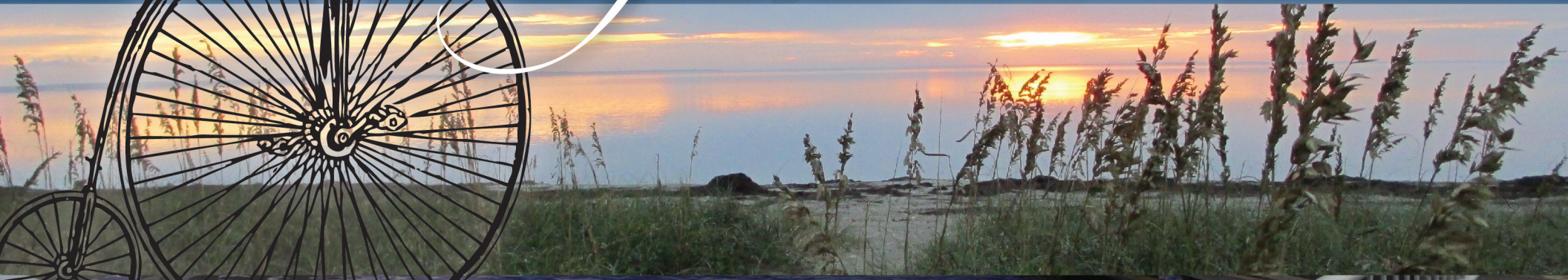


Albemarle Regional Bicycle Plan



Chapter Five

Priority & Demonstration Projects

OVERVIEW

A comprehensive bicycle network for the region was presented in Chapter 4. This chapter features the results of a prioritization of that network, as well as detailed analysis of select demonstration projects. Exhibits describing these demonstration projects contain design direction, cost estimates, and potential funding sources.

The prioritization results are presented for rough guidance only. While it is ideal to develop facilities in order of priority, it is best to also construct facilities as opportunities arise. Some of the most cost-effective opportunities to provide bicycle facilities are during routine roadway construction, reconstruction, and repaving projects. A new commercial development or a roadway widening project, for instance, would provide the means to build facilities as a component of an existing effort, regardless of priority ranking through this process.

PRIORITIZATION METHODOLOGY

Prioritization began by breaking down infrastructure recommendations into discrete segments at logical points, such as major intersections. These segments were then prioritized with scores based on the

weighted criteria listed below, which was custom designed for this plan based on Steering Committee input, public input through the online comment form, and existing conditions.

Where characteristics are relative (i.e. access to a higher-density residential area), criteria were applied such that a particular project is compared only to other projects within its county, rather than all projects across the region. Thus, scores are only comparable within counties.

Chapter Contents

Overview

Prioritization Methodology

Prioritization Results

Demonstration Project Selection

Demonstration Project Exhibits

Criteria	Weight
Provides access ¹ to a school (any level)	5
Provides access to a higher-density residential area	4
Provides access to a higher-density commercial area	4
Provides access to a park or recreation center (including the beach)	4
Connects to an existing or funded trail	4
Serves low-income areas with low car-ownership rates	4
Segment contains reported bike accidents or provides an alternative to a corridor with a high number of reported accidents	4
Higher relative feasibility (no acquisition required)	4
Top 1-5 "Most in need of improvement" from online comment form	4
Top 6-10 "Most in need of improvement" from online comment form	3
Segment contains a Top 10 Intersection "Most in need of improvement"	3

¹ Access is defined as a connection to the destination's driveway entrance to the nearest public street



PRIORITIZATION RESULTS

The results of prioritization are shown graphically at left. The top three priorities from each county are presented below. The full results of prioritization, showing the criteria met by each proposed facility and associated scores, are presented in Appendix C.

Facility Location	Facility Type	Street Name	From	To
<i>CAMDEN COUNTY</i>				
County	Paved Shoulder	US 158	Pasquotank County	NC 343
County	Paved Shoulder	NC 343	Scotland Rd	158 W
County	Greenway	343 N/Mullen Dr	US 17	Main St
<i>CHOWAN COUNTY</i>				
Edenton	Bicycle Lane, Road Diet	Broad St	Church St	Virginia Rd
Edenton	Bicycle Lane, Road Diet	Virginia Rd	US 17	Broad St
Edenton	Sharrow	Oakum St	Water St	Freemason St
<i>CURRITUCK COUNTY</i>				
County	Paved Shoulder	US 158/Shortcut Rd	NC 343	Tulls Creek Rd
Corolla	Signed Route	Shad St/Lighthouse Dr/Albacore St	Ocean Trl	Ocean Trl
County	Paved Shoulder	Caratoke Hwy	Tulls Creek Rd	Shortcut Rd

Facility Location	Facility Type	Street Name	From	To
<i>DARE COUNTY</i>				
Manteo	Sharrow	US 64/US 264	Harriot St	Patty Ln
County	Greenway	NC 12	Park Dr (Avon)	Eagle Pass Rd
Buxton	Bicycle Lane, Restripe	NC 12	Crooked Ridge Trl	Lighthouse Rd
<i>GATES COUNTY</i>				
County	Paved Shoulder	US 158	Maple St	Acorn Hill Rd/ Folly Rd
Gatesville	Bicycle Lane, Stripe	Main St	Court St	Town Edge
Gatesville	Bicycle Lane, Stripe	Main St	Gatesville Elementary School	Maple St
<i>HYDE COUNTY</i>				
County	Signed Route	NC 45/Oyster Creek Rd/ Juniper Bay Rd	US 264	Turnpike Rd at schools
County	Bicycle Lane, Restripe	US 264	W of school complex	NC 94
County	Paved Shoulder	US 264	NC 94	Golden St
<i>PASQUOTANK COUNTY</i>				
Elizabeth City	Greenway	Oak Stump Rd/ Ehringhaus St/ Halstead Blvd	Cooper Ln	Roanoke Ave/ RR Crossing
Elizabeth City	Bike Boulevard	Church St	Hughes Blvd	Water St
Elizabeth City	Sharrow	Main St	Road St	Water St

Facility Location	Facility Type	Street Name	From	To
<i>PERQUIMANS COUNTY</i>				
Hertford	Greenway	Off Road/ Church St	King St	Shopping center S of US 17
Hertford	Bicycle Lane, Restripe	Church St	N of Albemarle Sound	US 17
Hertford	Bicycle Lane, Restripe	Harvey Point Rd	US 17	Commerce Dr
<i>TYRRELL COUNTY</i>				
Columbia	Greenway	US 64	Water St	La Keiser Dr
Columbia	Sharrow	Main St	Water St	Road St
Columbia	Bicycle Lane, Stripe	Main St	Road St	US 64
<i>WASHINGTON COUNTY</i>				
Creswell	Sharrow	Main St	Eighth St	Second St
Creswell	Sharrow	Eighth St	US 64	Main St
Plymouth	Sharrow	Washington St	Water St	RR N of US 64



DEMONSTRATION PROJECT SELECTION

Twenty Demonstration Projects were selected from the recommended network for detailed analysis. The results of this analysis are presented on the following pages in summary exhibits. These exhibits are intended to illustrate how different recommended facilities might best be implemented in areas across the region. To meet that goal, segments were selected using a combination of the following inputs:

- Weighted score from prioritization,
- Geographic representation, and
- Facility type representation.

The result of this selection is a group of projects representing all subregions, counties, and municipalities of the region. These projects also cover a variety of facility types within each subregion. Projects are presented in random order by subregion. In combination with the Design Guidelines presented in Appendix D, these demonstration projects provide guidance on implementation of bike facilities across the region.

The following pages show planning level design concepts only. Project development will require local and NCDOT review and approval. Right-of-way costs are not included in cost estimates, since these must be negotiated at the time of implementation.

DEMONSTRATION PROJECT EXHIBITS

NORTH OF SOUND

Code	County	Location	Project Description	Page #
NS-A	Gates	Gatesville	Main Street Bike Lane	5-5
NS-B	Currituck	Moyock	Caratoke Highway Sidepath	5-6
NS-C	Chowan	Edenton	Broad Street Bike Lane/ Sharrow	5-7
NS-D	Pasquotank	Elizabeth City	Church Street Bike Boulevard	5-9
NS-E	Pasquotank	Elizabeth City	Ehringhaus Street Corridor Improvements	5-11
NS-F	Perquimans	Hertford	Hertford Greenway	5-13
NS-G	Perquimans	Hertford	Church Street Bike Lane/ Sharrow	5-14
NS-H	Camden	County	Dismal Swamp Greenway Extension	5-15

SOUTH OF SOUND

Code	County	Location	Project Description	Page #
SS-A	Hyde	Engelhard	US 264 Bike Lane	5-16
SS-B	Tyrrell	Columbia	US 64 Sidepath	5-17
SS-C	Washington	Plymouth	US 64 Sidepath	5-18
SS-D	Washington	Plymouth	Water Street/Park Drive Sharrow/ Bike Lane	5-19

OUTER BANKS

Code	County	Location	Project Description	Page #
OBX-A	Dare	Manteo	US 64 Sharrow/ Bike Lane	5-20
OBX-B	Dare	Nags Head/Kitty Hawk/Kill Devil Hills	US 158 Corridor Improvements	5-21
OBX-C	Dare	Buxton	NC 12 Sidepath/ Bike Lane	5-23
OBX-D	Dare	Duck	NC 12 Cycle Track	5-24
OBX-E	Dare	Nags Head	Memorial Avenue Bike Boulevard	5-25
OBX-F	Currituck	Corolla	Lighthouse Drive Signed Route	5-27
OBX-G	Dare	Southern Shores	Dogwood Trail Bike Boulevard	5-28
OBX-H	Dare	County	Colington Road Cycle Track	5-29



A: MAIN STREET- GATESVILLE

Main Street in Gatesville is a wide corridor with non-delineated—and largely underutilized—on-street parking. The parallel parking spaces are mainly used by the funeral home. Numerous homes front the corridor and have individual driveways. The recommended improvement is to restripe the corridor to add bicycle lanes, which could occur without changing the existing curb and gutter.

