

# Trail Feasibility

November 2006

## 1. Introduction

### What's inside?

- 1 Introduction
- 2 Project Purpose & Scope
- 3 Physical Inventory & Assessment of Right-of-Way
- 4 Trail Concept Plan
- 5 Financial Feasibility

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*The University of Florida  
Bureau of Economic and  
Business Research statistics  
indicate that in 2005 the  
population increased by  
19% since the 2000 Census.*

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The City of New Smyrna Beach, Florida has submitted to the Volusia County Metropolitan Planning Organization (VCMPO) an application for matching funds for a bicycle and pedestrian plan to connect various Beachside existing facilities. This application proposes the creation of a ten (10) foot wide paved path to complete the connection of three (3) loops between Peninsula Avenue, Saxon Drive and Atlantic Avenue. The application proposes a path along existing streets, separated from traffic. The general location of the loops; North Beach Loop, Central Beach Loop and South Beach Loop; is shown in Figure 1. More details regarding the specific loops are provided in Section 3 of this report.

In 2000, the VCMPO completed an update to its 2020 Long Range Transportation Plan (LRTP) for the County. One of the priorities that emerged from the transportation plan was the "importance of providing pedestrian and bicycle facilities as

a means of expanding the travel opportunities for county residents."<sup>1</sup> The 2020 LRTP also recognizes the importance of bicycle and pedestrian facilities as a tool for economic development and as an expansion of recreational activities for residents and visitors. The Volusia County Trail plan represents approximately 76 miles of multi-use trails throughout the County.

The 2020 LRTP describes the performance measures used to analyze and evaluate the need for improved or new bicycle and pedestrian facilities. The measures consider: bicycle and pedestrian injuries per million vehicle miles, connectivity of segments, proximity to attractions (such as schools, parks, civic centers, etc.), and proximity to transit.

The Beachside Loops facility encompasses the entire Beachside and provides a major connection to the U.S. 1 Corridor Trail via the existing North and South Causeway facilities. The loops will ultimately tie into the County's

Heritage and Cross Volusia Trails. Internally, the Loops provide connections to eight recreational parks, including Smyrna Dunes Park, the Flagler Avenue Business District and Coronado Beach Elementary.

Throughout time, the City of New Smyrna Beach, other agencies and developers have constructed pedestrian facilities as opportunities have arisen. Unfortunately, these facilities, constructed without a clear vision, have resulted in a system of disconnected facilities and service gaps. The proposal for the Beachside Loops works to correct this problem and to provide a complete system that will provide recreational options and added safety for both residents and visitors alike.

The trail is meant to serve both the approximately 10,000 New Smyrna beachside residents, as well as the large tourist population of New Smyrna Beach. Tourists and residents can use these loops to access shopping and recreation sites throughout the growing City.

<sup>1</sup>Volusia County Metropolitan Planning Organization, 2020 Long Range Transportation Plan, Chapter 5.

Figure 1: Project Location Map



## 2. Project Purpose & Scope

The following sections provide an overview of the Scope of Work completed for this feasibility study.

### Study Purpose

This study evaluated the needs of the Beachside Loops in an effort to provide a complete, connected system of paved pathways for recreational and transportation means. The goal of this study is to allow the VCMPO to determine the feasibility of a bicycle/pedestrian facility, considering items such as project need, support of jurisdictional planning studies, and construction cost estimates.

### Physical Inventory & Assessment of Right-of-Way

Based on property maps, GIS maps, and the mapping provided by the City of New Smyrna Beach along the Beachside corridor, the physical inventory was assessed as it relates to the proposed improvements. GIS databases were utilized to create mapping for the project and were supplemented with local municipal and county data.

Upon review of the existing data available, a field review and analysis was conducted

of the proposed corridor. This analysis provided information that was used to make specific recommendations for construction, safety, signing, and access.

An in-depth right-of-way analysis has not been completed for all sections of the trail. Based on physical inspection of the placement of utility poles along many of the streets, a general feeling of the right-of-way limitations was gained. Section 3 of this report discusses these limitations as they relate to specific portions of the corridor.

Also identified were potential locations for connections to public facilities, parking areas, and connections to other facilities that are part of the bicycle and pedestrian network.

### Trail Concept Plan

The field analysis and mapping were used as a base for the planning of the proposed construction elements. Mapping of the proposed corridors identified environmental and natural features, surrounding land uses, surrounding roads, community developments, community assets and

construction element locations. The final graphics include notes, diagrams, and callouts identifying the trail, access points, trail features and enhancements to the natural and the cultural features.

