	63.5	66	63.5	10	----	59.4	4.1	8	-3.9
Receiver128	128	1	0.0	62.2	66	62.2	10	----	58.7	3.5	8	-4.5
Receiver129	129	1	0.0	69.3	66	69.3	10	Snd Lvl	63.2	6.1	8	-1.9
Receiver130	130	1	0.0	67.7	66	67.7	10	Snd Lvl	62.9	4.8	8	-3.2
Receiver131	131	1	0.0	68.3	66	68.3	10	Snd Lvl	63.3	5.0	8	-3.0
Receiver132	132	1	0.0	67.5	66	67.5	10	Snd Lvl	63.2	4.3	8	-3.7
Receiver133	133	1	0.0	67.5	66	67.5	10	Snd Lvl	63.4	4.1	8	-3.9
Receiver134	134	1	0.0	66.7	66	66.7	10	Snd Lvl	62.9	3.8	8	-4.2
Receiver135	135	1	0.0	66.1	66	66.1	10	Snd Lvl	62.7	3.4	8	-4.6
Receiver136	136	1	0.0	65.3	66	65.3	10	----	62.3	3.0	8	-5.0
Receiver137	137	1	0.0	64.3	66	64.3	10	----	61.6	2.7	8	-5.3
Receiver138	138	1	0.0	63.5	66	63.5	10	----	61.1	2.4	8	-5.6
Receiver139	139	1	0.0	63.0	66	63.0	10	----	61.2	1.8	8	-6.2
Receiver140	140	1	0.0	66.5	66	66.5	10	Snd Lvl	61.9	4.6	8	-3.4
Receiver141	141	1	0.0	65.7	66	65.7	10	----	61.9	3.8	8	-4.2
Receiver142	142	1	0.0	64.5	66	64.5	10	----	61.6	2.9	8	-5.1
Receiver143	143	1	0.0	64.5	66	64.5	10	----	61.7	2.8	8	-5.2
Receiver144	144	1	0.0	63.5	66	63.5	10	----	61.3	2.2	8	-5.8
Receiver145	145	1	0.0	63.6	66	63.6	10	----	61.1	2.5	8	-5.5

Receiver146	146	1	0.0	63.1	66	63.1	10	----	60.9	2.2	8	-5.8
Receiver147	147	1	0.0	62.3	66	62.3	10	----	60.3	2.0	8	-6.0
Receiver148	148	1	0.0	61.6	66	61.6	10	----	60.0	1.6	8	-6.4
Receiver149	149	1	0.0	77.3	66	77.3	10	Snd Lvl	69.9	7.4	8	-0.6
Receiver150	150	1	0.0	75.1	66	75.1	10	Snd Lvl	68.8	6.3	8	-1.7
Receiver151	151	1	0.0	73.4	66	73.4	10	Snd Lvl	68.0	5.4	8	-2.6
Receiver152	152	1	0.0	72.1	66	72.1	10	Snd Lvl	67.3	4.8	8	-3.2
Receiver153	153	1	0.0	70.9	66	70.9	10	Snd Lvl	66.6	4.3	8	-3.7
Receiver154	154	1	0.0	69.9	66	69.9	10	Snd Lvl	66.0	3.9	8	-4.1
Receiver155	155	1	0.0	68.5	66	68.5	10	Snd Lvl	66.0	2.5	8	-5.5
Receiver156	156	1	0.0	72.1	66	72.1	10	Snd Lvl	67.2	4.9	8	-3.1
Receiver157	157	1	0.0	74.6	66	74.6	10	Snd Lvl	69.4	5.2	8	-2.8
Receiver158	158	1	0.0	77.7	66	77.7	10	Snd Lvl	73.2	4.5	8	-3.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	36	1.6	4.1	10.0
All Impacted	21	2.5	5.1	10.0
All that meet NR Goal	1	10.0	10.0	10.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C new 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	$
Existing 2	W	16.00	16.00	16.00	1266	20257				607719
									Total Cost:	607719

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C new 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
Receiver123	123	1	0.0	75.2	66	75.2	10	Snd Lvl	63.6	11.6	8	3.6
Receiver124	124	1	0.0	69.6	66	69.6	10	Snd Lvl	61.2	8.4	8	0.4
Receiver125	125	1	0.0	66.3	66	66.3	10	Snd Lvl	60.1	6.2	8	-1.8
Receiver126	126	1	0.0	64.7	66	64.7	10	----	59.2	5.5	8	-2.5
Receiver127	127	1	0.0	63.5	66	63.5	10	----	58.4	5.1	8	-2.9
Receiver128	128	1	0.0	62.2	66	62.2	10	----	57.7	4.5	8	-3.5
Receiver129	129	1	0.0	69.3	66	69.3	10	Snd Lvl	61.4	7.9	8	-0.1
Receiver130	130	1	0.0	67.7	66	67.7	10	Snd Lvl	61.0	6.7	8	-1.3
Receiver131	131	1	0.0	68.3	66	68.3	10	Snd Lvl	61.4	6.9	8	-1.1
Receiver132	132	1	0.0	67.5	66	67.5	10	Snd Lvl	61.3	6.2	8	-1.8
Receiver133	133	1	0.0	67.5	66	67.5	10	Snd Lvl	61.3	6.2	8	-1.8
Receiver134	134	1	0.0	66.7	66	66.7	10	Snd Lvl	60.9	5.8	8	-2.2
Receiver135	135	1	0.0	66.1	66	66.1	10	Snd Lvl	60.7	5.4	8	-2.6
Receiver136	136	1	0.0	65.3	66	65.3	10	----	60.2	5.1	8	-2.9
Receiver137	137	1	0.0	64.3	66	64.3	10	----	59.6	4.7	8	-3.3
Receiver138	138	1	0.0	63.5	66	63.5	10	----	59.4	4.1	8	-3.9
Receiver139	139	1	0.0	63.0	66	63.0	10	----	59.8	3.2	8	-4.8
Receiver140	140	1	0.0	66.5	66	66.5	10	Snd Lvl	60.2	6.3	8	-1.7
Receiver141	141	1	0.0	65.7	66	65.7	10	----	60.1	5.6	8	-2.4
Receiver142	142	1	0.0	64.5	66	64.5	10	----	59.8	4.7	8	-3.3
Receiver143	143	1	0.0	64.5	66	64.5	10	----	59.9	4.6	8	-3.4
Receiver144	144	1	0.0	63.5	66	63.5	10	----	59.7	3.8	8	-4.2
Receiver145	145	1	0.0	63.6	66	63.6	10	----	59.4	4.2	8	-3.8

Receiver146	146	1	0.0	63.1	66	63.1	10	----	59.5	3.6	8	-4.4
Receiver147	147	1	0.0	62.3	66	62.3	10	----	59.2	3.1	8	-4.9
Receiver148	148	1	0.0	61.6	66	61.6	10	----	59.0	2.6	8	-5.4
Receiver149	149	1	0.0	77.3	66	77.3	10	Snd Lvl	66.2	11.1	8	3.1
Receiver150	150	1	0.0	75.1	66	75.1	10	Snd Lvl	65.7	9.4	8	1.4
Receiver151	151	1	0.0	73.4	66	73.4	10	Snd Lvl	65.2	8.2	8	0.2
Receiver152	152	1	0.0	72.1	66	72.1	10	Snd Lvl	64.7	7.4	8	-0.6
Receiver153	153	1	0.0	70.9	66	70.9	10	Snd Lvl	64.2	6.7	8	-1.3
Receiver154	154	1	0.0	69.9	66	69.9	10	Snd Lvl	63.7	6.2	8	-1.8
Receiver155	155	1	0.0	68.5	66	68.5	10	Snd Lvl	64.5	4.0	8	-4.0
Receiver156	156	1	0.0	72.1	66	72.1	10	Snd Lvl	64.7	7.4	8	-0.6
Receiver157	157	1	0.0	74.6	66	74.6	10	Snd Lvl	66.4	8.2	8	0.2
Receiver158	158	1	0.0	77.7	66	77.7	10	Snd Lvl	69.0	8.7	8	0.7

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	36	2.6	6.1	11.6
All Impacted	21	4.0	7.4	11.6
All that meet NR Goal	7	8.2	9.4	11.6

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C new 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	$
Existing 2	W	18.00	18.00	18.00	1266	22789				683684
									Total Cost:	683684

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C new 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
Receiver123	123	1	0.0	75.2	66	75.2	10	Snd Lvl	63.6	11.6	8	3.6
Receiver124	124	1	0.0	69.6	66	69.6	10	Snd Lvl	61.2	8.4	8	0.4
Receiver125	125	1	0.0	66.3	66	66.3	10	Snd Lvl	60.1	6.2	8	-1.8
Receiver126	126	1	0.0	64.7	66	64.7	10	----	59.2	5.5	8	-2.5
Receiver127	127	1	0.0	63.5	66	63.5	10	----	58.4	5.1	8	-2.9
Receiver128	128	1	0.0	62.2	66	62.2	10	----	57.7	4.5	8	-3.5
Receiver129	129	1	0.0	69.3	66	69.3	10	Snd Lvl	61.4	7.9	8	-0.1
Receiver130	130	1	0.0	67.7	66	67.7	10	Snd Lvl	61.0	6.7	8	-1.3
Receiver131	131	1	0.0	68.3	66	68.3	10	Snd Lvl	61.4	6.9	8	-1.1
Receiver132	132	1	0.0	67.5	66	67.5	10	Snd Lvl	61.3	6.2	8	-1.8
Receiver133	133	1	0.0	67.5	66	67.5	10	Snd Lvl	61.3	6.2	8	-1.8
Receiver134	134	1	0.0	66.7	66	66.7	10	Snd Lvl	60.9	5.8	8	-2.2
Receiver135	135	1	0.0	66.1	66	66.1	10	Snd Lvl	60.7	5.4	8	-2.6
Receiver136	136	1	0.0	65.3	66	65.3	10	----	60.2	5.1	8	-2.9
Receiver137	137	1	0.0	64.3	66	64.3	10	----	59.6	4.7	8	-3.3
Receiver138	138	1	0.0	63.5	66	63.5	10	----	59.4	4.1	8	-3.9
Receiver139	139	1	0.0	63.0	66	63.0	10	----	59.8	3.2	8	-4.8
Receiver140	140	1	0.0	66.5	66	66.5	10	Snd Lvl	60.2	6.3	8	-1.7
Receiver141	141	1	0.0	65.7	66	65.7	10	----	60.1	5.6	8	-2.4
Receiver142	142	1	0.0	64.5	66	64.5	10	----	59.8	4.7	8	-3.3
Receiver143	143	1	0.0	64.5	66	64.5	10	----	59.9	4.6	8	-3.4
Receiver144	144	1	0.0	63.5	66	63.5	10	----	59.7	3.8	8	-4.2
Receiver145	145	1	0.0	63.6	66	63.6	10	----	59.4	4.2	8	-3.8

RESULTS: SOUND LEVELS

FDOT I-4 BtU

Receiver146	146	1	0.0	63.1	66	63.1	10	----	59.5	3.6	8	-4.4
Receiver147	147	1	0.0	62.3	66	62.3	10	----	59.2	3.1	8	-4.9
Receiver148	148	1	0.0	61.6	66	61.6	10	----	59.0	2.6	8	-5.4
Receiver149	149	1	0.0	77.3	66	77.3	10	Snd Lvl	66.2	11.1	8	3.1
Receiver150	150	1	0.0	75.1	66	75.1	10	Snd Lvl	65.7	9.4	8	1.4
Receiver151	151	1	0.0	73.4	66	73.4	10	Snd Lvl	65.2	8.2	8	0.2
Receiver152	152	1	0.0	72.1	66	72.1	10	Snd Lvl	64.7	7.4	8	-0.6
Receiver153	153	1	0.0	70.9	66	70.9	10	Snd Lvl	64.2	6.7	8	-1.3
Receiver154	154	1	0.0	69.9	66	69.9	10	Snd Lvl	63.7	6.2	8	-1.8
Receiver155	155	1	0.0	68.5	66	68.5	10	Snd Lvl	64.5	4.0	8	-4.0
Receiver156	156	1	0.0	72.1	66	72.1	10	Snd Lvl	64.7	7.4	8	-0.6
Receiver157	157	1	0.0	74.6	66	74.6	10	Snd Lvl	66.4	8.2	8	0.2
Receiver158	158	1	0.0	77.7	66	77.7	10	Snd Lvl	69.0	8.7	8	0.7

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	36	2.6	6.1	11.6
All Impacted	21	4.0	7.4	11.6
All that meet NR Goal	7	8.2	9.4	11.6

