



NATIONAL KEY DEER REFUGE TRANSPORTATION STUDY

Short and Long Range Improvement Plan

Contract No: DTFH71-09-D-00001



US Department of Transportation, Federal Highway Administration, Eastern Federal Lands Highway Division
in cooperation with US Fish and Wildlife Service



Kimley-Horn
and Associates, Inc.

June 2011

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Transportation Study**

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1. Introduction

The Florida Keys National Wildlife Refuges Complex is a chain of four National Wildlife Refuges (NWRs) in Monroe County, Florida. This plan focuses on the National Key Deer Refuge (NKDR). The NKDR encompasses a series of islands within the Lower Keys that include No Name Key, Big Pine Key, Little Torch Key, Ramrod Key, Summerland Key, Cudjoe Key, and Sugarloaf Key. It is the primary habitat for numerous federally endangered or threatened species including the Lower Keys Marsh Rabbit, the Silver Rice Rat, and the widely recognized Key Deer. The Refuge's approved acquisition boundary encompasses over 84,000 acres of lands and waters with nearly 9,200 acres of land owned or managed by the US Fish and Wildlife Service (USFWS).

The purpose of this report is to evaluate the environmental impacts of the preliminary candidate alternatives. The *Preliminary Candidate Alternatives Report* (March 2011) proposed five preliminary candidate alternatives and 14 additional recommendations at the National Key Deer Refuge.

This report describes the five preliminary candidate alternatives plus the additional recommendations in more detail.

1.1 Location

The NKDR is located in the Lower Keys Region of the Florida Keys in Monroe County, Florida. The *Existing Conditions Report* (January 2011) describes natural and community characteristics of the Refuge and adjacent areas.

1.2 Project History

1.2.1 Previous Studies

The following reports have been completed for this project:

- Existing Conditions Report – January 2011
- Traffic Needs and Safety Report – February 2011
- Preliminary Candidate Alternatives Report – March 2011

The information from this report and all of the previous reports will be summarized in the Transportation Study Report.

1.2.2 Responsible Partners

The following matrix, **Table 1.1**, was developed to identify potential alternatives and responsible partners. The partner agencies on this project include: USFWS, the Florida Department of Transportation (FDOT), Monroe County, FL, the Florida Fish and Wildlife Conservation Commission (FWC), the Florida Keys Overseas Heritage Trail (FKOHT), the Lower Keys Chamber of Commerce, Friends and Volunteers of Refuges (FAVOR), and the Key Deer Protection Alliance (KDPA). At stakeholder meetings, the stakeholders have agreed to work together to implement the alternatives.

Table 1.1: Proposed Stakeholder Responsibilities

	USFWS	FDOT	Monroe County	FWC	FKOHT	Lower Keys Chamber	FAVOR	KDPA
Blue Hole Site Parking Lot Reconfiguration	X		X					
Key Deer Boulevard Vegetation Trimming/Sight Distance	X		X					
Key Deer Boulevard Vegetation Trimming/Sign Visibility	X		X					
Key Deer Awareness Campaigns	X	X	X	X	X	X	X	X
Monroe County Sign Inventory Recommendations Implementation	X	X	X		X			
Identification of Missing Bicycle/Pedestrian Facility Segments	X		X		X			
New Visitor's Center Bicycle Rental Program Implementation	X				X	X		
USFWS Signage Upgrades	X		X					
Visitor Trip Characteristics Survey	X							
US 1 Deer Crossing Signage Improvements	X	X	X		X		X	X
Refuge Access Roadways Upgrades	X		X					
Long-Range Alternative Coordination	X	X	X	X	X	X	X	X
Key Deer Awareness Campaigns	X	X	X	X	X	X	X	X
Intelligent Transportation Systems Improvements	X	X	X		X			
Key Deer Boulevard Shared Pathway Extension/ Key Deer Boulevard Reconfiguration North of Kyle Boulevard	X		X					
Key Deer Boulevard Pathway Upgrades	X		X		X			
Refuge Access Roadways Upgrades	X		X					
Key Deer Awareness Campaigns	X	X	X	X	X	X	X	X
Stakeholder Coordination	X	X	X	X	X	X	X	X
	Short-Range Alternatives							
	Medium-Range Alternatives							
	Long-Range Alternatives							

2. Preliminary Candidate Alternatives

This section describes the five preliminary candidate alternatives and the additional recommendations presented in the *Preliminary Candidate Alternatives Report*. Each alternative has been identified as either short-range (2015), medium-range (2020), or long-range (2030). Preliminary designs and construction cost estimates have been developed for each of the five roadway improvement alternatives.

All construction costs are conceptual. The Engineer has no control over the cost of labor, materials, equipment, the Contractor's price determination methods, competitive bidding, or market conditions. Opinions of probable costs provided herein are based on the information known to the Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from opinions of probable costs.

2.1 Roadway Improvement Alternatives

There are five roadway design alternatives at NKDR, including a No Build alternative. These alternatives are not exclusive and should all be considered for implementation in the future. Also, for some of the alternatives, improvements have been subdivided into sections and prioritized. This allows improvements to be implemented in phases as monies are available. The roadway improvement alternatives are as follows:

2.1.1 No Build Alternative

The No Build alternative provides no improvements to the existing transportation facilities in the study area. Therefore, there also would be no improvement costs or impacts to the natural environment in the study area. In the No Build Alternative, the existing habitat would remain. However, there would be no improvements implemented that could minimize deer-vehicle collisions.

2.1.2 Alternative 1 (Figure 2.1) - Reconfigure Parking Area at Blue Hole Interpretive Site

Alternative 1 involves reconfiguring the parking area at the Blue Hole Interpretive Site to prevent vehicles from entering and blocking travel lanes on Key Deer Boulevard while performing parking maneuvers. With this reconfiguration, the parking lot vehicles will not need to maneuver onto Key Deer Boulevard. This alternative would result in no impacts to the environment. The construction cost estimate for this alternative is approximately \$5,000 for restriping and the median treatment. Detailed impacts are identified in **Section 2.6**.



Figure 2.1: Reconfigure Parking Area at Blue Hole Interpretive Site

2.1.3 Alternative 2 (Figures 2.2 & 2.3) - Bicycle, Pedestrian and Shoulder Facility Upgrades on Refuge Access Roadways

As stated in previous studies, a number of the roadways around the Refuge have substandard or no shoulders. Alternative 2 involves upgrading segments of these roadways around the Refuge. Alternative 2 is broken down into various options that can be constructed depending on the cost and implementation constraints.

2.1.3.1 Alternative 2a – Mid-Block Crosswalk across Key Deer Boulevard

Figure 2.2 shows an unsignalized pedestrian crossing alternative at the Blue Hole Interpretive Site. This alternative would include signing and striping and a mid-block crosswalk across Key Deer Boulevard at Blue Hole Interpretive Site. This crosswalk will be separate from the existing shared-use path on Key Deer Boulevard and will facilitate visitor access to the Blue Hole Interpretive Site for bicycles and pedestrians.

2.1.3.2 Alternative 2b – Sharrow Striping

An alternative to widening the roadways for bicycle lanes is the striping of sharrows on the roadway and the installation of appropriate signage. An example of sharrow striping in Miami, Florida is shown in **Figure 2.3**. It is recommended that sharrow implementation be reviewed for Watson Boulevard from Key Deer Boulevard to Avenue B, Watson Boulevard on No Name Key, Watson Boulevard from Key Deer Boulevard to the western terminus, along Big Pine Street, and along Koehn Avenue.

2.1.3.3 Alternative 2c – Shoulder Widening

Shoulder widening for bicycle lanes has been identified as another option. **Figure 2.4** shows an example of the widened section. Roadway segments and associated improvements have been prioritized based on their relative location and projected traffic volume. The recommended prioritization is as follows:

- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to Avenue B – approximately 3,950 feet
- Upgrade shoulder/widen to standard width Watson Boulevard from No Name Key Bridge to the east terminus – approximately 7,400 feet
- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to the west terminus – approximately 3,400 feet
- Upgrade shoulder on Key Deer Boulevard from Watson Boulevard to Big Pine Street – approximately 6,300 feet
- Upgrade shoulder on Key Deer Boulevard from Big Pine Street to Kyle Boulevard – approximately 7,350 feet