A conceptual plan of the trail project area was prepared and includes all of the features listed, as well as any other proposed enhancements.

### Financial Feasibility

Detailed estimates for construction were prepared based on the American Disabilities Act (ADA), the Florida Department of Transportation standards for design, the City of New Smyrna Beach Standards and the past construction bids for the construction of related projects.

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### 3. Physical Inventory & Assessment of Right-of-Way

A physical inventory and assessment (via field review) for the corridor was conducted in order to document present conditions, assets, and obstacles throughout the area. Topographic and soils maps were used to supplement the field reviews.

Two field reviews were conducted to determine the conditions along the proposed corridor. The initial field review was attended by the following persons, representing their respective entities:

- City of New Smyrna Beach – Chad Lingenfelter, AICP and Kyle Fegley, PE
- HNTB Corporation – Kate Brady, PE

The second field review was conducted by HNTB staff members to study the corridor in more detail.

During the initial meeting, discussion focused on addressing any gaps in the system and possible opportunities to upgrade any existing facilities to a ten (10) foot pathway. It was also decided that the pathways should be constructed from concrete.

#### Physical Description

A photographic inventory of the corridor is presented in this section to provide an understanding of the

physical features of the corridor. The corridor is discussed in several sections including the North Loop, the Central Loop and the South Loop.

#### North Beachside Loop

The North Beachside Loop begins at the corner of the SR 44/North Causeway/Flagler Avenue and North Peninsula Avenue. The loop runs north along North Peninsula Avenue to Surf Street. This portion of North Peninsula Avenue currently has sidewalk along the east side which is four (4) feet wide prior to Due East Street and five (5) feet wide along the remainder of the corridor. Figure 2 provides a picture of the section of North Peninsula Avenue where the existing sidewalk is four (4) feet in width. Figure 3 provides a visual image indicating where this sidewalk width change occurs. There is a small section along North Beach Community Park where the sidewalk is eight (8) feet wide.

The proposed pathway turns right on Surf Street from North Peninsula Avenue as seen in Figure 4. Surf Street ends on Beacon Street where the proposed path continues south. At this corner there is a pedestrian beach access. The path then converges with North

Atlantic Avenue by way of Cortez Street. Beacon Street from Cortez Street to Lakewood Street was considered early in the process for sidewalk improvements; however, it was determined that sidewalks are not feasible on the roadway as this is a shell road.

No sidewalk currently exists along North Atlantic Avenue except at the North Beach Community park and a small portion near Crawford Road. The North Beachside Loop utilizes the existing sidewalk along Flagler Avenue to complete the pathway.

#### Central Beachside Loop

The Central Beachside Loop utilizes South Peninsula Avenue, Flagler Avenue, South Atlantic Avenue and East 2<sup>nd</sup> Avenue to establish the pedestrian loop. Consideration was also given to sidewalk along South Cooper Street to provide an additional north/south pathway and Ocean Avenue for an additional east/west pathway. Figure 5 is taken south of Ocean Avenue facing south on South Atlantic Avenue. The figure indicates the roadway with curb and gutter, sidewalk and bike lane and provides a visual of the traffic circles that are

common to this portion of South Atlantic Avenue.



Figure 2: Taken North of Lincoln Ave. on Peninsula Ave. facing South



Figure 3: Facing North on Peninsula Ave. near Due East St.



Figure 4: Looking east on Surf St. from N. Peninsula Ave.



Figure 5: Looking south on South Atlantic Ave. south of Ocean Avenue.



Figure 6: Sidewalk construction on Saxon Dr.



Figure 7: Matthews Ave. and Michigan Ave. looking west



Figure 8: Coronado Beach Elementary School



Figure 9: Crosswalk marking at Peninsula Ave. and Cortez St.

Figure 3B-16. Examples of Crosswalk Markings

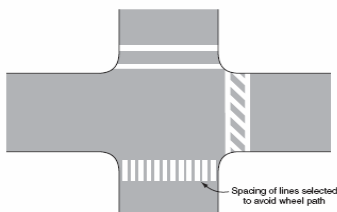


Figure 10: Examples of Crosswalk Markings as provided in the MUTCD

There is currently a four (4) foot wide sidewalk down Horton Street.

South Atlantic Avenue has a posted speed limit of 35 miles per hour; it has bike lanes and sidewalks along the length of this corridor. There is also a five (5) foot wide sidewalk along East 3<sup>rd</sup> Avenue which runs between South Atlantic Avenue and SR A1A.