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: FDOT I-4 BtU
RUN: I-4 PD&E NSA C
BARRIER DESIGN: NSA C EX 18
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	66.8	66	66.8	10	Snd Lvl	65.4	1.4	8	-6.6
Receiver2	2	1	0.0	71.3	66	71.3	10	Snd Lvl	68.7	2.6	8	-5.4
Receiver3	3	1	0.0	75.1	66	75.1	10	Snd Lvl	69.2	5.9	8	-2.1
Receiver4	4	1	0.0	76.4	66	76.4	10	Snd Lvl	66.4	10.0	8	2.0
Receiver5	5	1	0.0	76.5	66	76.5	10	Snd Lvl	65.2	11.3	8	3.3
Receiver6	6	1	0.0	76.4	66	76.4	10	Snd Lvl	64.6	11.8	8	3.8
Receiver7	7	1	0.0	76.5	66	76.5	10	Snd Lvl	64.3	12.2	8	4.2
Receiver8	8	1	0.0	76.3	66	76.3	10	Snd Lvl	64.4	11.9	8	3.9
Receiver9	9	1	0.0	76.7	66	76.7	10	Snd Lvl	64.3	12.4	8	4.4
Receiver10	10	1	0.0	76.4	66	76.4	10	Snd Lvl	64.2	12.2	8	4.2
Receiver11	11	1	0.0	76.5	66	76.5	10	Snd Lvl	64.2	12.3	8	4.3
Receiver12	12	1	0.0	76.4	66	76.4	10	Snd Lvl	63.9	12.5	8	4.5
Receiver13	13	1	0.0	76.2	66	76.2	10	Snd Lvl	63.8	12.4	8	4.4
Receiver14	14	1	0.0	66.4	66	66.4	10	Snd Lvl	62.0	4.4	8	-3.6
Receiver15	15	1	0.0	66.6	66	66.6	10	Snd Lvl	61.8	4.8	8	-3.2
Receiver16	16	1	0.0	66.8	66	66.8	10	Snd Lvl	61.5	5.3	8	-2.7
Receiver17	17	1	0.0	66.7	66	66.7	10	Snd Lvl	60.9	5.8	8	-2.2
Receiver18	18	1	0.0	66.6	66	66.6	10	Snd Lvl	60.7	5.9	8	-2.1
Receiver19	19	1	0.0	66.4	66	66.4	10	Snd Lvl	60.3	6.1	8	-1.9
Receiver20	20	1	0.0	66.7	66	66.7	10	Snd Lvl	60.1	6.6	8	-1.4
Receiver21	21	1	0.0	66.6	66	66.6	10	Snd Lvl	59.9	6.7	8	-1.3
Receiver22	22	1	0.0	66.4	66	66.4	10	Snd Lvl	59.6	6.8	8	-1.2
Receiver23	23	1	0.0	66.1	66	66.1	10	Snd Lvl	59.4	6.7	8	-1.3

Receiver25	25	1	0.0	76.1	66	76.1	10	Snd Lvl	63.6	12.5	8	4.5
Receiver26	26	1	0.0	76.1	66	76.1	10	Snd Lvl	63.6	12.5	8	4.5
Receiver27	27	1	0.0	76.1	66	76.1	10	Snd Lvl	63.3	12.8	8	4.8
Receiver28	28	1	0.0	76.2	66	76.2	10	Snd Lvl	63.3	12.9	8	4.9
Receiver29	29	1	0.0	76.4	66	76.4	10	Snd Lvl	63.2	13.2	8	5.2
Receiver30	30	1	0.0	76.2	66	76.2	10	Snd Lvl	63.1	13.1	8	5.1
Receiver31	31	1	0.0	75.9	66	75.9	10	Snd Lvl	63.1	12.8	8	4.8
Receiver32	32	1	0.0	76.5	66	76.5	10	Snd Lvl	63.2	13.3	8	5.3
Receiver33	33	1	0.0	76.8	66	76.8	10	Snd Lvl	63.2	13.6	8	5.6
Receiver34	34	1	0.0	63.8	66	63.8	10	----	59.0	4.8	8	-3.2
Receiver35	35	1	0.0	62.8	66	62.8	10	----	58.9	3.9	8	-4.1
Receiver36	36	1	0.0	62.5	66	62.5	10	----	58.8	3.7	8	-4.3
Receiver37	37	1	0.0	61.7	66	61.7	10	----	57.8	3.9	8	-4.1
Receiver38	38	1	0.0	61.9	66	61.9	10	----	58.0	3.9	8	-4.1
Receiver39	39	1	0.0	62.5	66	62.5	10	----	59.2	3.3	8	-4.7
Receiver40	40	1	0.0	62.5	66	62.5	10	----	59.4	3.1	8	-4.9
Receiver41	41	1	0.0	61.9	66	61.9	10	----	58.7	3.2	8	-4.8
Receiver42	42	1	0.0	61.0	66	61.0	10	----	57.8	3.2	8	-4.8
Receiver43	43	1	0.0	61.2	66	61.2	10	----	58.0	3.2	8	-4.8
Receiver44	44	1	0.0	61.6	66	61.6	10	----	58.5	3.1	8	-4.9
Receiver45	45	1	0.0	77.9	66	77.9	10	Snd Lvl	63.4	14.5	8	6.5
Receiver46	46	1	0.0	76.5	66	76.5	10	Snd Lvl	63.1	13.4	8	5.4
Receiver47	47	1	0.0	76.6	66	76.6	10	Snd Lvl	63.1	13.5	8	5.5
Receiver48	48	1	0.0	76.0	66	76.0	10	Snd Lvl	63.0	13.0	8	5.0
Receiver49	49	1	0.0	75.9	66	75.9	10	Snd Lvl	62.9	13.0	8	5.0
Receiver50	50	1	0.0	75.9	66	75.9	10	Snd Lvl	62.9	13.0	8	5.0
Receiver51	51	1	0.0	76.6	66	76.6	10	Snd Lvl	63.1	13.5	8	5.5
Receiver52	52	1	0.0	77.0	66	77.0	10	Snd Lvl	63.1	13.9	8	5.9
Receiver53	53	1	0.0	76.2	66	76.2	10	Snd Lvl	62.9	13.3	8	5.3
Receiver54	54	1	0.0	76.3	66	76.3	10	Snd Lvl	62.9	13.4	8	5.4
Receiver55	55	1	0.0	76.5	66	76.5	10	Snd Lvl	62.9	13.6	8	5.6
Receiver56	56	1	0.0	76.5	66	76.5	10	Snd Lvl	63.1	13.4	8	5.4
Receiver57	57	1	0.0	76.8	66	76.8	10	Snd Lvl	63.4	13.4	8	5.4
Receiver58	58	1	0.0	76.6	66	76.6	10	Snd Lvl	63.3	13.3	8	5.3
Receiver59	59	1	0.0	76.6	66	76.6	10	Snd Lvl	63.4	13.2	8	5.2
Receiver60	60	1	0.0	77.0	66	77.0	10	Snd Lvl	63.7	13.3	8	5.3
Receiver61	61	1	0.0	77.1	66	77.1	10	Snd Lvl	63.9	13.2	8	5.2
Receiver62	62	1	0.0	76.9	66	76.9	10	Snd Lvl	63.8	13.1	8	5.1
Receiver63	63	1	0.0	61.6	66	61.6	10	----	58.6	3.0	8	-5.0
Receiver64	64	1	0.0	61.6	66	61.6	10	----	58.6	3.0	8	-5.0
Receiver65	65	1	0.0	61.5	66	61.5	10	----	58.6	2.9	8	-5.1

Receiver66	66	1	0.0	61.4	66	61.4	10	----	58.5	2.9	8	-5.1
Receiver67	67	1	0.0	61.4	66	61.4	10	----	58.5	2.9	8	-5.1
Receiver68	68	1	0.0	61.3	66	61.3	10	----	58.4	2.9	8	-5.1
Receiver69	69	1	0.0	61.2	66	61.2	10	----	58.3	2.9	8	-5.1
Receiver70	70	1	0.0	61.1	66	61.1	10	----	58.3	2.8	8	-5.2
Receiver71	71	1	0.0	61.0	66	61.0	10	----	58.2	2.8	8	-5.2
Receiver72	72	1	0.0	61.0	66	61.0	10	----	58.2	2.8	8	-5.2
Receiver73	73	1	0.0	63.7	66	63.7	10	----	58.7	5.0	8	-3.0
Receiver74	74	1	0.0	63.8	66	63.8	10	----	58.9	4.9	8	-3.1
Receiver75	75	1	0.0	64.2	66	64.2	10	----	58.7	5.5	8	-2.5
Receiver76	76	1	0.0	64.1	66	64.1	10	----	58.6	5.5	8	-2.5
Receiver77	77	1	0.0	64.3	66	64.3	10	----	58.7	5.6	8	-2.4
Receiver78	78	1	0.0	64.3	66	64.3	10	----	58.7	5.6	8	-2.4
Receiver79	79	1	0.0	63.9	66	63.9	10	----	58.5	5.4	8	-2.6
Receiver80	80	1	0.0	63.8	66	63.8	10	----	58.4	5.4	8	-2.6
Receiver81	81	1	0.0	63.8	66	63.8	10	----	58.6	5.2	8	-2.8
Receiver82	82	1	0.0	63.6	66	63.6	10	----	58.5	5.1	8	-2.9
Receiver83	83	1	0.0	63.7	66	63.7	10	----	58.6	5.1	8	-2.9
Receiver84	84	1	0.0	63.7	66	63.7	10	----	58.8	4.9	8	-3.1
Receiver85	85	1	0.0	63.5	66	63.5	10	----	58.9	4.6	8	-3.4
Receiver86	86	1	0.0	63.8	66	63.8	10	----	59.4	4.4	8	-3.6
Receiver87	87	1	0.0	77.0	66	77.0	10	Snd Lvl	63.8	13.2	8	5.2
Receiver88	88	1	0.0	77.2	66	77.2	10	Snd Lvl	63.8	13.4	8	5.4
Receiver89	89	1	0.0	78.1	66	78.1	10	Snd Lvl	64.1	14.0	8	6.0
Receiver90	90	1	0.0	77.9	66	77.9	10	Snd Lvl	64.1	13.8	8	5.8
Receiver91	91	1	0.0	77.2	66	77.2	10	Snd Lvl	63.7	13.5	8	5.5
Receiver92	92	1	0.0	77.4	66	77.4	10	Snd Lvl	63.9	13.5	8	5.5
Receiver93	93	1	0.0	76.8	66	76.8	10	Snd Lvl	63.5	13.3	8	5.3
Receiver94	94	1	0.0	76.1	66	76.1	10	Snd Lvl	63.4	12.7	8	4.7
Receiver95	95	1	0.0	76.8	66	76.8	10	Snd Lvl	63.6	13.2	8	5.2
Receiver96	96	1	0.0	76.5	66	76.5	10	Snd Lvl	63.6	12.9	8	4.9
Receiver97	97	1	0.0	76.4	66	76.4	10	Snd Lvl	63.7	12.7	8	4.7
Receiver98	98	1	0.0	76.7	66	76.7	10	Snd Lvl	64.2	12.5	8	4.5
Receiver99	99	1	0.0	76.8	66	76.8	10	Snd Lvl	64.5	12.3	8	4.3
Receiver100	100	1	0.0	77.2	66	77.2	10	Snd Lvl	65.1	12.1	8	4.1
Receiver101	101	1	0.0	64.2	66	64.2	10	----	60.0	4.2	8	-3.8
Receiver102	102	1	0.0	64.0	66	64.0	10	----	60.2	3.8	8	-4.2
Receiver103	103	1	0.0	77.4	66	77.4	10	Snd Lvl	65.8	11.6	8	3.6
Receiver104	104	1	0.0	73.0	66	73.0	10	Snd Lvl	67.3	5.7	8	-2.3
Receiver105	105	1	0.0	66.7	66	66.7	10	Snd Lvl	64.0	2.7	8	-5.3
Receiver106	106	1	0.0	64.6	66	64.6	10	----	62.8	1.8	8	-6.2

Receiver107	107	1	0.0	65.2	66	65.2	10	----	63.8	1.4	8	-6.6
Receiver108	108	1	0.0	65.3	66	65.3	10	----	64.4	0.9	8	-7.1
Receiver109	109	1	0.0	65.3	66	65.3	10	----	64.7	0.6	8	-7.4
Receiver110	110	1	0.0	65.1	66	65.1	10	----	64.7	0.4	8	-7.6

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	109	0.4	8.3	14.5
All Impacted	67	1.4	11.2	14.5
All that meet NR Goal	52	10.0	12.9	14.5