Proposed Alternative 2a



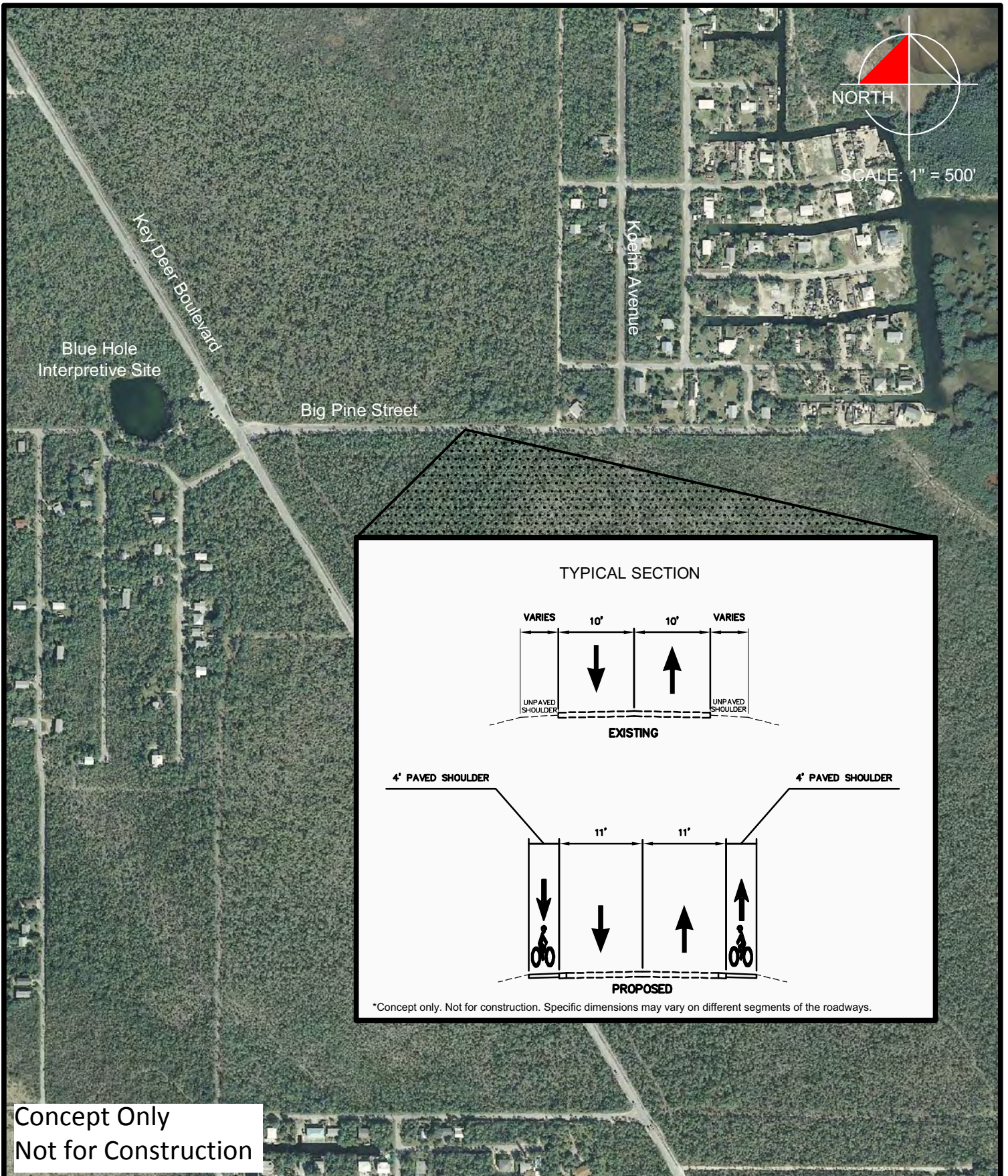
For visualization purposes.

Figure 2.2: Create Mid-Block Crosswalk at Blue Hole Interpretive Site



Figure 2.3 – Sharrow Striping Example

Proposed Alternative 2c



Concept Only
Not for Construction

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EXAMPLE CROSS SECTION FOR
RECOMMENDED FACILITY UPGRADES



Figure 2.4: Example Cross Section for Recommended Facility Upgrades

- Upgrade shoulder/widen to standard width Big Pine Street – approximately 1,500 feet
- Upgrade shoulder/widen to standard width Koehn Avenue – approximately 4,900 feet

Figure 2.5 show the locations of these segments. The prioritized list should be submitted to the County for inclusion in the capital improvement program as indicated in the “Livable Communikeys Program Masterplan for Future Development of Big Pine Key and No Name Key.” As monies become available, the County then has a systematic manner in determining the order in which projects should be completed in the future. It is expected that the first three locations on Watson Boulevard would be medium-range improvements with the remaining locations as long-range improvements.

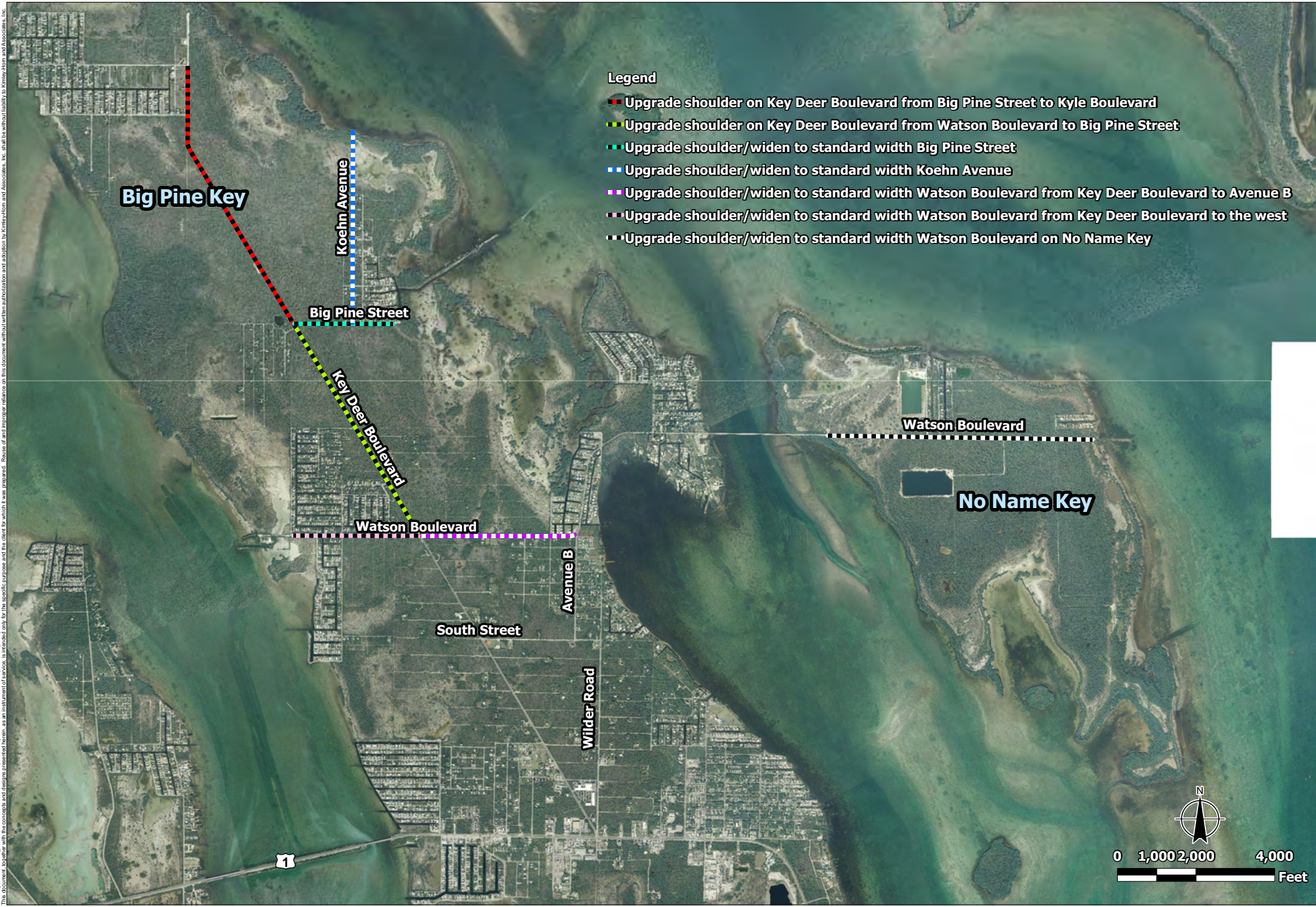
All improvements should be constructed consistent with Monroe County standards as appropriate. When upgrading for shoulders and widening to standard width, resurfacing will likely also occur. Resurfacing the existing roadway preserves the life expectancy of the road and enhances the travelers’ experience driving along the road.

Limited environmental impacts are expected for the striping and marking alternative, while some environmental impacts are expected for the shoulder or widening alternative sections. Detailed impacts are discussed in **Section 2.6**. As these facility upgrades occur, some impacts to the natural environment are expected as previously cleared shoulder areas may not be available at all upgrade locations.

The total construction cost estimate for this alternative is approximately \$3.1 million. However, it is expected that these projects would be completed in phases as previously discussed. The following list is a breakdown of each of these segments and the associated projected construction costs in priority order.

- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to Avenue B – approximately \$474,000
- Upgrade shoulder/widen to standard width Watson Boulevard from No Name Key Bridge to the east terminus – approximately \$888,000
- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to the west terminus– approximately \$408,000
- Upgrade shoulder on Key Deer Boulevard from Watson Boulevard to Big Pine Road – approximately \$663,000
- Upgrade shoulder on Key Deer Boulevard from Big Pine Road to Kyle Boulevard –approximately \$772,000
- Upgrade shoulder/widen to standard width Big Pine Street – approximately \$180,000
- Upgrade shoulder/widen to standard width Koehn Avenue – approximately \$588,000

Drawing path: K:\WB - Environmental\01161761\01\HW\KeyDeer\Map\02\SW\02 - Data courtesy of www.fgdl.org
 This document, together with the concepts and designs presented herein, is an instrument of service. It is intended only for the specific purpose and the client for which it was prepared. Reuse of and improper reliance on this document without authorization and addition by CenturyStorm and Associates, Inc. shall be without liability to CenturyStorm and Associates, Inc.