Extents and Facility Type: Gatesville Elementary School to Town limits: Bicycle Lane (Stripe)

Length: 0.9 miles

Traffic Volumes: Up to 3,200 AADT (Average Annual Daily Traffic)

Overview and Purpose: Main Street serves various municipal and civic uses and provides access to the downtown area and Gatesville Elementary. The width of the travel lanes and excess on-street parking could be redistributed to bicyclists through a low-cost restriping exercise. Two options are presented in the photosimulations below. The first option removes parking from both sides of the street and adds buffered bicycle lanes. The second option consolidates the parking to the southbound side to provide room for bicycle lanes. The second option requires narrow (9') travel lanes. Community input and feedback from NCDOT is needed to determine whether parking is necessary between Maple Street and Court Street.

Planning Level Cost Estimate: \$198,000 (assumes the full removal of on-street parking as shown in Option A).





B: CARATOKE HIGHWAY- MOYOCK

NC 168, known as Caratoke Highway, is an important route between North Carolina and Virginia, and an evacuation route for the Outer Banks. The highway is also the primary route within the small town of Moyock. Currently, NC 168 is not suitable for bicycle travel due to high traffic volumes, speeding vehicles, and a lack of bicycle facilities. The recommended treatment is a sidepath along the highway with intersection improvements at Camellia Road.

Extents and Facility Type: Shingle Landing Road to Powells Lane: Sidepath

Length: 1.3 miles

Traffic Volumes: Up to 21,000 AADT

Overview and Purpose: The sidepath is recommended to the south, with special considerations at Camellia Drive. Issues and constraints include limited right-of-way, utilities, numerous driveway conflicts,

and a stream crossing that will require a bridge and guardrail. Paved shoulders and a multi-use trail near Moyock Elementary School will complete the local network.

Planning Level Cost Estimate: \$981,250 (excludes cost of secondary multi-use trail north of school; excludes paved shoulder improvements).



C: BROAD STREET- EDENTON

Broad Street is one of the main entrances into historic Edenton and provides access to the downtown area, waterfront, and a variety of civic and retail uses. The corridor transitions from a more suburban four-lane section north of Church Street to an urban section with on-street parking. The corridor is also heavily traveled by local bicyclists. The recommended treatments are bicycle lanes or sharrows combined with streetscape and parking improvements.

Extents and Facility Type: Water Street to Church Street: Sharrow; Church Street to Virginia Avenue: Bicycle Lane (Road Diet); Virginia Avenue to Oakum Street: Bicycle Lane (Stripe)

Length: 1.3 miles

Traffic Volumes: Up to 7,800 AADT

Overview and Purpose: The purpose of this project is to blend improvements to the bicycle network with an enhanced gateway to the historic district. A recommended road diet would reduce the four-lane section north of Church Street to a two-lane divided section with bicycle lanes. South of Church Street, sharrows are recommended to enhance the awareness of motorists to bicycle traffic and to help direct bicyclists to the safest area of the travel lane. The safety of bicyclists would be further enhanced with back-in angled parking, which provides motorists with better vision of bicyclists and pedestrians as they exit a parking space.

Planning Level Cost Estimate: \$346,438 (restripe includes 0.3 miles of conversion to back-in angle parking; excludes cost of landscaped median for potential 2-lane divided road diet; excludes improvements to side streets).



Broad Street - Downtown Segment



Complete road diet
4-lane section to 2-lane divided
with bicycle lanes



Paint sharrows



Install bicycle
activation signal



Install high visibility crosswalks
throughout corridor

Consider converting on-street parking
to back-in angle parking.
Further study and business engagement required.



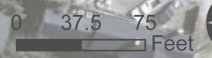
Paint sharrows



Install bicycle
activation signal



Paint sharrows





D: CHURCH STREET - ELIZABETH CITY

Church Street is a parallel route to Ehringhaus Street and Main Street. It connects the waterfront and downtown Elizabeth City with Hughes Boulevard (US 17 Business) by traveling through established residential areas and the historic district. Given the safety concerns for bicycle travel on Ehringhaus Street, Church Street was identified as a candidate for a bicycle boulevard.

Extents and Facility Type: Hughes Boulevard to Water Street: Bicycle Boulevard

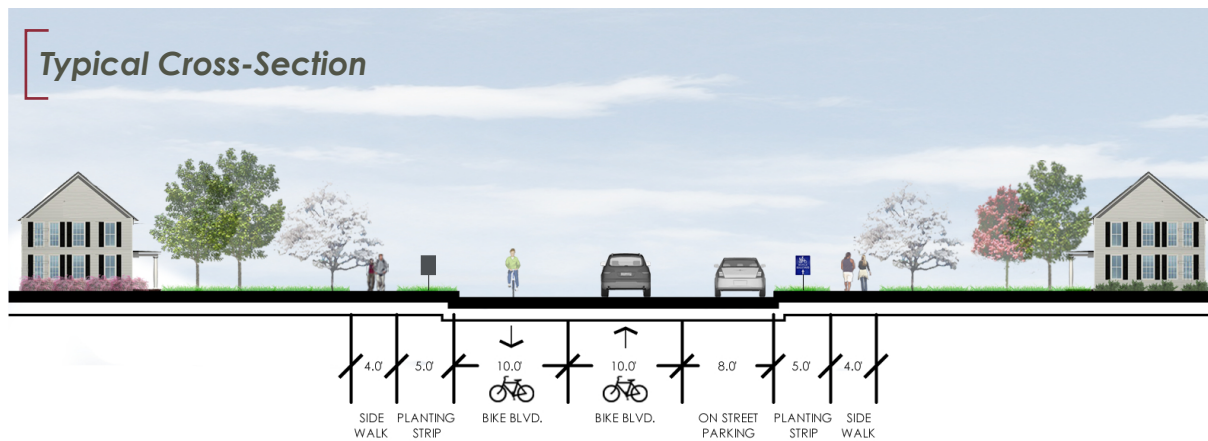
Length: 1.3 miles

Traffic Volumes: No Data

Overview and Purpose: The recommended bicycle boulevard would make Church Street more attractive and visible for bicyclists while minimizing the travel speeds of motor vehicles. Signage would direct

bicyclists from Ehringhaus Street and other roads to the corridor. Improvements at intersections such as mini traffic circles can help slow traffic and emphasize the priority of bicycle travel on Church Street. Issues and constraints include a narrow cross section (especially east of Road Street), in-street stormwater drains, numerous driveways, and non-delineated parallel parking. The bicycle boulevard could be enhanced by striping parking on one side. The exhibit shows potential plans for signage and pavement markings and identifies locations where traffic calming circles are appropriate. The signage plan also indicates destination points to increase accessibility.

Planning Level Cost Estimate: \$146,740



Existing traffic signal

Traffic calming circle

Bike Boulevard pavement marking

Street Sign Concepts

Church St
BICYCLE BOULEVARD

Main St
BICYCLE BOULEVARD

Selden St
BICYCLE BOULEVARD

Bicycle Lane, Stripe

Bicycle Lane, Road Diet

Bicycle Lane, New

Proposed Paved Shoulders

Proposed Bicycle Boulevard

Proposed Sharrows

Proposed Multi-Use Trail

Corridor Improvements

Boardwalk

State Bike Route

East Coast Greenway





E: EHRLINGHAUS STREET - ELIZABETH CITY

More than 20,000 vehicles per day travel Ehringhaus along its trek from downtown to US 17 and points west. The heavily commercialized corridor typically is a five-lane section with extensive driveway cuts, heavy traffic volumes, and large amounts of turning traffic. These features combine to make the corridor inhospitable to bicycle traffic and in need of improvements.

Extents and Facility Type: Hughes Boulevard to Water Street: Corridor Improvements