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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	$
NSA D	W	14.00	14.00	14.00	4819	67462				2023872
									Total Cost:	2023872

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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
Receiver1	1	1	0.0	71.1	66	71.1	10	Snd Lvl	65.1	6.0	8	-2.0
Receiver2	2	1	0.0	70.4	66	70.4	10	Snd Lvl	64.7	5.7	8	-2.3
Receiver3	3	1	0.0	66.2	66	66.2	10	Snd Lvl	62.9	3.3	8	-4.7
Receiver4	4	1	0.0	65.5	66	65.5	10	----	61.6	3.9	8	-4.1
Receiver5	5	1	0.0	64.0	66	64.0	10	----	61.2	2.8	8	-5.2
Receiver6	6	1	0.0	63.8	66	63.8	10	----	60.2	3.6	8	-4.4
Receiver7	7	1	0.0	73.4	66	73.4	10	Snd Lvl	66.9	6.5	8	-1.5
Receiver8	8	1	0.0	67.3	66	67.3	10	Snd Lvl	63.2	4.1	8	-3.9
Receiver9	9	1	0.0	65.3	66	65.3	10	----	61.4	3.9	8	-4.1
Receiver10	10	1	0.0	65.0	66	65.0	10	----	61.4	3.6	8	-4.4
Receiver11	11	1	0.0	67.4	66	67.4	10	Snd Lvl	63.6	3.8	8	-4.2
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	67.4	6.3	8	-1.7
Receiver13	13	1	0.0	73.1	66	73.1	10	Snd Lvl	67.1	6.0	8	-2.0
Receiver14	14	1	0.0	72.5	66	72.5	10	Snd Lvl	66.9	5.6	8	-2.4
Receiver15	15	1	0.0	66.8	66	66.8	10	Snd Lvl	63.1	3.7	8	-4.3
Receiver16	16	1	0.0	64.7	66	64.7	10	----	61.2	3.5	8	-4.5
Receiver17	17	1	0.0	64.7	66	64.7	10	----	61.4	3.3	8	-4.7
Receiver18	18	1	0.0	67.2	66	67.2	10	Snd Lvl	63.8	3.4	8	-4.6
Receiver19	19	1	0.0	72.3	66	72.3	10	Snd Lvl	67.0	5.3	8	-2.7
Receiver20	20	1	0.0	66.5	66	66.5	10	Snd Lvl	63.3	3.2	8	-4.8
Receiver21	21	1	0.0	64.4	66	64.4	10	----	61.2	3.2	8	-4.8
Receiver23	23	1	0.0	73.8	66	73.8	10	Snd Lvl	68.3	5.5	8	-2.5
Receiver24	24	1	0.0	68.5	66	68.5	10	Snd Lvl	65.0	3.5	8	-4.5

Receiver25	25	1	0.0	65.0	66	65.0	10	----	62.3	2.7	8	-5.3
Receiver26	26	1	0.0	63.4	66	63.4	10	----	60.4	3.0	8	-5.0
Receiver27	27	1	0.0	63.0	66	63.0	10	----	60.1	2.9	8	-5.1
Receiver28	28	1	0.0	64.8	66	64.8	10	----	62.0	2.8	8	-5.2
Receiver29	29	1	0.0	67.3	66	67.3	10	Snd Lvl	64.4	2.9	8	-5.1
Receiver30	30	1	0.0	71.2	66	71.2	10	Snd Lvl	66.9	4.3	8	-3.7
Receiver31	31	1	0.0	70.3	66	70.3	10	Snd Lvl	66.6	3.7	8	-4.3
Receiver32	32	1	0.0	66.0	66	66.0	10	Snd Lvl	63.5	2.5	8	-5.5
Receiver33	33	1	0.0	64.0	66	64.0	10	----	61.5	2.5	8	-5.5
Receiver34	34	1	0.0	63.6	66	63.6	10	----	61.1	2.5	8	-5.5
Receiver35	35	1	0.0	65.2	66	65.2	10	----	62.9	2.3	8	-5.7
Receiver36	36	1	0.0	68.7	66	68.7	10	Snd Lvl	65.8	2.9	8	-5.1
Receiver37	37	1	0.0	72.2	66	72.2	10	Snd Lvl	68.7	3.5	8	-4.5
Receiver38	38	1	0.0	66.3	66	66.3	10	Snd Lvl	64.6	1.7	8	-6.3
Receiver39	39	1	0.0	64.1	66	64.1	10	----	62.1	2.0	8	-6.0
Receiver40	40	1	0.0	62.6	66	62.6	10	----	60.4	2.2	8	-5.8
Receiver41	41	1	0.0	62.1	66	62.1	10	----	60.0	2.1	8	-5.9
Receiver42	42	1	0.0	63.6	66	63.6	10	----	61.6	2.0	8	-6.0
Receiver43	43	1	0.0	65.4	66	65.4	10	----	63.7	1.7	8	-6.3
Receiver44	44	1	0.0	68.8	66	68.8	10	Snd Lvl	66.8	2.0	8	-6.0
Receiver45	45	1	0.0	75.6	66	75.6	10	Snd Lvl	71.9	3.7	8	-4.3
Receiver46	46	1	0.0	74.3	66	74.3	10	Snd Lvl	71.4	2.9	8	-5.1
Receiver47	47	1	0.0	68.4	66	68.4	10	Snd Lvl	67.0	1.4	8	-6.6
Receiver48	48	1	0.0	65.2	66	65.2	10	----	63.9	1.3	8	-6.7
Receiver49	49	1	0.0	63.6	66	63.6	10	----	61.9	1.7	8	-6.3
Receiver50	50	1	0.0	63.8	66	63.8	10	----	62.4	1.4	8	-6.6
Receiver51	51	1	0.0	65.4	66	65.4	10	----	64.5	0.9	8	-7.1
Receiver52	52	1	0.0	69.0	66	69.0	10	Snd Lvl	67.5	1.5	8	-6.5
Receiver53	53	1	0.0	73.9	66	73.9	10	Snd Lvl	71.6	2.3	8	-5.7
Receiver54	54	1	0.0	73.7	66	73.7	10	Snd Lvl	72.0	1.7	8	-6.3
Receiver55	55	1	0.0	67.4	66	67.4	10	Snd Lvl	66.7	0.7	8	-7.3
Receiver56	56	1	0.0	65.1	66	65.1	10	----	64.3	0.8	8	-7.2
Receiver57	57	1	0.0	63.3	66	63.3	10	----	61.9	1.4	8	-6.6
Receiver58	58	1	0.0	62.5	66	62.5	10	----	60.9	1.6	8	-6.4
Receiver59	59	1	0.0	63.9	66	63.9	10	----	62.7	1.2	8	-6.8
Receiver60	60	1	0.0	65.8	66	65.8	10	----	65.3	0.5	8	-7.5
Receiver61	61	1	0.0	69.3	66	69.3	10	Snd Lvl	68.2	1.1	8	-6.9
Receiver62	62	1	0.0	71.8	66	71.8	10	Snd Lvl	70.0	1.8	8	-6.2
Receiver63	63	1	0.0	68.3	66	68.3	10	Snd Lvl	67.4	0.9	8	-7.1
Receiver64	64	1	0.0	64.9	66	64.9	10	----	63.8	1.1	8	-6.9
Receiver65	65	1	0.0	63.4	66	63.4	10	----	61.9	1.5	8	-6.5

Receiver66	66	1	0.0	61.8	66	61.8	10	----	59.8	2.0	8	-6.0
Receiver67	67	1	0.0	63.3	66	63.3	10	----	61.2	2.1	8	-5.9
Receiver68	68	1	0.0	64.9	66	64.9	10	----	62.9	2.0	8	-6.0
Receiver69	69	1	0.0	66.3	66	66.3	10	Snd Lvl	64.6	1.7	8	-6.3
Receiver70	70	1	0.0	70.8	66	70.8	10	Snd Lvl	68.1	2.7	8	-5.3
Receiver71	71	1	0.0	69.4	66	69.4	10	Snd Lvl	67.5	1.9	8	-6.1
Receiver72	72	1	0.0	73.4	66	73.4	10	Snd Lvl	70.5	2.9	8	-5.1
Receiver73	73	1	0.0	72.0	66	72.0	10	Snd Lvl	69.4	2.6	8	-5.4
Receiver74	74	1	0.0	72.6	66	72.6	10	Snd Lvl	70.2	2.4	8	-5.6
Receiver75	75	1	0.0	74.6	66	74.6	10	Snd Lvl	72.7	1.9	8	-6.1
Receiver76	76	1	0.0	71.3	66	71.3	10	Snd Lvl	67.5	3.8	8	-4.2
Receiver77	77	1	0.0	72.2	66	72.2	10	Snd Lvl	68.0	4.2	8	-3.8
Receiver78	78	1	0.0	68.5	66	68.5	10	Snd Lvl	64.9	3.6	8	-4.4

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	77	0.5	2.8	6.5
All Impacted	43	0.7	3.3	6.5
All that meet NR Goal	0	0.0	0.0	0.0

Stantec
M. Drauer

6 January 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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	$
NSA D	W	16.00	16.00	16.00	4819	77100				2312996
									Total Cost:	2312996

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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
Receiver1	1	1	0.0	71.1	66	71.1	10	Snd Lvl	64.4	6.7	8	-1.3
Receiver2	2	1	0.0	70.4	66	70.4	10	Snd Lvl	63.2	7.2	8	-0.8
Receiver3	3	1	0.0	66.2	66	66.2	10	Snd Lvl	62.6	3.6	8	-4.4
Receiver4	4	1	0.0	65.5	66	65.5	10	----	60.7	4.8	8	-3.2
Receiver5	5	1	0.0	64.0	66	64.0	10	----	60.9	3.1	8	-4.9
Receiver6	6	1	0.0	63.8	66	63.8	10	----	59.5	4.3	8	-3.7
Receiver7	7	1	0.0	73.4	66	73.4	10	Snd Lvl	64.6	8.8	8	0.8
Receiver8	8	1	0.0	67.3	66	67.3	10	Snd Lvl	61.8	5.5	8	-2.5
Receiver9	9	1	0.0	65.3	66	65.3	10	----	60.4	4.9	8	-3.1
Receiver10	10	1	0.0	65.0	66	65.0	10	----	60.3	4.7	8	-3.3
Receiver11	11	1	0.0	67.4	66	67.4	10	Snd Lvl	62.1	5.3	8	-2.7
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	65.0	8.7	8	0.7
Receiver13	13	1	0.0	73.1	66	73.1	10	Snd Lvl	65.0	8.1	8	0.1
Receiver14	14	1	0.0	72.5	66	72.5	10	Snd Lvl	65.7	6.8	8	-1.2
Receiver15	15	1	0.0	66.8	66	66.8	10	Snd Lvl	61.8	5.0	8	-3.0
Receiver16	16	1	0.0	64.7	66	64.7	10	----	60.2	4.5	8	-3.5
Receiver17	17	1	0.0	64.7	66	64.7	10	----	60.6	4.1	8	-3.9
Receiver18	18	1	0.0	67.2	66	67.2	10	Snd Lvl	62.8	4.4	8	-3.6
Receiver19	19	1	0.0	72.3	66	72.3	10	Snd Lvl	66.0	6.3	8	-1.7
Receiver20	20	1	0.0	66.5	66	66.5	10	Snd Lvl	62.5	4.0	8	-4.0
Receiver21	21	1	0.0	64.4	66	64.4	10	----	60.5	3.9	8	-4.1
Receiver23	23	1	0.0	73.8	66	73.8	10	Snd Lvl	67.3	6.5	8	-1.5
Receiver24	24	1	0.0	68.5	66	68.5	10	Snd Lvl	64.2	4.3	8	-3.7