Legend

- Upgrade shoulder on Key Deer Boulevard from Big Pine Street to Kyle Boulevard
- Upgrade shoulder on Key Deer Boulevard from Watson Boulevard to Big Pine Street
- Upgrade shoulder/widen to standard width Big Pine Street
- Upgrade shoulder/widen to standard width Koehn Avenue
- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to Avenue B
- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to the west
- Upgrade shoulder/widen to standard width Watson Boulevard on No Name Key

SCALE: AS SHOWN DESIGN SCALE: 1"=100' DRAWN BY: [Name] CHECKED BY: [Name]	METADATA NO. REVISIONS DATE BY

National Key Deer Refuge
 Transportation Study
 Contract No.: DTPH7-09D-0001
 FLORIDA
 MIAMI-DADE COUNTY

DATE: 03/29/11
 PROJECT NUMBER: 0102004
 SHEET NUMBER: XX.X

Figure 2.5: Alternative 2c Potential Segments

2.1.4 Alternative 3 (Figures 2.6) - Extend Shared Pathway and Add Shoulders on Key Deer Boulevard north of Kyle Boulevard

The shared pathway on Key Deer Boulevard currently terminates at Kyle Boulevard. This alternative would extend the pathway approximately 0.25 miles to the northern terminus of Key Deer Boulevard. The pathway extension would be constructed to standards for two-way bicycle and pedestrian traffic.

This alternative would also include the addition of paved shoulders and resurfacing of the existing roadway. Extending the shared pathway and constructing it to standards for two-way bicycle and pedestrian traffic help to provide connectivity and a better bicycle and pedestrian network for visitors around the Refuge. The addition of paved shoulders brings the road segments into compliance with County standards. Resurfacing the existing roadway preserves the life expectancy of the road and enhances the travelers' experience driving along the road. The environmental impacts to native habitat, wetlands and floodplains are minimal for this alternative because a majority of the improvements would occur within the existing cleared and maintained roadway and road shoulders. Environmental impacts are detailed in **Section 2.6**. The construction cost is estimated at approximately \$238,000 to extend the shared use path, add paved shoulders, and resurface the existing roadway.

2.1.5 Alternative 4 (Figures 2.7 and 2.8) – Widen Shared Pathway on Key Deer Boulevard

Currently the shared pathway on Key Deer Boulevard is eight feet wide. Alternative 4 has two options. Alternative 4a includes widening the existing pathway to 10 feet in width, two feet narrower than current standards and therefore would require a design exception. Alternative 4b involves widening the existing pathway to 10 feet in width and separating the pathway from Key Deer Boulevard north of Watson Boulevard. Widening the shared pathway increases the number of visitors who can safely and comfortably use the pathway. Environmental impacts are expected for each of these alternatives. Detailed impacts are discussed in **Section 2.6**. The estimated construction cost for Alternative 4a is approximately \$562,000. The estimated construction cost for Alternative 4b is approximately \$873,000.

2.2 Additional Recommendations (Non-roadway Improvements)

Fourteen additional transportation recommendations have been proposed at the National Key Deer Refuge. These recommendations are not anticipated to have direct impacts to the environment.

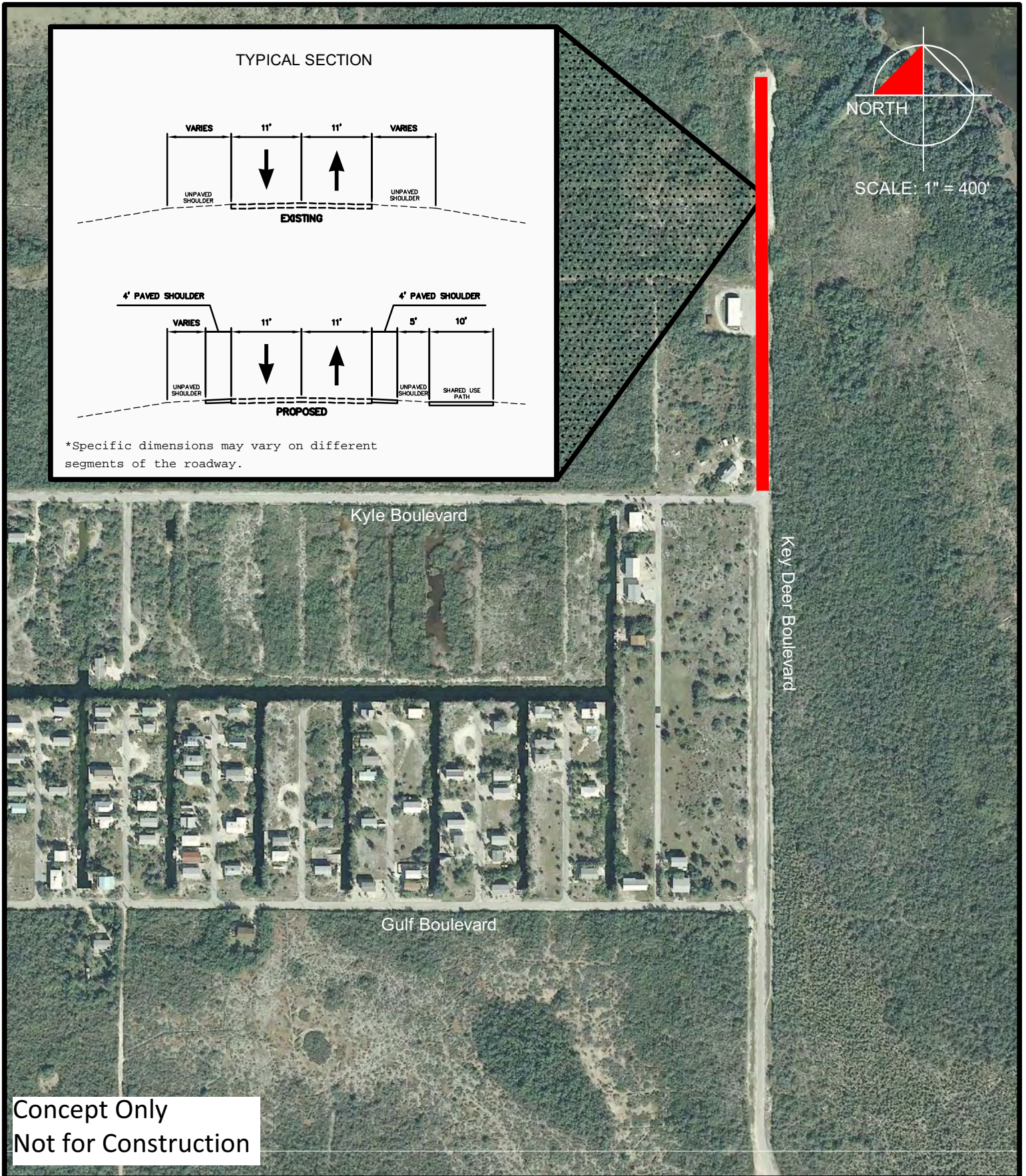
2.2.1 Alternative 5 - Trim vegetation at pullouts and intersections to increase sight distances where needed (i.e. Key Deer Boulevard)

See **Figure 2.9** for an example of the sight distance triangle on Key Deer Boulevard at the Nature Trail Entrance/Exit. Frequency schedule will be determined by vegetation growth.

2.2.2 Alternative 6 - Perform routine trimming of vegetation around signs for visibility

Similar to Alternative 5, trimming of vegetation around the signs will increase visibility. Partner with Monroe County and FDOT Maintenance staff for assistance.

Proposed Alternative 3



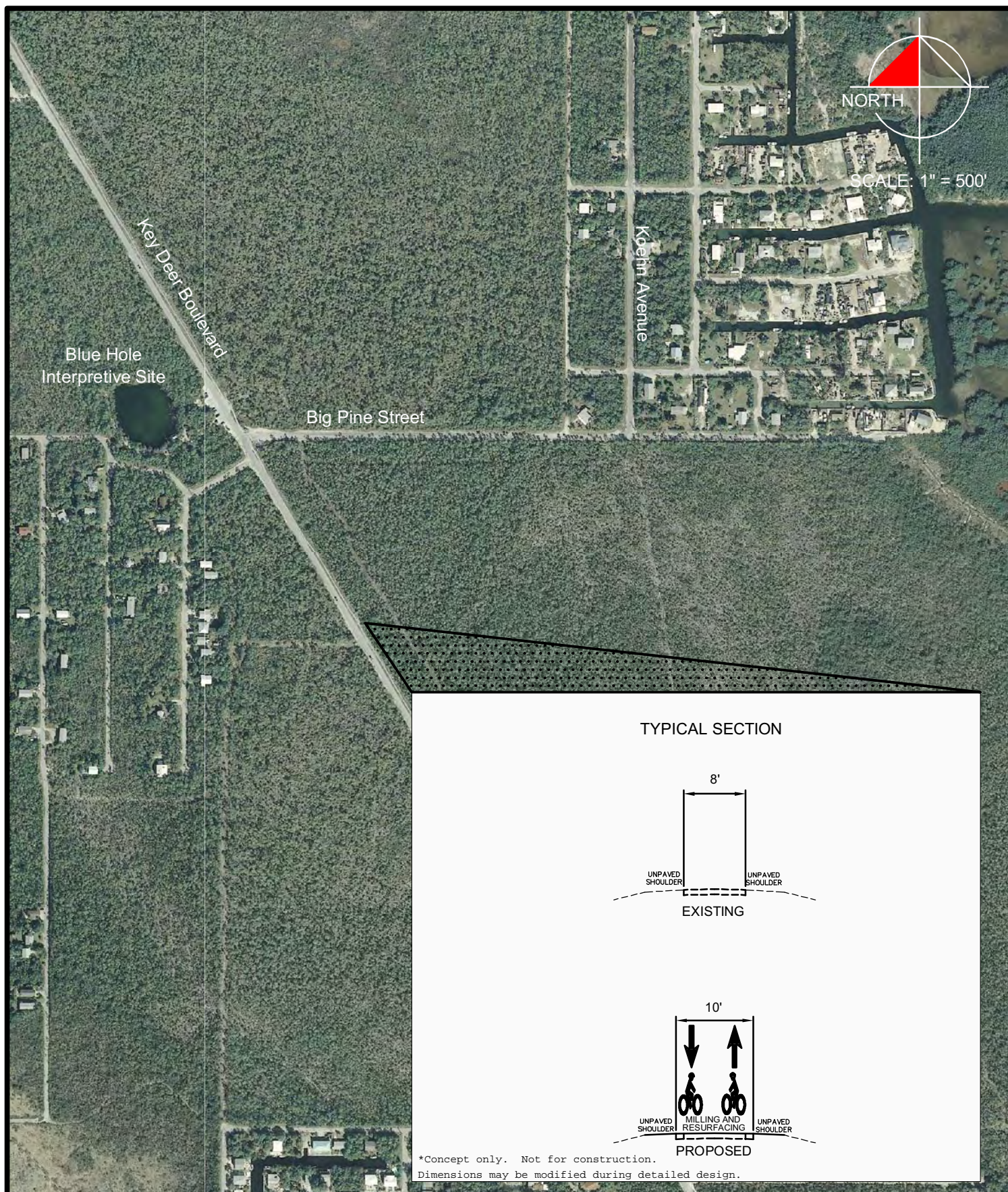
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Extend Shared Use Path and Add
Shoulders on Key Deer Blvd.