Length: 2.0 miles

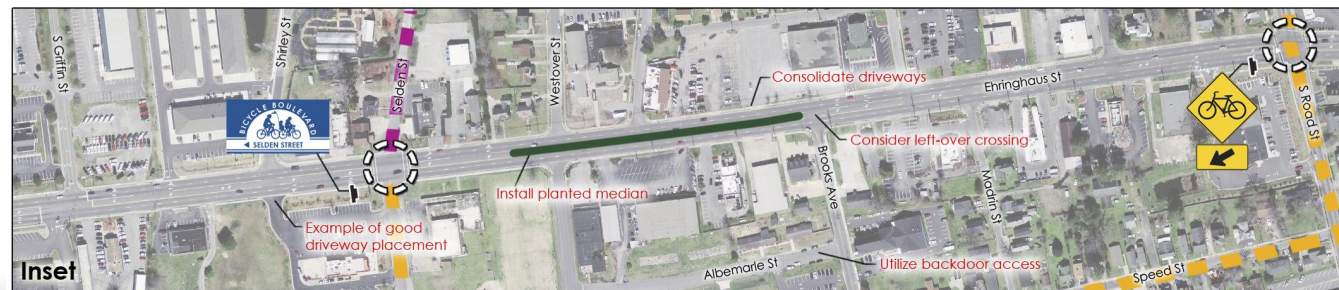
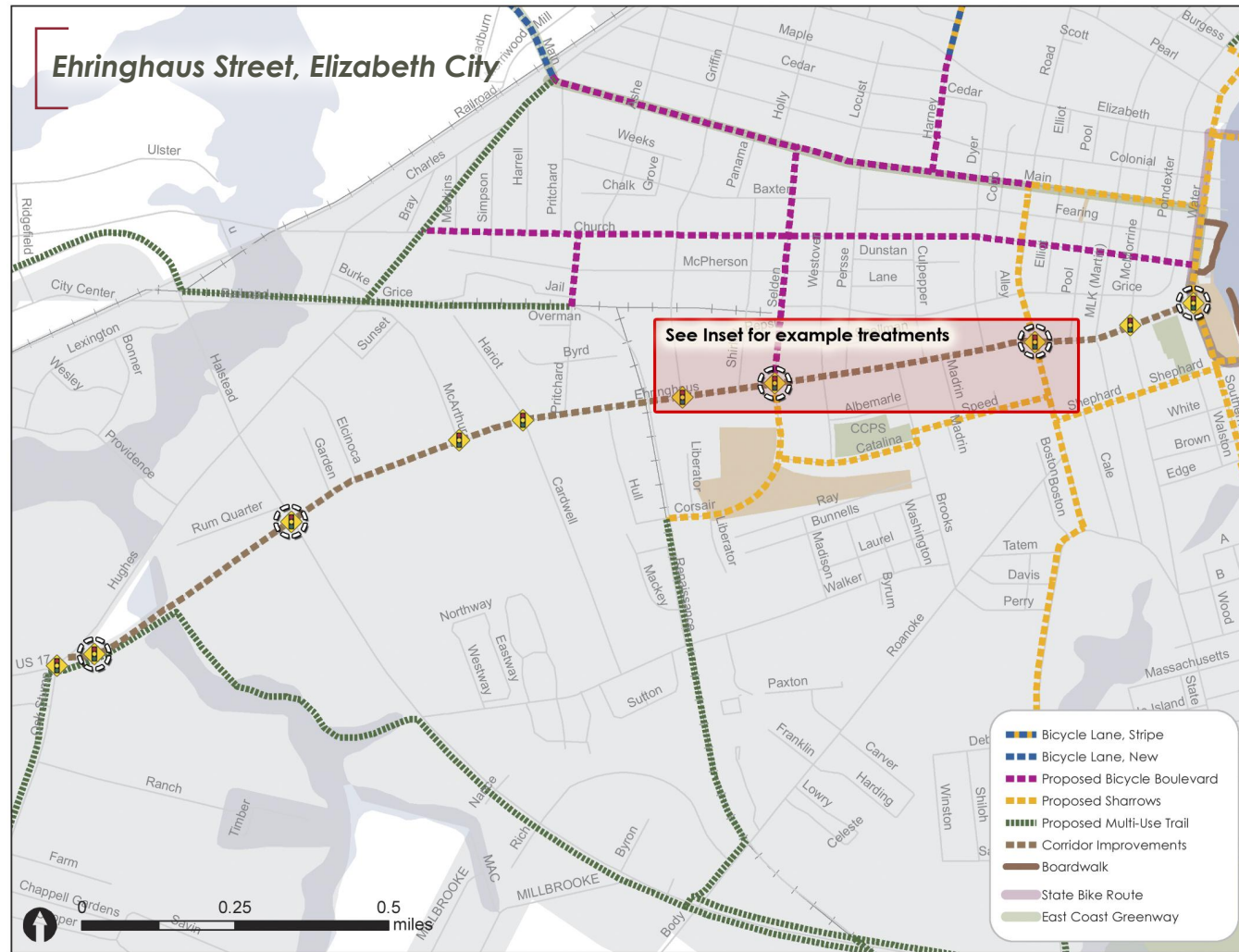
Traffic Volumes: Up to 20,000 AADT

Overview and Purpose: Many cyclist crashes have occurred along this corridor, demonstrating the need for bicycle safety improvements. The complexity of the land use and transportation dynamics along the two-mile corridor are beyond the scope of a regional bicycle plan. As a result, a transportation and land use corridor study is needed to consider how redevelopment and strategic enhancements can improve multimodal operations. Throughout the full length of the corridor, appropriate improvements may include restriping for wide outside lanes, consolidating driveways, installing a plantable median, intersection enhancements, and signage. The exhibit at right describes best practices for access management including an inset that shows a simplified representation of potential treatments. Improvements to Ehringhaus Street do not negate the

need for the adoption of Church Street as a bicycle boulevard. Each of these two roadways will attract different cyclist types.

Planning Level Cost Estimate: TBD (based on outcome of corridor-based land use and transportation study)

Ehringhaus Street, Elizabeth City



Best Practices Toolbox

Travelway Improvements

- Conduct a land use/transportation corridor study
- Restripe for wide outside lanes
 - Complete by narrowing two-way left turn lane during resurfacing
- Construct planted median in accordance with corridor study
- Develop and adhere to acceptable spacing standards
- Identify specific locations for left-over crossings and cross access
- Explore opportunities for depressed medians with rain gardens
- Coordinate traffic signals
- Install Share the Road signs



Intersection Enhancements

- Implement bicycle activation at key crossings (e.g. Selden St, Road St, Water St)
- Construct high visibility crosswalks
- Install pedestrian countdown signals
- Ensure advance warning of bicycle crossing (e.g. bicycle boulevard sign at Selden St)



Site Access Treatments

- Consolidate driveways through redevelopment
- Relocate driveways away from intersection (minimum 100')
- Implement cross access and backdoor access (especially in locations with a non-traversable median)
- Ensure proper "throat" length for driveways

Land Use Considerations

- Create land use policies and regulations that distribute local traffic
- Address common issues such as separation of uses and single access points
- Develop an overlay district to help implement recommendations from the corridor study



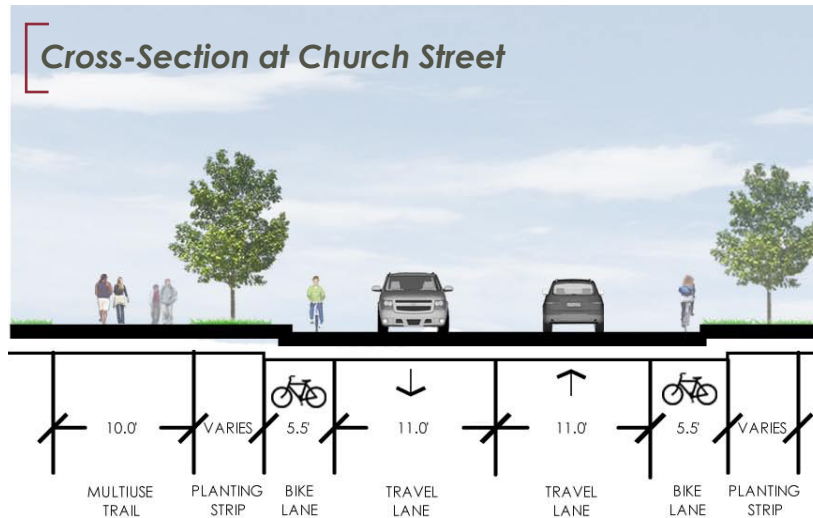
F: GREENWAY - HERTFORD

The Perquimans County Recreation Center on the banks of the Perquimans River is a significant community resource. To encourage an active lifestyle and to provide safe travel separated from traffic between the recreation center and downtown, a series of multi-use trails are recommended. These trails include greenways on independent alignments and sidepaths along Church Street.

Extents and Facility Type: King Street to Shopping Center south of US 17: Greenway

