BICYCLE/PEDESTRIAN FEASIBILITY STUDY

CITY OF NEW SMYRNA BEACH

COAST TO COAST CONNECTOR TRAIL

FINAL REPORT

December 21, 2015

Prepared by RS&H, Inc. at the direction of River to Sea TPO

RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

RS&H

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INTRODUCTION

The City of New Smyrna Beach submitted a 2015 application to the River to Sea Transportation Planning Organization (R2CTPO) for a feasibility study for the Coast to Coast Connector Trail. This study will examine the feasibility of a 12-foot wide trail beginning at the Daytona State College (DSC) Edgewater/New Smyrna campus, traversing east along 10th Street, then north along South Myrtle Avenue, then continuing east along Canal Street, terminating at US-1.

PROJECT PURPOSE AND SCOPE

In May 2015 the R2CTPO completed the Regional Trail Corridor Assessment (RTCA). The purpose of this study was to develop an inventory of the existing regional trail network, identify existing gaps, and begin developing concepts and/or recommendations to close the gaps, completing the regional trail system. One of the gaps identified in the RTCA was a connection from the East Central Regional Rail Trail (ECRRT) in Edgewater to the Florida East Coast Greenway Trail on Riverside Drive in New Smyrna Beach. The City of Edgewater is currently moving forward with the design of a trail that would begin at the ECRRT terminus on W. Park Avenue, head north on Dale Street, then through the eastern perimeter of the DSC campus, ending at 10th Street. Multiple alternative alignments have been proposed by the City of New Smyrna Beach to complete the connection through its city limits. The purpose of this feasibility report is to more closely study one of the alternative alignments mentioned in the RTCA; a 12-foot trail beginning at DSC campus on 10th Street in New Smyrna Beach (terminus of the Edgewater trail), heading east along 10th Street, north along South Myrtle Avenue, east along Canal Street, and ending at US-1.

At the southern end of the project is New Smyrna Beach Middle School (NSBMS) and just west of the project is New Smyrna Beach High School (NSBHS). The proposed trail alignment is located within the designated walk zone for both schools. At the northern end of the project on Canal Street is New Smyrna Beach's Historic Downtown District. There is a mix of residential, both multi-family and single family, as well as commercial properties in the area. There is existing sidewalk, varying in width between five and 10 feet throughout the corridor, however the majority of the street crossings are not up to current standards. The proposed trail will enhance pedestrian and bicyclist safety in the area as well as provide a vital connection through New Smyrna Beach between the City of Edgewater and the East Coast Greenway Trail.

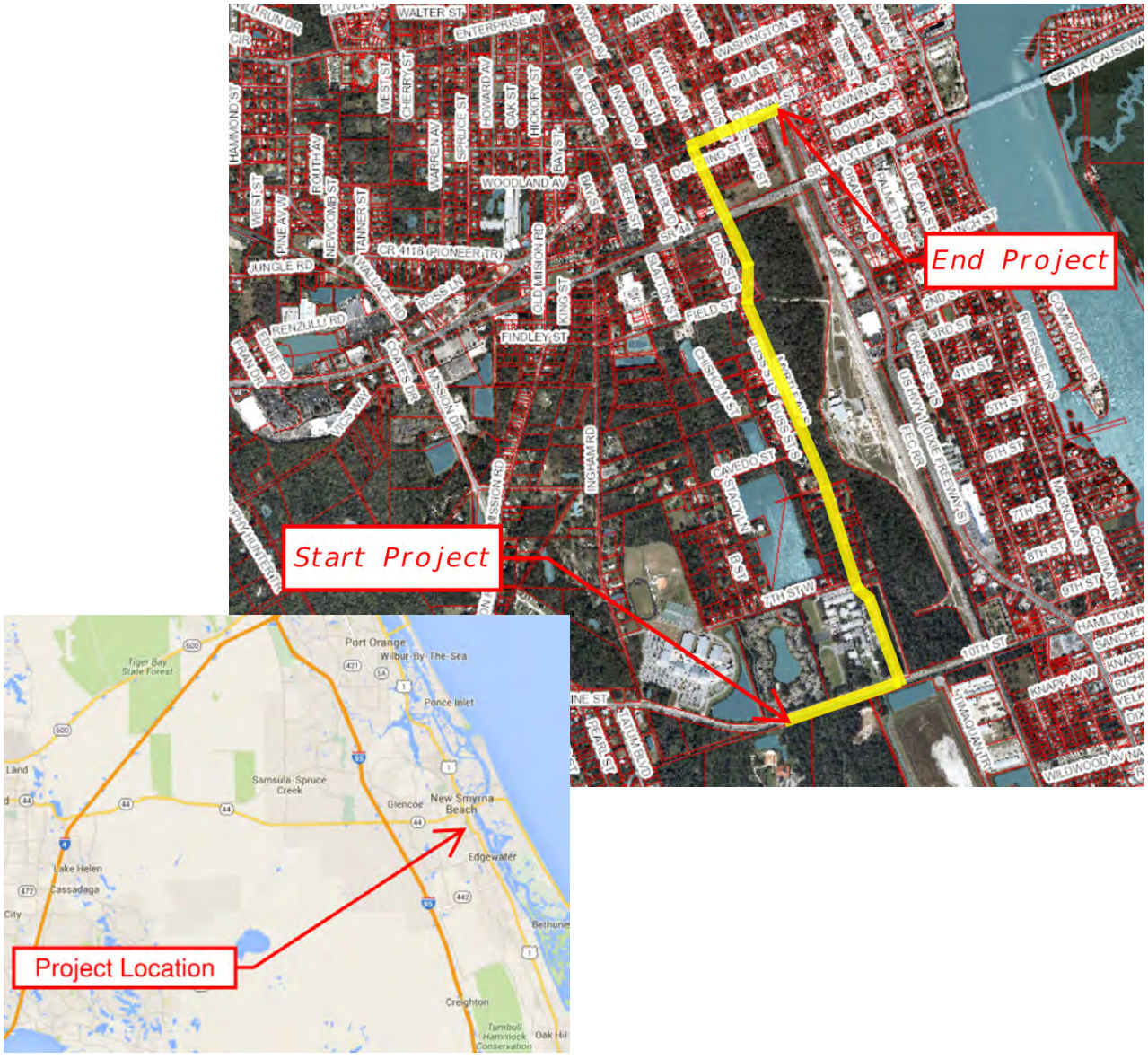
A cost estimate has been prepared as part of this study, for the R2CTPO's budgeting and planning purposes. Multiple field reviews were conducted during the study for the purposes of data collection, concept development, corridor evaluation and cost estimation.

The graphics within this report include notes, diagrams and callouts identifying the apparent right-of-way, driveways, location of the proposed trail, and street names. Considerations include conformance to the requirements of the Americans with Disabilities Act (ADA), and appropriate signage and pavement markings along the facility at roadway and/or driveway crossings.

This study required coordination with several agency representatives and stakeholders which the Study Team would like to thank for their continuing interest in this project and their assistance:

Stephan Harris – *R2CTPO*
Gail Henrickson – *City of New Smyrna Beach*
Michelle Updike – *City of New Smyrna Beach*
Amir Asgarinik – *FDOT*
Todd Alexander – *FDOT*
Scott Martin – *Volusia County*
Al Chandler – *Volusia County Schools, Director of Student Transportation*
Elizabeth Johnson – *New Smyrna Beach Middle School, Principal*
Randy Walter – *City of New Smyrna Beach Utilities Commission*

Figure 1: Project Location Map



PHYSICAL INVENTORY AND ASSESSMENT OF RIGHT-OF-WAY

General Description

The study area is located in the City of New Smyrna Beach. The proposed trail is approximately two miles long. There is an existing eight-foot wide concrete sidewalk adjacent to curb and gutter along the north side of 10th Street. No sidewalk is present on the south side of 10th Street between the college and South Myrtle Avenue. The concrete sidewalk and curb and gutter continue from 10th Street on to the west side of South Myrtle Avenue until the first entrance to NSBMS. Beyond the first entrance there is an existing seven to eight foot wide asphalt trail. The asphalt trail crosses from the west side of South Myrtle Avenue to the east side at Joel Street, approximately 0.5 mile north of 10th Street. The existing asphalt trail continues along the east side of the road up to the intersection with SR 44. From the north side of the intersection of SR 44 and South Myrtle Avenue up to Canal Street there is existing five-foot wide concrete sidewalk on each side of South Myrtle Avenue. Canal Street is an urban road with existing 10-foot wide concrete sidewalk adjacent to type F curb and gutter on either side of the road from South Myrtle Avenue east to the railroad tracks. The railroad tracks are owned by Florida East Coast Railway (FECR). Between the railroad tracks and US-1 there is existing five-foot wide sidewalk separated from the road with a grass utility strip on the south side of Canal Street; there is an existing eight-foot wide concrete sidewalk adjacent to curb and gutter on the north side of the road.

The adjacent land uses are primarily residential along 10th Street and South Myrtle Avenue. In addition, DSC is located on 10th Street and NSBMS is located at the intersection of 10th Street and South Myrtle Avenue. New Smyrna Beach High School is located on the north side of 10th Street approximately 0.25 miles west of the begin project limit. The project limits are located within the designated walk zone for both NSBMS and NSBHS (maps located in Appendix C). The land use on Canal Street is primarily commercial.

Field reviews were conducted by RS&H staff on September 9, 2015 and September 15, 2015. During these field reviews existing land uses were noted, roadway crossings were assessed, underground and overhead utilities were inventoried, stormwater drainage features were identified, distance and offset measurements of various elements were conducted, and numerous photographs were taken.

FIGURE 2: NEWPORT SOUND APARTMENT COMPLEX

The field review began on 10th Street at its intersection with DSC and the Newport Sound apartment complex. The apartment complex and campus exiting traffic is stop controlled, while the 10th street traffic is free flow. 10th Street is a 4-Lane divided urban road with left turn lanes present in each direction. The posted speed limit ranges from 30 to 35 MPH. There is an existing mid-block crosswalk striped on the east side of the intersection. The crosswalk does not meet current FDOT design standards for a special emphasis crosswalk. On the north side of 10th street existing 54" railing and a short retaining wall were noted along the back of existing sidewalk in front of the apartment complex. East of the

apartment complex is NSBMS. The school property is separated from the sidewalk by a chain link fence located approximately two feet from the back of sidewalk. The chain link fence continues on to South Myrtle Avenue up to West 7th Street.

The intersection of South Myrtle Avenue and 10th Street is signal controlled. There is an existing crosswalk on the north side of the intersection connecting pedestrians to the sidewalk that continues along 10th Street east to US-1.

FIGURE 3: SIGNALIZED INTERSECTION AT SOUTH MYRTLE AND 10TH STREET

There are 4 entrances to the middle school along South Myrtle Avenue. It was noted that none of the middle school entrances had existing crosswalk stripes. A meeting was held at NSBMS on September 16th, 2015 with representatives from RS&H, the City of New Smyrna Beach, the R2CTPO, and the Volusia County School District Transportation Department as well as Ms. Elizabeth Johnson, Principal of NSBMS, to discuss pedestrian and vehicular traffic related to the school that may impact this proposed trail. According to Ms. Johnson she and four others from the school are outside at the beginning and end of each day; two located at the gates and three directing traffic. There are no crossing guards present as they are not required for middle and high schools. Students walking or biking to and from school access the campus through the center gate. Traffic queues up along Myrtle Avenue, particularly at the end of the day when students are released. Ms. Johnson stated that many parents park along the front of the school blocking the existing sidewalk, waiting to pick up their children. A suggestion was made during the meeting to consider placing railing in between the road and trail in front of the school. However, an additional point of discussion was that this railing would be additional maintenance for the City and be an attractor for students to graffiti, stand or climb on, etc. Mr. Al Chandler, Director of the school board transportation department, discussed that his department will need to coordinate with the City, R2CTPO, and design engineer as this project proceeds through design and construction in order to make appropriate accommodations for the students who walk or bike to school during the trail's construction. The general consensus from the meeting is that the trail will be viewed as a positive improvement by both the school and school board.

FIGURE 4: EXISTING ASPHALT PATH IN FRONT OF NEW SYMRNA BEACH MIDDLE SCHOOL

The field review continued north along Myrtle Avenue. As previously stated, the existing asphalt trail is located on the west side of Myrtle Avenue up to Joel street then continues along the east side up to SR 44. The study team considered both sides of Myrtle Avenue for the proposed trail. The current alignment has the trail located on the side of the road with the least number of driveways. Between West 7th Street

and Joel Street there are only 3 existing driveways on the west side of the road, while on the east side there are numerous homes. Conversely, between Joel Street and SR 44 there are many houses located along the west side of the road, while the east side is undeveloped. Every driveway and side street that a trail crosses creates a potential point of conflict between trail users and vehicular traffic. Reducing these conflict points as much as possible is important for the safety of the trail users.

There is an existing crosswalk at the intersection of Joel Street and South Myrtle Avenue. There are two crosswalks striped; one diagonal and one perpendicular. Both are faded and in poor condition. The two crosswalks are redundant and only one is needed. There are small stop signs on either side of the road which are intended for the trail users. However, they are not located properly causing confusion to drivers.

FIGURE 5: EXISTING CROSSWALK AT INTERSECTION OF JOEL STREET AND SOUTH MYRTLE AVENUE

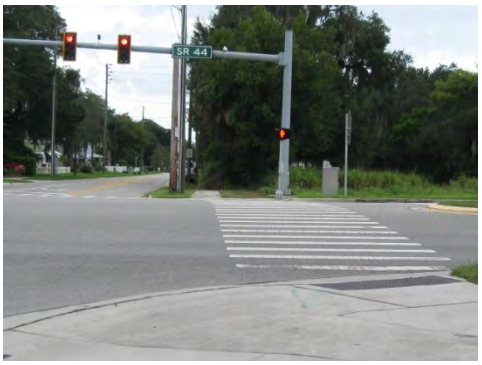


FIGURE 6: INTERSECTION AT SR 44 AND SOUTH MYRTLE AVENUE

The intersection between SR 44 and South Myrtle Avenue is signal controlled. SR 44 is a 4-lane divided arterial with a posted speed limit of 45 MPH. There are existing sidewalks along both sides of SR 44 and existing crosswalks on all four legs of the intersection.