Proposed Alternative 4a



NATIONAL KEY DEER REFUGE
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Widen Existing Shared Use Pathway on
Key Deer Boulevard



Figure 2.7: Widen Existing Shared Use Pathway on Key Deer Blvd.

Proposed Alternative 4b



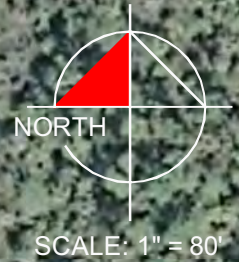
NATIONAL KEY DEER REFUGE
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Widen Shared Use Pathway and
Separate from Key Deer Blvd.



For visualization purposes only *Specific dimensions may vary on different roadway segments.

Figure 2.8: Widen Shared Use Pathway and Separate from Key Deer Blvd.



SIGHT DISTANCE EQUATION

$$ISD = 1.47 * V_{major} * t_g$$

ISD = Intersection sight distance measured perpendicular from the center of the lane of the major roadway (ft.)

V_{major} = Design Speed of the major road (mph)

t_g = Time gap for minor road vehicle to enter the major road (sec.)

Time gap for left turn from minor road (passenger car) = 7.5 seconds
 Time gap for right turn from the minor road (passenger car) = 6.5 seconds

Source: FDOT Florida Greenbook, May 2007

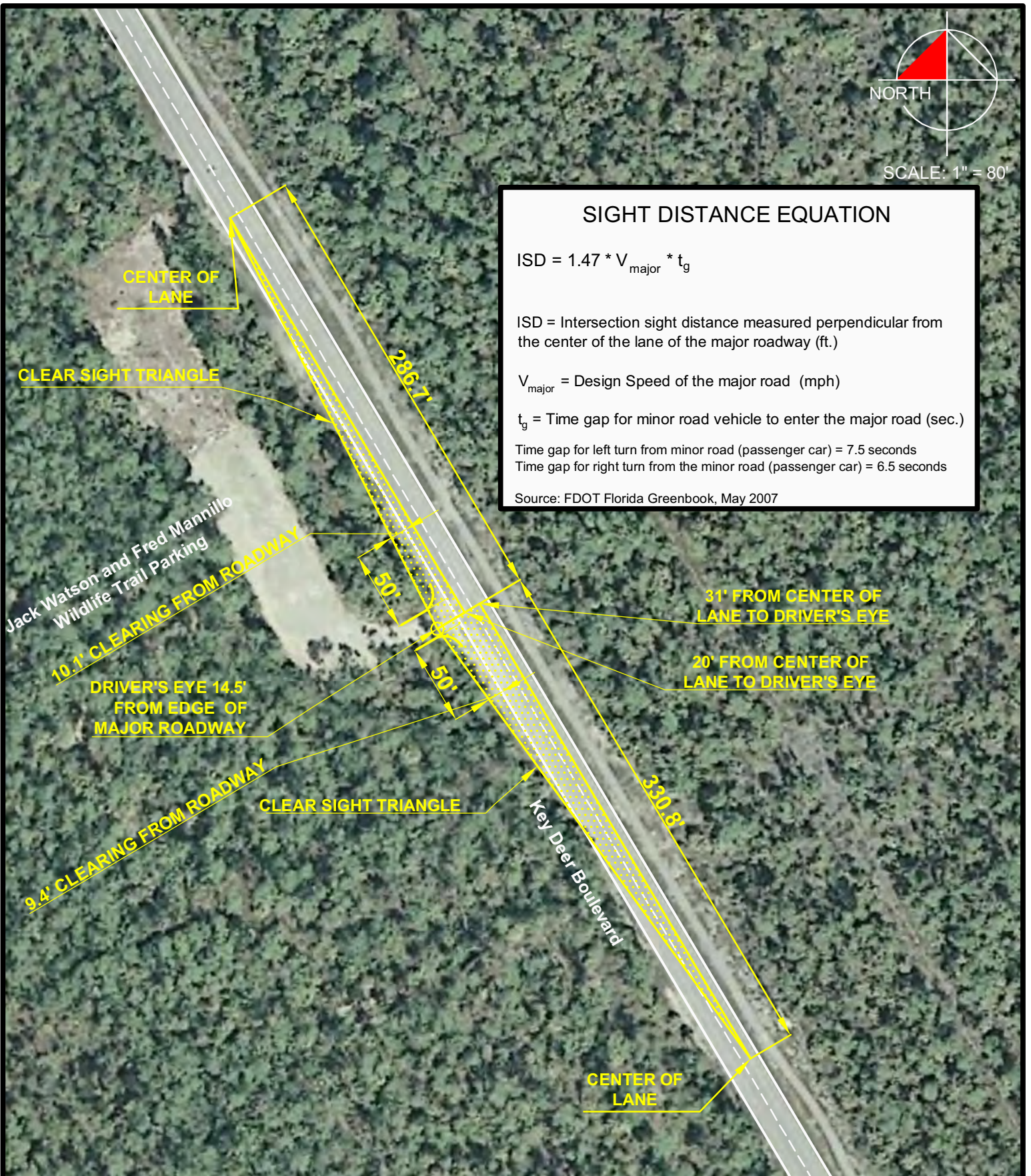


Figure 2.9: Sight Triangle at Nature Trail Entrance/Exit

2.3.1 Alternative 7 - Review Monroe County's US-1 sign inventory sign study and implement sign improvements

The inventory task has been completed. The Refuge will coordinate with Monroe County regarding new sign locations identified in Alternative 15.

2.3.2 Alternative 8 - Once constructed, the new Visitors Center should tie into existing bicycle and pedestrian facilities already in place on US 1 and also potentially the back side of the property.

Include this bicycle/pedestrian connectivity during the development of the new Visitors Center. Environmental impacts of this alternative have not been determined because the impact is subject to more specific design parameters (e.g. location of the trail at the back of the property, additional parking facilities, etc.). It is expected that there would be impacts to upland habitat with the construction of trails or bicycle facilities at the back side of the property. These impacts could be minimized depending on the size and type of trail that is designed and constructed.

2.3.3 Alternative 9 - Purchase a radar speed check trailer to notify drivers of their travel speed on County roads within the Refuge area

Coordinate with Monroe County Sheriff's Department prior to purchase. Identify if there is opportunity for shared use of an existing speed check trailer. Work with the Sheriff's Department on implementation of placement.

2.3.4 Alternative 10 - Perform a Traffic Calming Study on key roadways around the Refuge to determine if traffic calming measures are appropriate to help reduce vehicle speeds

Formally request a traffic calming study be performed on Key Deer Boulevard, Watson Boulevard (on Big Pine Key and No Name Key), and any other roadways of interest to Monroe County. When available, Monroe County can then perform a traffic calming study for these roadways to determine what traffic calming measures would be appropriate. This was also recommended as an action item in the Livable Communikeys Masterplan.

2.3.5 Alternative 11 - In coordination with a local vendor, implement a bike rental station at the new Visitor's Center for Refuge visitors.

Recommend this to be completed when new Visitors Center is built.

2.3.6 Alternative 12 - Upgrade USFWS signage to the Manual of Uniform Traffic Control Devices (MUTCD) standard lettering

Upgrade signs at the Blue Hole Interpretive Site and the Nature Trail to MUTCD standards. Examples of General Directional Guide signs can be seen in Figure 2M-2 on page 334 of the MUTCD, 2009 Edition. This section can be accessed via the following weblink:

<http://mutcd.fhwa.dot.gov/pdfs/2009/part2ithu2n.pdf>

Examples have been provided to the Refuge under separate cover.