Receiver25	25	1	0.0	65.0	66	65.0	10	----	61.6	3.4	8	-4.6
Receiver26	26	1	0.0	63.4	66	63.4	10	----	59.8	3.6	8	-4.4
Receiver27	27	1	0.0	63.0	66	63.0	10	----	59.6	3.4	8	-4.6
Receiver28	28	1	0.0	64.8	66	64.8	10	----	61.4	3.4	8	-4.6
Receiver29	29	1	0.0	67.3	66	67.3	10	Snd Lvl	63.6	3.7	8	-4.3
Receiver30	30	1	0.0	71.2	66	71.2	10	Snd Lvl	66.0	5.2	8	-2.8
Receiver31	31	1	0.0	70.3	66	70.3	10	Snd Lvl	65.6	4.7	8	-3.3
Receiver32	32	1	0.0	66.0	66	66.0	10	Snd Lvl	62.8	3.2	8	-4.8
Receiver33	33	1	0.0	64.0	66	64.0	10	----	60.9	3.1	8	-4.9
Receiver34	34	1	0.0	63.6	66	63.6	10	----	60.5	3.1	8	-4.9
Receiver35	35	1	0.0	65.2	66	65.2	10	----	62.2	3.0	8	-5.0
Receiver36	36	1	0.0	68.7	66	68.7	10	Snd Lvl	64.8	3.9	8	-4.1
Receiver37	37	1	0.0	72.2	66	72.2	10	Snd Lvl	67.1	5.1	8	-2.9
Receiver38	38	1	0.0	66.3	66	66.3	10	Snd Lvl	63.6	2.7	8	-5.3
Receiver39	39	1	0.0	64.1	66	64.1	10	----	61.4	2.7	8	-5.3
Receiver40	40	1	0.0	62.6	66	62.6	10	----	59.8	2.8	8	-5.2
Receiver41	41	1	0.0	62.1	66	62.1	10	----	59.4	2.7	8	-5.3
Receiver42	42	1	0.0	63.6	66	63.6	10	----	61.0	2.6	8	-5.4
Receiver43	43	1	0.0	65.4	66	65.4	10	----	62.8	2.6	8	-5.4
Receiver44	44	1	0.0	68.8	66	68.8	10	Snd Lvl	65.3	3.5	8	-4.5
Receiver45	45	1	0.0	75.6	66	75.6	10	Snd Lvl	70.0	5.6	8	-2.4
Receiver46	46	1	0.0	74.3	66	74.3	10	Snd Lvl	69.8	4.5	8	-3.5
Receiver47	47	1	0.0	68.4	66	68.4	10	Snd Lvl	65.4	3.0	8	-5.0
Receiver48	48	1	0.0	65.2	66	65.2	10	----	63.0	2.2	8	-5.8
Receiver49	49	1	0.0	63.6	66	63.6	10	----	61.2	2.4	8	-5.6
Receiver50	50	1	0.0	63.8	66	63.8	10	----	61.6	2.2	8	-5.8
Receiver51	51	1	0.0	65.4	66	65.4	10	----	63.4	2.0	8	-6.0
Receiver52	52	1	0.0	69.0	66	69.0	10	Snd Lvl	66.1	2.9	8	-5.1
Receiver53	53	1	0.0	73.9	66	73.9	10	Snd Lvl	70.1	3.8	8	-4.2
Receiver54	54	1	0.0	73.7	66	73.7	10	Snd Lvl	70.5	3.2	8	-4.8
Receiver55	55	1	0.0	67.4	66	67.4	10	Snd Lvl	65.4	2.0	8	-6.0
Receiver56	56	1	0.0	65.1	66	65.1	10	----	63.2	1.9	8	-6.1
Receiver57	57	1	0.0	63.3	66	63.3	10	----	61.2	2.1	8	-5.9
Receiver58	58	1	0.0	62.5	66	62.5	10	----	60.3	2.2	8	-5.8
Receiver59	59	1	0.0	63.9	66	63.9	10	----	61.9	2.0	8	-6.0
Receiver60	60	1	0.0	65.8	66	65.8	10	----	64.0	1.8	8	-6.2
Receiver61	61	1	0.0	69.3	66	69.3	10	Snd Lvl	67.3	2.0	8	-6.0
Receiver62	62	1	0.0	71.8	66	71.8	10	Snd Lvl	68.9	2.9	8	-5.1
Receiver63	63	1	0.0	68.3	66	68.3	10	Snd Lvl	66.1	2.2	8	-5.8
Receiver64	64	1	0.0	64.9	66	64.9	10	----	63.0	1.9	8	-6.1
Receiver65	65	1	0.0	63.4	66	63.4	10	----	61.3	2.1	8	-5.9

Receiver66	66	1	0.0	61.8	66	61.8	10	----	59.4	2.4	8	-5.6
Receiver67	67	1	0.0	63.3	66	63.3	10	----	60.7	2.6	8	-5.4
Receiver68	68	1	0.0	64.9	66	64.9	10	----	62.3	2.6	8	-5.4
Receiver69	69	1	0.0	66.3	66	66.3	10	Snd Lvl	63.8	2.5	8	-5.5
Receiver70	70	1	0.0	70.8	66	70.8	10	Snd Lvl	66.9	3.9	8	-4.1
Receiver71	71	1	0.0	69.4	66	69.4	10	Snd Lvl	66.2	3.2	8	-4.8
Receiver72	72	1	0.0	73.4	66	73.4	10	Snd Lvl	68.8	4.6	8	-3.4
Receiver73	73	1	0.0	72.0	66	72.0	10	Snd Lvl	67.8	4.2	8	-3.8
Receiver74	74	1	0.0	72.6	66	72.6	10	Snd Lvl	68.9	3.7	8	-4.3
Receiver75	75	1	0.0	74.6	66	74.6	10	Snd Lvl	70.9	3.7	8	-4.3
Receiver76	76	1	0.0	71.3	66	71.3	10	Snd Lvl	66.3	5.0	8	-3.0
Receiver77	77	1	0.0	72.2	66	72.2	10	Snd Lvl	66.6	5.6	8	-2.4
Receiver78	78	1	0.0	68.5	66	68.5	10	Snd Lvl	64.2	4.3	8	-3.7

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	77	1.8	3.9	8.8
All Impacted	43	2.0	4.6	8.8
All that meet NR Goal	3	8.1	8.5	8.8

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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	$
NSA D	W	18.00	18.00	18.00	4819	86737				2602121
									Total Cost:	2602121

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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
Receiver1	1	1	0.0	71.1	66	71.1	10	Snd Lvl	63.9	7.2	8	-0.8
Receiver2	2	1	0.0	70.4	66	70.4	10	Snd Lvl	62.4	8.0	8	0.0
Receiver3	3	1	0.0	66.2	66	66.2	10	Snd Lvl	62.3	3.9	8	-4.1
Receiver4	4	1	0.0	65.5	66	65.5	10	----	60.1	5.4	8	-2.6
Receiver5	5	1	0.0	64.0	66	64.0	10	----	60.7	3.3	8	-4.7
Receiver6	6	1	0.0	63.8	66	63.8	10	----	59.0	4.8	8	-3.2
Receiver7	7	1	0.0	73.4	66	73.4	10	Snd Lvl	63.6	9.8	8	1.8
Receiver8	8	1	0.0	67.3	66	67.3	10	Snd Lvl	61.0	6.3	8	-1.7
Receiver9	9	1	0.0	65.3	66	65.3	10	----	59.8	5.5	8	-2.5
Receiver10	10	1	0.0	65.0	66	65.0	10	----	59.4	5.6	8	-2.4
Receiver11	11	1	0.0	67.4	66	67.4	10	Snd Lvl	61.0	6.4	8	-1.6
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	63.7	10.0	8	2.0
Receiver13	13	1	0.0	73.1	66	73.1	10	Snd Lvl	63.4	9.7	8	1.7
Receiver14	14	1	0.0	72.5	66	72.5	10	Snd Lvl	63.4	9.1	8	1.1
Receiver15	15	1	0.0	66.8	66	66.8	10	Snd Lvl	60.6	6.2	8	-1.8
Receiver16	16	1	0.0	64.7	66	64.7	10	----	59.1	5.6	8	-2.4
Receiver17	17	1	0.0	64.7	66	64.7	10	----	59.3	5.4	8	-2.6
Receiver18	18	1	0.0	67.2	66	67.2	10	Snd Lvl	61.1	6.1	8	-1.9
Receiver19	19	1	0.0	72.3	66	72.3	10	Snd Lvl	63.6	8.7	8	0.7
Receiver20	20	1	0.0	66.5	66	66.5	10	Snd Lvl	60.8	5.7	8	-2.3
Receiver21	21	1	0.0	64.4	66	64.4	10	----	59.2	5.2	8	-2.8
Receiver23	23	1	0.0	73.8	66	73.8	10	Snd Lvl	64.8	9.0	8	1.0
Receiver24	24	1	0.0	68.5	66	68.5	10	Snd Lvl	62.6	5.9	8	-2.1

Receiver25	25	1	0.0	65.0	66	65.0	10	----	60.4	4.6	8	-3.4
Receiver26	26	1	0.0	63.4	66	63.4	10	----	58.8	4.6	8	-3.4
Receiver27	27	1	0.0	63.0	66	63.0	10	----	58.7	4.3	8	-3.7
Receiver28	28	1	0.0	64.8	66	64.8	10	----	60.3	4.5	8	-3.5
Receiver29	29	1	0.0	67.3	66	67.3	10	Snd Lvl	62.3	5.0	8	-3.0
Receiver30	30	1	0.0	71.2	66	71.2	10	Snd Lvl	64.5	6.7	8	-1.3
Receiver31	31	1	0.0	70.3	66	70.3	10	Snd Lvl	64.7	5.6	8	-2.4
Receiver32	32	1	0.0	66.0	66	66.0	10	Snd Lvl	61.9	4.1	8	-3.9
Receiver33	33	1	0.0	64.0	66	64.0	10	----	60.1	3.9	8	-4.1
Receiver34	34	1	0.0	63.6	66	63.6	10	----	59.9	3.7	8	-4.3
Receiver35	35	1	0.0	65.2	66	65.2	10	----	61.5	3.7	8	-4.3
Receiver36	36	1	0.0	68.7	66	68.7	10	Snd Lvl	64.0	4.7	8	-3.3
Receiver37	37	1	0.0	72.2	66	72.2	10	Snd Lvl	66.2	6.0	8	-2.0
Receiver38	38	1	0.0	66.3	66	66.3	10	Snd Lvl	62.9	3.4	8	-4.6
Receiver39	39	1	0.0	64.1	66	64.1	10	----	60.8	3.3	8	-4.7
Receiver40	40	1	0.0	62.6	66	62.6	10	----	59.3	3.3	8	-4.7
Receiver41	41	1	0.0	62.1	66	62.1	10	----	58.9	3.2	8	-4.8
Receiver42	42	1	0.0	63.6	66	63.6	10	----	60.4	3.2	8	-4.8
Receiver43	43	1	0.0	65.4	66	65.4	10	----	62.1	3.3	8	-4.7
Receiver44	44	1	0.0	68.8	66	68.8	10	Snd Lvl	64.4	4.4	8	-3.6
Receiver45	45	1	0.0	75.6	66	75.6	10	Snd Lvl	68.6	7.0	8	-1.0
Receiver46	46	1	0.0	74.3	66	74.3	10	Snd Lvl	68.1	6.2	8	-1.8
Receiver47	47	1	0.0	68.4	66	68.4	10	Snd Lvl	64.5	3.9	8	-4.1
Receiver48	48	1	0.0	65.2	66	65.2	10	----	62.2	3.0	8	-5.0
Receiver49	49	1	0.0	63.6	66	63.6	10	----	60.6	3.0	8	-5.0
Receiver50	50	1	0.0	63.8	66	63.8	10	----	60.9	2.9	8	-5.1
Receiver51	51	1	0.0	65.4	66	65.4	10	----	62.6	2.8	8	-5.2
Receiver52	52	1	0.0	69.0	66	69.0	10	Snd Lvl	65.0	4.0	8	-4.0
Receiver53	53	1	0.0	73.9	66	73.9	10	Snd Lvl	68.3	5.6	8	-2.4
Receiver54	54	1	0.0	73.7	66	73.7	10	Snd Lvl	68.6	5.1	8	-2.9
Receiver55	55	1	0.0	67.4	66	67.4	10	Snd Lvl	64.3	3.1	8	-4.9
Receiver56	56	1	0.0	65.1	66	65.1	10	----	62.4	2.7	8	-5.3
Receiver57	57	1	0.0	63.3	66	63.3	10	----	60.6	2.7	8	-5.3
Receiver58	58	1	0.0	62.5	66	62.5	10	----	59.8	2.7	8	-5.3
Receiver59	59	1	0.0	63.9	66	63.9	10	----	61.2	2.7	8	-5.3
Receiver60	60	1	0.0	65.8	66	65.8	10	----	63.1	2.7	8	-5.3
Receiver61	61	1	0.0	69.3	66	69.3	10	Snd Lvl	65.6	3.7	8	-4.3
Receiver62	62	1	0.0	71.8	66	71.8	10	Snd Lvl	67.1	4.7	8	-3.3
Receiver63	63	1	0.0	68.3	66	68.3	10	Snd Lvl	64.9	3.4	8	-4.6
Receiver64	64	1	0.0	64.9	66	64.9	10	----	62.2	2.7	8	-5.3
Receiver65	65	1	0.0	63.4	66	63.4	10	----	60.6	2.8	8	-5.2