North of SR 44, there is existing sidewalk present on each side of Myrtle Avenue. There are single family residences located along both sides of the road. The existing conditions appear to be the same on either side of the road therefore the study team did not see any benefit to locating the trail on the west side of Myrtle Avenue between SR 44 and Canal Street.

There is a restaurant, Hottie Coffee, located at the southeast corner of Myrtle Avenue and Canal Street. The edge of the building is located 17 feet from the edge of pavement which should leave enough space for the full 12-foot wide trail. On the day of the field visit several cars were parked in the area between Myrtle Avenue and the coffee shop, completely blocking the existing sidewalk. Measures will need to be taken to ensure this area is no longer used for parking once the trail is constructed. One option to deter this illegal parking is to install concrete bollards along the edge of the trail. In addition, during the design phase, the City of New Smyrna should coordinate with the business owner to ensure this change in parking is communicated to their patrons. The patrons should be using the marked parking spaces located along Canal Street or on the west side of South Myrtle Avenue.

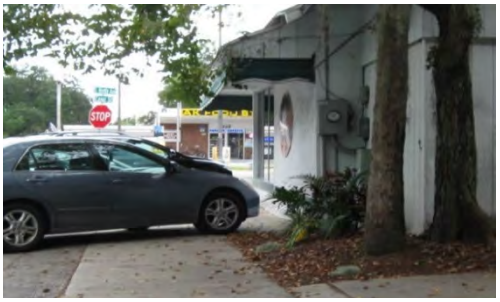


FIGURE 7: HOTTIE COFFEE WITH CARS PARKED ON THE EXISTING SIDEWALK

FIGURE 8: CANAL STREET AMENITIES SHOWN INCLUDE A BENCH, PLANTER, AND TRASHCAN

At the intersection with Canal Street, South Myrtle Avenue is stop controlled while Canal Street is free flow. Canal Street has a posted speed limit of 35 MPH. Between Myrtle Avenue and US-1 it is a two-lane undivided urban road with bike lanes and parallel street parking present in each direction. There is an existing crosswalk across Canal Street at South Myrtle Avenue. There are pedestrian crossing signs located in each direction. During our field visit we noted it was very difficult to cross Canal Street in this location. There is a significant amount of traffic and very few gaps during which to cross. No vehicles were observed to stop for pedestrians waiting to cross. Both sides of Canal Street have 10 feet of existing concrete sidewalk adjacent to type F curb and gutter. There are amenities present on both sides including benches, trash cans, street lights, planter boxes, and bike racks. There are also existing warning and regulatory signs present in the existing path. On the south side of Canal Street there are two businesses with concrete ADA switchback ramps providing access to their entrances. These ramps reduce the clear width of the sidewalk to less than five feet. The front of the buildings for these businesses are located immediately adjacent to the existing concrete sidewalk. Unless these parcels are acquired and the buildings demolished, it is not feasible to fit a trail on the south side of Canal Street. While the north side of Canal Street has similar challenges with the existing amenities, there are no business entrances that would prevent the trail from meeting the minimum requirement of 8 feet. Canal Street crosses the Florida East Coast Railroad approximately 200 feet west of US-1. The sidewalk on either side of Canal Street continues over the railroad tracks. However, it reduces in width to approximately eight feet on the north side and five feet on the south side.

FIGURE 9: FLORIDA EAST COAST RAILROAD CROSSING ON CANAL STREET

The intersection of US-1 and Canal Street is signal controlled. There are crosswalks present on all four legs of the intersection with sidewalk continuing along both sides of US-1 and Canal Street in each direction. The US-1 and Canal Street Beautification project (FPID 240992-5) is currently under design by the Florida Department of Transportation (FDOT) District 5 (D5). The project is scheduled for a May 2017 letting date and a July 2017 production date. A 10-foot wide sidewalk will be constructed on the north side of Canal Street from 90 feet west of the railroad tracks up to US-1. The sidewalk on the south side of Canal Street will only be 7.5 feet wide. The proposed design is shown on the concept plans in Appendix A.

Utilities

A utilities assessment was made during the field visit. Along 10th Street between DSC and South Myrtle Avenue there are overhead power lines and poles located along the north side of the street. The face of the pole is typically located two to three feet from the back of sidewalk. In order to construct a 12-foot wide trail, these poles would need to be relocated or the trail width would need to be instantaneously reduced at each pole location. No overhead utilities were noted along the south side of the road. However, there is a deep canal present, making this side of the road unsuitable for the trail. Overhead power lines and poles are running parallel to South Myrtle Avenue along the east side of the road from 10th Street all the way up to Canal Street. Street light luminaires are located on many of the poles; typically every other one. Two power poles were noted on the west side of South Myrtle Avenue between 10th Street and Joel Street, and then sporadically from Joel Street to SR 44, each with overhead utility lines crossing above the road. The poles along the east side of the road present a challenge for the trail construction. Some are located close enough to the existing edge of pavement (three to four feet) to allow the trail to be located behind the pole without requiring relocation. However, those located further from the road, and closer to the canal, would need to be relocated in order to accommodate the trail. Beginning at SR 44 and ending just south of Canal Street there are overhead lines and poles paralleling both sides of South Myrtle Avenue. The poles and overhead lines located on the east side of the road from SR 44 to Canal would also need to be relocated to accommodate trail construction. No overhead utility lines were noted along Canal Street.

FIGURE 10: OVERHEAD POWER LINES AND POLES ALONG 10TH STREET

FIGURE 11: OVERHEAD POWER LINES AND POLES LOCATED ALONG SOUTH MYRTLE AVENUE

Water valves were noted throughout the corridor both in the existing sidewalk and outside of the pavement limits. Many of these valves will be located within the proposed trail and the tops would need to be adjusted to be flush with the trail surface. The traffic signal control box as well as a pull box is located at the northwest corner of 10th Street and South Myrtle Avenue. An instantaneous reduction in trail width is recommended in front of the control box to avoid needing to relocate it. The pull box can be adjusted to be flush with the trail surface. There are several hydrants located on the west side of South Myrtle Avenue between 10th Street and Joel Street; five of which would require relocation. There is an additional hydrant located on the northeast corner of Downing Street and South Myrtle

FIGURE 12: TRAFFIC SIGNAL CONTROL BOX LOCATED AT INTERSECTION OF SOUTH MYRTLE AVENUE AND 10TH STREET

Avenue that would need to be relocated. Cable markers were noted on South Myrtle Avenue in front of the middle school. Impacts to the buried cable line are not anticipated.

On the east side of South Myrtle Avenue across from Cavedo Street there is a lift station. The existing sidewalk meanders around the lift station. The proposed trail will need to follow a similar alignment in order to avoid impacts to the utility. There is an existing utility box located across from Field Street on the east side of South Myrtle Avenue approximately 11'-3" from the EOP that will either need to be relocated or will require an instantaneous reduction in trail width. Gas line markers were noted in between the roadway and the existing trail beginning approximately 700 feet south of SR 44. Impacts to the gas line are not anticipated. The signal control box for the SR 44 intersection is located on the northeast corner at South Myrtle Avenue. It is further east than the mast arm for the signal. Neither are anticipated to be impacted.

FIGURE 13: LIFT STATION LOCATED ON SOUTH MYRTLE AVENUE ACROSS FROM CAVEDO STREET

Environmental

Field investigation by a qualified biologist was conducted on September 9, 2015. The purpose of the inspection was to determine the extent of any wetlands and surface waters as well as identify environmental issues that could impact the development of the trail. The project corridor follows existing roadways through rural and residential areas of New Smyrna Beach, west of the Indian River Lagoon.

Based on the 2009 land use data from the St. Johns River Water Management District (SJRWMD), land uses within 200 feet of the proposed alignment are predominantly residential. However, approximately 16 acres of upland prairie and forest, 14 acres of forested wetland, and 6 acres of surface waters remain undeveloped. According to the Volusia County Property Appraiser, the majority of the land classified as upland forest is associated with undeveloped residential lots and upland forest located off 10th Street which is owned by Daytona State College. The surface waters along the project corridor consist of roadside ditches and previously permitted storm water features. The two largest surface waters are storm water features located at the intersection of South Myrtle Avenue and 10th Street. A roadside swale parallels the proposed corridor for the entire length of 10th Street. Another roadside swale parallels the east side of South Myrtle Avenue and the existing trail from Cavedo Street to Field Street. This swale is immediately adjacent to the only natural forested wetland system which is located east of South Myrtle Road. This wetland is classified as Mixed Wetland Hardwoods by the Florida Department of Transportation (FDOT) Florida Land Use, Cover and Form Classification System (FLUCFCS). This category defines wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions but lack a defined mix of canopy species. Upon visual inspection, the canopy species included laurel oak (Quercus laurifolia), sabal palm (Sabal palmetto), red maple (Acer rubrum), and cypress (Taxodium) species.

Federally protected species with the potential to be impacted by this project include the bald eagle (Haliaeetus leucocephalus), Florida scrub jay (Aphelocoma coerulescens), wood stork (Mycteria americana), red-cockaded woodpecker (Picoides borealis), and Eastern indigo snake (Drymarchon couperi). State protected species with the potential to be impacted by this project include the gopher tortoise (Gopherus polyphemus) and state-listed wading birds. No federal or state-listed species were observed during field reviews. The project will be constructed along existing roadways and through an already developed region. Little suitable habitat exists for protected, upland-dwelling species. Through the implementation of standard protection measures during construction, impacts to listed species are not anticipated.

The Florida Fish and Wildlife Conservation Commission's (FWC) Eagle Nest Locator web site revealed that the nearest documented nest (VO111) is located approximately 2,500 feet west of the project site. No bald eagles or undocumented nests were observed during the site inspection. The study site is not located within any area designated as critical habitat by the U. S. Fish and Wildlife Service (USFWS), but is located within a USFWS-designated Service Area for the Florida scrub jay. However, since no suitable habitat for this species is present, no impact to the species is anticipated. According to the USFWS website, the project site is not located within the Core Foraging Area of any wood stork rookeries. There are no wood stork or wading bird rookeries near the project and none were observed during the site inspection. It is unlikely that Eastern indigo snakes are present in the upland areas of this project. However, surveys for this species will likely be recommended prior to construction. Preconstruction surveys and standard protection measures during construction will minimize impacts to this species. No suitable habitat exists along the project corridor for the red-cockaded woodpecker as they prefer mature pine stands. No gopher tortoise burrows were observed in the open canopied upland areas within the corridor. According to the USFWS, Rugel's pawpaw (Deeringothamnus rugelii) and Okeechobee gourd (Annona glabra) are the only two federally listed species in Volusia County. No endangered or threatened plant species listed by both USFWS and the Florida Department of Agriculture & Consumer Services (FDACS) are known to occur at the project site or were observed during the site inspection.

Drainage and Permitting

During the field assessment of the project corridor, the following existing drainage system features were noted:

- Storm drains along 10th Street, South Myrtle Avenue near the middle school, and Myrtle Avenue from Field Street to SR 44. The remainder of the project area drains via sheet flow.
- A canal along the south side of 10th Street with a Concrete Box Culvert located near Parktowne Blvd.; The Concrete Box Culvert is located under Parktowne Blvd. It is a side drain that provides conveyance to the canal along the south side of 10th Street;

- Two wet detention ponds located on either side of 10th Street at South Myrtle Avenue;
- Double-barrel cross drain located approximately 455 feet north of West 7th Street. The cross drain conveys the existing canal that flows east/west under Myrtle Avenue at this location;
- Existing canal along the east side of Myrtle Avenue between 50 feet north of Joel Street and Field Street;
- Existing 36-inch side-drain located on the east side of South Myrtle Avenue at the rear of the utility station. This pipe conveys the canal under the existing utility station and sidewalk.

FIGURE 14: CROSS DRAIN UNDER SOUTH MYRTLE AVENUE AT DRAINAGE CANAL 455 FT. NORTH OF W. 7TH ST.

FIGURE 15: EXISTING CANAL ALONG THE EAST SIDE OF MYRTLE AVE.

FIGURE 16: EXISTING SIDE DRAIN LOCATED AT REAR OF UTILITY STATION.

A review of FEMA's Flood Insurance Rate Maps (FIRMs) for Volusia County showed that the study area is located within Zones AE and Other Flood Areas; the FIRMs for the study area are included in Appendix D with the project limits noted in red. As shown on the FIRMs, portions of the project corridor are within a Special Flood Hazard Area (Zone AE), from just north of Cavedo Street to just north of Field Street. However, because this project will not significantly impact the FEMA flood zones, and the project is not within a Special Basin, as defined by the SJRWMD, flood plain compensation is not required. Based on discussions with SJRWMD permitting staff the majority of the project will qualify for a permit exemption. However, the portion of the project where the proposed gravity wall impacts the existing canal will require onsite review by SJRWMD staff to determine the extent of the impacts, and if any permitting or mitigation will be required. The U.S. Army Corps of Engineers (USACE) considers the canals located along South Myrtle Avenue jurisdictional wetlands below the established ordinary high water elevation. Wetland impacts that total less than one-half acre will require a Nationwide permit, and no mitigation. If wetland impacts are greater than one-half acre then a Standard General permit will be required. If additional

wetlands are found along the project limits during the design phase of the project, the Engineer of Record will need to coordinate with the SJRWMD and USACE to determine the permitting requirements.

Soils Information

The proposed trail route on 10th Street traverses through Basinger fine sand, which is very poorly drained sandy soil; Myakka variant fine sand and Riviera fine sand, which are poorly drained sandy soils; and Cocoa sand, which is a well-drained sandy soil. South of SR 44 on South Myrtle Avenue, the proposed trail route traverses through Riviera fine sand and Cocoa sand which are poorly drained and well drained sandy soils, respectively. North of SR 44 and throughout Canal Street, the proposed trail route traverses through Cocoa-Urban land complex, which is well-drained sandy soil. A soil survey map is included in Appendix E. This map was prepared through the Web Soil Survey (WSS) operated by the USDA Natural Resources Conservation Service (NRCS).