2.3.7 Alternative 13 - Survey Refuge visitors at the existing Visitors Center and the Blue Hole Interpretive Site on their trip characteristics to develop visitor pass-by information.

If a traffic study is required for the Visitors Center, it is recommended that a survey questionnaire be prepared to determine visitor pass-by trip characteristics. This survey will need to be coordinated with OMB for approval of the survey. Also access to the site should be reviewed including turn-lane warrant analyses as necessary.

Thank you for visiting the National Key Deer Refuge. In an effort to better understanding our visitors, we ask that you answer the following questions related to your trip today.

1. Are you a full-time resident, part-time resident, or vacationer?
2. Prior to arriving at the Refuge today, what city, mile-marker, or zip code was your previous stop?
3. After visiting the Refuge today, will you go directly back to your previous stop?
 - a. If yes, proceed to question 4.
 - b. If no, what is the city, mile-marker, or zip code of your next destination?
4. If you had not stopped at the Refuge today, would you have traveled on U.S. 1 through Big Pine Key?

2.3.8 Alternative 14 - Installation of a kiosk at new Visitors Center where multiple entities could provide information rather than have multiple signs

Recommend a kiosk be installed when new Visitors Center is built.

2.3.9 Alternative 15 - Update/add/remove appropriate Key Deer Warning Signs on US 1 through entire Key Deer habitat (including Sugarloaf Key, Cudjoe Key, Summerland Key, Ramrod Key, Little Torch Key, and West Summerland Key).

Partner with FDOT to determine the permitting procedures and sign standards on US 1. Suggest placement of signs at the start of the Key Deer habitat rather than just on Big Pine Key to make motorists aware of the potential deer crossings. Recommend working with stakeholders on determining the locations and messages on signs.

2.3.10 Alternative 16 - Continue awareness of Key Deer and other threatened and endangered species crossing area roadways

Continue public outreach activities.

2.3.11 Alternative 17 - Implement Intelligent Transportation System application to notify drivers of deer entering roadways

ITS applications are mainly research based, with many different technologies being tested worldwide with the most success being found with large (elk-size) migratory animals. Recommend coordinating with FDOT, Monroe County and animal/vehicle sign experts on proper location of signs. Some well known animal/vehicle sign experts are Dr. Marcel P. Huijser at Montana State University and Patricia White with Defenders of Wildlife. Recommend contacting animal/vehicle collision experts and request the Refuge be included in one of the research activities to help determine the proper type of ITS application.

2.3.12 Alternative 18 - Ongoing coordination with stakeholders

Continue partnerships with stakeholders.

2.4 Planning and Environmental Screening

This report describes the preliminary impact screening for the alternatives proposed at the National Key Deer Refuge. Impacts are based on the preliminary footprints of the conceptual alternatives previously discussed.

2.5 Summary of Screening

The following categories were considered during the preliminary impact screening process.

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communikeys Masterplan – Changes to existing and proposed land uses. The conditions of the Federal Fish and Wildlife Permit No. TE 083411-0 and the supporting Habitat Conservation Plan (HCP) limits the amount of clearing of native vegetation that can occur on Big Pine Key and No Name Key to seven acres through year 2023. Coordination with USFWS’s Ecological Services Division will be required if it is decided that alternatives described herein are selected for implementation and thus using portions of the seven acre threshold. The Livable Communikeys Program created a “Masterplan for Future Development of Big Pine Key and No Name Key” and established a number of goals, follow-on strategies and action items related to land use and redevelopment, environmental protection, community character, economic development, traffic and transportation, and community participation. These goals will be reviewed relative to the alternatives presented.

Socioeconomic and Community Features – Socioeconomic composition of affected communities and impacts to community features.

Environmental Justice – Impacts on minority or low-income populations.

Cultural Resources – Impacts to historic or archaeological resources.

Transportation and Safety – Changes in traffic patterns and safety for drivers, pedestrians, and bicyclists.

Visitor Use and Experience – Changes to visitor facilities and experience.

Wetlands – Impacts to jurisdictional waters and wetlands based on National Wetland Inventory (NWI) mapping.

Floodplains – Changes to impervious area within floodplains and floodways based on Federal Emergency Management Agency (FEMA) mapping.

2.6 Potential Impacts to Existing Conditions

The following section briefly describes the existing natural and human environment within the National Key Deer Refuge and potentially impacted areas.

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communikeys Masterplan – The study area contains a wide range of intensities and patterns of land use including large tracts of undeveloped lands, including property under public ownership or protected through conservation easement; pockets of low density residential use; moderate to higher density residential development concentrated in improved subdivisions; and strips of commercial and industrial development along stretches of US 1. The areas potentially impacted by the proposed alternatives are located primarily in the roadway right-of-way owned by either Monroe County or USFWS. The HCP allows for the no more than seven total acres of native vegetation to be cleared through year 2023 on Big Pine Key and No Name Key. The HCP accounts for the future roadway improvements to both paved and unpaved roadways within the Refuge generally consistent with the proposed improvements. However, it is conceivable that proposed alternatives may not be implemented if the acreage of the removed vegetation exceeds the desired amount allocated for improvements to roadway facilities. The Livable Communikeys Masterplan addresses these types of improvements with action items to permit bicycle and pedestrian facilities in limited right-of-way, where appropriate.

Socioeconomic and Community Features – The National Key Deer Refuge is located in Monroe County Florida. The alternatives proposed within the Refuge are concentrated on two of the islands within the National Key Deer Refuge - Big Pine Key and No Name Key. It is not expected that any community features will be adversely impacted by these improvements. Two public information meetings have occurred for this project and citizen input on the alternatives has been requested. Advertisement and notification of these meetings has been through mailers to stakeholders, news announcements, email from the Refuge to local citizens and through the project specific web page.

Environmental Justice – Although the Refuge is open to all visitors, residents of the Florida Keys and Monroe County are more likely to pass through the Refuge. US 1, the main arterial to the Refuge, functions as both a local and regional facility throughout the Florida Keys. It is a lifeline for the regional economy and the only hurricane evacuation route for Keys residents and visitors. According to 2000 Census data, 6.5% of residents in Big Pine Key are minority (primarily two or more races, Black, or Asian). The 2000 US Census indicated that 10% of families and individuals in Monroe County and 9% in Big Pine Key are below the poverty level, which is lower than both state and national poverty levels (12%). The percentages of minority residents and the families below poverty are lower in Monroe County and specifically Big Pine Key than the state as a whole. Each of the alternatives proposed occur along existing roads and do not result disproportionate impacts to low income or minority populations.

Cultural Resources – The planning area contains several archeological sites and older structures that may be of local historic importance. No cultural resources in the Refuge are listed on the National Register of Historic Places (NRHP) and none have been evaluated by SHPO for eligibility for listing on the NRHP. There are no expected impacts to cultural resources for the alternatives considered in this study.

Transportation and Safety – The transportation study area for the project includes US 1, Key Deer Boulevard, Watson Boulevard, Long Beach Drive, Big Pine Road, South Street, Avenue B, Koehn Avenue and Wilder Road. Safety concerns within the Refuge include deer-vehicle collisions (DVCs), visitors backing out of parking lots into oncoming traffic, and lack of standard shoulders, and lack of standard pedestrians/bicycle facilities.

Visitor Use and Experience – Vehicular access to Refuge lands is provided through various County-maintained public roadways. The majority of public access to the NKDR is provided on Big Pine and No Name Keys via US 1. Roadways on Big Pine Key that provide primary access to the Refuge via US 1 include Key Deer Boulevard, Wilder Road, and Long Beach Road. Some entrances from public streets to the NKDR are gated and not accessible to the public by vehicle. However, there are small unmarked, unpaved parking areas where visitors can park and enter the Refuge by foot. There are also several Refuge trails that provide entrances to the NKDR Refuge for pedestrians and bicyclists only. These include Blue Hole Interpretive Site, Watson/Mannillo Trails, the northern terminus of Key Deer Boulevard, the eastern terminus of Watson Boulevard, Long Beach Trail, and Ohio Key Beach Trail. The existing Visitor Center is located near US 1 MM 30.5 on Key Deer Boulevard. A one-acre site for a new Visitor Center has been acquired along US 1. The shoulder and pathways alternatives are expected to further enhance the visitor's mobility and experience.

Wetlands – Based on NWI and GIS land cover mapping, wetlands are located throughout all the islands in the National Key Deer Refuge. Impacts to wetlands are minimal for all alternatives.

Floodplains – FEMA mapping indicates that portions of the Refuge are located within Flood Zone X500, between the limits of the 100-year and 500-year flood; Flood Zone AE, subject to the 100-year flood; and Flood Zone VE, subject to the 100-year flood and additional velocity hazard (wave action). Low lying floodplain areas within the refuge are vulnerable to sea level rise and flooding events such as hurricanes and other major storms. Areas that are within the velocity hazard zone are vulnerable to storm surges. These types of events can result in habitat changes where salt water inundates freshwater systems affecting the vegetative composition or the availability of freshwater for wildlife including the key deer. Loss of floodplain from development outside the refuge also affects the extent of flooding.

2.7 Potential Impacts

Impacts to wetlands, habitat and floodplains have been calculated for the alternatives. This study is being conducted primarily using existing Geographical Information System data. The impact acreages are approximate and were determined based on GIS mapping and aerial interpretation. The acreages are provided for comparative purposes but are subject to field evaluation, wetland delineation and final engineering during future design and permitting phases including further examination by the USFWS

locally and the Ecological Services Division as it relates to consistency with the HCP. It should be noted that this future screening may result in the elimination of certain alternatives from implementation.