Receiver66	66	1	0.0	61.8	66	61.8	10	----	58.9	2.9	8	-5.1
Receiver67	67	1	0.0	63.3	66	63.3	10	----	60.2	3.1	8	-4.9
Receiver68	68	1	0.0	64.9	66	64.9	10	----	61.6	3.3	8	-4.7
Receiver69	69	1	0.0	66.3	66	66.3	10	Snd Lvl	63.0	3.3	8	-4.7
Receiver70	70	1	0.0	70.8	66	70.8	10	Snd Lvl	65.7	5.1	8	-2.9
Receiver71	71	1	0.0	69.4	66	69.4	10	Snd Lvl	65.2	4.2	8	-3.8
Receiver72	72	1	0.0	73.4	66	73.4	10	Snd Lvl	67.6	5.8	8	-2.2
Receiver73	73	1	0.0	72.0	66	72.0	10	Snd Lvl	66.7	5.3	8	-2.7
Receiver74	74	1	0.0	72.6	66	72.6	10	Snd Lvl	67.4	5.2	8	-2.8
Receiver75	75	1	0.0	74.6	66	74.6	10	Snd Lvl	69.1	5.5	8	-2.5
Receiver76	76	1	0.0	71.3	66	71.3	10	Snd Lvl	65.0	6.3	8	-1.7
Receiver77	77	1	0.0	72.2	66	72.2	10	Snd Lvl	65.4	6.8	8	-1.2
Receiver78	78	1	0.0	68.5	66	68.5	10	Snd Lvl	63.6	4.9	8	-3.1

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	77	2.7	4.9	10.0
All Impacted	43	3.1	5.8	10.0
All that meet NR Goal	7	8.0	9.2	10.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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	$
NSA D	W	20.00	20.00	20.00	4819	96375				2891246
									Total Cost:	2891246

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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
Receiver1	1	1	0.0	71.1	66	71.1	10	Snd Lvl	63.5	7.6	8	-0.4
Receiver2	2	1	0.0	70.4	66	70.4	10	Snd Lvl	61.8	8.6	8	0.6
Receiver3	3	1	0.0	66.2	66	66.2	10	Snd Lvl	62.1	4.1	8	-3.9
Receiver4	4	1	0.0	65.5	66	65.5	10	----	59.8	5.7	8	-2.3
Receiver5	5	1	0.0	64.0	66	64.0	10	----	60.6	3.4	8	-4.6
Receiver6	6	1	0.0	63.8	66	63.8	10	----	58.8	5.0	8	-3.0
Receiver7	7	1	0.0	73.4	66	73.4	10	Snd Lvl	62.8	10.6	8	2.6
Receiver8	8	1	0.0	67.3	66	67.3	10	Snd Lvl	60.5	6.8	8	-1.2
Receiver9	9	1	0.0	65.3	66	65.3	10	----	59.4	5.9	8	-2.1
Receiver10	10	1	0.0	65.0	66	65.0	10	----	58.9	6.1	8	-1.9
Receiver11	11	1	0.0	67.4	66	67.4	10	Snd Lvl	60.3	7.1	8	-0.9
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	62.8	10.9	8	2.9
Receiver13	13	1	0.0	73.1	66	73.1	10	Snd Lvl	62.5	10.6	8	2.6
Receiver14	14	1	0.0	72.5	66	72.5	10	Snd Lvl	62.4	10.1	8	2.1
Receiver15	15	1	0.0	66.8	66	66.8	10	Snd Lvl	59.9	6.9	8	-1.1
Receiver16	16	1	0.0	64.7	66	64.7	10	----	58.6	6.1	8	-1.9
Receiver17	17	1	0.0	64.7	66	64.7	10	----	58.6	6.1	8	-1.9
Receiver18	18	1	0.0	67.2	66	67.2	10	Snd Lvl	60.2	7.0	8	-1.0
Receiver19	19	1	0.0	72.3	66	72.3	10	Snd Lvl	62.4	9.9	8	1.9
Receiver20	20	1	0.0	66.5	66	66.5	10	Snd Lvl	59.8	6.7	8	-1.3
Receiver21	21	1	0.0	64.4	66	64.4	10	----	58.4	6.0	8	-2.0
Receiver23	23	1	0.0	73.8	66	73.8	10	Snd Lvl	63.4	10.4	8	2.4
Receiver24	24	1	0.0	68.5	66	68.5	10	Snd Lvl	61.1	7.4	8	-0.6

Receiver25	25	1	0.0	65.0	66	65.0	10	----	59.2	5.8	8	-2.2
Receiver26	26	1	0.0	63.4	66	63.4	10	----	57.8	5.6	8	-2.4
Receiver27	27	1	0.0	63.0	66	63.0	10	----	57.6	5.4	8	-2.6
Receiver28	28	1	0.0	64.8	66	64.8	10	----	59.0	5.8	8	-2.2
Receiver29	29	1	0.0	67.3	66	67.3	10	Snd Lvl	60.7	6.6	8	-1.4
Receiver30	30	1	0.0	71.2	66	71.2	10	Snd Lvl	62.5	8.7	8	0.7
Receiver31	31	1	0.0	70.3	66	70.3	10	Snd Lvl	62.4	7.9	8	-0.1
Receiver32	32	1	0.0	66.0	66	66.0	10	Snd Lvl	60.3	5.7	8	-2.3
Receiver33	33	1	0.0	64.0	66	64.0	10	----	58.8	5.2	8	-2.8
Receiver34	34	1	0.0	63.6	66	63.6	10	----	58.7	4.9	8	-3.1
Receiver35	35	1	0.0	65.2	66	65.2	10	----	60.0	5.2	8	-2.8
Receiver36	36	1	0.0	68.7	66	68.7	10	Snd Lvl	62.1	6.6	8	-1.4
Receiver37	37	1	0.0	72.2	66	72.2	10	Snd Lvl	64.2	8.0	8	0.0
Receiver38	38	1	0.0	66.3	66	66.3	10	Snd Lvl	61.6	4.7	8	-3.3
Receiver39	39	1	0.0	64.1	66	64.1	10	----	59.7	4.4	8	-3.6
Receiver40	40	1	0.0	62.6	66	62.6	10	----	58.3	4.3	8	-3.7
Receiver41	41	1	0.0	62.1	66	62.1	10	----	58.1	4.0	8	-4.0
Receiver42	42	1	0.0	63.6	66	63.6	10	----	59.5	4.1	8	-3.9
Receiver43	43	1	0.0	65.4	66	65.4	10	----	61.1	4.3	8	-3.7
Receiver44	44	1	0.0	68.8	66	68.8	10	Snd Lvl	63.2	5.6	8	-2.4
Receiver45	45	1	0.0	75.6	66	75.6	10	Snd Lvl	67.1	8.5	8	0.5
Receiver46	46	1	0.0	74.3	66	74.3	10	Snd Lvl	67.1	7.2	8	-0.8
Receiver47	47	1	0.0	68.4	66	68.4	10	Snd Lvl	63.6	4.8	8	-3.2
Receiver48	48	1	0.0	65.2	66	65.2	10	----	61.5	3.7	8	-4.3
Receiver49	49	1	0.0	63.6	66	63.6	10	----	59.9	3.7	8	-4.3
Receiver50	50	1	0.0	63.8	66	63.8	10	----	60.3	3.5	8	-4.5
Receiver51	51	1	0.0	65.4	66	65.4	10	----	61.8	3.6	8	-4.4
Receiver52	52	1	0.0	69.0	66	69.0	10	Snd Lvl	64.1	4.9	8	-3.1
Receiver53	53	1	0.0	73.9	66	73.9	10	Snd Lvl	67.2	6.7	8	-1.3
Receiver54	54	1	0.0	73.7	66	73.7	10	Snd Lvl	67.5	6.2	8	-1.8
Receiver55	55	1	0.0	67.4	66	67.4	10	Snd Lvl	63.5	3.9	8	-4.1
Receiver56	56	1	0.0	65.1	66	65.1	10	----	61.7	3.4	8	-4.6
Receiver57	57	1	0.0	63.3	66	63.3	10	----	60.0	3.3	8	-4.7
Receiver58	58	1	0.0	62.5	66	62.5	10	----	59.2	3.3	8	-4.7
Receiver59	59	1	0.0	63.9	66	63.9	10	----	60.6	3.3	8	-4.7
Receiver60	60	1	0.0	65.8	66	65.8	10	----	62.4	3.4	8	-4.6
Receiver61	61	1	0.0	69.3	66	69.3	10	Snd Lvl	64.8	4.5	8	-3.5
Receiver62	62	1	0.0	71.8	66	71.8	10	Snd Lvl	66.2	5.6	8	-2.4
Receiver63	63	1	0.0	68.3	66	68.3	10	Snd Lvl	64.1	4.2	8	-3.8
Receiver64	64	1	0.0	64.9	66	64.9	10	----	61.5	3.4	8	-4.6
Receiver65	65	1	0.0	63.4	66	63.4	10	----	60.0	3.4	8	-4.6

Receiver66	66	1	0.0	61.8	66	61.8	10	----	58.4	3.4	8	-4.6
Receiver67	67	1	0.0	63.3	66	63.3	10	----	59.6	3.7	8	-4.3
Receiver68	68	1	0.0	64.9	66	64.9	10	----	60.9	4.0	8	-4.0
Receiver69	69	1	0.0	66.3	66	66.3	10	Snd Lvl	62.0	4.3	8	-3.7
Receiver70	70	1	0.0	70.8	66	70.8	10	Snd Lvl	64.3	6.5	8	-1.5
Receiver71	71	1	0.0	69.4	66	69.4	10	Snd Lvl	64.2	5.2	8	-2.8
Receiver72	72	1	0.0	73.4	66	73.4	10	Snd Lvl	66.3	7.1	8	-0.9
Receiver73	73	1	0.0	72.0	66	72.0	10	Snd Lvl	65.6	6.4	8	-1.6
Receiver74	74	1	0.0	72.6	66	72.6	10	Snd Lvl	66.5	6.1	8	-1.9
Receiver75	75	1	0.0	74.6	66	74.6	10	Snd Lvl	68.0	6.6	8	-1.4
Receiver76	76	1	0.0	71.3	66	71.3	10	Snd Lvl	63.8	7.5	8	-0.5
Receiver77	77	1	0.0	72.2	66	72.2	10	Snd Lvl	64.4	7.8	8	-0.2
Receiver78	78	1	0.0	68.5	66	68.5	10	Snd Lvl	63.2	5.3	8	-2.7

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	77	3.3	5.8	10.9
All Impacted	43	3.9	6.9	10.9
All that meet NR Goal	10	8.0	9.6	10.9

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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	$
NSA D	W	22.00	22.00	22.00	4819	106012				3180370
									Total Cost:	3180370

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: I-4 PD&E NSA D
BARRIER DESIGN: NSA D 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
Receiver1	1	1	0.0	71.1	66	71.1	10	Snd Lvl	63.2	7.9	8	-0.1
Receiver2	2	1	0.0	70.4	66	70.4	10	Snd Lvl	61.2	9.2	8	1.2
Receiver3	3	1	0.0	66.2	66	66.2	10	Snd Lvl	62.0	4.2	8	-3.8
Receiver4	4	1	0.0	65.5	66	65.5	10	----	59.5	6.0	8	-2.0
Receiver5	5	1	0.0	64.0	66	64.0	10	----	60.5	3.5	8	-4.5
Receiver6	6	1	0.0	63.8	66	63.8	10	----	58.5	5.3	8	-2.7
Receiver7	7	1	0.0	73.4	66	73.4	10	Snd Lvl	62.1	11.3	8	3.3
Receiver8	8	1	0.0	67.3	66	67.3	10	Snd Lvl	60.1	7.2	8	-0.8
Receiver9	9	1	0.0	65.3	66	65.3	10	----	59.1	6.2	8	-1.8
Receiver10	10	1	0.0	65.0	66	65.0	10	----	58.5	6.5	8	-1.5
Receiver11	11	1	0.0	67.4	66	67.4	10	Snd Lvl	59.8	7.6	8	-0.4
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	62.1	11.6	8	3.6
Receiver13	13	1	0.0	73.1	66	73.1	10	Snd Lvl	61.7	11.4	8	3.4
Receiver14	14	1	0.0	72.5	66	72.5	10	Snd Lvl	61.6	10.9	8	2.9
Receiver15	15	1	0.0	66.8	66	66.8	10	Snd Lvl	59.4	7.4	8	-0.6
Receiver16	16	1	0.0	64.7	66	64.7	10	----	58.2	6.5	8	-1.5
Receiver17	17	1	0.0	64.7	66	64.7	10	----	58.0	6.7	8	-1.3
Receiver18	18	1	0.0	67.2	66	67.2	10	Snd Lvl	59.5	7.7	8	-0.3
Receiver19	19	1	0.0	72.3	66	72.3	10	Snd Lvl	61.6	10.7	8	2.7
Receiver20	20	1	0.0	66.5	66	66.5	10	Snd Lvl	59.2	7.3	8	-0.7
Receiver21	21	1	0.0	64.4	66	64.4	10	----	57.8	6.6	8	-1.4
Receiver23	23	1	0.0	73.8	66	73.8	10	Snd Lvl	62.4	11.4	8	3.4
Receiver24	24	1	0.0	68.5	66	68.5	10	Snd Lvl	60.3	8.2	8	0.2