Length: 2.4 miles

Traffic Volumes: Not Applicable

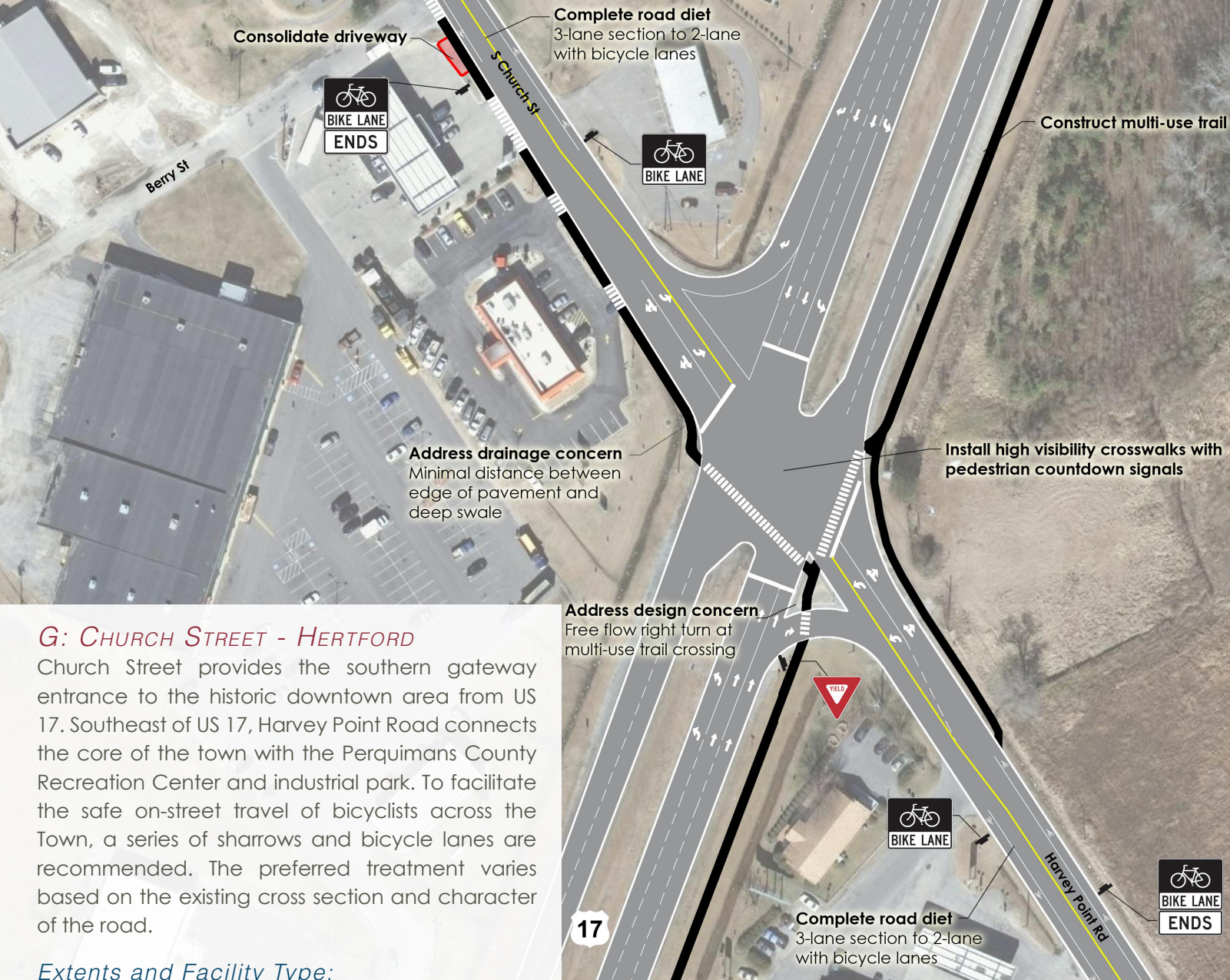


Overview and Purpose: The recommended network of multi-use trails will connect the heart of Hertford, including Perquimans County High School, with the community facilities at the Perquimans County Recreation Center. The network maximizes exposure to the Perquimans River east of US 17. West of US 17, the trail forms a sidepath along Church Street over the bridge just south of downtown before turning west and following the creekbed.

Right-of-way acquisition will be required along the creekbed between Church Street and King Street. Right-of-way along Church Street typically is 60 feet, though it expands to approximately 150 feet from White Street south across the bridge. Design challenges include limited right-of-way and driveway conflicts approaching US 17. The segment parallel to US 17 between Harvey Point Road and the shopping center will require special attention due to shoulder slope and setback requirements from the travel lanes. As an alternative, placement of the multi-use trail outside the existing right-of-way adjacent to the commercial property may be preferable.

The exhibit at left provides a cross-section view on Church Street of the sidepath along the corridor with bicycle lanes.

Planning Level Cost Estimate: \$1,131,250 (excludes loop trail to water or connection to recreation center; significant water crossing not included in cost estimate; additional contingency added to account for construction hardships).



Overview and Purpose: Over the past decade, the Town of Hertford has seen renewed interest in development southeast of US 17. Connecting this growth (including commercial and industrial properties such as the Food Lion, residences, and a county park) to the historic downtown is a priority. The recommended on-street improvements offer cost-effective solutions that could be coupled with multi-use trails to provide adequate facilities for all users. The exhibit focuses on improvements at the intersection of Church Street/Harvey Point Road and US 17 to show how the various facilities will interact. Constraints include limited right-of-way, the proximity of utilities, drainage/flooding concerns, and bridge crossings. In addition to the recommended facilities, additional signage is needed to indicate the route to the Perquimans County Recreation Center.

G: CHURCH STREET - HERTFORD

Church Street provides the southern gateway entrance to the historic downtown area from US 17. Southeast of US 17, Harvey Point Road connects the core of the town with the Perquimans County Recreation Center and industrial park. To facilitate the safe on-street travel of bicyclists across the Town, a series of sharrows and bicycle lanes are recommended. The preferred treatment varies based on the existing cross section and character of the road.

Extents and Facility Type:

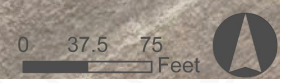
Church Street - Phelps Street to Winfall Boulevard: Sharrow, Grubb Street to Phelps Street: Bicycle Lane (Restripe), Grubb Street to White Street: Sharrow, White Street to South of Creek Bridge: Bicycle Lane (Restripe), South of Creek Bridge to US 17: Bicycle Lane (Restripe); Harvey Point Road - US 17 to

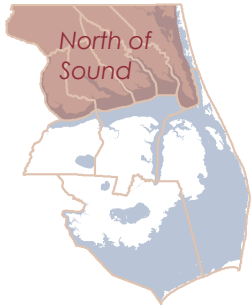
Commerce Drive: Bicycle Lane (Restripe)

Length: 2.4 miles

Traffic Volumes: Up to 4,800 AADT

Planning Level Cost Estimate: \$317,513





H: GREENWAY - DISMAL SWAMP

Extents and Facility Type: Dismal Swamp Canal Welcome Center to Virginia state line: Greenway

Length: 3.5 miles

Traffic Volumes: Up to 11,000 AADT (US 17)

Purpose and Need: The Dismal Swamp Canal Trail Extension is a regionally significant greenway that will connect the existing Dismal Swamp Canal Trail to the Virginia state line, running parallel between US 17 and the Dismal Swamp Canal. A feasibility study with 30% design plans was completed in 2011 for this segment. A separate project would extend the trail in Virginia 1.6 miles north from the state line to link with an 8.3-mile segment of existing trail that connects to Dominion Boulevard in Chesapeake.

Background and History: Construction on the existing 3-mile trail began in 2001. From the trail's southern terminus at NC 343, a 5-foot paved shoulder along NC 343 and Mullen Road provides access to South Mills. A feasibility study of the trail extension was completed in 2011. The study included a full survey from the Virginia line to the Welcome Center. Based on the survey, a route was mapped and 30% design documents developed.

Design Status: The route was designed to minimize tree removal while maintaining a safe buffer between the trail and travel lanes on US 17. At the Welcome Center, the trail meanders between the canal and the existing sidewalk to join the existing trailhead at its northern terminus. The proposed trail lies within NCDOT right-of-way and easement from the Welcome Center.

At the Welcome Center, the route travels between the parking area and the Dismal Swamp Canal until it joins the existing trail.

Environmental Concerns

Minimizing environmental impacts to the historic Dismal Swamp Canal and the surrounding area was a key consideration for the trail design developed as part of the feasibility study. The study notes that an Environmental Assessment (EA) will be required due to the trail's proximity to the historic canal, the presence of endangered species in the area, and the placement of the trail on park property. In addition to minimizing the removal of vegetation, the trail design also warrants minimal grading and does not require retaining walls.

Next Steps

The extension of the Dismal Swamp Canal Trail will add a critical link of what could become a 16.5-mile segment of greenway along the banks of the historic Dismal Swamp Canal. With assistance from the State of Virginia, the completed greenway will connect the Chesapeake area of Virginia to the Great Dismal Swamp Welcome Center and the Village of South Mills in North Carolina. With the right-of-way obtained and 30% design plan in hand, local stakeholders should continue to seek funding for environmental documentation, full design, and construction.

Planning Level Cost Estimate: \$1.6 million (from the Dismal Canal Trail Extension final report)

A: US 264 - ENGELHARD

US 264 carries up to 2,300 vehicles through the small fishing community of Engelhard on an average day. Despite being a rural outpost, Engelhard offers numerous community activity centers, including retail stores, a hotel, banks, and restaurants. The community also hosts a popular seafood festival each spring. The recommended treatment takes advantage of the wide 32' cross section and creates bicycle lanes through a striping exercise. A small bridge over Far Creek on the eastern edge of the recommended corridor is a constraint.

Extents and Facility Type: Golden Street to Golden Street: Bicycle Lane (Stripe)

Length: 0.2 miles

Traffic Volumes: 900 - 1,100 AADT

Overview and Purpose: While pedestrians are accommodated with sidewalks and a boardwalk in Engelhard, bicyclists do not have a dedicated facility. The width of US 264 through the unincorporated community is sufficient to allow dedicated bicycle lanes through a low-cost striping exercise. The resulting facility will narrow the travel lanes to discourage speeding, further improving safety for bicyclists. The exhibit includes a cross section and photosimulation at the western edge of the proposed bicycle lane near the East Carolina Bank offices. The cross section also shows the existing boardwalk.