As stated previously, the HCP dictates that the seven acres includes habitat loss due to public and private projects including roadway improvements for bicycles, paving of dirt roads, three-laneing of US 1 and private development on previously disturbed land. There are no specific projects identified, except for the widening of US 1. Therefore, in general the roadway alternatives presented fall within the HCP and Livable Communities Masterplan compliance if USFWS is willing to utilize the remaining acreage for these transportation improvements. Specific habitat impacts are summarized for each alternative in the following sections.

2.7.1 Alternative 1 – Reconfigure Parking Area at Blue Hole Interpretive Site

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communities Masterplan – Alternative 1 involves reconfiguring the parking area of an existing unpaved parking lot at the Blue Hole Interpretive Site. Ten head-in parking spaces will be replaced with nine angled parking spaces and a median will be added to separate the parking lot from Key Deer Boulevard. No negative impacts are anticipated.

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative 1.

Transportation and Safety – Alternative 1 will help improve safety on Key Deer Boulevard by preventing vehicles from entering the Blue Hole Parking Facility and blocking Key Deer Boulevard while performing parking maneuvers. It will also prevent visitors from backing out of their parking space, conflicting with Key Deer Boulevard southbound traffic positively improving traffic flow.

Visitor Use and Experience – The improvements included as part of Alternative 1 will enhance the visitor experience and safety making it easier to both park at the Blue Hole Interpretive Site and travel along Key Deer Boulevard.

Wetlands – No impacts to wetlands are anticipated.

Floodplains – No impacts to floodplains are anticipated.

2.7.2 Alternative 2 – Bicycle, pedestrian and shoulder facility upgrades on Refuge access roadways

2.7.2.1 Alternative 2a – Mid-Block Crosswalk across Key Deer Boulevard

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communities Masterplan – Alternative 2a includes striping a mid-block crosswalk at the Blue Hole Interpretive Site. No negative impacts are anticipated.

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative 2a.

Transportation and Safety – The addition of a mid-block crosswalk at the Blue Hole Interpretive Site will improve safety by providing pedestrians with a designated point to cross Key Deer Boulevard.

Visitor Use and Experience – The bicycle and pedestrian facility upgrades will make enhance pedestrian and bicyclist travel on the Refuge access roadways.

Wetlands – No impacts to wetlands are anticipated.

Floodplains – No impacts to floodplains are anticipated.

2.7.2.2 Alternative 2b – Sharrow Striping

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communikeys Masterplan – Alternative 2b provides bicycle and pedestrian upgrades by striping sharrows on key roadway facilities and installing the appropriate signage. This is consistent with the HCP and the Livable Communikeys Masterplan.

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative 2b.

Transportation and Safety – Alternative 2b will provide a designated area for bicyclists on key area roadways.

Visitor Use and Experience – The bicycle facility upgrades will enhance bicyclist travel on the Refuge access roadways.

Wetlands – No impacts to wetlands are anticipated.

Floodplains – No impacts to floodplains are anticipated.

2.7.2.3 Alternative 2c – Shoulder Widening

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communikeys Masterplan – Alternative 2c provides bicycle and pedestrian upgrades including adding paved shoulders and widening of seven road segments. A total of 27,345 linear feet will be impacted for the shoulder/widening projects. Impacted areas are undeveloped areas containing native habitat on the edge of roadways. For the shoulder improvements, approximately 0.5 acres of upland habitat impacts (primarily pinelands and hammocks) are projected to be impacted. The Communikeys Masterplan identifies widening of specific roadways for bicycle facilities as a goal with an action item to permit the

necessary road widening within the right-of-way. Also it was noted to work with the County's seven year roadway maintenance plan for these types of improvements. This alternative would need to be reviewed further for willingness to use some of the remaining HCP acreage.

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative 2.

Transportation and Safety – The widening of road segments will allow vehicles and bicyclists to more safely share the road. The addition of paved shoulders will bring the road segments into compliance with County standards while resurfacing of the road segments will enhance the safety of the roadways.

Visitor Use and Experience – The bicycle, pedestrian, and shoulder facility upgrades will enhance pedestrian and bicyclist travel on the Refuge access roadways.

Wetlands – Approximately 0.09 acres of wetland impacts would occur with this alternative. Impacts to wetlands will need to be avoided and minimized to the extent practical during final design of the improvements.

Floodplains – Approximately 1.03 acres of impact to floodplains could occur with this alternative. Impacts to floodplains will need to be minimized to the extent practical during final design of the improvements.

2.7.3 Alternative 3– Extend Shared Pathway on Key Deer Boulevard

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communikeys Masterplan – Alternative 3 would extend the existing shared pathway from its current terminus at Kyle Boulevard to the northern terminus of Key Deer Boulevard. The alternative is anticipated to impact 1,320 linear ft of land, primarily undeveloped land containing trees and shrubs. Approximately 0.05 acres of habitat impacts are projected. This is consistent with the Livable Communikeys Masterplan as an enhancement to the bicycle facility system. This alternative would need to be reviewed further for willingness to use some of the remaining HCP acreage.

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – Construction of Alternative 3 will help provide a more comprehensive bicycle and pedestrian network within the Refuge. There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative 3.

Transportation and Safety – Alternative 3 would improve bicycle and pedestrian safety by allowing bicyclists and pedestrians to travel on the northernmost section of Key Deer Boulevard without having to share travel lanes with vehicles.

Visitor Use and Experience – Extending the shared pathway will enhance the visitor experience by expanding the bicycle and pedestrian network available to Refuge visitors.

Wetlands – No impacts to wetlands are anticipated.

Floodplains – Approximately impacts to 0.68 acres of floodplains could occur with this alternative.

2.7.4 Alternative 4– Widen Shared Pathway on Key Deer Boulevard

Land Use, Habitat Conservation Plan (HCP) Impacts and applicability to Livable Communikeys Masterplan – Alternative 4 widens the shared use path along Key Deer Boulevard from US 1 to Kyle Boulevard. This alternative is anticipated to impact approximately 22,500 ft. of land, primarily undeveloped land containing trees and shrubs. Alternative 4a widens the pathway at the existing location while Alternative 4b also separates the pathway from Key Deer Boulevard where it is currently adjacent. Alternative 4a is projected to impact 0.13 acres of pineland and Alternative 4b is projected to impact 0.14 acres of pineland. The enhancement of bicycle facilities where appropriate with limited right-of-way permitting is an overall action item of the Livable Communikeys Masterplan. This alternative would need to be reviewed further for willingness to use some of the remaining HCP acreage.

Socioeconomic and Community Features – This alternative will not directly impact any residents, communities, or community features.

Environmental Justice – Construction of Alternative 4 will improve the functionality of the pathway, improving the experience of bicyclists and pedestrians. There are no disproportionate impacts to low income or minority populations as a result of this alternative.

Cultural Resources – No impacts are anticipated as a result of Alternative 4.

Transportation and Safety – Widening the shared pathway would improve bicycle and pedestrian by allowing two-way travel on the existing shared use pathway. In Alternative 4b, it would further provide separation of the bicyclists and pedestrians from vehicles traveling on Key Deer Boulevard.

Visitor Use and Experience – Widening the shared pathway will enhance the visitor experience by improving bicycle and pedestrian facilities near the Refuge.

Wetlands – No impacts to wetlands are anticipated.

Floodplains – Alternative 4a would impact approximately 1.04 acres of floodplains and Alternative 4b would impact approximately 1.44 acres of floodplains.

3. Conclusion

3.1 Summary Matrix

Table 3.1 summarizes potential impacts for each roadway improvement alternative described in this report.

Table 3.1. Impact Summary

Impact Resource or Category	Alternative						
	Alternative 1	Alternative 2a	Alternative 2b	Alternative 2c	Alternative 3	Alternative 4a	Alternative 4b
Upland Habitat (acres)	No Impact	No Impact	No Impact	0.5	0.05	0.13	0.14
Community Features	Temporary construction impact to Blue Hole Interpretive site.	No Impact	No Impact	No impact	No Impact	No Impact	No Impact
Environmental Justice	No impact	No impact	No impact	No impact	No impact	No impact	No impact
Cultural Resources	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated	No impact anticipated
Transportation and Safety	Improve operation for visitors using the parking facilities and travelers on Key Deer Blvd.	Enhances bicycle and pedestrian crossing of Key Deer Blvd.	Improves bicycle facilities	improves bicycle and pedestrian facilities	Improves bicycle and pedestrian facilities	Improve shared use pathway	Improve shared use pathway and provides separation from traffic on Key Deer Blvd.
Visitor Use and Experience	Enhances	Enhances	Enhances	Enhances	Enhances	Enhances	Enhances
Wetlands (acres)	No impact	No impact	No impact	0.09	No impact	No impact	No impact
Floodplains (acres)	No impact	No impact	No impact	1.03	0.68	1.04	1.44

3.2 Implementation Priorities

This report provides refinement and initial screening of the transportation alternatives presented in this study. With the cooperation of the project stakeholders these alternatives should be placed on transportation plans and/or scheduled for further study as appropriate. Based on the preliminary impacts presented in this report, the following roadway improvement alternatives are recommended during the following timeframes:

Short-range (2015) –

Alternative 1. Reconfigure Blue Hole Interpretive Site parking lot with defined entrances and exists. Reconfiguring the parking area would allow entering and exiting vehicles to perform parking maneuvers without blocking travel lanes on Key Deer Boulevard.