Receiver25	25	1	0.0	65.0	66	65.0	10	----	58.5	6.5	8	-1.5
Receiver26	26	1	0.0	63.4	66	63.4	10	----	57.2	6.2	8	-1.8
Receiver27	27	1	0.0	63.0	66	63.0	10	----	57.0	6.0	8	-2.0
Receiver28	28	1	0.0	64.8	66	64.8	10	----	58.3	6.5	8	-1.5
Receiver29	29	1	0.0	67.3	66	67.3	10	Snd Lvl	59.8	7.5	8	-0.5
Receiver30	30	1	0.0	71.2	66	71.2	10	Snd Lvl	61.5	9.7	8	1.7
Receiver31	31	1	0.0	70.3	66	70.3	10	Snd Lvl	61.3	9.0	8	1.0
Receiver32	32	1	0.0	66.0	66	66.0	10	Snd Lvl	59.3	6.7	8	-1.3
Receiver33	33	1	0.0	64.0	66	64.0	10	----	57.9	6.1	8	-1.9
Receiver34	34	1	0.0	63.6	66	63.6	10	----	57.7	5.9	8	-2.1
Receiver35	35	1	0.0	65.2	66	65.2	10	----	58.9	6.3	8	-1.7
Receiver36	36	1	0.0	68.7	66	68.7	10	Snd Lvl	60.8	7.9	8	-0.1
Receiver37	37	1	0.0	72.2	66	72.2	10	Snd Lvl	62.5	9.7	8	1.7
Receiver38	38	1	0.0	66.3	66	66.3	10	Snd Lvl	60.1	6.2	8	-1.8
Receiver39	39	1	0.0	64.1	66	64.1	10	----	58.5	5.6	8	-2.4
Receiver40	40	1	0.0	62.6	66	62.6	10	----	57.2	5.4	8	-2.6
Receiver41	41	1	0.0	62.1	66	62.1	10	----	57.0	5.1	8	-2.9
Receiver42	42	1	0.0	63.6	66	63.6	10	----	58.2	5.4	8	-2.6
Receiver43	43	1	0.0	65.4	66	65.4	10	----	59.6	5.8	8	-2.2
Receiver44	44	1	0.0	68.8	66	68.8	10	Snd Lvl	61.3	7.5	8	-0.5
Receiver45	45	1	0.0	75.6	66	75.6	10	Snd Lvl	64.6	11.0	8	3.0
Receiver46	46	1	0.0	74.3	66	74.3	10	Snd Lvl	64.5	9.8	8	1.8
Receiver47	47	1	0.0	68.4	66	68.4	10	Snd Lvl	61.8	6.6	8	-1.4
Receiver48	48	1	0.0	65.2	66	65.2	10	----	60.0	5.2	8	-2.8
Receiver49	49	1	0.0	63.6	66	63.6	10	----	58.6	5.0	8	-3.0
Receiver50	50	1	0.0	63.8	66	63.8	10	----	59.1	4.7	8	-3.3
Receiver51	51	1	0.0	65.4	66	65.4	10	----	60.5	4.9	8	-3.1
Receiver52	52	1	0.0	69.0	66	69.0	10	Snd Lvl	62.5	6.5	8	-1.5
Receiver53	53	1	0.0	73.9	66	73.9	10	Snd Lvl	65.3	8.6	8	0.6
Receiver54	54	1	0.0	73.7	66	73.7	10	Snd Lvl	66.1	7.6	8	-0.4
Receiver55	55	1	0.0	67.4	66	67.4	10	Snd Lvl	62.4	5.0	8	-3.0
Receiver56	56	1	0.0	65.1	66	65.1	10	----	60.7	4.4	8	-3.6
Receiver57	57	1	0.0	63.3	66	63.3	10	----	59.1	4.2	8	-3.8
Receiver58	58	1	0.0	62.5	66	62.5	10	----	58.4	4.1	8	-3.9
Receiver59	59	1	0.0	63.9	66	63.9	10	----	59.7	4.2	8	-3.8
Receiver60	60	1	0.0	65.8	66	65.8	10	----	61.4	4.4	8	-3.6
Receiver61	61	1	0.0	69.3	66	69.3	10	Snd Lvl	63.7	5.6	8	-2.4
Receiver62	62	1	0.0	71.8	66	71.8	10	Snd Lvl	65.0	6.8	8	-1.2
Receiver63	63	1	0.0	68.3	66	68.3	10	Snd Lvl	62.9	5.4	8	-2.6
Receiver64	64	1	0.0	64.9	66	64.9	10	----	60.5	4.4	8	-3.6
Receiver65	65	1	0.0	63.4	66	63.4	10	----	59.2	4.2	8	-3.8

Receiver66	66	1	0.0	61.8	66	61.8	10	----	57.6	4.2	8	-3.8
Receiver67	67	1	0.0	63.3	66	63.3	10	----	58.7	4.6	8	-3.4
Receiver68	68	1	0.0	64.9	66	64.9	10	----	59.9	5.0	8	-3.0
Receiver69	69	1	0.0	66.3	66	66.3	10	Snd Lvl	61.0	5.3	8	-2.7
Receiver70	70	1	0.0	70.8	66	70.8	10	Snd Lvl	63.1	7.7	8	-0.3
Receiver71	71	1	0.0	69.4	66	69.4	10	Snd Lvl	62.5	6.9	8	-1.1
Receiver72	72	1	0.0	73.4	66	73.4	10	Snd Lvl	64.3	9.1	8	1.1
Receiver73	73	1	0.0	72.0	66	72.0	10	Snd Lvl	63.6	8.4	8	0.4
Receiver74	74	1	0.0	72.6	66	72.6	10	Snd Lvl	64.5	8.1	8	0.1
Receiver75	75	1	0.0	74.6	66	74.6	10	Snd Lvl	66.1	8.5	8	0.5
Receiver76	76	1	0.0	71.3	66	71.3	10	Snd Lvl	63.0	8.3	8	0.3
Receiver77	77	1	0.0	72.2	66	72.2	10	Snd Lvl	63.6	8.6	8	0.6
Receiver78	78	1	0.0	68.5	66	68.5	10	Snd Lvl	62.8	5.7	8	-2.3

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	77	3.5	6.9	11.6
All Impacted	43	4.2	8.1	11.6
All that meet NR Goal	20	8.1	9.7	11.6

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F1 existing 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
Receiver1	1	1	0.0	60.6	66	60.6	10	----	59.8	0.8	8	-7.2
Receiver2	2	1	0.0	59.5	66	59.5	10	----	58.6	0.9	8	-7.1
Receiver3	3	1	0.0	63.4	66	63.4	10	----	60.2	3.2	8	-4.8
Receiver4	4	1	0.0	65.0	66	65.0	10	----	58.9	6.1	8	-1.9
Receiver5	5	1	0.0	63.3	66	63.3	10	----	59.4	3.9	8	-4.1
Receiver6	6	1	0.0	62.0	66	62.0	10	----	58.9	3.1	8	-4.9
Receiver7	7	1	0.0	61.6	66	61.6	10	----	59.3	2.3	8	-5.7
Receiver8	8	1	0.0	68.5	66	68.5	10	Snd Lvl	59.6	8.9	8	0.9
Receiver9	9	1	0.0	70.4	66	70.4	10	Snd Lvl	60.5	9.9	8	1.9
Receiver10	10	1	0.0	71.3	66	71.3	10	Snd Lvl	61.7	9.6	8	1.6
Receiver11	11	1	0.0	72.0	66	72.0	10	Snd Lvl	62.2	9.8	8	1.8
Receiver12	12	1	0.0	73.7	66	73.7	10	Snd Lvl	62.6	11.1	8	3.1
Receiver13	13	1	0.0	75.6	66	75.6	10	Snd Lvl	63.5	12.1	8	4.1
Receiver14	14	1	0.0	65.9	66	65.9	10	----	59.7	6.2	8	-1.8
Receiver15	15	1	0.0	66.4	66	66.4	10	Snd Lvl	60.1	6.3	8	-1.7
Receiver16	16	1	0.0	64.5	66	64.5	10	----	59.0	5.5	8	-2.5
Receiver17	17	1	0.0	64.0	66	64.0	10	----	58.9	5.1	8	-2.9
Receiver18	18	1	0.0	62.8	66	62.8	10	----	58.4	4.4	8	-3.6
Receiver19	19	1	0.0	63.2	66	63.2	10	----	58.5	4.7	8	-3.3
Receiver21	21	1	0.0	66.6	66	66.6	10	Snd Lvl	60.5	6.1	8	-1.9
Receiver22	22	1	0.0	67.0	66	67.0	10	Snd Lvl	60.8	6.2	8	-1.8
Receiver23	23	1	0.0	67.1	66	67.1	10	Snd Lvl	60.8	6.3	8	-1.7
Receiver24	24	1	0.0	67.1	66	67.1	10	Snd Lvl	60.9	6.2	8	-1.8

Receiver25	25	1	0.0	67.1	66	67.1	10	Snd Lvl	61.0	6.1	8	-1.9
Receiver26	26	1	0.0	65.2	66	65.2	10	----	59.4	5.8	8	-2.2
Receiver27	27	1	0.0	76.8	66	76.8	10	Snd Lvl	63.9	12.9	8	4.9
Receiver28	28	1	0.0	78.6	66	78.6	10	Snd Lvl	64.8	13.8	8	5.8
Receiver29	29	1	0.0	78.1	66	78.1	10	Snd Lvl	65.2	12.9	8	4.9
Receiver30	30	1	0.0	78.2	66	78.2	10	Snd Lvl	64.8	13.4	8	5.4
Receiver31	31	1	0.0	78.1	66	78.1	10	Snd Lvl	64.5	13.6	8	5.6
Receiver32	32	1	0.0	78.0	66	78.0	10	Snd Lvl	64.2	13.8	8	5.8
Receiver33	33	1	0.0	77.1	66	77.1	10	Snd Lvl	63.9	13.2	8	5.2
Receiver34	34	1	0.0	77.5	66	77.5	10	Snd Lvl	63.7	13.8	8	5.8
Receiver35	35	1	0.0	77.6	66	77.6	10	Snd Lvl	63.4	14.2	8	6.2
Receiver36	36	1	0.0	77.1	66	77.1	10	Snd Lvl	63.3	13.8	8	5.8
Receiver37	37	1	0.0	76.5	66	76.5	10	Snd Lvl	63.4	13.1	8	5.1
Receiver38	38	1	0.0	76.3	66	76.3	10	Snd Lvl	63.4	12.9	8	4.9
Receiver39	39	1	0.0	77.1	66	77.1	10	Snd Lvl	63.7	13.4	8	5.4
Receiver40	40	1	0.0	77.0	66	77.0	10	Snd Lvl	63.8	13.2	8	5.2
Receiver41	41	1	0.0	76.4	66	76.4	10	Snd Lvl	63.9	12.5	8	4.5
Receiver42	42	1	0.0	67.6	66	67.6	10	Snd Lvl	60.8	6.8	8	-1.2
Receiver43	43	1	0.0	67.8	66	67.8	10	Snd Lvl	61.0	6.8	8	-1.2
Receiver44	44	1	0.0	66.5	66	66.5	10	Snd Lvl	59.9	6.6	8	-1.4
Receiver45	45	1	0.0	66.3	66	66.3	10	Snd Lvl	59.7	6.6	8	-1.4
Receiver46	46	1	0.0	68.0	66	68.0	10	Snd Lvl	60.7	7.3	8	-0.7
Receiver47	47	1	0.0	67.8	66	67.8	10	Snd Lvl	60.5	7.3	8	-0.7
Receiver48	48	1	0.0	65.9	66	65.9	10	----	59.4	6.5	8	-1.5
Receiver49	49	1	0.0	65.2	66	65.2	10	----	59.0	6.2	8	-1.8
Receiver50	50	1	0.0	67.9	66	67.9	10	Snd Lvl	61.1	6.8	8	-1.2
Receiver51	51	1	0.0	67.3	66	67.3	10	Snd Lvl	61.2	6.1	8	-1.9
Receiver52	52	1	0.0	65.8	66	65.8	10	----	60.4	5.4	8	-2.6
Receiver53	53	1	0.0	66.4	66	66.4	10	Snd Lvl	60.4	6.0	8	-2.0
Receiver54	54	1	0.0	64.9	66	64.9	10	----	59.6	5.3	8	-2.7
Receiver55	55	1	0.0	76.7	66	76.7	10	Snd Lvl	64.0	12.7	8	4.7
Receiver56	56	1	0.0	72.2	66	72.2	10	Snd Lvl	63.4	8.8	8	0.8
Receiver57	57	1	0.0	75.0	66	75.0	10	Snd Lvl	64.8	10.2	8	2.2
Receiver58	58	1	0.0	71.2	66	71.2	10	Snd Lvl	64.8	6.4	8	-1.6
Receiver59	59	1	0.0	68.1	66	68.1	10	Snd Lvl	63.7	4.4	8	-3.6
Receiver60	60	1	0.0	66.5	66	66.5	10	Snd Lvl	62.8	3.7	8	-4.3
Receiver61	61	1	0.0	68.4	66	68.4	10	Snd Lvl	62.6	5.8	8	-2.2
Receiver62	62	1	0.0	66.4	66	66.4	10	Snd Lvl	61.9	4.5	8	-3.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB

All Selected	61	0.8	8.1	14.2
All Impacted	44	3.7	9.5	14.2
All that meet NR Goal	24	8.8	12.2	14.2

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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	$
NSA F	W	14.00	14.00	14.00	1822	25512				765358
									Total Cost:	765358

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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
Receiver63	63	1	0.0	72.5	66	72.5	10	Snd Lvl	64.8	7.7	8	-0.3
Receiver64	64	1	0.0	71.1	66	71.1	10	Snd Lvl	63.9	7.2	8	-0.8
Receiver65	65	1	0.0	70.1	66	70.1	10	Snd Lvl	63.2	6.9	8	-1.1
Receiver66	66	1	0.0	68.4	66	68.4	10	Snd Lvl	62.5	5.9	8	-2.1
Receiver67	67	1	0.0	67.4	66	67.4	10	Snd Lvl	62.3	5.1	8	-2.9
Receiver68	68	1	0.0	65.9	66	65.9	10	----	62.2	3.7	8	-4.3
Receiver69	69	1	0.0	62.8	66	62.8	10	----	60.9	1.9	8	-6.1
Receiver70	70	1	0.0	62.1	66	62.1	10	----	60.6	1.5	8	-6.5
Galveston 3	71	1	0.0	65.6	66	65.6	10	----	65.5	0.1	8	-7.9
Galveston 2	72	1	0.0	64.6	66	64.6	10	----	64.5	0.1	8	-7.9
Galveston	73	1	0.0	63.5	66	63.5	10	----	63.4	0.1	8	-7.9
Receiver75	75	1	0.0	71.3	66	71.3	10	Snd Lvl	65.7	5.6	8	-2.4
Receiver76	76	1	0.0	68.0	66	68.0	10	Snd Lvl	64.9	3.1	8	-4.9
Receiver77	77	1	0.0	66.3	66	66.3	10	Snd Lvl	63.4	2.9	8	-5.1
Receiver78	78	1	0.0	72.7	66	72.7	10	Snd Lvl	65.3	7.4	8	-0.6
Receiver79	79	1	0.0	72.8	66	72.8	10	Snd Lvl	64.5	8.3	8	0.3
Receiver82	82	1	0.0	72.4	66	72.4	10	Snd Lvl	63.9	8.5	8	0.5
Receiver83	83	1	0.0	72.3	66	72.3	10	Snd Lvl	64.0	8.3	8	0.3
Receiver84	84	1	0.0	72.4	66	72.4	10	Snd Lvl	63.9	8.5	8	0.5
Receiver85	85	1	0.0	72.4	66	72.4	10	Snd Lvl	63.8	8.6	8	0.6
Receiver87	87	1	0.0	66.0	66	66.0	10	Snd Lvl	61.1	4.9	8	-3.1
Receiver88	88	1	0.0	65.9	66	65.9	10	----	61.5	4.4	8	-3.6
Receiver89	89	1	0.0	64.8	66	64.8	10	----	60.3	4.5	8	-3.5

Receiver90	90	1	0.0	64.3	66	64.3	10	----	60.4	3.9	8	-4.1
Receiver91	91	1	0.0	66.5	66	66.5	10	Snd Lvl	60.9	5.6	8	-2.4
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	60.5	5.5	8	-2.5
Receiver92	92	1	0.0	64.7	66	64.7	10	----	59.5	5.2	8	-2.8
Receiver93	93	1	0.0	62.7	66	62.7	10	----	56.8	5.9	8	-2.1
Receiver96	96	1	0.0	66.0	66	66.0	10	Snd Lvl	60.2	5.8	8	-2.2

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	29	0.1	5.1	8.6
All Impacted	18	2.9	6.4	8.6
All that meet NR Goal	5	8.3	8.4	8.6

Stantec
M. Drauer

6 January 2015
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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	$
NSA F	W	16.00	16.00	16.00	1822	29156				874695
									Total Cost:	874695

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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
Receiver63	63	1	0.0	72.5	66	72.5	10	Snd Lvl	63.6	8.9	8	0.9
Receiver64	64	1	0.0	71.1	66	71.1	10	Snd Lvl	62.8	8.3	8	0.3
Receiver65	65	1	0.0	70.1	66	70.1	10	Snd Lvl	62.2	7.9	8	-0.1
Receiver66	66	1	0.0	68.4	66	68.4	10	Snd Lvl	61.6	6.8	8	-1.2
Receiver67	67	1	0.0	67.4	66	67.4	10	Snd Lvl	61.7	5.7	8	-2.3
Receiver68	68	1	0.0	65.9	66	65.9	10	----	61.7	4.2	8	-3.8
Receiver69	69	1	0.0	62.8	66	62.8	10	----	60.7	2.1	8	-5.9
Receiver70	70	1	0.0	62.1	66	62.1	10	----	60.4	1.7	8	-6.3
Galveston 3	71	1	0.0	65.6	66	65.6	10	----	65.5	0.1	8	-7.9
Galveston 2	72	1	0.0	64.6	66	64.6	10	----	64.5	0.1	8	-7.9
Galveston	73	1	0.0	63.5	66	63.5	10	----	63.4	0.1	8	-7.9
Receiver75	75	1	0.0	71.3	66	71.3	10	Snd Lvl	65.2	6.1	8	-1.9
Receiver76	76	1	0.0	68.0	66	68.0	10	Snd Lvl	64.6	3.4	8	-4.6
Receiver77	77	1	0.0	66.3	66	66.3	10	Snd Lvl	63.2	3.1	8	-4.9
Receiver78	78	1	0.0	72.7	66	72.7	10	Snd Lvl	64.6	8.1	8	0.1
Receiver79	79	1	0.0	72.8	66	72.8	10	Snd Lvl	63.8	9.0	8	1.0
Receiver82	82	1	0.0	72.4	66	72.4	10	Snd Lvl	62.9	9.5	8	1.5
Receiver83	83	1	0.0	72.3	66	72.3	10	Snd Lvl	63.1	9.2	8	1.2
Receiver84	84	1	0.0	72.4	66	72.4	10	Snd Lvl	62.9	9.5	8	1.5
Receiver85	85	1	0.0	72.4	66	72.4	10	Snd Lvl	63.0	9.4	8	1.4
Receiver87	87	1	0.0	66.0	66	66.0	10	Snd Lvl	60.7	5.3	8	-2.7
Receiver88	88	1	0.0	65.9	66	65.9	10	----	61.1	4.8	8	-3.2
Receiver89	89	1	0.0	64.8	66	64.8	10	----	60.0	4.8	8	-3.2

Receiver90	90	1	0.0	64.3	66	64.3	10	----	60.1	4.2	8	-3.8
Receiver91	91	1	0.0	66.5	66	66.5	10	Snd Lvl	60.3	6.2	8	-1.8
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	59.9	6.1	8	-1.9
Receiver92	92	1	0.0	64.7	66	64.7	10	----	59.0	5.7	8	-2.3
Receiver93	93	1	0.0	62.7	66	62.7	10	----	56.6	6.1	8	-1.9
Receiver96	96	1	0.0	66.0	66	66.0	10	Snd Lvl	59.5	6.5	8	-1.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	29	0.1	5.6	9.5
All Impacted	18	3.1	7.2	9.5
All that meet NR Goal	8	8.1	9.0	9.5

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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	$
NSA F	W	18.00	18.00	18.00	1822	32801				984032
									Total Cost:	984032

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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
Receiver63	63	1	0.0	72.5	66	72.5	10	Snd Lvl	62.7	9.8	8	1.8
Receiver64	64	1	0.0	71.1	66	71.1	10	Snd Lvl	62.0	9.1	8	1.1
Receiver65	65	1	0.0	70.1	66	70.1	10	Snd Lvl	61.5	8.6	8	0.6
Receiver66	66	1	0.0	68.4	66	68.4	10	Snd Lvl	61.0	7.4	8	-0.6
Receiver67	67	1	0.0	67.4	66	67.4	10	Snd Lvl	61.2	6.2	8	-1.8
Receiver68	68	1	0.0	65.9	66	65.9	10	----	61.4	4.5	8	-3.5
Receiver69	69	1	0.0	62.8	66	62.8	10	----	60.5	2.3	8	-5.7
Receiver70	70	1	0.0	62.1	66	62.1	10	----	60.3	1.8	8	-6.2
Galveston 3	71	1	0.0	65.6	66	65.6	10	----	65.5	0.1	8	-7.9
Galveston 2	72	1	0.0	64.6	66	64.6	10	----	64.5	0.1	8	-7.9
Galveston	73	1	0.0	63.5	66	63.5	10	----	63.4	0.1	8	-7.9
Receiver75	75	1	0.0	71.3	66	71.3	10	Snd Lvl	64.8	6.5	8	-1.5
Receiver76	76	1	0.0	68.0	66	68.0	10	Snd Lvl	64.4	3.6	8	-4.4
Receiver77	77	1	0.0	66.3	66	66.3	10	Snd Lvl	63.0	3.3	8	-4.7
Receiver78	78	1	0.0	72.7	66	72.7	10	Snd Lvl	64.0	8.7	8	0.7
Receiver79	79	1	0.0	72.8	66	72.8	10	Snd Lvl	63.2	9.6	8	1.6
Receiver82	82	1	0.0	72.4	66	72.4	10	Snd Lvl	62.1	10.3	8	2.3
Receiver83	83	1	0.0	72.3	66	72.3	10	Snd Lvl	62.3	10.0	8	2.0
Receiver84	84	1	0.0	72.4	66	72.4	10	Snd Lvl	62.2	10.2	8	2.2
Receiver85	85	1	0.0	72.4	66	72.4	10	Snd Lvl	62.3	10.1	8	2.1
Receiver87	87	1	0.0	66.0	66	66.0	10	Snd Lvl	60.3	5.7	8	-2.3
Receiver88	88	1	0.0	65.9	66	65.9	10	----	60.8	5.1	8	-2.9
Receiver89	89	1	0.0	64.8	66	64.8	10	----	59.6	5.2	8	-2.8

Receiver90	90	1	0.0	64.3	66	64.3	10	----	59.8	4.5	8	-3.5
Receiver91	91	1	0.0	66.5	66	66.5	10	Snd Lvl	59.8	6.7	8	-1.3
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	59.4	6.6	8	-1.4
Receiver92	92	1	0.0	64.7	66	64.7	10	----	58.6	6.1	8	-1.9
Receiver93	93	1	0.0	62.7	66	62.7	10	----	56.3	6.4	8	-1.6
Receiver96	96	1	0.0	66.0	66	66.0	10	Snd Lvl	58.9	7.1	8	-0.9

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	29	0.1	6.1	10.3
All Impacted	18	3.3	7.8	10.3
All that meet NR Goal	9	8.6	9.6	10.3

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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	$
NSA F	W	20.00	20.00	20.00	1822	36446				1093368
									Total Cost:	1093368