Planning Level Cost Estimate: \$6,600

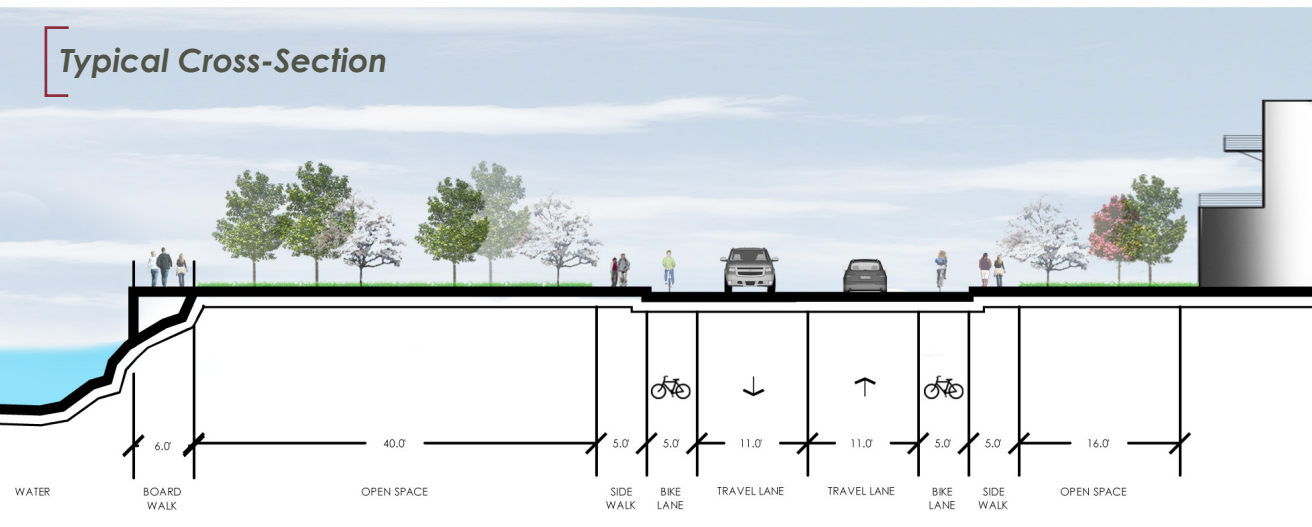


Before



After

Typical Cross-Section





B: SIDEPATH - COLUMBIA

Columbia, the Hyde County seat on the banks of the Scuppernon River, sits halfway between Plymouth and Manteo. As the county seat, it accommodates numerous civic uses, including Columbia Middle School and county services. Columbia has a high rate of bicycle use due to its small, relatively compact town design and lower income profile. The recommended sidepath will provide a safer option for bicyclists traveling along US 64 between downtown and the town's largest shopping center.

Extends and Facility Type: Water Street to LaKeiser Drive: Sidepath

Length: 0.8 miles

Traffic Volumes: Up to 8,600 AADT

Overview and Purpose: A sidewalk currently exists where the sidepath is recommended. The sidewalk should be widened to form a multi-use sidepath. The eastern terminus of the proposed

sidepath is the Food Lion shopping center near LaKeiser Drive. From there, users can enjoy a dedicated facility on the westbound side of US 64 to the banks of the Scuppernon River. Construction of the sidepath will require consideration for right-of-way constraints, utilities close to roadway, and major intersection crossings. The exhibit highlights the segment between Road Street and Main Street, showing the interaction of the proposed sidepath

with a variety of on-street facilities (sharrows on Fonsoe and Road Streets and bicycle lanes on Main Street).

Planning Level Cost Estimate: \$845,000 (excludes improvements to side streets, including Main Street)

C: SIDEPATH - PLYMOUTH

With traffic volumes on US 64 exceeding 21,000 vehicles per day and a community that takes to the street on bicycle for everyday trips, creating safe bicycling options in Plymouth is a critical concern. US 64 provides local access to Washington County Hospital, several shopping centers, and numerous restaurants. The recommended sidepaths on US 64 between West Avenue and Main Street form the spine of an expanded on- and off-street bicycle network in Plymouth.

Extents and Facility Type: West Avenue to Main Street: Sidepath



Length: 1.9 miles

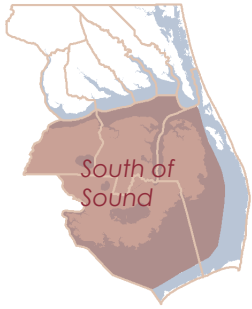
Traffic Volumes: Up to 21,000 AADT

Overview and Purpose: The key connection along the corridor is the Food Lion near Washington County hospital. Given the high traffic volumes on US 64, concerns for speeding traffic, and limited signalized crossing opportunities, dual sidepaths

are recommended. Sidepaths along both sides of the road will allow bicyclists and pedestrians to travel the full extent of the corridor and minimize the need for crossing at unsignalized locations. Design constraints include driveway conflicts, right-of-way constraints, and a lack of offset utilities. The exhibit shows a detailed view of the intersection of US 64 and NC 32. It highlights the numerous driveway

conflicts and shows supplemental facilities on NC 32 (sharrows to the north and bicycle lanes to the south of the railroad).

Planning Level Cost Estimate: \$2,786,000 (excludes multi-use trail (rail-to-trail conversion) north of US 64; excludes improvements to side streets; significant hardships expected).



D: WATER STREET/PARK DRIVE - PLYMOUTH
Bicycling activity in Plymouth was observed to be among the highest in the 10-county region. The downtown area boasts numerous activity centers and destinations of interest to bicyclists, including retail and civic uses typical of a small downtown as well as a bicycle shop, two schools, a hospital and the waterfront bicycle shop. When combined with the local demand for bicycling, these activity centers establish the area as a priority. The recommended network of on-street facilities in the downtown area includes bicycle lanes and sharrows depending on the existing cross section of the street.

Extents and Facility Type: Park Drive/Martin Lane - Madison Street to Main Street: Bicycle Lane (Restripe); Water Street - Main Street to Madison Street: Sharrow

Length: 0.9 miles

Traffic Volumes: No Data

Overview and Purpose: Using a combination of bicycle lanes and sharrows, the recommended treatments in Plymouth will create a continuous bicycle corridor through downtown. These improvements can be realized through a cost-effective striping exercise. The exhibits show a pair of photosimulations that illustrate existing and proposed conditions. At Park Drive near the Port O' Plymouth Museum bicycle lanes and a centerline are added to the wide 32' cross-section. On Water Street in the heart of downtown, sharrows are recommended to direct bicyclists to the proper placement in the lane, a particularly important improvement due to the presence of parallel parking. It should be noted that drainage issues on Water Street may preclude striping bicycle lanes in that section, and coordination is needed with NCDOT.

Planning Level Cost Estimate: \$18,975



Water St. Before



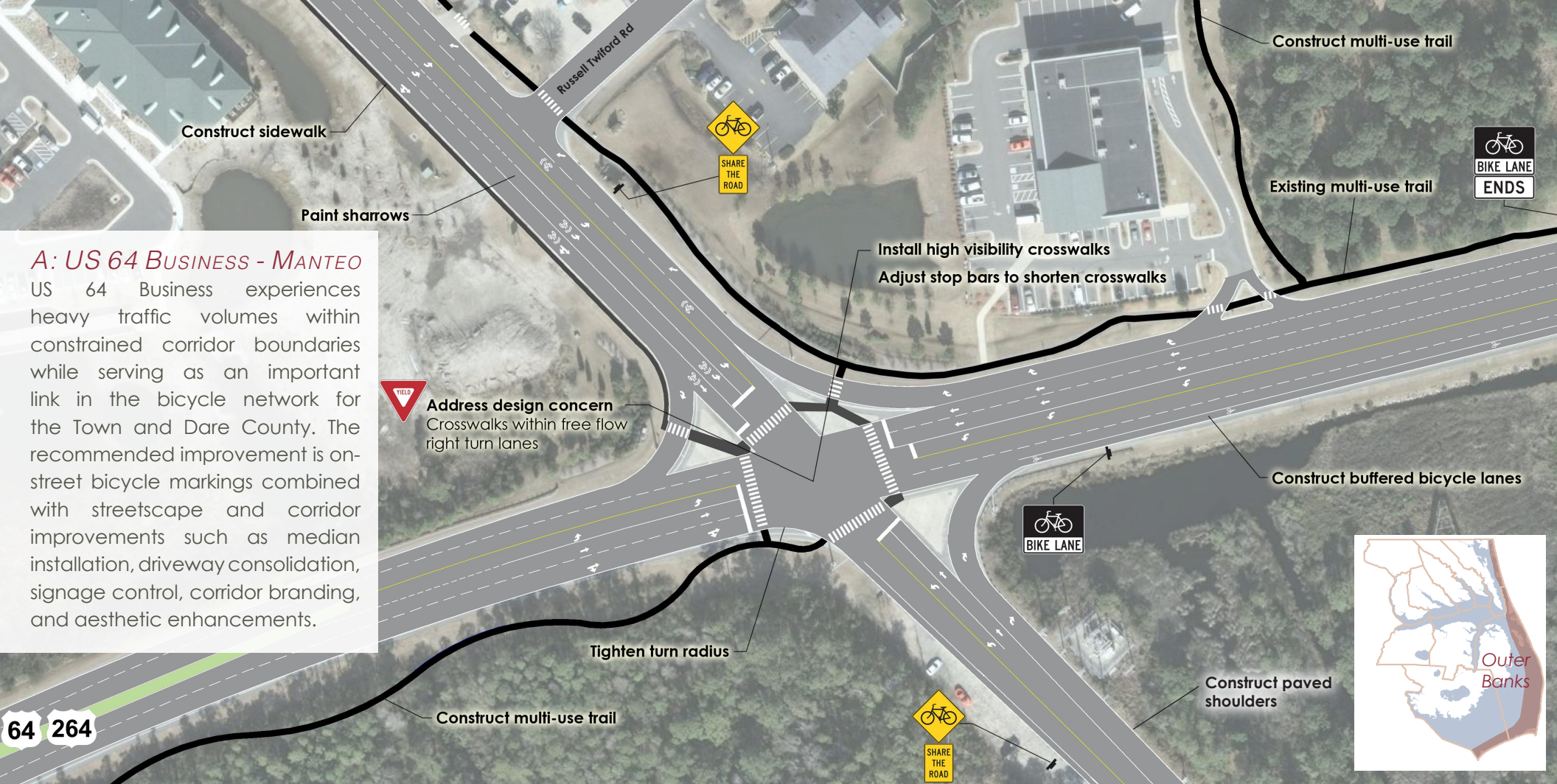
Water St. After



Park Dr. Before



Park Dr. After



A: US 64 BUSINESS - MANTEO

US 64 Business experiences heavy traffic volumes within constrained corridor boundaries while serving as an important link in the bicycle network for the Town and Dare County. The recommended improvement is on-street bicycle markings combined with streetscape and corridor improvements such as median installation, driveway consolidation, signage control, corridor branding, and aesthetic enhancements.