Alternative 2a. Striping and signing a mid-block crosswalk across Key Deer Boulevard at Blue Hole Interpretive Site from the existing shared-use path on Key Deer Boulevard.

Alternative 2b. Striping of sharrows on Watson Boulevard from Key Deer Boulevard to Avenue B, Watson Boulevard on No Name Key, Watson Boulevard from Key Deer Boulevard to the western terminus, along Big Pine Street, and along Koehn Avenue to help facilitate bicycle travel.

Medium-range (2020)/Long-range (2030)

As identified during the project process, Alternatives 2c, 3, and 4 have impacts to the environment that may not be considered acceptable to the community. Using the discussion in **Section 2.6** and **Table 3.1** as a guide, the implementation of the remaining roadway improvement alternatives should be weighed for all impacts and determined by the Refuge if the alternatives should move forward.

Alternative 2c. The following priorities have been developed for improvements to bicycle/pedestrian/shoulder facilities proposed in Alternative 2:

- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to Avenue B
- Upgrade shoulder/widen to standard width on Watson Boulevard from No Name Key bridge to eastern terminus
- Upgrade shoulder/widen to standard width Watson Boulevard from Key Deer Boulevard to the western terminus
- Upgrade shoulder on Key Deer Boulevard from Watson Boulevard to Big Pine Street
- Upgrade shoulder on Key Deer Boulevard from Big Pine Street to Kyle Boulevard
- Upgrade shoulder/widen to standard width Big Pine Street
- Upgrade shoulder/widen to standard width Koehn Avenue

Alternative 3. Alternative 3 extends the shared pathway on Key Deer Boulevard (approximately 0.25 miles) to the northern terminus of Key Deer Boulevard and improves the shoulder facilities on Key Deer Boulevard in that area.

Alternative 4. Alternative 4 widens the shared pathway on Key Deer Boulevard from eight to ten feet to allow for two-way bicycle and pedestrian traffic improving the safety of the path. Alternative 4b would also straighten out the shared pathway.

3.3 Next Steps

The alternatives have been presented to the stakeholders and public at the final public meeting. This report will be shaped with the stakeholders and community for comment then be incorporated into the final Transportation Study Report along with the other previously prepared reports. For the medium-and long-range alternatives, further discussion will need to occur reviewing the impacts and desire to implement the alternatives.

Appendix

Construction Cost Estimates

OPINION OF PROBABLE COST

Restriping of Blue Hole Parking Lot

ITEM NUMBER	DESCRIPTION	UNIT	QTY.	UNIT PRICE	TOTAL COST
SIGNING AND PAVEMENT MARKING PAY ITEMS					
711-11-111	THERMOPLASTIC, WHITE SOLID, 6 INCHES	NM	0.091	\$ 3,257.00	\$ 296.40
711-11-421	THERMOPLASTIC, BLUE SOLID, 6 INCHES	LF	54	\$ 0.84	\$ 45.40
711-11-460	THERMOPLASTIC, BLUE, MESSAGE	EA	1	\$ 150.00	\$ 150.00
SIGNING & PM TOTAL					\$ 491.80
SUBTOTAL					\$ 491.80
101-1	MOBILIZATION	LS	10%	-	\$ 50.00
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	\$ 50.00
	PE & CEI	LS	30%	-	\$ 147.54
	CONTINGENCY	LS	25%	-	\$ 122.95
	SMALL PROJECT PREMIUM	LS	15%	-	\$ 73.77
GRAND TOTAL					\$ 936.06

Kimley-Horn and Associates, Inc. has no control over the cost of labor, materials, equipment, or services furnished by others, or over methods of determining price, or over competitive bidding or market conditions. Any and all professional opinions as to costs reflected herein, including but not limited to professional opinions as to the costs of construction materials, are made on the basis of professional experience and available data. Kimley-Horn and Associates, Inc. cannot and does not guarantee or warrant that proposals, bids, or actual costs will not vary from the professional opinions of costs shown herein.

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 FBPE Number: CA 00000696



OPINION OF PROBABLE COST

Crosswalk at Blue Hole Interpretive Site

ITEM NUMBER	DESCRIPTION	UNIT	QTY.	UNIT PRICE	TOTAL COST
ROADWAY PAY ITEMS					
522-2	SIDEWALK, CONCRETE, 6" THICK	SY	2	\$ 46.00	\$ 92.00
ROADWAY TOTAL					\$ 92.00
SIGNING AND PAVEMENT MARKING PAY ITEMS					
700-20-11	SIGN, SINGLE POST, FURNISH AND INSTALL	AS	4	\$ 250.94	\$ 1,003.80
711-11-123	THERMOPLASTIC, WHITE SOLID, 12 INCHES	LF	44	\$ 2.04	\$ 89.80
711-11-125	THERMOPLASTIC, WHITE SOLID, 24 INCHES	LF	27	\$ 3.37	\$ 91.00
711-11-180	THERMOPLASTIC, WHITE, YIELD LINE	LF	44	\$ 1.20	\$ 52.80
SIGNING & PM TOTAL					\$ 1,237.40
SUBTOTAL					\$ 1,329.40
101-1	MOBILIZATION	LS	10%	-	\$ 133.00
102-1	MAINTENANCE OF TRAFFIC	LS	10%	-	\$ 133.00
	PE & CEI	LS	50%	-	\$ 664.70
	CONTINGENCY	LS	50%	-	\$ 664.70
	SMALL PROJECT PREMIUM	LS	75%	-	\$ 997.05
GRAND TOTAL					\$ 3,921.85
SAY					\$ 4,000

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OPINION OF PROBABLE COST
Add Paved Shoulder, Resurface Roadway

Description	Pay Item #	Width (ft)	Thickness (in)	Length (ft)	Unit	Quantity	Unit Price*	Total Cost
ROADWAY AND DRAINAGE								
CLEARING & GRUBBING	110-1-1	12		1	AC	0.000275	\$15,350.42	\$4.23
EMBANKMENT	120-6	21	12	1	CY	0.778	\$10.47	\$8.14
MILLING AND RESURFACING (Two 11' lanes)								
MILLING EXIST ASPH PAVT, 2" AVG DEPTH	327-70-5	22	2	1	SY	2.44	\$1.65	\$4.03
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	22	1	1	TN	0.134	\$94.05	\$12.64
ASPH CONC FC,TRAFFIC C,FC-9.5,RUBBER	337-7-32	22	1	1	TN	0.134	\$118.20	\$15.89
SHOULDER NEW CONSTRUCTION/WIDENING (on each side: 4' Paved Shoulder and 2' Unpaved Shoulder)								
TYPE B STABILIZATION	160-4	12		1	SY	1.33	\$4.30	\$5.73
OPTIONAL BASE,BASE GROUP 08 (Shoulder)	285-708	8.67		1	SY	0.963	\$13.49	\$12.99
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	8	1	1	TN	0.049	\$94.05	\$4.60
ASPH CONC FC,TRAFFIC C,FC-9.5,RUBBER	337-7-32	8	1	1	TN	0.049	\$118.20	\$5.78
THERMOPLASTIC, STD, WHITE, MESSAGE	711-11-160			1	EA	0.000758	\$91.04	\$0.07
							Roadway Sub-Total	\$74.11
							Maintenance of Traffic (15%)	\$11.12
							Mobilization (15%)	\$11.12
							Signing and Marking (5%)	\$3.71
							Contingency (20%)	\$14.82
							***Total	\$100.05
							***Say	\$105.00

* Unit costs are FDOT Item Average costs from February 2010 to January 2011 whenever available.

*** List of items not included in the Total Estimated Cost includes but is not limited to: Signals, Lighting, Landscaping, Structures, Utilities, R/W costs, Permits, Engineering or CEI fees, factor for inflation.

*** Because the Consultant does not control the cost of labor, materials, equipment or services furnished by others, methods of determining prices, or competitive bidding or market conditions, any opinions rendered as to costs, including but not limited to opinions as to the costs of construction and materials, shall be made on the basis of its experience and represent its judgment as an experienced and qualified professional, familiar with the industry. The Consultant cannot and does not guarantee that proposals, bids or actual costs will not vary from its opinions of cost. If the Client wishes greater assurance as to the amount of any cost, it shall employ an independent cost estimator.