Right-of-way

10th Street is a county road for which Volusia County has maintenance responsibilities. The County provided plans for two widening projects along 10th Street; the already completed widening on 10th street from Tatum Boulevard to Myrtle Avenue (Project No. 4906); and the 30% design plans for the future widening of 10th Street from Myrtle Avenue to US-1 (Project No. P-5061-A). These two sets of plans were used to establish the right-of-way (ROW) along 10th Street. The ROW along 10th Street is very constrained; it is located within the existing sidewalk on the north side of the road and at the back of the canal on the south side. South Myrtle Avenue and Canal Street are city streets for which the City of New Smyrna Beach has maintenance responsibilities. The City does not have ROW maps available for Myrtle Avenue or Canal Street within the limits of this project. Therefore, parcel lines obtained through the Volusia County Geographic Information Services (GIS), were used to assess the apparent ROW width. Historical Plats were also obtained. However, the plats date back to the early 1900's at which time Myrtle Avenue followed a different alignment. The apparent ROW along the majority of South Myrtle Avenue is somewhat constrained south of SR 44, varying in width from 30 feet to 48 feet. North of SR 44 the ROW widens to between 70 feet and 80 feet. The existing apparent ROW along Canal Street is also constrained, being located at the back of or within the limits of the existing sidewalk. FDOT District 5 has a current design project which includes improvements to the intersection of Canal Street and US-1 (240992-5-52-01). This project provided surveyed ROW information for the very end of this project from just east of Citron Street to US-1. The FDOT D5 project did include some ROW acquisition around the railroad crossing on Canal Street. The concept plans in Appendix A reflect the ROW limits, both apparent and surveyed, and parcel lines as described.

SHARED USE PATH CONCEPT PLAN

The following sections describe the elements that make up the concept for this project. All proposed elements are depicted graphically in the conceptual plan sheets (Appendix A) as well as the conceptual Typical Sections (Appendix B).

Trail Typical Section

The proposed trail shall typically be 12 feet wide, either adjacent to curb and gutter, or separated from the road by a minimum 4-foot grass buffer.

- In areas of existing or proposed curb and gutter, it is recommended that the trail be constructed of 6" concrete, as shown in the concept plans in Appendix A.
- When no curb and gutter is present, trail material can be either 6" concrete or asphalt consisting of 2" structural course (Traffic Level B), Optional Base Group 4, and Type B Stabilization. The concept plans in Appendix A show an asphalt trail where the trail is separated from the road by a grass buffer. However, in the Financial Feasibility section of the report cost estimates have been included for both options.
- Per the FDOT Plans Preparation Manal section 8.8, handrail should be placed at the back of trail when a drop off of greater than 10 inches is located within two feet of the back of path; or if the total drop off is greater than five feet. Our concept plans call for handrail in areas where the drop off appeared it would meet one of these two conditions. Actual limits will need to be verified during the final design phase of this project when survey is available.

Trail Alignment and Crossings

The City of Edgewater is currently in the design phase of a 12-foot trail that will begin at the terminus of the East Central Regional Rail Trail on Dale Street and continue northerly through the DSC campus, ending at 10th Street. The Coast to Coast Connector Trail is intended to begin where Edgewater's trail ends, on the northeast side of the DSC campus entrance. During the design phase of this project the Engineer will need to coordinate with the City of Edgewater and DSC to determine the exact location of the connection. The Engineer with also need to work with Daytona State College to obtain a permanent easement in order to complete the connection.

Both sides of the road were reviewed throughout this study in order to make a recommendation for the proposed trail alignment. The canal present along the south side of 10th Street presents a major challenge to the proposed trail construction. There is not sufficient distance between the back of existing curb and the front slope of the canal to construct a 12-foot wide trail on the south side of the road. In order to do so, the trail would need to be constructed on some sort of structure. One option would be a sheet pile wall with a cantilevered trail on top. This would be extremely costly. Constructing the trail without a structure would cause the existing swale to be partially, if not completely, filled in resulting in major environmental and permitting concerns. As such, it was determined that the north side of 10th Street is the best location for the proposed trail.

As previously noted, the intersection of 10th Street and Parktowne Boulevard is not signalized. It is recommended that during the preliminary design phase of this trail, a traffic study be completed to determine if a traffic signal is warranted. At a minimum, in order to emphasize the crosswalk, we recommend installing a Rectangular Rapid Flashing Beacon (RRFB) system, with appropriate advance signing on 10th Street.

Along South Myrtle Avenue, the proposed trail is recommended to follow the alignment of the existing 8 foot trail. It should be located along the west side from 10th Street to Joel Street then cross to the east side from Joel Street up to Canal Street. This alignment allows for more direct access to the middle school, and reduces the number of pedestrian vehicular conflict points between 10th Street and SR 44. Between

SR 44 and Canal Street the challenges (utilities, ROW, and residential driveways) are present in equal measure on either side of the road. However, shifting the alignment to the west side of the road would result in 2 additional street crossings. Therefore, it is recommended to continue the proposed trail on the east side of South Myrtle Avenue.

The intersection of Canal Street and South Myrtle Avenue is not signalized, nor is it 4-way stop controlled. Therefore, it would be ideal to construct the trail on the south side of Canal Street. However, there are two businesses with handicap accessible ramps in front of their buildings which reduce the available width between the road and the business to less than five feet. Therefore it is not feasible to construct a continuous trail along the south side of Canal Street up to US-1. Similar to the 10th Street crossing, it is recommended that a traffic study be completed during the preliminary design phase to determine if a signal or 4-way stop is warranted at the intersection of Canal Street and South Myrtle Avenue. At a minimum we recommend installing an RRFB system.

The existing concrete sidewalk located on the north side of Canal Street is 10 feet wide until just west of the railroad crossing. Upon completion of the US-1 Canal Street Beautification project, the 10-foot wide path will continue all the way to US-1. There is not sufficient ROW available to widen the path to 12 feet without acquiring ROW from each parcel between South Myrtle Avenue and US-1. There are two existing commercial buildings located between Dimmick Street and the railroad tracks that are adjacent to the existing 10-foot trail. Both would need to be acquired and demolished in order to add the additional two feet of trail width. In addition, widening the existing path from 10-feet to 12-feet through the railroad crossing would require coordination with and approval from FECR. The national standard width for a trail is 12-feet wide. However, in constrained locations a 10-foot wide trail can be deemed acceptable. Isolated locations of only 8 feet wide, due to utility poles, trees, etc. are also allowed. The study team considers Canal Street to be a constrained location and it is recommended that the existing 10-foot wide concrete path be used for the Coast to Coast Connector Trail. However, in order to gain a full 10-foot wide path the existing amenities (planters, benches, trashcans, etc.) need to be removed or relocated to the back of the existing sidewalk. There are existing signs located in the path. All but one are regulatory or warning signs and appear to be located the minimum distance from the face of curb. It is recommended that they remain in place. Relocating the signs to the back of the 10-foot path would place them too far from the travel lanes to be properly effective. During the design phase, the engineer should verify that the signs are in fact as close to the road as allowable and relocate as appropriate to ensure the maximum amount of trail clear space is achieved. There is one informational sign designating the Lawton Chiles Trail which should be relocated to the back of the existing 10-foot path. It should be noted that acquiring ROW to widening the existing path from 10-feet to 12-feet along Canal Street is estimated to cost $1,972,000. In addition, there would likely be additional costs associated with railroad crossing upgrades.

The proposed trail elements included in this concept are:

- Construct a 12-foot wide trail from the terminus of the Edgewater Dale Street to 10th Street trail project, north to 10th Street.
- New special emphasis crosswalk with RRFB system at the intersection of Parktowne Boulevard and 10th Street.

- Construct 12-foot wide concrete trail adjacent to existing curb and gutter on the north side of 10th Street.
    - Seven utility poles will need to be relocated
    - Construct 450 LF of gravity wall with 42" railing along Newport Sound Apartment complex parcel.
    - Relocate existing fence along middle school property to new ROW limit.
    - ROW will need to be acquired from 2 parcels.
- Continue 12-foot wide concrete trail adjacent to existing curb and gutter along the west side of South Myrtle Avenue.
    - Instantaneous reduction of trail width at northwest corner of 10th Street and South Myrtle Avenue to avoid impacts to existing signal mast arm and control box.
    - Relocate existing fire hydrant located at the first entrance to the middle school.
    - Construct 25 LF of type F curb and gutter just north of the first entrance to the middle school.
- Construct 12-foot trail with 4-foot grass buffer between the road and trail from the end of the type F curb and gutter to West 7th Street.
    - Construct new Type B Fence at the proposed ROW limit
    - Relocate existing fire hydrant located near the second school entrance and near West 7th Street.
    - ROW will need to be acquired from one parcel.
- Continue 12-foot trail with 4-foot minimum grass buffer along the west side of South Myrtle Avenue from West 7th Street to Joel Street.
    - Relocate two fire hydrants and one utility pole.
    - Construct three ADA compliant concrete turnouts. Relocate associated mailboxes.
    - ROW will need to be acquired from five parcels.
- Construct new trail crossing perpendicular to South Myrtle Avenue on the north side of Joel Street. Relocate existing fence on the northwest corner of Joel Street to follow proposed ROW limit. Existing crosswalks should be removed.
- Construct 12-foot trail along the east side of South Myrtle Avenue with minimum 4-foot grass buffer.
    - ROW will need to be acquired from one parcel.
- Route trail to the east to avoid impacting the existing lift station located across from Cavedo Street. North of utility continue trail parallel to Myrtle Avenue with minimum 4-foot grass buffer.
    - Existing utility pole located across from Brown Street will either need the guy wires adjusted to be parallel to Myrtle Avenue and not cross the trail, or the trail width will need to be reduced to eight feet in order to ensure the minimum vertical clearance requirement of eight feet is met for the width of the trail.
- Beginning north of Brown Street and continuing to SR 44 there are several utility poles that will need to be relocated. The existing poles meander further from the road not leaving enough space between the pole and existing swale to construct the full 12-foot trail width.
- Between Brown Street and Suitor Street construct 42" railing at the back of trail due to drop off conditions.

- Just south of Suitor Street to just south of Field Street construct gravity wall with 42" railing at the back of proposed trail to minimize impacts to the existing swale.
    - The trail will need to shift closer to Myrtle Avenue around the curve across from Field Street reducing the grass buffer to as little as one foot. Immediately following the curve, shift alignment back to the east to create the minimum 4-foot buffer.
    - ROW will need to be acquired from one parcel.
- Construct ADA compliant concrete turnout and relocate existing mailbox just south of the intersection with Endsley Lane.
- Shift trail alignment to the east just north of Endsley Lane to avoid existing Live Oak.
- Continue 12-foot trail with 4-foot minimum grass buffer north to SR 44.
    - End trail at the existing curb ramp. Existing concrete curb ramps on either side of SR 44 to remain as they appear to be ADA compliant and in good condition.
    - ROW will need to be acquired from one parcel.
- Continue 12-foot trail with 4-foot minimum grass buffer on the east side of South Myrtle Avenue from north of SR 44 to Downing Street.
    - Reduce trail width to eight feet to avoid large Live Oak located just north of SR 44.
    - Relocate six existing utility poles
    - Construct three ADA compliant concrete turnouts. Relocate associated mailboxes.
- Construct 12-foot concrete trail adjacent to existing type F curb and gutter from Downing Street to the intersection with Canal Street.
    - Relocate existing fire hydrant.
- New special emphasis crosswalk with RRFB system at the intersection of South Myrtle Avenue and Canal Street.
- Existing 10-foot wide concrete trail adjacent to existing type F curb and gutter to remain.
    - Remove, or relocate outside of the 10-foot clear width, all amenities located within the trail including planter boxes, benches, bike racks, and trash cans.
    - All regulatory and warning signs shall remain. Engineer to verify that they are located as close as possible to the back of curb. Relocate, if appropriate to gain additional clear space.
    - Existing light poles to remain at the back of trail.
    - Existing Lawton Chiles Trail sign to be relocated to the back of trail.
- All existing water meters or utility access boxes located within the final trail surface shall be either relocated or the tops adjusted to be flush with the trail surface.

Drainage

- All existing drainage patterns should be maintained.
- To collect runoff from South Myrtle Avenue and prevent ponding, ditch bottom inlets are proposed in the grass strip between South Myrtle Avenue and the proposed trail from Joel Street to Brown Street. The proposed ditch bottom inlets would outfall directly to the canal that is adjacent to the proposed trail. The grass swale could be replaced with valley gutter if the minimum required slope of the swale

cannot be achieved. Survey is necessary to make this determination, which will take place during final design. The concept and cost estimate is based on the grass swale. The use of valley gutter would increase the cost by approximately $50,000.

- The section of the existing drainage canal along the east side of South Myrtle Avenue from just south of Suitor Street to just south of Field Street will be impacted by the proposed trail and gravity wall. The proposed improvements in this area encroach on the canal between 2 feet and 5 feet.
- The remainder of the project corridor includes minor stormwater improvements. The proposed improvements include relocating or adjusting existing ditch bottom inlets and manholes to ensure positive drainage and conformance with surficial features are maintained.
- All existing and proposed inlets within the project limits will require inlet protection systems during construction.

The alignment shown in this concept report and described above is considered to be the minimum allowable design, requiring the least amount of additional ROW and disturbance to existing drainage systems.

FINANCIAL FEASIBILITY

Tables 1 and 2 provide preliminary cost estimates for the design and construction of the proposed shared use path. Table 1 is the cost estimate for the trail construction as depicted in Appendix A which consists of concrete trail when adjacent to curb and gutter and asphalt trail when it is separated from the road by a grass buffer. Table 2 represents an estimate for constructing the entire trail in concrete. These cost estimates are to be considered an opinion of probable cost based solely on the results of this feasibility study. The item numbers and units of measure are based on the FDOT Basis of Estimates Manual. The unit prices are based on historical average costs for each pay item as provided by FDOT. The cost estimate does not include tree removal or permitting fees that may be associated with the final design phase. The cost estimate for the construction of the proposed shared use path is $3,113,538 for the concrete/asphalt trail and $3,588,142 for concrete-only trail. These estimates include $1,619,000 for ROW acquisition. The ROW acquisition has been estimated with an FDOT District Five confidence level of D.