Extents and Facility Type

Harriot Street to Patty Lane: Sharrow; Patty Lane to US 64/US 264: Sharrow (or Bicycle Lane Restripe)

Length: 1.4 miles

Traffic Volumes: Up to 17,000 AADT

Overview and Purpose: US 64 Business provides the spine for the commercial, cultural, and recreational heart of Manteo. Key connections include three schools (Manteo High School, Dare County Alternative High School, and Manteo

Elementary School), College of the Albemarle Dare campus, Dare County Library, Roanoke Island Festival Park, civic buildings, and a local bicycle shop. The striping exercise represents a low cost opportunity to raise awareness to the presence of bicyclists along this route. Streetscape improvements will provide predictability to vehicular traffic, minimize conflicts between cyclists and motor vehicles, and enhance the visual appeal of the corridor. Improvements must occur within the existing boundaries of the

corridor, as corridor regulations prohibit changes to the sidewalks and street trees. The exhibit focuses on improvements to the intersection of US 64/US 264 and US 64 Business.

Planning Level Cost Estimate: \$42,550 (excludes multi-use trail along US 64/264).



**B: US 158 - KITTY HAWK/KILL DEVIL HILLS/
NAGS HEAD**

US 158 bears the weight of local access and regional mobility. Locally, the corridor serves as the commercial and residential lifeline for Kitty Hawk, Kill Devil Hills, and Nags Head. It also provides critical mobility for regional trips and during evacuations. US 158 is designated as a boulevard in need of upgrade as part of the state's Strategic Highway Network. Several issues make the corridor dangerous for bicycle travel: high traffic volumes, unpredictable automobile movements, an inconsistent bicycle network, and limited safe crossing opportunities.

Extents and Facility Type: Byrd Street (Kitty Hawk) to Washington-Baum Bridge (Nags Head): Corridor Improvements

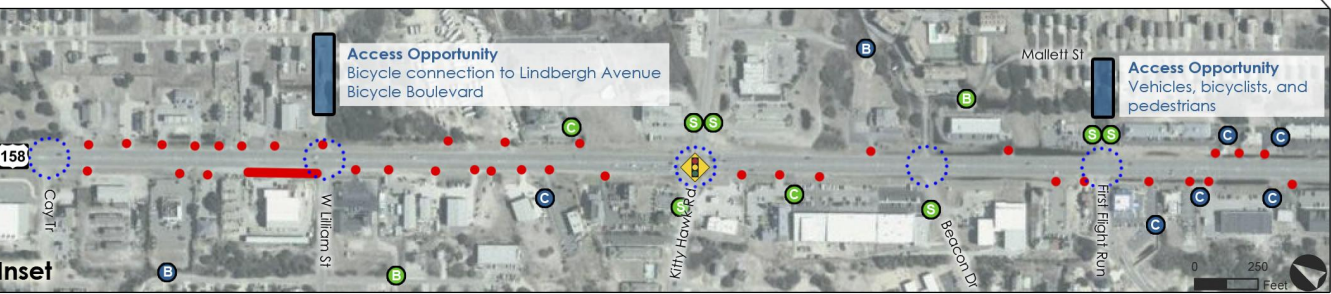
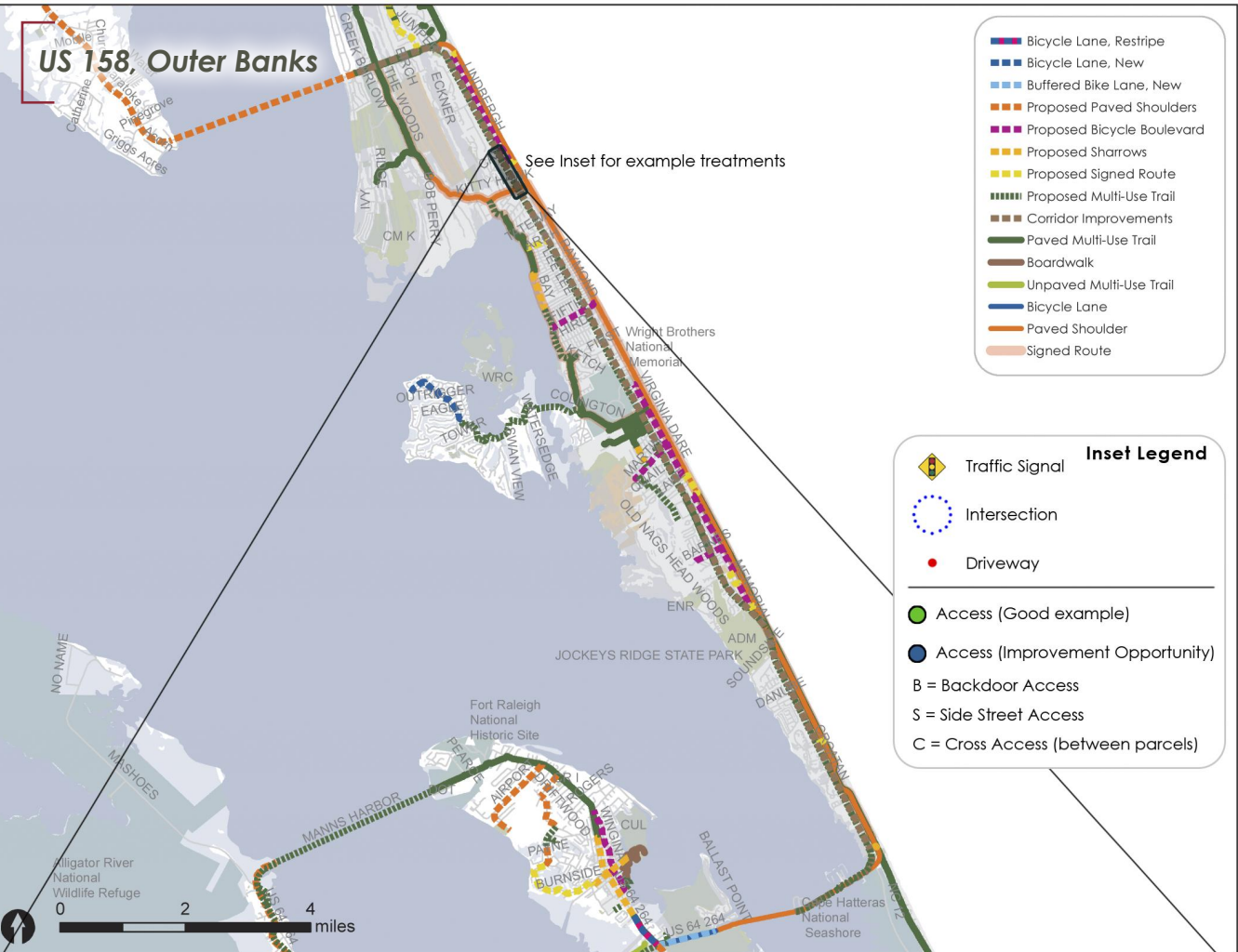
Length: 18.3 miles

Traffic Volumes: Up to 27,000 AADT

Overview and Purpose: US 158 provides access to numerous activity centers (e.g. the Wright Brothers National Memorial and Jockey's Ridge State Park) as well as the majority of the beach's commercial properties and residences. Many cyclist crashes have occurred along the corridor, indicating a need to address bicycle safety. A comprehensive corridor study is needed to understand fully the existing conditions, future concerns for multimodal travel, and potential countermeasures. The likely outcome of the

corridor study would be an engineering approach toward filling gaps in the existing sidepath, adding non-traversable medians, consolidating driveways, and improving intersections. The exhibit describes best practices for access management including an inset that highlights issues and best practices in action for a roadway segment representative of the corridor at large. The recommended corridor study could be funded through a joint effort between the municipalities and the RPO.

Planning Level Cost Estimate: TBD based on outcome of corridor-based land use and transportation study.



Best Practices Toolbox

Travelway Improvements



- Conduct a land use/transportation corridor study
- Identify locations to divert bicycle traffic to parallel routes
- Identify gaps in the sidepath and ways to complete the network
- Construct planted median in accordance with corridor study
 - Develop and adhere to acceptable spacing standards
 - Identify specific locations for left-over crossings and cross access
 - Explore opportunities for depressed medians with rain gardens
- Coordinate traffic signals
- Install Share the Road signs

Intersection Enhancements



- Develop engineered solutions for intersection treatments
- Implement bicycle activation at key crossings (e.g. Dogwood Rd, Fifth St, Ocean Bay Blvd, Barnes St)
- Construct high visibility crosswalks
- Install pedestrian countdown signals
- Ensure advance warning of bicycle crossings



Site Access Treatments

- Consolidate driveways through redevelopment
- Relocate driveways away from intersection (minimum 100')
- Implement cross access and backdoor access where appropriate (especially in locations with a non-traversable median)
- Ensure proper "throat" length for driveways