OPINION OF PROBABLE COST
Add Paved Shoulder and Widen Roadway

Description	Pay Item #	Width (ft)	Thickness (in)	Length (ft)	Unit	Quantity	Unit Price*	Total Cost
ROADWAY AND DRAINAGE								
CLEARING & GRUBBING	110-1-1	16		1	AC	0.000367	\$15,350.42	\$5.64
EMBANKMENT	120-6	16	12	1	CY	0.593	\$10.47	\$6.20
MILLING AND RESURFACING (Two 10' lanes)								
MILLING EXIST ASPH PAVT, 2" AVG DEPTH	327-70-5	20	2	1	SY	2.22	\$1.65	\$3.67
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	20	1	1	TN	0.122	\$94.05	\$11.50
ASPH CONC FC,TRAFFIC C,FC-9.5,RUBBER	337-7-32	20	1	1	TN	0.122	\$118.20	\$14.45
ROADWAY WIDENING (on each side: 2' Pavement)								
TYPE B STABILIZATION	160-4	0		1	SY	0.0	\$4.30	\$0.00
OPTIONAL BASE,BASE GROUP 11 (Roadway Pavement)	285-711	4.67		1	SY	0.519	\$22.00	\$11.41
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	4	1	1	TN	0.0244	\$94.05	\$2.30
ASPH CONC FC,TRAFFIC C,FC-9.5,RUBBER	337-7-32	4	1	1	TN	0.0244	\$118.20	\$2.89
SHOULDER NEW CONSTRUCTION/WIDENING (on each side: 4' Paved Shoulder and 2' Unpaved Shoulder)								
TYPE B STABILIZATION	160-4	12		1	SY	1.33	\$4.30	\$5.73
OPTIONAL BASE,BASE GROUP 08 (Shoulder)	285-708	8.67		1	SY	0.963	\$13.49	\$12.99
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	8	1	1	TN	0.0489	\$94.05	\$4.60
ASPH CONC FC,TRAFFIC C,FC-9.5,RUBBER	337-7-32	8	1	1	TN	0.0489	\$118.20	\$5.78
THERMOPLASTIC, STD, WHITE, MESSAGE	711-11-160			1	EA	0.000758	\$91.04	\$0.07
Roadway Sub-Total								\$87.22
Maintenance of Traffic (15%)								\$13.08
Mobilization (15%)								\$13.08
Signing and Marking (5%)								\$4.36
Contingency (20%)								\$17.44
***Total								\$117.74
***Say								\$120.00

* Unit costs are FDOT Item Average costs from February 2010 to January 2011 whenever available.

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OPINION OF PROBABLE COST
Extend Shared Use Path and Add Paved Shoulders, Resurface Roadway

Description	Pay Item #	Width (ft)	Thickness (in)	Length (ft)	Unit	Quantity	Unit Price*	Total Cost
ROADWAY AND DRAINAGE								
CLEARING & GRUBBING	110-1-1	30		1	AC	0.000689	\$15,350.42	\$10.57
EMBANKMENT	120-6	21	12	1	CY	0.778	\$10.47	\$8.14
MILLING AND RESURFACING (Two 11' lanes)								
MILLING EXIST ASPH PAVT, 2" AVG DEPTH	327-70-5	22	2	1	SY	2.44	\$1.65	\$4.03
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	22	1	1	TN	0.134	\$94.05	\$12.64
ASPH CONC FC, TRAFFIC C, FC-9.5, RUBBER	337-7-32	22	1	1	TN	0.134	\$118.20	\$15.89
SHOULDER NEW CONSTRUCTION/WIDENING (on each side: 4' Paved Shoulder and 2' Unpaved Shoulder)								
TYPE B STABILIZATION	160-4	12		1	SY	1.33	\$4.30	\$5.73
OPTIONAL BASE, BASE GROUP 08 (Shoulder)	285-708	8.67		1	SY	0.963	\$13.49	\$12.99
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	8	1	1	TN	0.0489	\$94.05	\$4.60
ASPH CONC FC, TRAFFIC C, FC-9.5, RUBBER	337-7-32	8	1	1	TN	0.049	\$118.20	\$5.78
SHARED USE PATH (10' Wide)								
TYPE B STABILIZATION	160-4	14		1	SY	1.56	\$4.30	\$6.69
OPTIONAL BASE GROUP 01	285-701	10.67		1	SY	1.19	\$32.00	\$37.93
SUPERPAVE ASPHALTIC CONC, TRAFFIC A (1")	334-1-11	10	1	1	TN	0.0611	\$97.32	\$5.95
THERMOPLASTIC, STD, WHITE, MESSAGE	711-11-160			1	EA	0.000758	\$91.04	\$0.07
							Roadway Sub-Total	\$131.02
							Maintenance of Traffic (15%)	\$19.65
							Mobilization (15%)	\$19.65
							Signing and Marking (5%)	\$6.55
							Contingency (20%)	\$26.20
							***Total	\$176.87
							***Say	\$180.00

* Unit costs are FDOT Item Average costs from February 2010 to January 2011 whenever available.

*** List of items not included in the Total Estimated Cost includes but is not limited to: Signals, Lighting, Landscaping, Structures, Utilities, R/W costs, Permits, Engineering or CEI fees, factor for inflation.

*** Because the Consultant does not control the cost of labor, materials, equipment or services furnished by others, methods of determining prices, or competitive bidding or market conditions, any opinions rendered as to costs, including but not limited to opinions as to the costs of construction and materials, shall be made on the basis of its experience and represent its judgment as an experienced and qualified professional, familiar with the industry. The Consultant cannot and does not guarantee that proposals, bids or actual costs will not vary from its opinions of cost. If the Client wishes greater assurance as to the amount of any cost, it shall employ an independent cost estimator.

OPINION OF PROBABLE COST
Widen Shared Use Path

Description	Pay Item #	Width (ft)	Thickness (in)	Length (ft)	Unit	Quantity	Unit Price*	Total Cost
ROADWAY AND DRAINAGE								
CLEARING & GRUBBING	110-1-1	8		1	AC	0.000184	\$15,350.42	\$2.82
EMBANKMENT	120-6	4	6	1	CY	0.0741	\$10.47	\$0.78
SHARED USE PATH (Widen 8' path to 10' - 2' Widening)								
TYPE B STABILIZATION	160-4	6		1	SY	0.667	\$4.30	\$2.87
OPTIONAL BASE GROUP 01	285-701	2.67		1	SY	0.296	\$32.00	\$9.48
SUPERPAVE ASPHALTIC CONC, TRAFFIC A (1")	334-1-11	2	1	1	TN	0.0122	\$97.32	\$1.19
THERMOPLASTIC, STD, WHITE, MESSAGE	711-11-160			1	EA	0.0	\$91.04	\$0.07
Roadway Sub-Total								\$17.20
Maintenance of Traffic (15%)								\$2.58
Mobilization (15%)								\$2.58
Signing and Marking (5%)								\$0.86
Contingency (20%)								\$3.44
***Total								\$23.22
***Say								\$25.00

* Unit costs are FDOT Item Average costs from February 2010 to January 2011 whenever available.

*** List of items not included in the Total Estimated Cost includes but is not limited to: Signals, Lighting, Landscaping, Structures, Utilities, R/W costs, Permits, Engineering or CEI fees, factor for inflation.

*** Because the Consultant does not control the cost of labor, materials, equipment or services furnished by others, methods of determining prices, or competitive bidding or market conditions, any opinions rendered as to costs, including but not limited to opinions as to the costs of construction and materials, shall be made on the basis of its experience and represent its judgment as an experienced and qualified professional, familiar with the industry. The Consultant cannot and does not guarantee that proposals, bids or actual costs will not vary from its opinions of cost. If the Client wishes greater assurance as to the amount of any cost, it shall employ an independent cost estimator.

OPINION OF PROBABLE COST
Replace Existing Path with Shoulder and Construct Shared Use Path with Separation from Roadway

Description	Pay Item #	Width (ft)	Thickness (in)	Length (ft)	Unit	Quantity	Unit Price*	Total Cost
ROADWAY AND DRAINAGE								
CLEARING & GRUBBING	110-1-1	20		1	AC	0.000459	\$15,350.42	\$7.05
EMBANKMENT	120-6	15	12	1	CY	0.556	\$10.47	\$5.82
MILLING AND RESURFACING (Two 11' lanes)								
MILLING EXIST ASPH PAVT, 2" AVG DEPTH	327-70-5	22	2	0	SY	0.00	\$1.65	\$0.00
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	22	1	0	TN	0.000	\$94.05	\$0.00
ASPH CONC FC, TRAFFIC C, FC-9.5, RUBBER	337-7-32	22	1	0	TN	0.000	\$118.20	\$0.00
SHOULDER NEW CONSTRUCTION/WIDENING (on each side: 4' Paved Shoulder and 2' Unpaved Shoulder)								
TYPE B STABILIZATION	160-4	6		1	SY	0.67	\$4.30	\$2.87
OPTIONAL BASE, BASE GROUP 08 (Shoulder)	285-708	4.33		1	SY	0.481	\$13.49	\$6.50
SUPERPAVE ASPHALTIC CONC, TRAFFIC C	334-1-13	4	1	1	TN	0.0244	\$94.05	\$2.30
ASPH CONC FC, TRAFFIC C, FC-9.5, RUBBER	337-7-32	4	1	1	TN	0.024	\$118.20	\$2.89
SHARED USE PATH (10' Wide)								
TYPE B STABILIZATION	160-4	14		1	SY	1.56	\$4.30	\$6.69
OPTIONAL BASE GROUP 01	285-701	10.67		1	SY	1.19	\$32.00	\$37.93
SUPERPAVE ASPHALTIC CONC, TRAFFIC A (1")	334-1-11	10	1	1	TN	0.0611	\$97.32	\$5.95
THERMOPLASTIC, STD, WHITE, MESSAGE	711-11-160			0	EA	0.000000	\$91.04	\$0.00
							Roadway Sub-Total	\$77.98
							Maintenance of Traffic (20%)	\$15.60
							Mobilization (20%)	\$15.60
							Signing and Marking (5%)	\$3.90
							Contingency (20%)	\$15.60
							***Total	\$113.07
							***Say	\$115.00

* Unit costs are FDOT Item Average costs from February 2010 to January 2011 whenever available.

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