To adjust for potential future increases in the project's cost estimate, an annual inflationary factor may be applied. FDOT provides annual inflation factors for roadway construction costs which may be used as a guideline for this trail project. The cost estimate provided herein has been adjusted by the FDOT inflationary factors noted in Tables 1 and 2 to determine inflation-adjusted cost estimates for the Coast to Coast Connector Trail project for the next three years. A listing of the FDOT approved inflation factors through 2036 is available in Appendix F. The inflation-adjusted cost estimates for 2017, 2018, and 2019 are $3,191,376, $3,278,555, and $3,368,848, respectively for the concrete/asphalt section. The inflation-adjusted cost estimates for 2017, 2018, and 2019 are $3,677,845, $3,778,313, and $3,882,369, respectively for the concrete-only section.

TABLE 1

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST - CONCRETE/ASPHALT OPTION					
PAY ITEM NO.	**ITEM DESCRIPTION**	**UNIT**	**BASE QTY**	**BASE UNIT COST**	**TOTAL COST**
101-1	MOBILIZATION	LS	1	10%	$ 83,202
102-1	MAINTENANCE OF TRAFFIC	LS	1	15%	$ 122,517
104-10-3	SEDIMENT BARRIER	LF	10600	$ 1.50	$ 15,900
104-18	INLET PROTECTION SYSTEM	EA	23	$ 95.00	$ 2,185
110-1-1	CLEARING AND GRUBBING	AC	4.17	$ 8,000.00	$ 33,360
110-7-1	MAILBOX	EA	6	$ 200.00	$ 1,200
120-1	REGULAR EXCAVATION	CY	1900	$ 15.00	$ 28,500
120-6	EMBANKMENT	CY	600	$ 11.50	$ 6,900
160-4	STABILIZATION (TYPE B)	SY	10782	$ 3.00	$ 32,347
285-704	OPTIONAL BASE GROUP 04	SY	8648	$ 10.00	$ 86,477
334-1-12	SUPERPAVE ASPHALTIC CONCRETE (TRAFFIC B) (2")	TN	904.1	$ 100.00	$ 90,410
400-0-11	GRAVITY WALL	CY	225.0	$ 500.00	$ 112,500
425-1-361	INLET, CURB, TYPE 6	EA	1	$ 5,165.00	$ 5,165
425-1-561	INLET, DITCH BOTTOM, TYPE F	EA	14	$ 5,500.00	$ 77,000
425-1-571	INLET, DITCH BOTTOM, TYPE G WITH BAFFLE	EA	1	$ 6,000.00	$ 6,000
425-5	ADJUST MANHOLE	EA	4	$ 585.00	$ 2,340
430-175-118	PIPE CULVERT, OPT. MTL, ROUND, 18” S/CD	LF	120	$ 65.00	$ 7,800
430-982-125	MES, OPTIONAL ROUND, 18” CD	EA	8	$ 1,220.00	$ 9,760
515-1-2	HANDRAIL, ALUMINUM	LF	1926	$ 30.00	$ 57,780
519-78	BOLLARD	EA	12	$ 300.00	$ 3,600
522-2	CONCRETE SIDEWALK, 6" THICK	SY	3198	$ 61.00	$ 195,078
527-2	DETECTABLE WARNINGS	SF	410	$ 35.00	$ 14,361
570-1-2	PERFORMANCE TURF, SOD	SY	6439	$ 2.00	$ 12,877
654-2-22	RAPID RECTANGULAR FLASHING BEACON SYSTEM	EA	4	$ 7,000.00	$ 28,000
700-1-11	SINGLE POST SIGN (FURNISH AND INSTALL)	EA	10	$ 250.00	$ 2,500
700-1-50	SINGLE POST SIGN (RELOCATE)	EA	4	$ 150.00	$ 600
700-1-60	SINGLE POST SIGN (REMOVE)	EA	2	$ 20.00	$ 40
710-11-123	PAINTED PAVEMENT MARKINGS, STD, WHITE, 12"	LF	1261	$ 3.00	$ 3,783
710-11-125	PAINTED PAVEMENT MARKINGS, STD, WHITE, 24"	LF	750	$ 5.00	$ 3,750
710-11-160	PAINTED PAVEMENT MARKINGS, STD, WHITE, MESSAGE	EA	8	$ 55.00	$ 440
710-11-180	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, YIELD LINE	LF	24	$ 3.00	$ 72
1644-8800	FIRE HYDRANT RELOCATE	EA	6	$ 1,200.00	$ 7,200
	UTILITY POLE ADJUSTMENT/RELOCATION	EA	24	$ 4,000.00	$ 96,000
				SUBTOTAL	**$ 1,149,644**
N/A	DESIGN ENGINEERING, SURVEY, ROW MAPPING	LS	1	30%	$ 344,893.28
N/A	ROW ACQUISITION	LS	1	$ 1,619,000	$ 1,619,000
				TOTAL	**$ 3,113,538**

FDOT Inflation-Adjusted Estimate	*Factor*	*PDC Multiplier*	***Estimate***
Year 1 Inflation-adjusted Estimate (2017)	2.5%	1.025	**$ 3,191,376**
Year 2 Inflation-adjusted Estimate (2018)	2.7%	1.053	**$ 3,278,555**
Year 3 Inflation-adjusted Estimate (2019)	2.8%	1.082	**$ 3,368,848**

TABLE 2

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST - CONCRETE-ONLY OPTION					
PAY ITEM NO.	**ITEM DESCRIPTION**	**UNIT**	**BASE QTY**	**BASE UNIT COST**	**TOTAL COST**
101-1	MOBILIZATION	LS	1	10%	$ 112,409
102-1	MAINTENANCE OF TRAFFIC	LS	1	15%	$ 166,327
104-10-3	SEDIMENT BARRIER	LF	10600	$ 1.50	$ 15,900
104-18	INLET PROTECTION SYSTEM	EA	23	$ 95.00	$ 2,185
110-1-1	CLEARING AND GRUBBING	AC	4.17	$ 8,000.00	$ 33,360
110-7-1	MAILBOX	EA	6	$ 200.00	$ 1,200
120-1	REGULAR EXCAVATION	CY	1900	$ 15.00	$ 28,500
120-6	EMBANKMENT	CY	600	$ 11.50	$ 6,900
400-0-11	GRAVITY WALL	CY	225.0	$ 500.00	$ 112,500
425-1-361	INLET, CURB, TYPE 6	EA	1	$ 5,165.00	$ 5,165
425-1-561	INLET, DITCH BOTTOM, TYPE F	EA	14	$ 5,500.00	$ 77,000
425-1-571	INLET, DITCH BOTTOM, TYPE G WITH BAFFLE	EA	1	$ 6,000.00	$ 6,000
425-5	ADJUST MANHOLE	EA	4	$ 585.00	$ 2,340
430-175-118	PIPE CULVERT, OPT. MTL, ROUND, 18” S/CD	LF	120	$ 65.00	$ 7,800
430-982-125	MES, OPTIONAL ROUND, 18” CD	EA	8	$ 1,220.00	$ 9,760
515-1-2	HANDRAIL, ALUMINUM	LF	1926	$ 30.00	$ 57,780
519-78	BOLLARD	EA	12	$ 300.00	$ 3,600
522-2	CONCRETE SIDEWALK, 6" THICK	SY	11416	$ 61.00	$ 696,376
527-2	DETECTABLE WARNINGS	SF	410	$ 35.00	$ 14,361
570-1-2	PERFORMANCE TURF, SOD	SY	6439	$ 2.00	$ 12,877
654-2-22	RAPID RECTANGULAR FLASHING BEACON SYSTEM	EA	4	$ 7,000.00	$ 28,000
700-1-11	SINGLE POST SIGN (FURNISH AND INSTALL)	EA	10	$ 250.00	$ 2,500
700-1-50	SINGLE POST SIGN (RELOCATE)	EA	4	$ 150.00	$ 600
700-1-60	SINGLE POST SIGN (REMOVE)	EA	2	$ 20.00	$ 40
710-11-123	PAINTED PAVEMENT MARKINGS, STD, WHITE, 12"	LF	1261	$ 3.00	$ 3,783
710-11-125	PAINTED PAVEMENT MARKINGS, STD, WHITE, 24"	LF	750	$ 5.00	$ 3,750
710-11-160	PAINTED PAVEMENT MARKINGS, STD, WHITE, MESSAGE	EA	8	$ 55.00	$ 440
710-11-180	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, YIE	LF	24	$ 3.00	$ 72
1644-8800	FIRE HYDRANT RELOCATE	EA	6	$ 1,200.00	$ 7,200
	UTILITY POLE ADJUSTMENT/RELOCATION	EA	24	$ 4,000.00	$ 96,000
				SUBTOTAL	**$ 1,514,724**
N/A	DESIGN ENGINEERING, SURVEY, ROW MAPPING	LS	1	30%	$ 454,417
N/A	ROW ACQUISITION	LS	1	$ 1,619,000	$ 1,619,000
				TOTAL	**$ 3,588,142**

FDOT Inflation-Adjusted Estimate	*Factor*	*PDC Multiplier*	***Estimate***
Year 1 Inflation-adjusted Estimate (2017)	2.5%	1.025	**$ 3,677,845**
Year 2 Inflation-adjusted Estimate (2018)	2.7%	1.053	**$ 3,778,313**
Year 3 Inflation-adjusted Estimate (2019)	2.8%	1.082	**$ 3,882,369**

CONCLUSION

The purpose of this study was to evaluate the feasibility of constructing a 12-foot wide trail from DSC on 10th Street, east along 10th Street, north along South Myrtle Avenue, and east along Canal Street, terminating at US-1. The proposed trail is recommended to be constructed of 6-inch concrete in sections adjacent to curb and gutter and can be either asphalt or concrete where it is separated from the road by a grassed buffer. Recommended improvements include striped crosswalks at all street crossings, RRFB's with special emphasis crossings at the intersections of Parktowne Boulevard and 10th Street and South Myrtle Avenue and Canal Street, new driveway turnouts, gravity wall and handrail to reduce impacts to the existing swale along South Myrtle, and minor drainage improvements to maintain the current drainage patterns. As a result of this study, it has been determined that the path is feasible though there are many challenges associated with the alignment that will need to be overcome. Right-of-way will need to be acquired from several parcels along 10th Street and South Myrtle Avenue. There are several overhead utility lines and poles as well as fire hydrants throughout the project that will need to be relocated. This will need to be coordinated with utility owners during final design. Canal Street presents its own set of challenges. Canal Street is a constrained corridor with buildings located adjacent to the existing 10-foot wide concrete path. The right-of-way impacts that would be necessary to construct an additional two feet of trail width along Canal Street are severe. In addition to the existing 10-foot wide path, there are also bike lanes present on either side of Canal Street. This study recommends the existing 10-foot wide concrete path remain; however, the amenities located in the trail would need to be removed or relocated.

DATA COLLECTION REFERENCES

Data collection sources used in the report included the following:

- City of New Smyrna Beach http://www.cityofnsb.com/
- National Resources Conservation Service, Web Soil Survey, http://websoilsurvey.nrcs.usda.gov/app/
- River to Sea Transportation Planning Organization, http://www.r2ctpo.org/
- Volusia County Property Appraiser's Land Mapping System
- Volusia County Geographic Information Services (GIS)
- Volusia County Flood Map Viewer, http://maps1.vcgov.org/FloodMaps/FIRM_PDFs/Map_Index.pdf
- FEMA Map Service Center
- FDOT 2015 Basis of Estimates Manual
- 2012 FDOT Volusia County Aerials, http://www.dot.state.fl.us/surveyingandmapping/
- 2010 ADA Standards for Accessible Design
- Google Maps, https://maps.google.com

APPENDIX A
CONCEPT PLANS

LEGEND

- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

PROPOSED SPECIAL EMPHASIS CROSSWALK

RAPID RECTAGULAR FLASHING BEACON SYSTEM
654-2-22

RELOCATE EXIST. POWER POLE

CONST. 450' L.F. GRAVITY WALL W/ 42" PEDESTRIAN/BICYCLE RAILING

APPROX. 0.372 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173401230010

PROPOSED ADA CONCRETE TURNOUT

N

0 20 100
Feet

NEWPORT SOUND PLACE

TRAIL X-ING AHEAD

10TH STREET

MATCHLINE A-A

250'

120'

EXIST. TYPE F CURB AND GUTTER TO REMAIN

PROPOSED 12' TRAIL

REPLACE EXISTING "SCHOOL" PAVEMENT MESSAGE WITH "TRAIL XING" PAVEMENT MESSAGE

RELOCATE EXIST. POWER POLE

APPROX. 0.131 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173401230020

PARKTOWNE BLVD.

TRAIL X-ING AHEAD

RAPID RECTAGULAR FLASHING BEACON SYSTEM
654-2-22

OBTAIN PERMANTENT EASEMENT FROM DAYTONA STATE COLLEGE

FUTURE CITY OF EDGEWATER MULTI-USE TRAIL:
DALE STREET TO DAYTONA STATE COLLEGE

DAYTONA STATE COLLEGE
EDGEWATER/NEW SMYRNA CAMPUS

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H
301 E Pine St. Suite 300
Orlando, Florida 32801
407-893-5800
FL Cert. No. EB0005620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-2

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MATCHLINE A-A

MATCHLINE B-B

N

0 20 100
Feet

120'

10TH STREET

PROPOSED ADA COMPLIANT CONCRETE TURNOUT

EXIST. FENCE TO BE REMOVED AND REPLACED WITH NEW TYPE B FENCE LOCATED AT THE PROPOSED R/W.

EXIST. POWER POLE TO BE RELOCATED

APPROX. 0.372 ACRES RW TO BE AQUIRED FROM PARCEL ID #4917340123O010

EXIST. SIGNAL MAST ARM AND CONTROL BOX TO REMAIN. REDUCE TRAIL WIDTH TO 10' TO AVOID IMPACTS.

RELOCATE EXIST. "NO TURN ON RED" SIGN

ADJUST SIGNAL PULL BOX TO MATCH TRAIL GRADE

EXIST. UTILITY POLE TO BE RELOCATED

PROPOSED CROSSWALK

RELOCATE EXIST HYDRANT

PROPOSED CROSSWALK

PROPOSED 12' TRAIL

SOUTH MYRTLE AVENUE

85'

RELOCATE EXIST. HYDRANT

EXIST. TYPE F CURB AND GUTTER TO REMAIN

EXIST. DBI TO BE REMOVED AND REPLACED WITH TYPE F DBI LOCATED BEHIND PROP. 12' TRAIL

CONST. 25 L.F. TYPE F CURB AND GUTTER

PROPOSED 12' TRAIL

CONST. TYPE 6 CURB INLET

RELOCATE EXIST. "END SCHOOL ZONE" SIGN

PROPOSED CROSSWALK

ADJUST VALVE TO MATCH TRAIL SURFACE

EXIST. FENCE TO BE REMOVED AND REPLACED WITH NEW TYPE B FENCE LOCATED AT THE PROPOSED R/W.