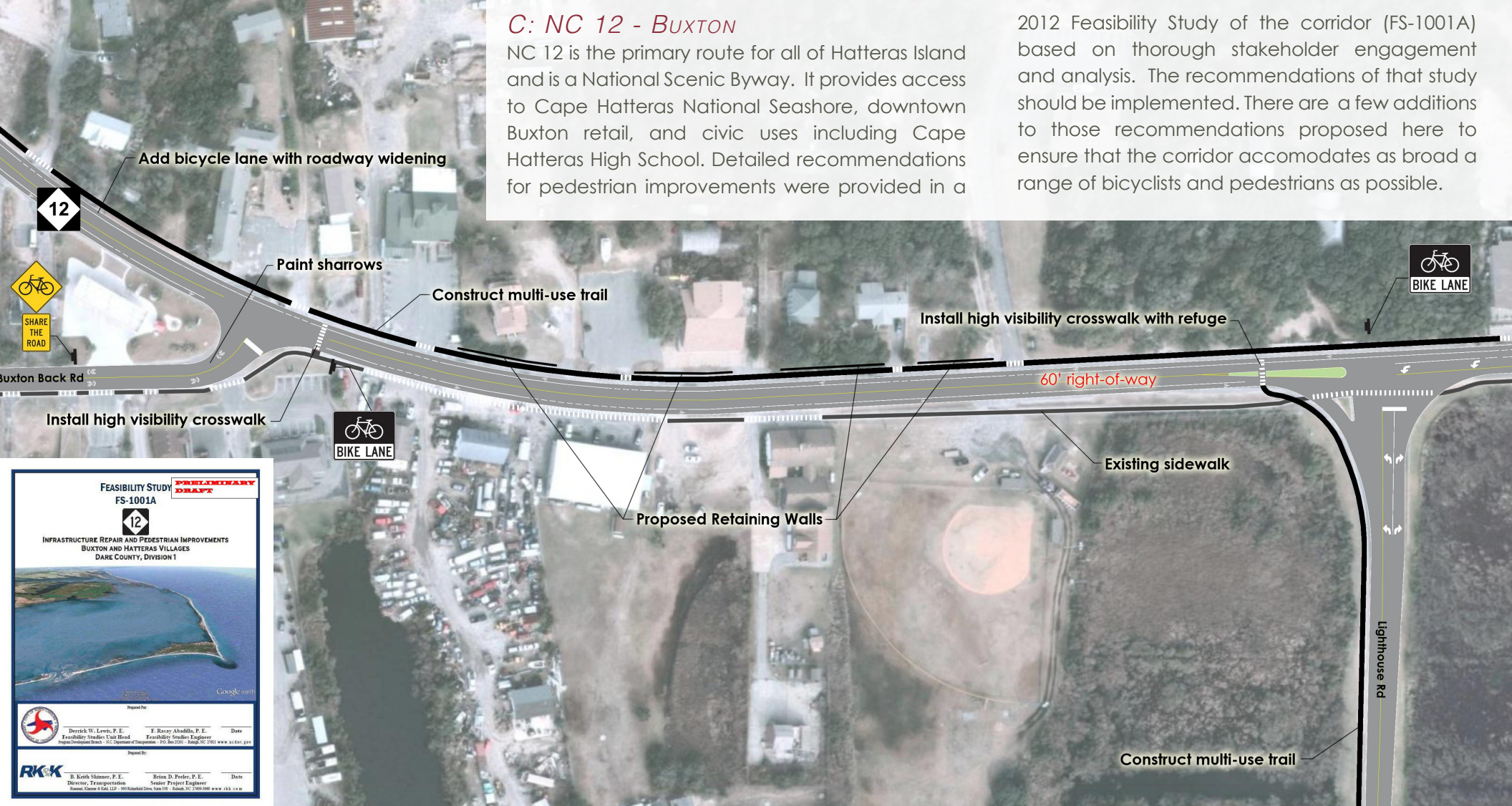
Land Use Considerations

- Create land use policies and regulations that distribute local traffic (coordinate among municipalities)
- Address common issues such as separation of uses and single access points
- Develop an overlay district to help implement recommendations from the corridor study

C: NC 12 - BUXTON

NC 12 is the primary route for all of Hatteras Island and is a National Scenic Byway. It provides access to Cape Hatteras National Seashore, downtown Buxton retail, and civic uses including Cape Hatteras High School. Detailed recommendations for pedestrian improvements were provided in a

2012 Feasibility Study of the corridor (FS-1001A) based on thorough stakeholder engagement and analysis. The recommendations of that study should be implemented. There are a few additions to those recommendations proposed here to ensure that the corridor accommodates as broad a range of bicyclists and pedestrians as possible.



Extents and Facility Type: Buxton Back Road to Buxton Village border: Sidewalk and Bicycle Lane (Restripe).

Length: 0.7 miles

Traffic Volumes: Up to 9,500 AADT

Recommendations: Feasibility Study 1001A recommends widening the travel lanes to 15' each, with 12' lanes, 3' paved shoulder for

cyclists, and 5' sidewalks indicated for both cyclists and pedestrians (therefore functioning as sidepaths). This plan recommends that 10' lanes be considered during design and implementation of this project to accommodate full 5' bike lanes that will attract more users. These bike lanes are especially important given the constrained right-of-way that prevents wider sidepaths. If right-of-way does allow it in any locations, the

sidepaths should be widened beyond 5' to better accommodate multiple user types.

Planning Level Cost Estimate: \$4,250,000 (from Feasibility Study 1001A).

D: NC 12 - Duck

Over the past decade, the communities on NC 12 north of US 158 have made significant improvements to the bicycle and pedestrian network, including sidepaths and bicycle lanes. In Duck, the sidepath dissolves into a pair of buffered paved shoulders shared by pedestrians and cyclists. During the peak tourist season, these shared lanes are highly congested. The recommended treatment links the sidepaths at either end of town by consolidating the paved shoulders into an on-street, buffered multi-use sidepath on the northbound side of the road.

Extents and Facility Type: North of Barrier Island Station to existing trail south of Scarborough Lane: Sidepath

Length: 1.1 miles

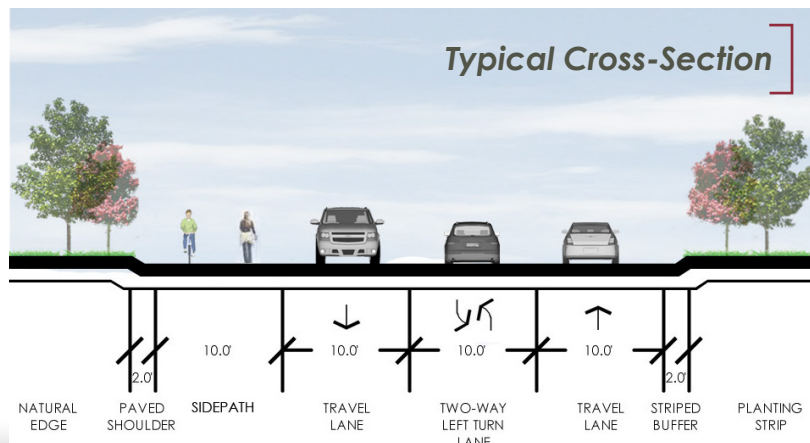
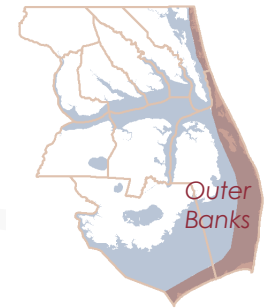
Traffic Volumes: Up to 10,000 AADT

Overview and Purpose: The sidepaths on either side of town transition to bicycle lanes and create crossing concerns. The existing design also fails to provide a comfortable environment for all users.

The recommended improvement shifts the current buffered bike lanes/shared paths to the northbound side of the road, creating a multi-use trail along the roadbed that matches the existing sidepaths at the town edges. The treatment is largely a restriping exercise within the existing pavement, though additional shoulder may be required in some locations. Bollards are recommended to alert motorists of the potential presence of bicyclists and pedestrians. Other barriers were considered but ultimately not selected because of their cost and impact on stormwater flow.

Design considerations should include intersection and driveway breaks, limited right-of-way, and the constrained cross-section at the northern end. Bicycle- and pedestrian-friendly crossings at intersections and destination points also should be emphasized. The exhibit shows a photosimulation and cross section of the proposed treatment.

Planning Level Cost Estimate: \$316,250





E: MEMORIAL AVENUE - NAGS HEAD

Memorial Avenue is a parallel route to US 158 and NC 12 in Nags Head. The 2.1-mile corridor mostly traverses a residential area with individual driveway access throughout its extents. An emerging gallery district exists near Gallery Row and Driftwood Street. Because US 158 is not well suited for bicycle travel, bicyclists should be encouraged to use Memorial Avenue. The recommended bicycle boulevard would make the route more attractive and visible for bicyclists while attempting to minimize cut-through vehicular traffic. Memorial Avenue is discontinued for one block, so the bicycle boulevard diverts to a signed route at Bladen Street.