**South Beachside Loop**  
Saxon Drive, Schoolway Avenue/East 30<sup>th</sup> Avenue and SR A1A comprise the South Beachside Loop. During the course of this study, Volusia County has begun construction of sidewalk along the east side of Saxon Drive. This construction can be seen in Figure 6. SR A1A has bike lanes and sidewalk along this section of the corridor.

There is a six (6) foot wide sidewalk along Matthews Avenue (see Figure 7) and the majority of Michigan Avenue includes a seven (7) foot wide asphalt pathway. Michigan Avenue provides access to Coronado Beach Elementary School seen in Figure 8. A portion of this roadway is an unpaved dirt road.

Throughout the corridor crosswalks have been painted where they are required. The crosswalk

markings observed do not meet the criteria as specified in the Manual on Uniform Traffic Control Devices (MUTCD). Consideration should be given to removing/replacing the existing crosswalk markings with patterns provided in the MUTCD as seen in Figure 10.

**Right-of-Way**

As stated previously in this report, an in-depth right-of-way assessment has not been completed for the system of Beachside Loops that have been proposed by the City of New Smyrna Beach. The information included in this section was gathered based on GIS parcel data and visual observations conducted in the field. A more detailed assessment of the right-of-way is necessary to fully understand the impacts and the ability to upgrade existing sidewalks in the study area.

Right-of-way along the North Beachside Loop varies extensively. Near Flagler Avenue along Peninsula Avenue, the right-of-way available to widen the existing sidewalk is tight and most likely unavailable as can be seen in Figure 2.

As the existing sidewalk gets wider along Peninsula Avenue it seems that enough right-of-way exists to

widen the sidewalk from five (5) feet to ten (10) feet. Along Surf Street there appears to be appropriate right-of-way to construct the ten (10) foot sidewalk along the southside of the existing roadway. Based on observations in the field and as shown in Figure 4, it appears that property owners are utilizing the easement along the roadway to park their vehicles. This would not be able to continue should the pathway be constructed.

Cortez Street (Figure 9) shows that sidewalk is likely feasible along the north side of the roadway.

Atlantic Avenue has some right-of-way constraints along the eastern side and therefore sidewalk is more likely feasible along the western side of the roadway. Figure 11 shows the slope that exists along the majority of the eastern side of Atlantic Avenue making construction along that side more difficult and costly. One of the major constraints along Atlantic Avenue's eastern side is the stone retaining wall pictured in Figure 12.

The roadways within the Central Beachside Loop have very few right-of-way concerns. Many of the streets have plenty available right-of-way within which to

construct the proposed ten (10) foot pathway. The main concerns occur along East 2<sup>nd</sup> Avenue where not only is the right-of-way tight along the south side but there is a drainage culvert system with high end cap walls along the northern side as seen in Figure 13.

At the corner of East 2<sup>nd</sup> Avenue, South Peninsula Avenue and SR A1A presents several challenges in geometry and safe crossing for pedestrians. However, this area is currently under study as there is an FDOT treatment pond along East 2<sup>nd</sup> Avenue and agencies are working together to enhance the geometry, the pond and the park across south Peninsula Avenue. The edge of the pond can be seen in Figure 14 taken from East 2<sup>nd</sup> Avenue looking toward south Peninsula Avenue.

Figure 15 provides a view of Cooper Street looking north and indicates the vast amount of right-of-way available for construction of a pathway to create an additional north/south corridor.

The next section of this report utilizes the information presented in this section to identify locations for the proposed pathway to be constructed and

explains in greater detail the limitations along each roadway.



Figure 11: N. Atlantic Ave. looking south near Inlet St.



Figure 12: N. Atlantic Ave. looking north near Inlet St.



Figure 13: East 2<sup>nd</sup> Ave. looking east



Figure 14: East 2<sup>nd</sup> Ave. looking west towards Peninsula Ave.



Figure 15: Cooper St. south

## 4. Trail Concept Plan

Establishing a trail system within New Smyrna Beach will offer residents and visitors a network of recreational facilities and alternative forms of transportation. This trail will provide a safe, pedestrian friendly connection to other proposed systems throughout New Smyrna Beach, neighboring towns and cities, and throughout Volusia County.

The trail, as proposed, will be ten (10) feet wide and will be constructed of concrete.

The trail should be designed to meet requirements of the City and to meet FDOT standards. Drainage should be considered and the sidewalk should be built outside any drainage swale area and within the existing right-of-way.