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

LEGEND

- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H
301 E Pine St, Suite 300
Orlando, Florida 32801
407-893-5800
FL Cert. No. EB0005620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-3

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LEGEND
- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

0 20 100
Feet

RELOCATE EXIST. HYDRANT

CONST. 42" PED/BICYCLE RAILING

APPROX. 0.090 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173408020170

APPROX. 0.171 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173408020050

WEST 7TH STREET

EXISTING CANAL

EXIST. FENCE TO BE REMOVED AND REPLACED WITH NEW TYPE B FENCE LOCATED AT THE PROPOSED R/W.

RELOCATE EXIST. MAILBOX

RELOCATE EXIST. HYDRANT

PROPOSED CROSSWALK

MATCHLINE C-C

MATCHLINE B-B

SOUTH MYRTLE AVENUE

40'

RELOCATE EXIST. HYDRANT

APPROX. 0.372 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173401230010

PROPOSED ADA COMPLIANT CONCRETE TURNOUT

EXIST. POWER POLE TO BE RELOCATED

AHEAD

700-1-11
W11-2
W16-9P

PROPOSED 12' TRAIL

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H
301 E Pine St, Suite 300
Orlando, Florida 32801
407-893-5800
FL Cert. No. EB0005620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-4

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LEGEND

- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

EXIST. STOP/STREET SIGN TO BE RELOCATED

EXIST. FENCE TO BE RELOCATED

APPROX. 0.016 ACRES RW TO BE AQUIRED FROM PARCEL ID #19173423000030

700-1-11 W11-2 W16-7PL

700-1-11 W11-2 W16-9P

700-1-11 R01-01 (18"X18")

REPLOCATE EXIST. MAILBOX

JOEL STREET

CAVEDO STREET

EXIST. MANHOLE TO BE ADJUST

PROPOSED 12' TRAIL

BROWN STREET

CONST. DBI TYPE F

700-1-11 R01-05L

CONST. DBI TYPE F

SOUTH MYRTLE AVENUE

MATCHLINE C-C

MATCHLINE D-D

LIFT STATION

CONST. 1:2 18" MES WITH 18" PIPE

APPROX. 0.329 ACRES RW TO BE AQUIRED FROM PARCEL ID #19173423000041

700-1-11 R01-05L

700-1-11 W11-2 W16-7PL

700-1-11 R01-01 (18"X18")

CONST. 1:2 18" MES WITH 18" PIPE

UTILITY COORDINATION NEEDED TO RELOCATE GUY WIRE OR REDUCE TRAIL WIDTH TO 8'

CONST. 42" PED/BICYCLE RAILING

PROPOSED 12' TRAIL

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

APPROX. 0.038 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173408020010

ADJUST WATER METER TO MATCH TROAIL SURFACE

APPROX. 0.033 ACRES RW TO BE AQUIRED FROM PARCEL ID #49173408020030

N

0 20 100

Feet

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-5

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LEGEND

- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

N

0 20 100
Feet

MATCHLINE D-D

MATCHLINE E-E

CONST. 12' TRAIL

THOMAS STREET

SUTTOR STREET

EXIST. POWER POLES TO BE RELOCATED

SOUTH MYRTLE AVENUE

P P P P P P

4.5'

EXIST. POWER POLES TO BE RELOCATED

CONST. 42" PED/BICYCLE RAILING

START CANAL 2'-5' IMPACT

CONST. GRAVITY WALL WITH 42" PED/BICYCLE RAILING

END CANAL 2'-5' IMPACT

EXISTING WALL TO REMAIN

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

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NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-6

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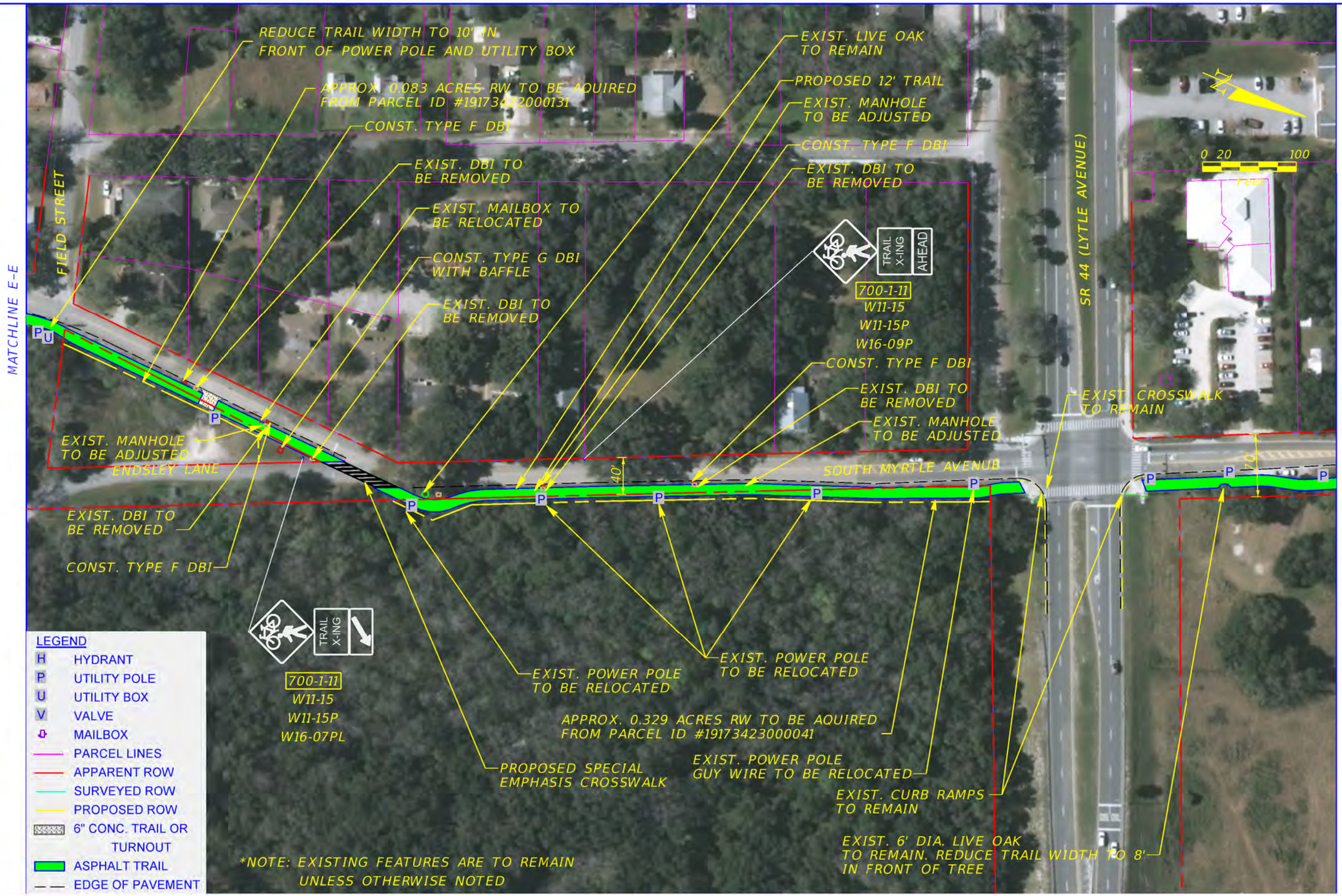

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-7

LEGEND

- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

PROPOSED CONCRETE BOLLARDS AT 4' C-C TO PREVENT PARKING ON TRAIL

EXIST. CURB AND GUTTER TO REMAIN

EXIST. POWER POLE/GUY WIRES TO BE RELOCATED

EXIST. FENCE TO REMAIN

RAPID RECTAGULAR FLASHING BEACON SYSTEM 654-2-22

PROPOSED SPECIAL EMPHASIS CROSSWALK

0 20 100 Feet

PROPOSED ADA COMPLIANT CONCRETE TURNOUT

EXIST. POWER POLE TO BE RELOCATED

PROPOSED ADA COMPLIANT CONCRETE TURNOUT

DOWNING STREET

SOUTH MYRTLE AVENUE

NORTH MYRTLE AVENUE

RAPID RECTAGULAR FLASHING BEACON SYSTEM 654-2-22

250'

80'

70'

PROPOSED ADA COMPLIANT CONCRETE TURNOUT

EXIST. HYDRANT TO BE RELOCATED

EXIST. POWER POLE TO BE RELOCATED

EXIST. DBI TO BE REMOVED

CONST. TYPE F DBI

CANAL STREET

EXIST. PLANTERS, BENCHES, BIKE RACKS, AND TRASH CANS TO BE REMOVED OR RELOCATED OUTSIDE OF TRAIL. EXIST. SIGNS TO REMAIN UNLESS OTHERWISE NOTED.

EXIST. MAILBOXES TO BE RELOCATED

PROPOSED 12' TRAIL

GUY WIRES TO BE RELOCATED

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

LEWIS STREET

MATCHLINE F-F

MATCHLINE G-G

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-8

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LEGEND

- H HYDRANT
- P UTILITY POLE
- U UTILITY BOX
- V VALVE
- MAILBOX
- PARCEL LINES
- APPARENT ROW
- SURVEYED ROW
- PROPOSED ROW
- 6" CONC. TRAIL OR TURNOUT
- ASPHALT TRAIL
- EDGE OF PAVEMENT

MATCHLINE G-G

DIMMICK STREET

EXIST. PLANTERS, BENCHES, BIKE RACKS, AND TRASH CANS TO BE REMOVED OR RELOCATED OUTSIDE OF TRAIL. EXIST. SIGNS TO REMAIN UNLESS OTHERWISE NOTED.

EXISTING "LAWTON CHILES TRAIL" SIGN TO BE RELOCATED

70'

CANAL STREET

CHESTNUT STREET

CITRON STREET

BEGIN FDOT D5 PROJECT FPID 240992-5-52-01

US-1 (NORTH DIXIE FREEWAY)

*NOTE: EXISTING FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED

N

0 20 100

Feet

REVISIONS			
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NSB COAST TO COAST CONCEPT PLAN

SHEET NO. A-9

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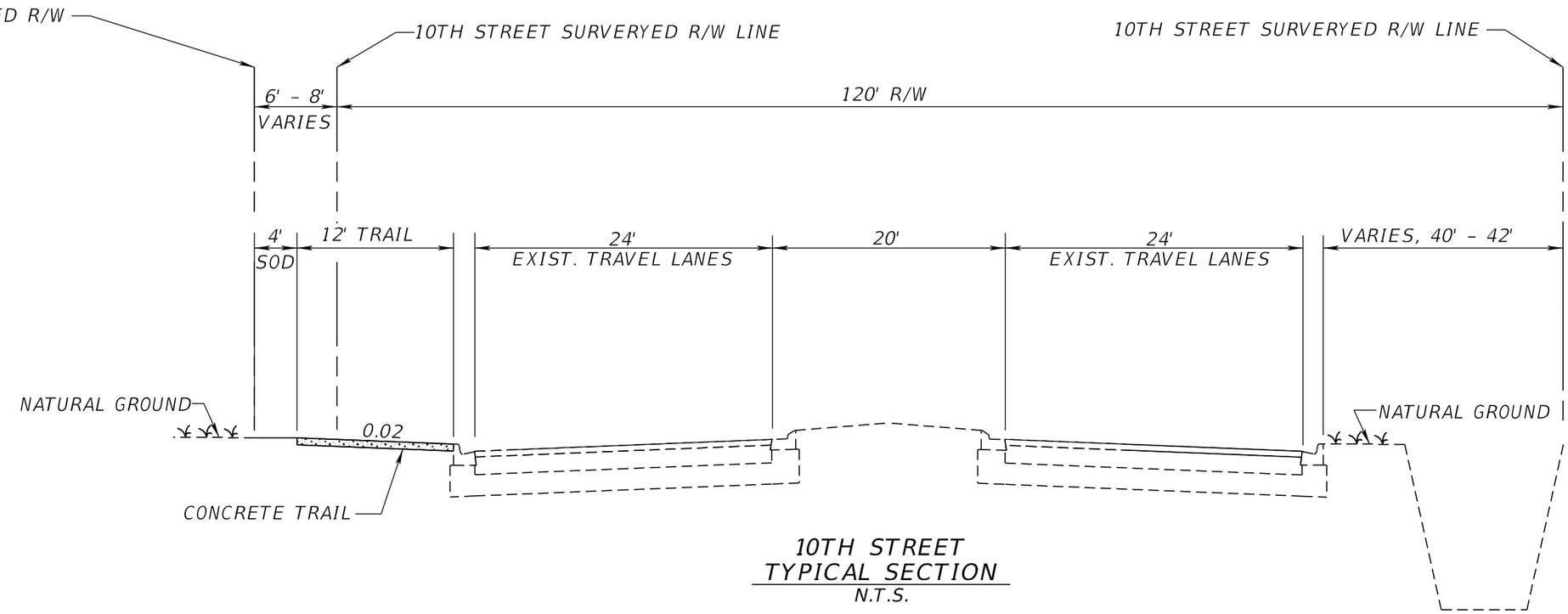
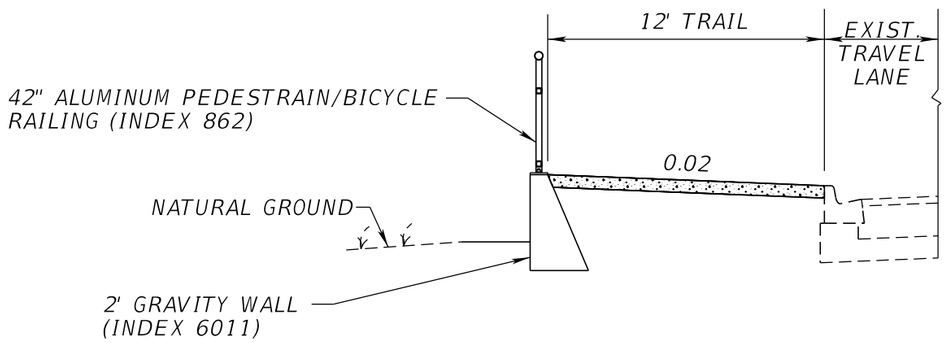
APPENDIX B
TYPICAL SECTIONS



10TH STREET
TYPICAL SECTION
N.T.S.