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 20'
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver63	63	1	0.0	72.5	66	72.5	10	Snd Lvl	61.8	10.7	8	2.7
Receiver64	64	1	0.0	71.1	66	71.1	10	Snd Lvl	61.3	9.8	8	1.8
Receiver65	65	1	0.0	70.1	66	70.1	10	Snd Lvl	60.9	9.2	8	1.2
Receiver66	66	1	0.0	68.4	66	68.4	10	Snd Lvl	60.4	8.0	8	0.0
Receiver67	67	1	0.0	67.4	66	67.4	10	Snd Lvl	60.8	6.6	8	-1.4
Receiver68	68	1	0.0	65.9	66	65.9	10	----	61.2	4.7	8	-3.3
Receiver69	69	1	0.0	62.8	66	62.8	10	----	60.4	2.4	8	-5.6
Receiver70	70	1	0.0	62.1	66	62.1	10	----	60.2	1.9	8	-6.1
Galveston 3	71	1	0.0	65.6	66	65.6	10	----	65.5	0.1	8	-7.9
Galveston 2	72	1	0.0	64.6	66	64.6	10	----	64.5	0.1	8	-7.9
Galveston	73	1	0.0	63.5	66	63.5	10	----	63.4	0.1	8	-7.9
Receiver75	75	1	0.0	71.3	66	71.3	10	Snd Lvl	64.4	6.9	8	-1.1
Receiver76	76	1	0.0	68.0	66	68.0	10	Snd Lvl	64.2	3.8	8	-4.2
Receiver77	77	1	0.0	66.3	66	66.3	10	Snd Lvl	62.8	3.5	8	-4.5
Receiver78	78	1	0.0	72.7	66	72.7	10	Snd Lvl	63.5	9.2	8	1.2
Receiver79	79	1	0.0	72.8	66	72.8	10	Snd Lvl	62.6	10.2	8	2.2
Receiver82	82	1	0.0	72.4	66	72.4	10	Snd Lvl	61.4	11.0	8	3.0
Receiver83	83	1	0.0	72.3	66	72.3	10	Snd Lvl	61.7	10.6	8	2.6
Receiver84	84	1	0.0	72.4	66	72.4	10	Snd Lvl	61.6	10.8	8	2.8
Receiver85	85	1	0.0	72.4	66	72.4	10	Snd Lvl	61.6	10.8	8	2.8
Receiver87	87	1	0.0	66.0	66	66.0	10	Snd Lvl	59.9	6.1	8	-1.9
Receiver88	88	1	0.0	65.9	66	65.9	10	----	60.6	5.3	8	-2.7
Receiver89	89	1	0.0	64.8	66	64.8	10	----	59.4	5.4	8	-2.6

Receiver90	90	1	0.0	64.3	66	64.3	10	----	59.6	4.7	8	-3.3
Receiver91	91	1	0.0	66.5	66	66.5	10	Snd Lvl	59.3	7.2	8	-0.8
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	59.0	7.0	8	-1.0
Receiver92	92	1	0.0	64.7	66	64.7	10	----	58.2	6.5	8	-1.5
Receiver93	93	1	0.0	62.7	66	62.7	10	----	56.1	6.6	8	-1.4
Receiver96	96	1	0.0	66.0	66	66.0	10	Snd Lvl	58.4	7.6	8	-0.4

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	29	0.1	6.4	11.0
All Impacted	18	3.5	8.3	11.0
All that meet NR Goal	10	8.0	10.0	11.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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	$
NSA F	W	22.00	22.00	22.00	1822	40090				1202705
									Total Cost:	1202705

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 BtU
RUN: NSA F
BARRIER DESIGN: NSA F 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
Receiver63	63	1	0.0	72.5	66	72.5	10	Snd Lvl	61.2	11.3	8	3.3
Receiver64	64	1	0.0	71.1	66	71.1	10	Snd Lvl	60.7	10.4	8	2.4
Receiver65	65	1	0.0	70.1	66	70.1	10	Snd Lvl	60.4	9.7	8	1.7
Receiver66	66	1	0.0	68.4	66	68.4	10	Snd Lvl	60.0	8.4	8	0.4
Receiver67	67	1	0.0	67.4	66	67.4	10	Snd Lvl	60.5	6.9	8	-1.1
Receiver68	68	1	0.0	65.9	66	65.9	10	----	61.0	4.9	8	-3.1
Receiver69	69	1	0.0	62.8	66	62.8	10	----	60.3	2.5	8	-5.5
Receiver70	70	1	0.0	62.1	66	62.1	10	----	60.2	1.9	8	-6.1
Galveston 3	71	1	0.0	65.6	66	65.6	10	----	65.5	0.1	8	-7.9
Galveston 2	72	1	0.0	64.6	66	64.6	10	----	64.5	0.1	8	-7.9
Galveston	73	1	0.0	63.5	66	63.5	10	----	63.4	0.1	8	-7.9
Receiver75	75	1	0.0	71.3	66	71.3	10	Snd Lvl	64.2	7.1	8	-0.9
Receiver76	76	1	0.0	68.0	66	68.0	10	Snd Lvl	64.0	4.0	8	-4.0
Receiver77	77	1	0.0	66.3	66	66.3	10	Snd Lvl	62.7	3.6	8	-4.4
Receiver78	78	1	0.0	72.7	66	72.7	10	Snd Lvl	63.2	9.5	8	1.5
Receiver79	79	1	0.0	72.8	66	72.8	10	Snd Lvl	62.2	10.6	8	2.6
Receiver82	82	1	0.0	72.4	66	72.4	10	Snd Lvl	60.7	11.7	8	3.7
Receiver83	83	1	0.0	72.3	66	72.3	10	Snd Lvl	61.1	11.2	8	3.2
Receiver84	84	1	0.0	72.4	66	72.4	10	Snd Lvl	61.0	11.4	8	3.4
Receiver85	85	1	0.0	72.4	66	72.4	10	Snd Lvl	61.1	11.3	8	3.3
Receiver87	87	1	0.0	66.0	66	66.0	10	Snd Lvl	59.6	6.4	8	-1.6
Receiver88	88	1	0.0	65.9	66	65.9	10	----	60.4	5.5	8	-2.5
Receiver89	89	1	0.0	64.8	66	64.8	10	----	59.1	5.7	8	-2.3

RESULTS: SOUND LEVELS

I-4 BtU

Receiver90	90	1	0.0	64.3	66	64.3	10	----	59.4	4.9	8	-3.1
Receiver91	91	1	0.0	66.5	66	66.5	10	Snd Lvl	58.9	7.6	8	-0.4
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	58.6	7.4	8	-0.6
Receiver92	92	1	0.0	64.7	66	64.7	10	----	57.9	6.8	8	-1.2
Receiver93	93	1	0.0	62.7	66	62.7	10	----	56.0	6.7	8	-1.3
Receiver96	96	1	0.0	66.0	66	66.0	10	Snd Lvl	57.9	8.1	8	0.1

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	29	0.1	6.8	11.7
All Impacted	18	3.6	8.7	11.7
All that meet NR Goal	11	8.1	10.3	11.7

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA G
BARRIER DESIGN: G 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
Receiver1	1	5	0.0	66.7	66	66.7	10	Snd Lvl	63.8	2.9	8	-5.1
Receiver2	2	5	0.0	67.7	66	67.7	10	Snd Lvl	64.3	3.4	8	-4.6
Receiver3	3	5	0.0	69.1	66	69.1	10	Snd Lvl	63.2	5.9	8	-2.1
Receiver4	4	5	0.0	73.2	66	73.2	10	Snd Lvl	63.4	9.8	8	1.8
Receiver5	5	5	0.0	80.1	66	80.1	10	Snd Lvl	66.7	13.4	8	5.4
Receiver6	6	5	0.0	80.1	66	80.1	10	Snd Lvl	64.8	15.3	8	7.3
Receiver7	7	5	0.0	80.4	66	80.4	10	Snd Lvl	63.3	17.1	8	9.1
Receiver8	8	5	0.0	80.6	66	80.6	10	Snd Lvl	63.0	17.6	8	9.6
Receiver9	9	5	0.0	80.3	66	80.3	10	Snd Lvl	63.7	16.6	8	8.6
Receiver10	10	5	0.0	80.2	66	80.2	10	Snd Lvl	63.6	16.6	8	8.6
Receiver11	11	5	0.0	80.4	66	80.4	10	Snd Lvl	63.4	17.0	8	9.0
Receiver12	12	5	0.0	75.3	66	75.3	10	Snd Lvl	63.3	12.0	8	4.0
Receiver13	13	5	0.0	76.2	66	76.2	10	Snd Lvl	64.0	12.2	8	4.2
Receiver14	14	5	0.0	78.3	66	78.3	10	Snd Lvl	68.6	9.7	8	1.7
Receiver15	15	5	0.0	68.9	66	68.9	10	Snd Lvl	66.8	2.1	8	-5.9
Receiver16	16	5	0.0	65.6	66	65.6	10	----	64.1	1.5	8	-6.5
Receiver17	17	5	0.0	68.9	66	68.9	10	Snd Lvl	60.8	8.1	8	0.1
Receiver18	18	5	0.0	63.7	66	63.7	10	----	57.3	6.4	8	-1.6
Receiver19	19	5	0.0	62.8	66	62.8	10	----	56.8	6.0	8	-2.0
Receiver20	20	5	0.0	68.1	66	68.1	10	Snd Lvl	60.2	7.9	8	-0.1
Receiver21	21	5	0.0	70.4	66	70.4	10	Snd Lvl	61.3	9.1	8	1.1
Receiver22	22	5	0.0	70.1	66	70.1	10	Snd Lvl	61.2	8.9	8	0.9
Receiver23	23	5	0.0	70.2	66	70.2	10	Snd Lvl	61.8	8.4	8	0.4

Receiver24	24	5	0.0	71.8	66	71.8	10	Snd Lvl	63.0	8.8	8	0.8
Receiver25	25	5	0.0	68.3	66	68.3	10	Snd Lvl	61.6	6.7	8	-1.3
Receiver26	26	5	0.0	66.7	66	66.7	10	Snd Lvl	61.4	5.3	8	-2.7
Receiver27	27	5	0.0	65.9	66	65.9	10	----	62.1	3.8	8	-4.2

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	135	1.5	9.4	17.6
All Impacted	115	2.1	10.2	17.6
All that meet NR Goal	80	8.1	12.5	17.6

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA H
BARRIER DESIGN: NSA H 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	$
NSA H	W	14.00	14.00	14.00	1422	19914				597420
									Total Cost:	597420

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA H
BARRIER DESIGN: NSA H 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
Receiver33	33	1	0.0	72.5	66	72.5	10	Snd Lvl	64.6	7.9	8	-0.1
Receiver34	34	1	0.0	64.2	66	64.2	10	----	60.4	3.8	8	-4.2
Receiver35	35	1	0.0	60.4	66	60.4	10	----	57.4	3.0	8	-5.0
Receiver37	37	1	0.0	69.3	66	69.3	10	Snd Lvl	60.3	9.0	8	1.0
Receiver38	38	1	0.0	58.0	66	58.0	10	----	54.9	3.1	8	-4.9
Receiver39	39	1	0.0	61.8	66	61.8	10	----	56.3	5.5	8	-2.5
Receiver41	41	1	0.0	55.5	66	55.5	10	----	51.5	4.0	8	-4.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	3.0	5.2	9.0
All Impacted	2	7.9	8.5	9.0
All that meet NR Goal	1	9.0	9.0	9.0

Stantec 6 January 2015
M. Drauer TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA H
BARRIER DESIGN: NSA H 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	$
NSA H	W	16.00	16.00	16.00	1422	22759				682765
									Total Cost:	682765

Stantec
M. Drauer

6 January 2015
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: I-4 PD&E
RUN: NSA H
BARRIER DESIGN: NSA H 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
Receiver33	33	1	0.0	72.5	66	72.5	10	Snd Lvl	64.1	8.4	8	0.4
Receiver34	34	1	0.0	64.2	66	64.2	10	----	60.0	4.2	8	-3.8
Receiver35	35	1	0.0	60.4	66	60.4	10	----	57.1	3.3	8	-4.7
Receiver37	37	1	0.0	69.3	66	69.3	10	Snd Lvl	59.6	9.7	8	1.7
Receiver38	38	1	0.0	58.0	66	58.0	10	----	54.6	3.4	8	-4.6
Receiver39	39	1	0.0	61.8	66	61.8	10	----	55.9	5.9	8	-2.1
Receiver41	41	1	0.0	55.5	66	55.5	10	----	51.4	4.1	8	-3.9

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	3.3	5.6	9.7
All Impacted	2	8.4	9.1	9.7
All that meet NR Goal	2	8.4	9.1	9.7