Conceptual plan sheets are provided in Figures 16 through 21. The figures provide graphical representations of the location of existing sidewalk and proposed new sidewalk. There are some instances where this report provides for the option of upgrading the existing sidewalk. This topic is discussed in further detail in Section 6.

Figure 16 illustrates in

concept the conditions in the most northern portion of the North Beach Loop.

Ten (10) foot concrete sidewalk is shown along Surf Street on the southern side due to the availability of right-of-way. A new crosswalk is proposed from the corner of Surf Street and Beacon Street to provide access to a small new portion of sidewalk providing access to the pedestrian entrance to the beach. Sidewalk is shown along the west side of Beacon Street from Surf Street to Cortez Street where a new crosswalk will connect to the proposed sidewalk along the north side of Cortez Street. An additional crosswalk is shown at Cortez Street and N. Atlantic Avenue to allow pedestrians to continue down N. Atlantic Avenue on the west side of the roadway. Crosswalks are provided at Tide Street and Inlet Street. The sidewalk is proposed to be constructed along N. Atlantic Avenue on the west side of the roadway due to the slope of the ground on the eastern side and other structural obstructions.

The middle section of the North Beachside Loop (Figure 17) begins

at Beachway Avenue where the sidewalk continues down the western edge of Atlantic Avenue to N. Lakewood Street. Existing sidewalk shown in this figure is on N. Peninsula Avenue, Sapphire Road and on the portion of N. Atlantic Avenue at the North Beach Community Park.

Figure 18 provides an aerial view of the southern portion of the North Beachside Loop. This portion features existing crosswalk on Peninsula Avenue, a very small block of N. Atlantic Avenue and along Flagler Avenue. To complete this Loop, sidewalk is proposed along the western side of Atlantic Avenue where it does not exist today.

Figures 19 and 20 to show the Central Beachside Loop and have a match line along the right and left pages, respectively.

This Loop begins with the existing sidewalk along Flagler Avenue, then follows the existing sidewalk on S. Atlantic Avenue and proposes ten (10) foot sidewalk along East 2<sup>nd</sup> Avenue to tie into the existing sidewalk on Peninsula Avenue, completing the Loop. A Four (4) foot wide sidewalk exists on Horton Street and will

not be upgraded as new sidewalk is proposed along Cooper Street to provide additional north/south options. Ten (10) foot pathway is also proposed along Ocean Avenue to provide an additional east/west movement.

The sidewalk along East 2<sup>nd</sup> Avenue is proposed on the south side from Atlantic Avenue to S. Cooper Street and then along the north side for the remainder of the roadway due to the drainage systems along the north side.

The area near the intersection of Peninsula Avenue, SR A1A and East 2<sup>nd</sup> Avenue creates some geometry issues and safety issues for pedestrians crossing to Peninsula Avenue. The City has directed that this portion should be currently shown as to be completed through upcoming study. Therefore this area of the study has not been included in the cost estimate.

The South Beachside Loop is presented in Figure 21. This Loop consists of Schoolway Avenue, CR 4133/Saxon Drive, Matthews Avenue and CR A1A/S. Atlantic Avenue. The sidewalk along Schoolway Avenue is four (4) feet wide and

will be upgraded to ten (10) feet. The portion of Michigan Avenue in front of the school does not have a sidewalk system to connect the two sidewalk systems on the various ends. Each end of Michigan Avenue has a seven (7) foot asphalt paved path on one side.

Matthews Avenue also has a paved pathway, six (6) feet wide along one side. A crosswalk exists across Matthews Avenue to Michigan but should be repositioned for safety. The intersection of Matthews Avenue and CR A1A currently has a pedestrian crossing signal, operated by push button. Consideration should be given to adding signage along A1A notifying drivers that they are approaching a trail crossing.

The sidewalk along CR 4133/Saxon Drive is under construction by Volusia County and should be completed in time for the upcoming school year. This sidewalk paired with the improvements listed above will serve to complete the South Beachside Loop.

As can be seen in Figures 22 through 24, the topographic variations along the corridor are minimal lending to a smooth

passage for both bicyclists and pedestrians throughout the entire New Smyrna Beachside. Figures 25 through 27 indicate the soil conditions along the Beachside. The soil types vary throughout; however, based on this level of analysis they seem to be suitable for construction of this type.