GRAVITY WALL WITH HANDRAIL DETAIL
10TH STREET - ADJACENT TO NEWPORT SOUND COMPLEX

REVISIONS			
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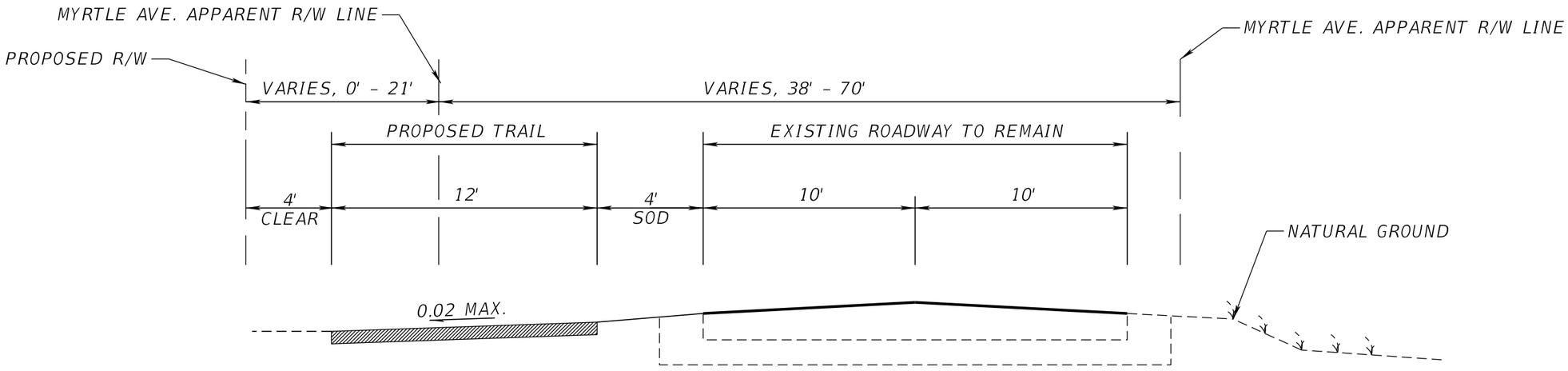
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

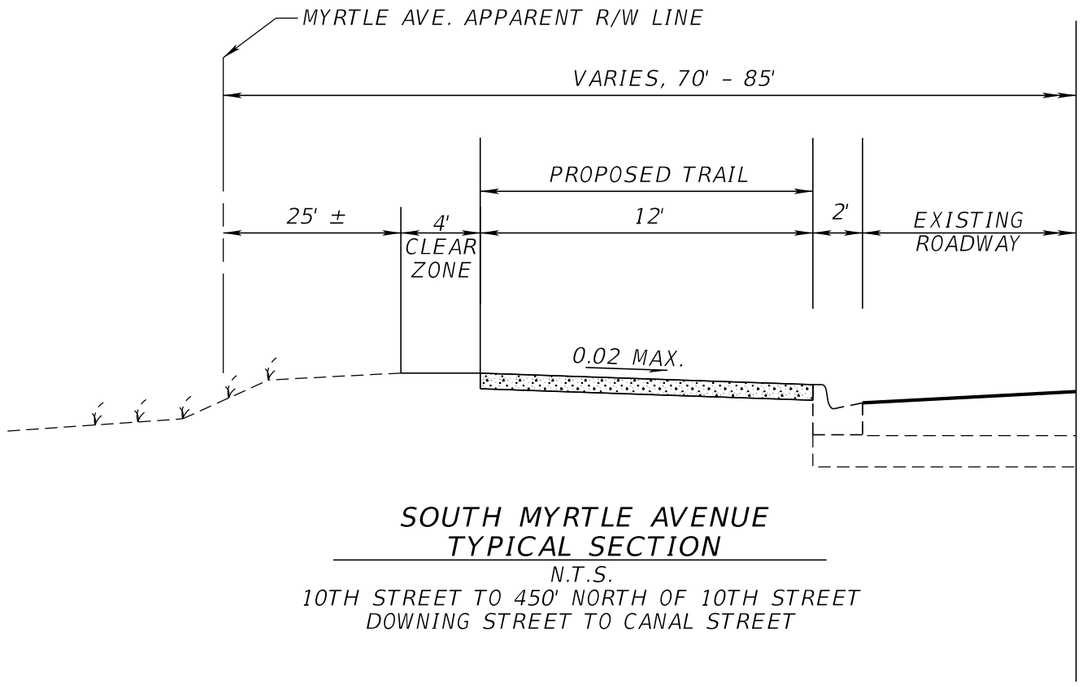
NSB COAST TO COAST
TYPICAL SECTION

SHEET NO.
B-2



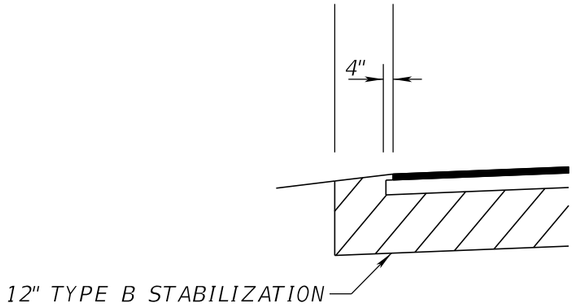
SOUTH MYRTLE AVENUE
TYPICAL SECTION

N.T.S.
450' NORTH OF 10TH STREET
TO JOEL STREET



SOUTH MYRTLE AVENUE
TYPICAL SECTION

N.T.S.
10TH STREET TO 450' NORTH OF 10TH STREET
DOWNING STREET TO CANAL STREET



ASPHALT OPTION

OPTIONAL BASE GROUP 4 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (2")

CONCRETE OPTION

6" PLAIN CEMENT CONCRETE PAVEMENT

REVISIONS			
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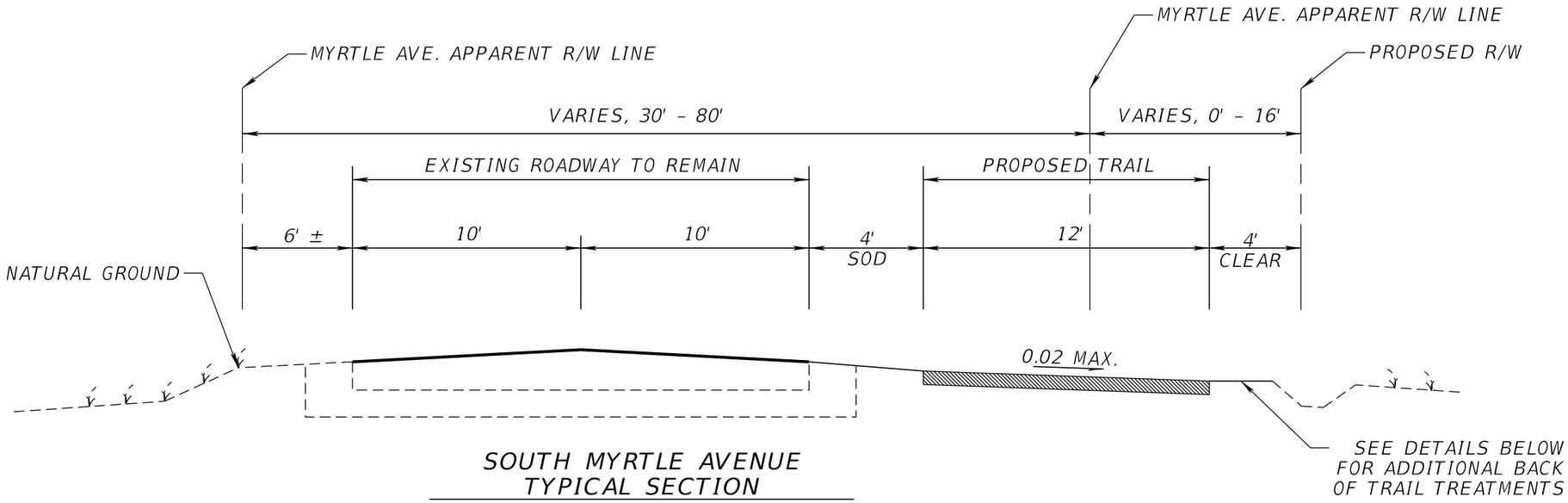
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

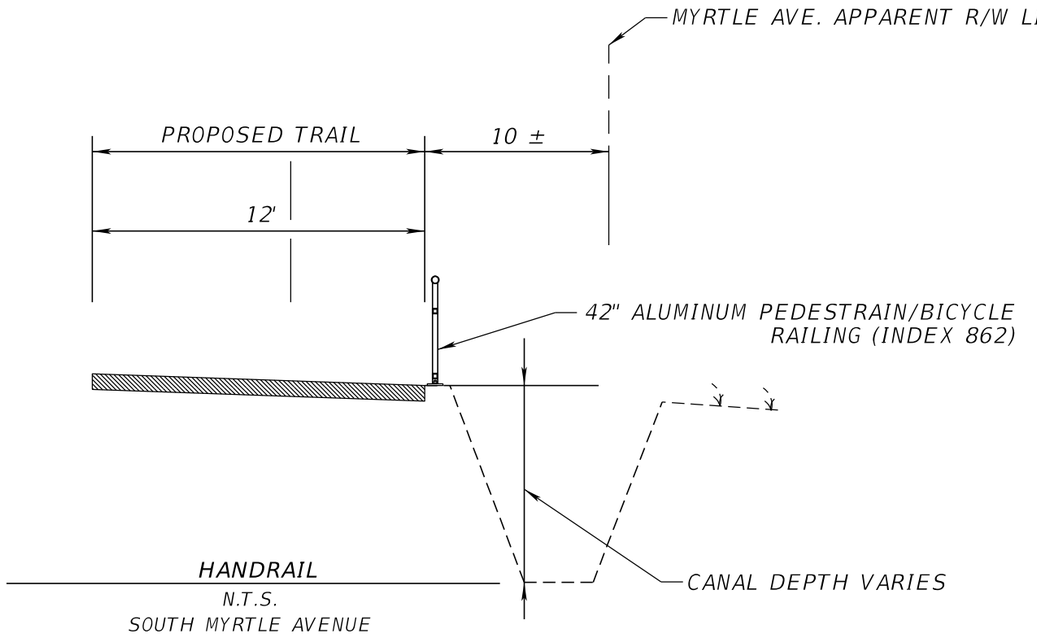
NSB COAST TO COAST
TYPICAL SECTION

SHEET NO.
B-3



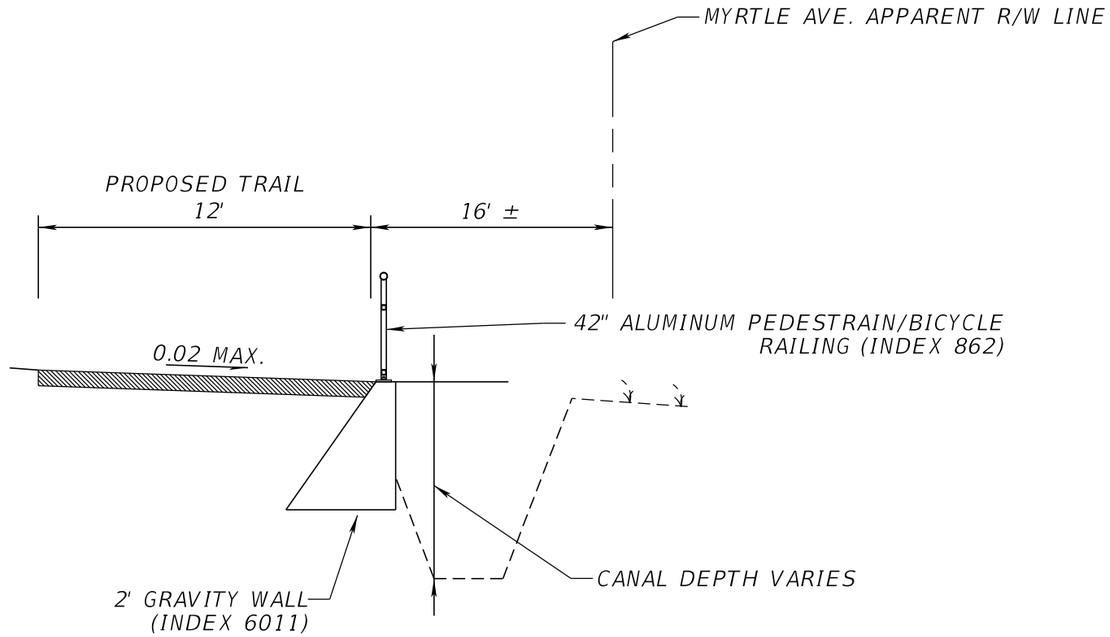
SOUTH MYRTLE AVENUE
TYPICAL SECTION

N.T.S.
JOEL STREET TO DOWNING STREET



HANDRAIL

N.T.S.
SOUTH MYRTLE AVENUE
FROM BROWN STREET
TO 70' SOUTH OF SUITOR STREET



GRAVITY WALL WITH HANDRAIL

N.T.S.
SOUTH MYRTLE AVENUE
FROM 70' SOUTH OF SUITOR STREET
TO 70' SOUTH OF FIELD STREET

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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DEPARTMENT OF TRANSPORTATION

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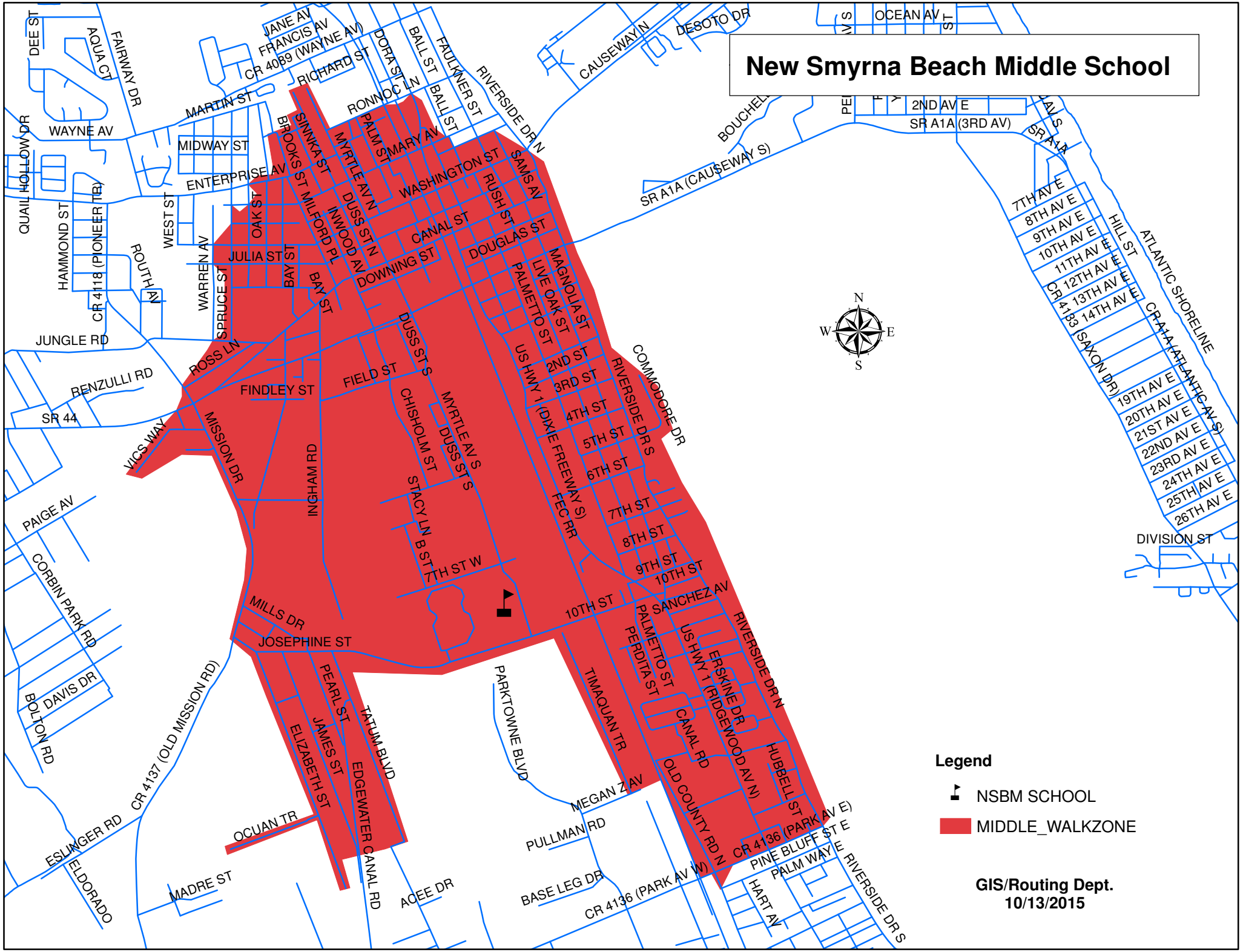
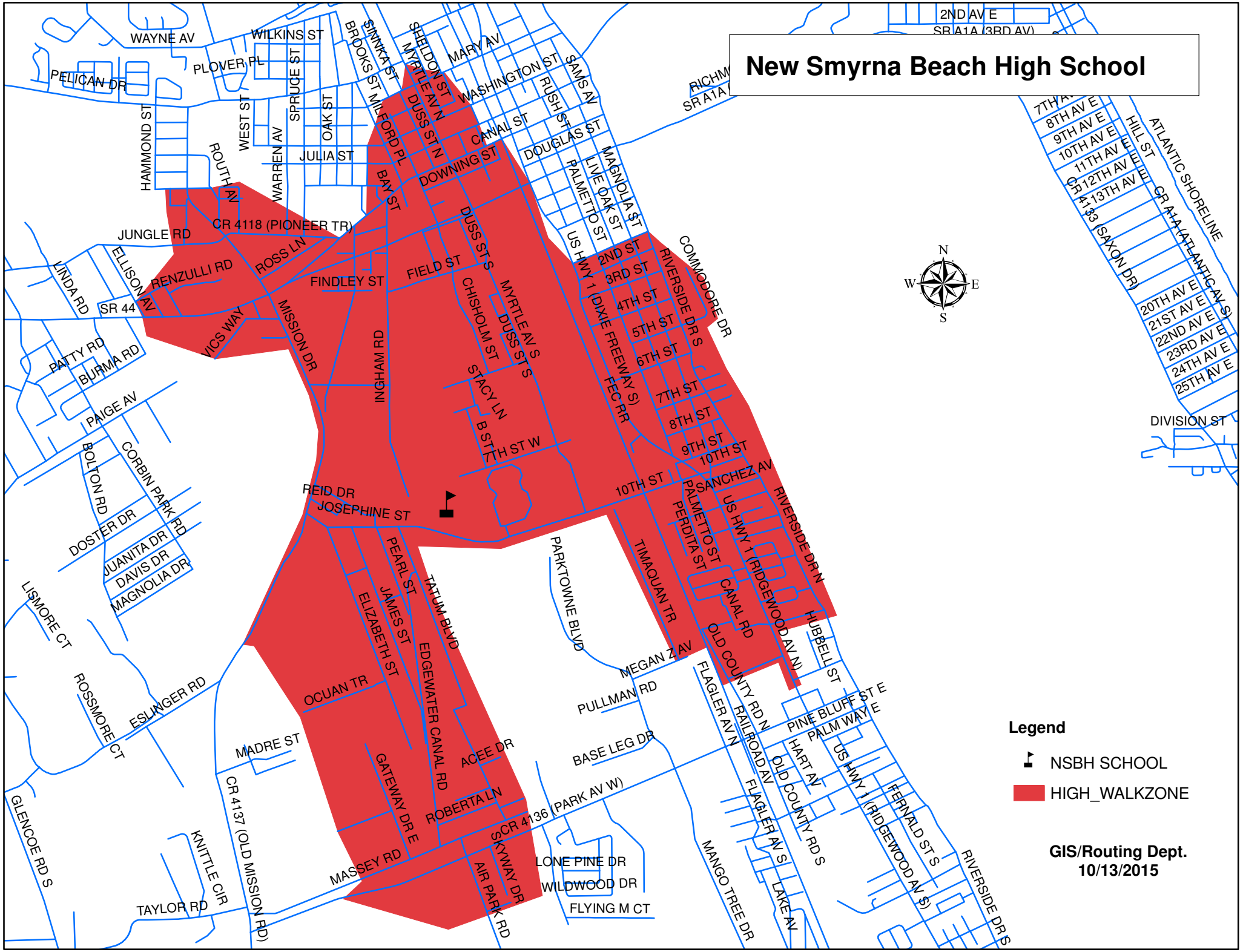
NSB COAST TO COAST
TYPICAL SECTION

SHEET NO. B-4

APPENDIX C
DESIGNATED SCHOOL WALK ZONES


New Smyrna Beach Middle School
DEE ST
AQUA CT
FAIRWAY DR
JANE AV
FRANCIS AV
CR 4089 (WAYNE AV)
RICHARD ST
DORA ST LN
BALL ST
FAULKNER ST
RIVERSIDE DR N
CAUSEWAY N
DESOTO DR
OCEAN AV
2ND AV E
SR A1A (3RD AV)
SR A1A (CAUSEWAY S)
MARTIN ST
WAYNE AV
MIDWAY ST
ENTERPRISE AV
RONNOC LN
PALM ST
MARY AV
WASHINGTON ST
SAMS AV
RUSH ST
CANAL ST
DOUGLAS ST
MAGNOLIA ST
LIVE OAK ST
PALMETTO ST
US HWY 1 (DIXIE FREEWAY S)
FEC RR
2ND ST
3RD ST
4TH ST
5TH ST
6TH ST
7TH ST
8TH ST
9TH ST
10TH ST
RIVERSIDE DR S
COMMODORE DR
SANCHEZ AV
PERDITA ST
US HWY 1 (RIDGEWOOD AV N)
ERSKINE DR
CANAL RD
OLD COUNTY RD N
HUBBELL ST
RIVERSIDE DR N
TIMAQUAN TR
PARKTOWNE BLVD
MEGAN Z AV
PULLMAN RD
BASE LEG DR
CR 4136 (PARK AV W)
CR 4136 (PARK AV E)
PINE BLUFF ST E
PALM WAY E
HART AV
RIVERSIDE DR S
7TH AV E
8TH AV E
9TH AV E
10TH AV E
11TH AV E
12TH AV E
13TH AV E
14TH AV E
CR 4133 (SAXON DR)
HILL ST
ATLANTIC SHORELINE
CR A1A (ATLANTIC AV S)
19TH AV E
20TH AV E
21ST AV E
22ND AV E
23RD AV E
24TH AV E
25TH AV E
26TH AV E
DIVISION ST
SINNKA ST
BROOKS ST
MILFORD PL
MYRTLE AV N
DUSS ST N
INWOOD AV
OAK ST
JULIA ST
BAY ST
DOWNING ST
WEST ST
WARREN AV
SPRUCE ST
HAMMOND ST
CR 4118 (PIONEER TR)
QUAIL HOLLOW DR
ROUTH AV
JUNGLE RD
ROSS LN
RENZULLI RD
SR 44
VICS WAY
MISSION DR
FINDLEY ST
FIELD ST
INGHAM RD
DUSS ST S
CHISHOLM ST
MYRTLE AV S
DUSS ST S
STACY LN
B ST
7TH ST W
MILLS DR
JOSEPHINE ST
PAIGE AV
CORBIN PARK RD
DAVIS DR
BOLTON RD
CR 4137 (OLD MISSION RD)
ESLINGER RD
ELDORADO
MADRE ST
OCUAN TR
ELIZABETH ST
JAMES ST
PEARL ST
TATUM BLVD
EDGEWATER CANAL RD
ACEE DR
N
W
E
S
Legend
NSBM SCHOOL
MIDDLE_WALKZONE
GIS/Routing Dept.
10/13/2015


New Smyrna Beach High School
WAYNE AV
WILKINS ST
PLOVER PL
PELICAN DR
HAMMOND ST
WEST ST
SPRUCE ST
OAK ST
BROOKS ST
SINNKA ST
MILFORD PL
SHELDON ST
MYRTLE AV N
DUSS ST N
MARY AV
WASHINGTON ST
SAMS AV
RUSH ST
CANAL ST
DOUGLAS ST
MAGNOLIA ST
LIVE OAK ST
PALMETTO ST
US HWY 1 (DIXIE FREEWAY S)
2ND ST
3RD ST
4TH ST
5TH ST
6TH ST
7TH ST
8TH ST
9TH ST
10TH ST
RIVERSIDE DR S
COMMODORE DR
FEC RR
RIVERSIDE DR N
SANCHEZ AV
PALMETTO ST
PERDITA ST
US HWY 1 (RIDGEWOOD AV N)
CANAL RD
OLD COUNTY RD N
HUBBELL ST
2ND AV E
SR A1A (3RD AV)
7TH AV E
8TH AV E
9TH AV E
10TH AV E
11TH AV E
CR 312TH AV E
CR 4133 (SAXON DR)
HILL ST
ATLANTIC SHORELINE
CR A1A (ATLANTIC AV S)
20TH AV E
21ST AV E
22ND AV E
23RD AV E
24TH AV E
25TH AV E
DIVISION ST
ROUTH AV
WARREN AV
JULIA ST
BAY ST
DOWNING ST
CR 4118 (PIONEER TR)
JUNGLE RD
ROSS LN
RENZULLI RD
ELLISON AV
LINDA RD
SR 44
FINDLEY ST
FIELD ST
DUSS ST S
CHISHOLM ST
MYRTLE AV S
DUSS ST S
STACY LN
B ST
7TH ST W
MISSION DR
INGHAM RD
VICS WAY
PATTY RD
BURMA RD
PAIGE AV
BOLTON RD
CORBIN PARK RD
DOSTER DR
JUANITA DR
DAVIS DR
MAGNOLIA DR
REID DR
JOSEPHINE ST
10TH ST
PEARL ST
JAMES ST
ELIZABETH ST
TATUM BLVD
EDGEWATER CANAL RD
OCUAN TR
PARKTOWNE BLVD
TIMAQUAN TR
MEGAN Z AV
PULLMAN RD
BASE LEG DR
ACEE DR
ROBERTA LN
GATEWAY DR E
SKYWAY DR
AIR PARK RD
LONE PINE DR
WILDWOOD DR
FLYING M CT
CR 4136 (PARK AV W)
MASSEY RD
TAYLOR RD
CR 4137 (OLD MISSION RD)
MADRE ST
KNITTLE CIR
GLENCOE RD S
ROSSMORE CT
ESLINGER RD
LISMORE CT
MANGO TREE DR
FLAGLER AV S
FLAGLER AV N
RAILROAD AV
OLD COUNTY RD S
HART AV
PINE BLUFF ST E
PALM WAY E
US HWY 1 (RIDGEWOOD AV S)
FERNALD ST S
LAKE AV
RIVERSIDE DR S
N
W
E
S
Legend
NSBH SCHOOL
HIGH_WALKZONE
GIS/Routing Dept.
10/13/2015

APPENDIX D
FEMA FIRM MAP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Florida State Plane East zone (FIPS zone 0901). The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 Spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland, 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by the Volusia County, Florida GIS Department at a scale of 1:12,000 or larger from photography dated 2006 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