Figure 22: Topographic Conditions – North Beachside Loop



Figure 23: Topographic Conditions – Central Beachside Loop



Figure 24: Topographic Conditions – South Beachside Loop



Figure 25: Soil Conditions – North Beachside Loop



Figure 26: Soil Conditions – Central Beachside Loop



Figure 27: Soil Conditions – South Beachside Loop



## 5. Financial Feasibility

Table 1 provides cost estimates for the design and construction of the proposed pathway facilities. The item number and unit of measure are based on the Florida Department of Transportation Basis of Estimate manual. The unit prices are based on the average costs for each pay item as provided by the Florida Department of Transportation (Jan. 2006 to Jun. 2006).

The cost estimate is based on Florida Department of Transportation design for Bike Paths and Trails. This estimate includes cost for concrete construction throughout the length of the corridor where sidewalk is proposed.

As shown in Table 1, the total estimated cost for design and construction of the multi-use trail as detailed in the conceptual plan and discussed in this report is \$699,142.14.

This project will be planned, designed and constructed with a variety of funds. The project is eligible for federal funds that will flow through the Florida Department of Transportation and VCMPO and will be matched by the City of New Smyrna Beach.

**Table 1: Cost Estimates**

ITEM NUMBER	DESCRIPTION	EST QTY	UNIT OF MEASURE	UNIT PRICE	EXTENDED PRICE
110-1-1	Clearing & Grubbing (4.9 acres)	1.0	LS	\$18,000.00	\$18,000.00
120-1	Regular Excavation	1,867.9.0	CY	\$7.80	\$13,821.60
522-1	Concrete Sidewalk	16,812.1	SY	\$20.59	\$328,369.32
570-1-1	Performance Turf, Seeding	6,724.4	SY	\$1.35	\$8,611.79
711-11-123	Traffic Stripe-Solid, White, 12"	5,880.0	LF	\$0.92	\$5,409.60
<b>SUBTOTAL BEFORE MOT AND MOBILIZATION</b>					<b>\$393,218.30</b>
	Drainage		LS	3%	\$11,796.55
101-1	Mobilization		LS	12%	\$47,186.20
102-1	Maintenance of Traffic		LS	12%	\$47,186.20
<b>SUBTOTAL BEFORE DESIGN/CONSTRUCTION/SCOPE CREEP</b>					<b>\$499,387.24</b>
N/A	Engineering & Design		LS	15%	\$74,908.09
999-25	Initial Contingency		LS	5%	\$24,969.36
999-99	Scope Creep		LS	20%	\$99,877.45
<b>TOTAL COST</b>					<b>\$699,142.14</b>

## 5. Financial Feasibility of Options to Upgrade Existing Sidewalks

Table 2 provides cost estimates for the design and construction of the proposed pathway facilities that are proposed as upgrades. The item number and unit of measure are based on the Florida Department of Transportation Basis of Estimate manual. The unit prices are based on the average costs for each pay item as provided by the Florida Department of Transportation (Jan. 2006 to Jun. 2006).

The cost estimate is based on Florida Department of Transportation design for Bike Paths and Trails. This estimate includes cost for concrete construction throughout the length of the corridor where sidewalk is proposed.

This estimate is provided separately in order for the County and City to determine whether to proceed with the reconstruction of existing sidewalk. This estimate assumes that the right-of-way is available to utilize the same inside sidewalk line.

As shown in Table 2, the total estimated cost for design and construction of the multi-use trail as detailed in the conceptual plan and

discussed in this report is \$621,147.22.

**Table 2: Cost Estimates of Optional Pathway Features**

ITEM NUMBER	DESCRIPTION	EST QTY	UNIT OF MEASURE	UNIT PRICE	EXTENDED PRICE
110-1-1	Clearing & Grubbing (2.9 acres)	1.0	LS	\$10,000.00	\$10,000.00
120-1	Regular Excavation	1,714.2	CY	\$7.80	\$13,370.76
522-1	Concrete Sidewalk	15,427.4	SY	\$20.59	\$317,650.17
570-1-1	Performance Turf, Seeding	6,170.9	SY	\$1.35	\$8,330.72
<b>SUBTOTAL BEFORE MOT AND MOBILIZATION</b>					\$349,351.64
	Drainage		LS	3%	\$10,480.55
101-1	Mobilization		LS	12%	\$41,922.20
102-1	Maintenance of Traffic		LS	12%	\$41,922.20
<b>SUBTOTAL BEFORE DESIGN/CONSTRUCTION/SCOPE CREEP</b>					\$443,676.58
N/A	Engineering & Design		LS	15%	\$66,551.49
999-25	Initial Contingency		LS	5%	\$22,183.83
999-99	Scope Creep		LS	20%	\$88,735.32
<b>TOTAL COST</b>					\$621,147.22