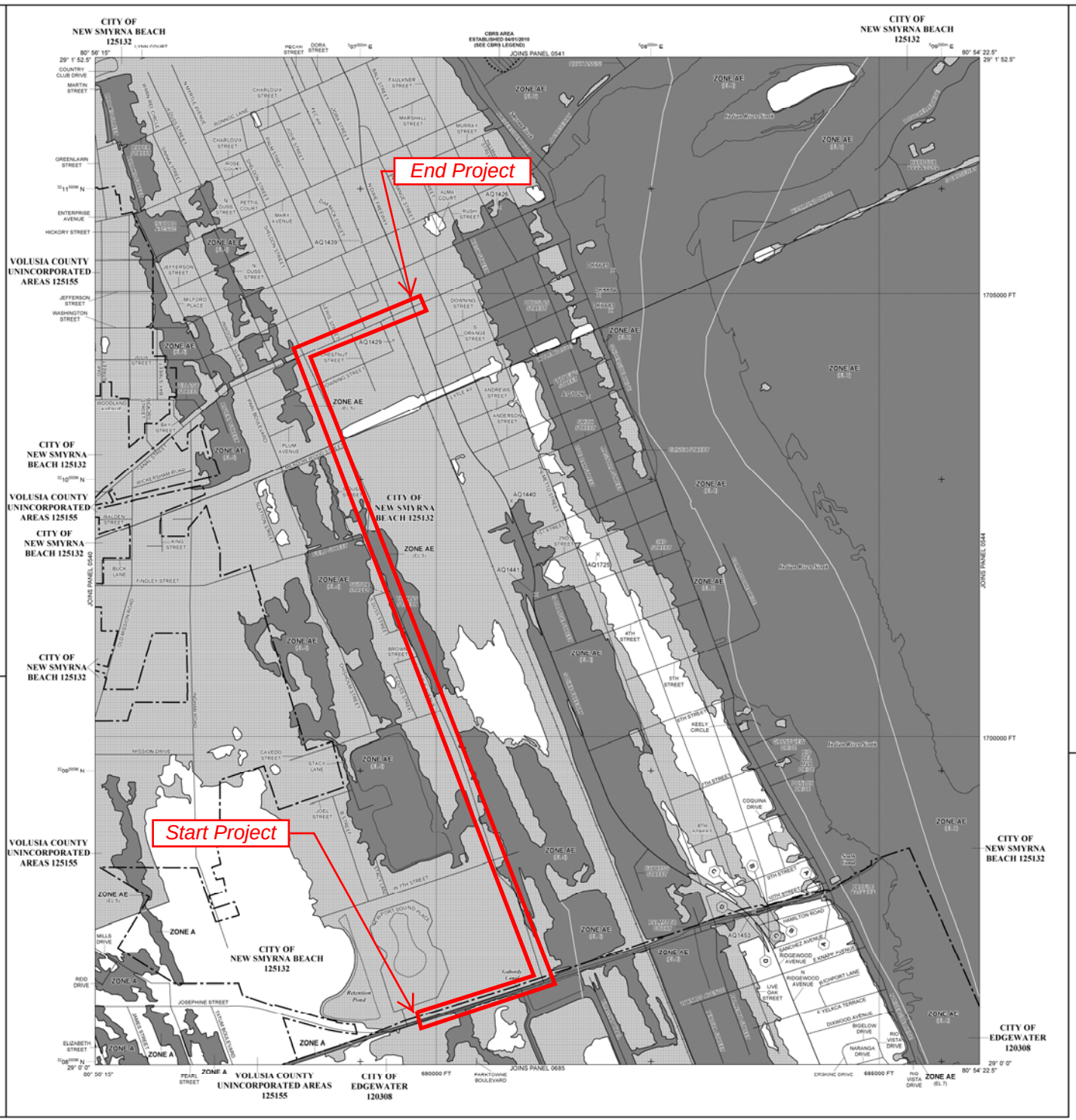
For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) LEGEND

(04-01-2010) CBRS Area

FLOOD INSURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER APRIL 1, 2010 IN DESIGNATED CBRS AREAS.

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this FIRM were transferred from the official CBRS source map(s) for this area and are depicted on this FIRM for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and maintained by the U.S. Fish and Wildlife Service (FWS). The official CBRS maps used to determine whether or not an area is located within the CBRS are available for download at http://www.fws.gov. For an official determination of whether or not an area is located within the CBRS, or for any questions regarding the CBRS, please contact the FWS field office for this area at (703) 358-2161.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4989000 N — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 4989000FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPS Zone 0901) Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
APRIL 15, 2002

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 19, 2014 - to update corporate limits, to reflect updated topographic information, to add and change Base Flood Elevations, to add floodways, to add and change Special Flood Hazard Areas, to incorporate previously issued Letters of Map Revision, and to change zone designations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0543H

FIRM

FLOOD INSURANCE RATE MAP

VOLUSIA COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 543 OF 930
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EDGEWATER, CITY OF	120308	0543	H
NEW SMYRNA BEACH, CITY OF	125132	0543	H
VOLUSIA COUNTY	125155	0543	H

- NOTE -

THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12127C0543H
MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

APPENDIX E
SOIL SURVEY MAP

Custom Soil Resource Report
Soil Map

Map Scale: 1:17,500 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Volusia County, Florida
Survey Area Data: Version 12, Sep 18, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2015—Apr 4, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Volusia County, Florida (FL127)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
8	Basinger fine sand, depressional, 0 to 1 percent slopes	4.8	1.4%
13	Cassia fine sand	7.3	2.1%
15	Cocoa sand, 0 to 5 percent slopes	115.5	33.9%
16	Cocoa-Urban land complex, 0 to 5 percent slopes	57.5	16.9%
17	Daytona sand, 0 to 5 percent slopes	15.2	4.5%
29	Immokalee sand	2.0	0.6%
32	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	17.6	5.2%
33	Myakka fine sand, depressional	2.8	0.8%
34	Myakka-St. Johns complex	0.9	0.3%
36	Myakka variant fine sand	13.8	4.0%
47	Pits	0.0	0.0%
53	Pompano-Placid complex	1.1	0.3%
55	Riviera fine sand	91.3	26.8%
71	Urban land	11.0	3.2%
Totals for Area of Interest		**340.9**	**100.0%**

APPENDIX F
FDOT INFLATION FACTORS

Inflation Factors

This *"Transportation Costs"* report is one of a series of reports issued by the Office of Policy Planning. It provides information on inflation factors and other indices that may be used to convert Present Day Costs (PDC) to Year Of Expenditure costs (YOE) or vice versa. This report is updated annually when the factors are posted within the FDOT Work Program Instructions.

Please note that the methodology for Inflationary adjustments relating to specific transportation projects should be addressed with the district office where the project will be located. For general use or non-specific areas, the guidelines provided herein may be used for inflationary adjustments.

Construction Cost Inflation Factors

The table on the next page includes the inflation factors and present day cost (PDC) multipliers that are applied to the Department's Work Program for highway construction costs expressed in Fiscal Year 2016 dollars.

Other Transportation Cost Inflation Factors

Other indices may be used to adjust project costs for other transportation modes or non-construction components of costs. Examples are as follows:

The Consumer Price Index (CPI, also retail price index) is a weighted average of prices of a specified set of products and services purchased by wage earners in urban areas. Restated, it is a price index which tracks the prices of a specified set of consumer products and services, providing a measure of inflation. The CPI is a fixed quantity price index and a reasonable cost-of-living index.

The Employment Cost Index (ECI) is based on the National Compensation Survey. It measures quarterly changes in compensation costs, which include wages, salaries, and other employer costs for civilian workers (nonfarm private industry and state and local government).

The monthly series, Producer Price Index for Other Non-residential Construction, is available from the Bureau of Labor Statistics (BLS). This index is not exclusively a highway construction index, but it is the best available national estimate of changes in highway costs from month to month.

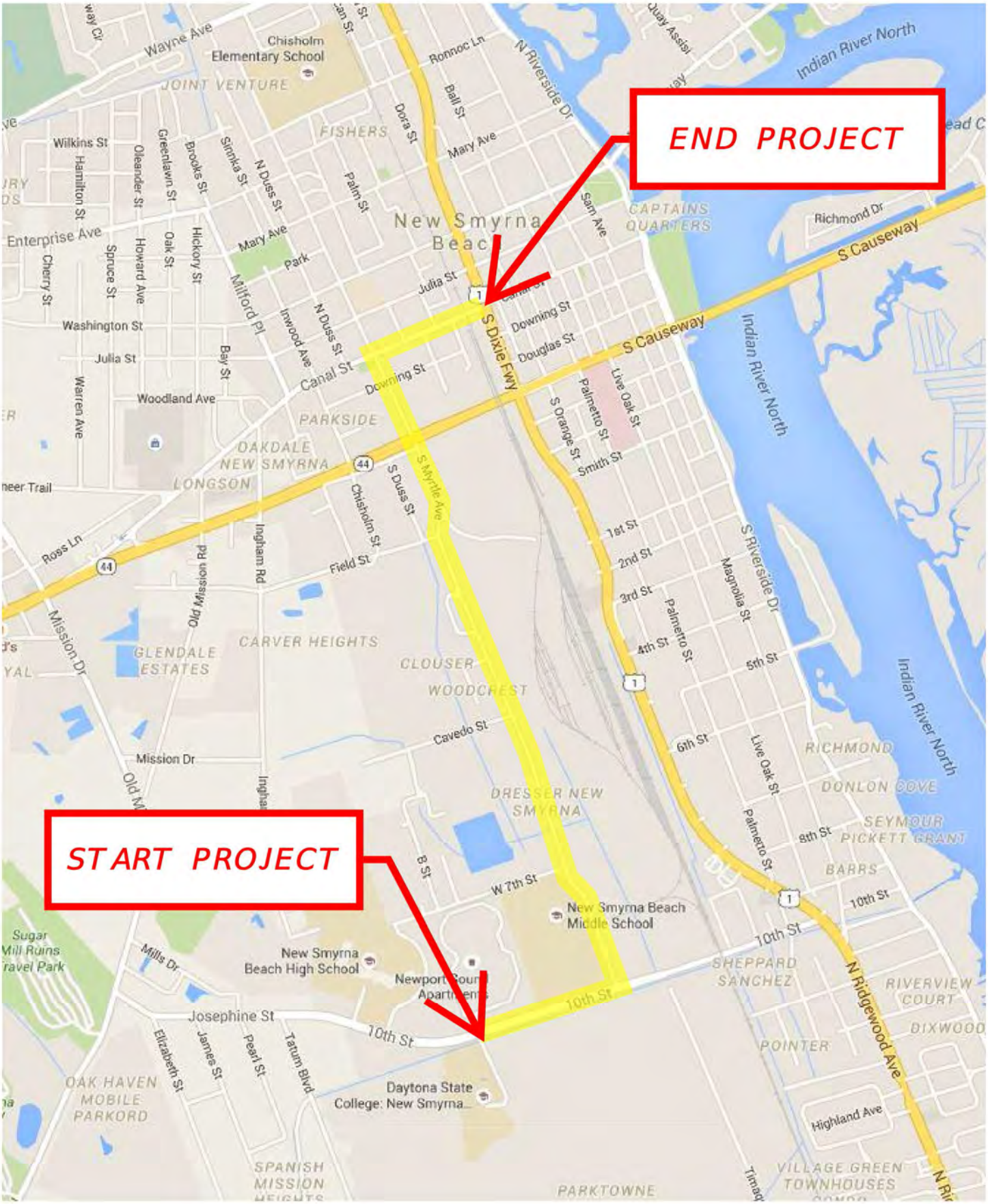
Work Program
Highway Construction Cost Inflation Factors

Fiscal Year	Inflation Factor	PDC Multiplier
2016	Base	1.000
2017	2.5%	1.025
2018	2.7%	1.053
2019	2.8%	1.082
2020	2.6%	1.110
2021	2.5%	1.138
2022	2.7%	1.169
2023	2.8%	1.201
2024	2.9%	1.236
2025	3.0%	1.273
2026	3.1%	1.313
2027	3.2%	1.355
2028	3.3%	1.399
2029	3.3%	1.446
2030	3.3%	1.493
2031	3.3%	1.543
2032	3.3%	1.593
2033	3.3%	1.646
2034	3.3%	1700
2035	3.3%	1.756
2036	3.3%	1.814
Source: Office of Work Program and Budget, (Fiscal Year 2016 is July 1, 2015 to June 30, 2016)		

Advisory Inflation Factors For Previous Years

Another *"Transportation Costs"* report is available covering highway construction cost inflation for previous years. "*Advisory Inflation Factors For Previous Years (1987-2015)* provides Present Day Cost (PDC) multipliers that enable project cost estimates from previous years to be updated to FY 2015. This report is updated about once a year. For the table and text providing this information, please go to http://www.dot.state.fl.us/planning/policy/costs/RetroCostInflation.pdf.

APPENDIX G
OVERALL PROJECT LOCATION MAP


END PROJECT
START PROJECT
Wayne Ave
Chisholm Elementary School
JOINT VENTURE
FISHERS
Ronnoc Ln
N Riverside Dr
Indian River North
Ball St
Dora St
Mary Ave
Wilkins St
Hamilton St
Oleander St
Greenlawn St
Brooks St
Simmka St
N Duss St
Palm St
New Smyrna Beach
CAPTAINS QUARTERS
Sam Ave
Richmond Dr
S Causeway
Enterprise Ave
Cherry St
Spruce St
Howard Ave
Oak St
Hickory St
Mary Ave
Park
Julia St
Milford Pl
Inwood Ave
N Duss St
S Dixie Fwy
Downing St
Douglas St
Washington St
Julia St
Bay St
Canal St
Downing St
Indian River North
Warren Ave
Woodland Ave
PARKSIDE
Palmetto St
Live Oak St
S Orange St
Smith St
OAKDALE NEW SMYRNA
LONGSON
S Myrtle Ave
S Duss St
Chisholm St
1st St
2nd St
3rd St
4th St
5th St
6th St
Ross Ln
Field St
Ingham Rd
Old Mission Rd
S Riverside Dr
Magnolia St
Palmetto St
Mission Dr
GLENDALE ESTATES
CARVER HEIGHTS
CLOUSER
WOODCREST
Cavedo St
Live Oak St
RICHMOND
DONLON COVE
DRESSER NEW SMYRNA
SEYMOUR PICKETT GRANT
8th St
BARRS
B St
W 7th St
10th St
New Smyrna Beach Middle School
Sugar Mill Ruins Travel Park
Mills Dr
New Smyrna Beach High School
SHEPPARD SANCHEZ
RIVERVIEW COURT
N Ridgewood Ave
Josephine St
10th St
Elizabeth St
Jamee St
Pearl St
Tatum Blvd
POINTER
DIXWOOD
OAK HAVEN MOBILE PARKORD
Daytona State College: New Smyrna...
Highland Ave
SPANISH MISSION
PARKTOWNE
VILLAGE GREEN TOWNHOUSES