Extents and Facility Type: Eighth Street to Hollowell Street: Bicycle Boulevard

Length: 2.1 miles

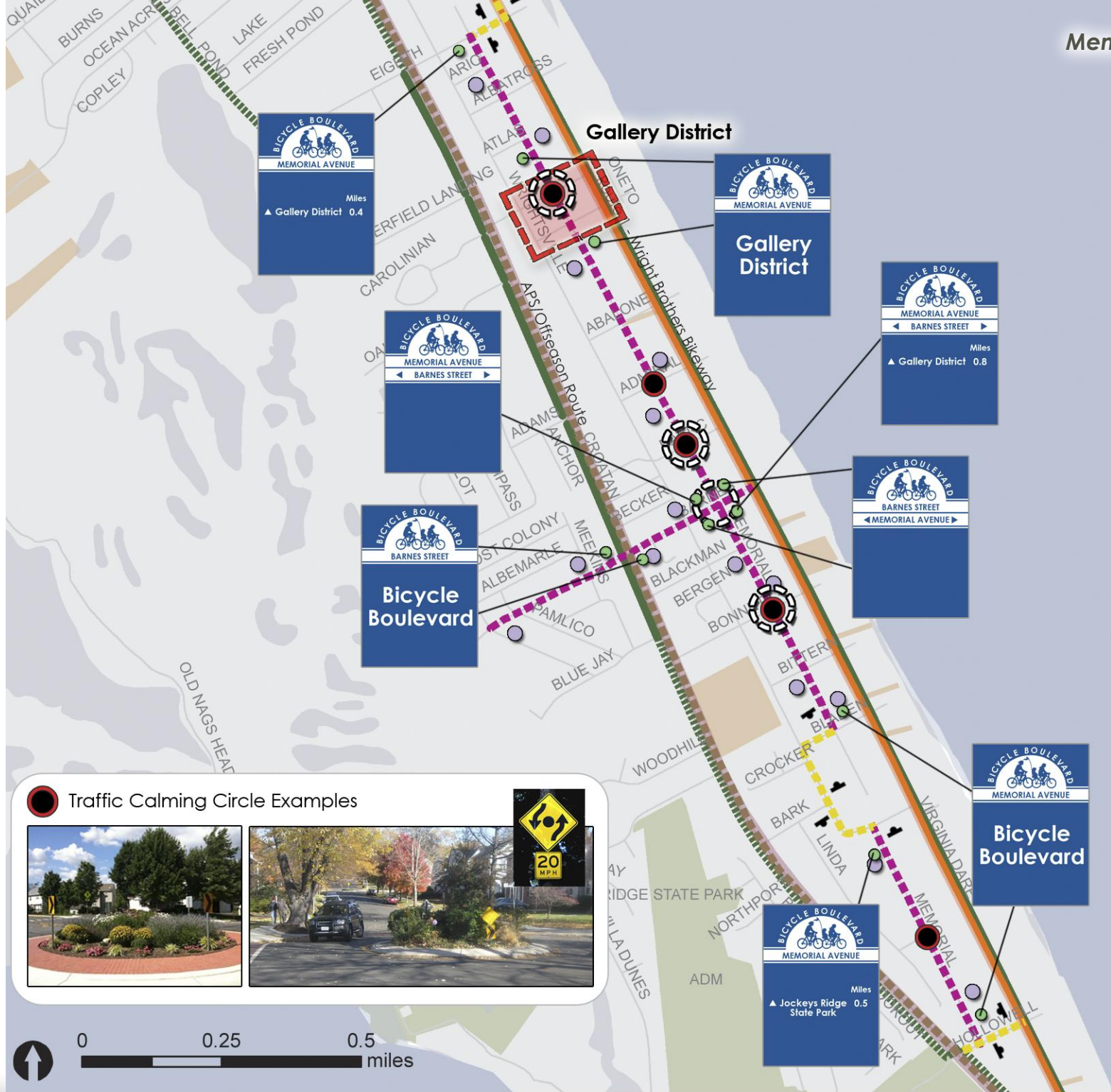
Traffic Volumes: No Data

Overview and Purpose: The Memorial Avenue Bicycle Boulevard is designed to make the route an attractive alternative to bicyclists. The intent is to encourage bicycle travel along Memorial Avenue while discouraging through trips of excessive speeds by automobiles. The conversion requires new signage, pavement markings, and improved intersections. The exhibit shows potential plans for signage and pavement markings while also identifying locations where stop signs along Memorial Avenue should be

oriented to the side streets and where intersection should be retrofitted with traffic calming features. The signage plan also indicates destination points to increase accessibility. Future plans for the Gallery District should include the bicycle boulevard concept.

Planning Level Cost Estimate: \$199,788 (assumes improvements to Memorial Avenue and Barnes Street as shown in exhibit)

Memorial Avenue, Nags Head



- Grocery Store
- Local Destination
- School
- Proposed Bicycle Boulevard
- Proposed Signed Route
- Proposed Multi-Use Trail
- Corridor Improvements
- Paved Multi-Use Trail
- Paved Shoulder
- Signed Route
- State Bike Route
- Wetland
- State Conservation Land
- Other Conservation Land
- Municipal Boundary

- Traffic calming circle
- Relocate stop signs from Memorial Avenue to cross street
- Bike Boulevard pavement marking
- Bike route sign with directional arrows where appropriate

Street Sign Concepts

- Memorial Ave BICYCLE BOULEVARD
- Barnes St BICYCLE BOULEVARD

Traffic Calming Circle Examples



F: LIGHTHOUSE DRIVE - COROLLA

Lighthouse Drive nearly stretches the full length of Corolla and provides a parallel option to NC 12. The facility is a low volume residential street extending 3.6 miles from north to south. The corridor is suitable for a signed bicycle route, which typically is designated along residential streets with lower traffic volumes and where additional roadway width is not possible or warranted.

Extents and Facility Type: Shad Street, Lighthouse Drive, and Albacore Street: Signed Route

Length: 3.6 miles

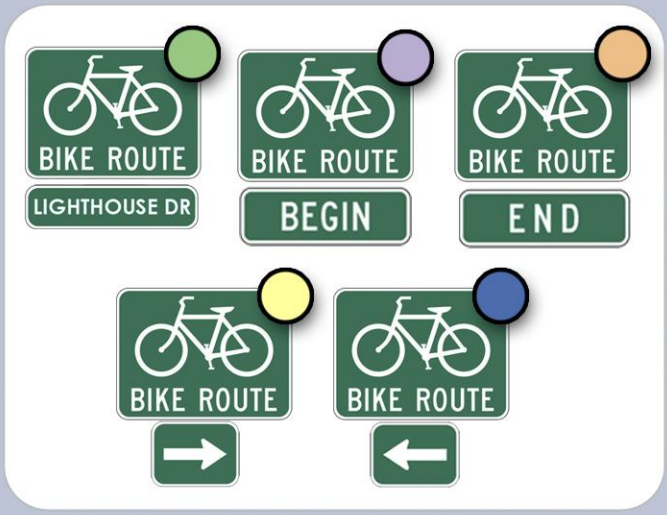
Traffic Volumes: No Data

Overview and Purpose: Lighthouse Road is a low volume corridor near the beach that is conducive to additional bicycle traffic. However, signage is needed to direct cyclists to this corridor from NC 12. Concerns along the route include residential uses with numerous driveways, poor drainage, trashcans in the roadway, and limited right-of-way. However, as a low volume, low speed corridor, bicyclists should be able to blend with traffic. The exhibit shows standard bike route signs with directional arrows where necessary. This signage can be designed in accordance with Corolla's 2013 wayfinding project.

Planning Level Cost Estimate: \$9,504



- Proposed Paved Shoulders
- Proposed Signed Route
- Proposed Multi-Use Trail
- Paved Multi-Use Trail
- Paved Shoulder





Kitty Hawk Elementary School

G: DOGWOOD TRAIL - SOUTHERN SHORES

South Dogwood Trail and East Dogwood Trail create a 3.3-mile parallel route to NC 12 through Southern Shores and bordering the Duck Woods Country Club. The corridor is an attractive alternative for north and southbound bicyclists given its lower traffic volumes in comparison to NC 12. The recommended construction of a sidepath is intended to facilitate safer bicycle travel north of US 158.

Extents and Facility Type: US 158/Croatan Highway to Ocean Boulevard: Sidepath

Length: 3.3 miles

Traffic Volumes: No Data

Overview and Purpose: An existing sidepath extends nearly one mile north from the intersection of South Dogwood Trail and US 158/Croatan Highway to just beyond Ginguite Trail. The completion of a sidepath along Dogwood Trail would require widening (if feasible - the current

path is functionally a sidewalk) and extending the existing path an additional 2.3 miles. Existing right-of-way should be sufficient, though construction likely would require the removal of trees and shrubbery. Design constraints include two narrow bridges (one on South Dogwood Trail 180 feet north of Fairway Drive and one on East Dogwood

Trail 350 feet east of its terminus with South Dogwood Trail) and driveway conflicts. For the Regional Bicycle Plan, special consideration was given to the intersection of Dogwood Trail and US 158. The exhibit illustrates these improvements.

Planning Level Cost Estimate: \$2,366,000



H: COLINGTON ROAD - DARE COUNTY

Colington Road is often cited as a critical—and overlooked—corridor on the Outer Banks. More than 8,000 residents in the Colington area depend on the road to reach US 158. NCDOT was exploring options to widen the corridor as of spring 2013, which includes a few alternatives for bicycle facilities. This plan's recommended treatment is a multi-use sidepath on the westbound side of the corridor.

Extents and Facility Type: Kill Devil Hills to End of Colington Drive: Sidepath

Length: 3.9 miles

Traffic Volumes: No Data

Overview and Purpose: Many bicyclists feel more comfortable being separated from traffic. A delineated sidepath on Colington Road as shown in the photosimulation would establish a dedicated

facility on the westbound side of the road for both bicyclists and pedestrians. The residents of Colington Road have expressed their desire for a fully separated facility, and this recommendation aims to create as much separation as possible given the corridor's constraints. Issues and constraints include significantly constrained right-of-way, sharp curves, wetlands, driveway openings, bridge crossings, and poor drainage. These constraints are detailed in the exhibit and would require community involvement during planning and design.

If the constraints associated with this recommendation are not overcome in time for near-term roadway work, paved shoulders should be provided at a minimum as a temporary measure.

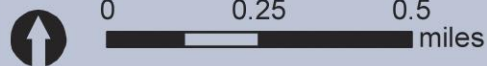
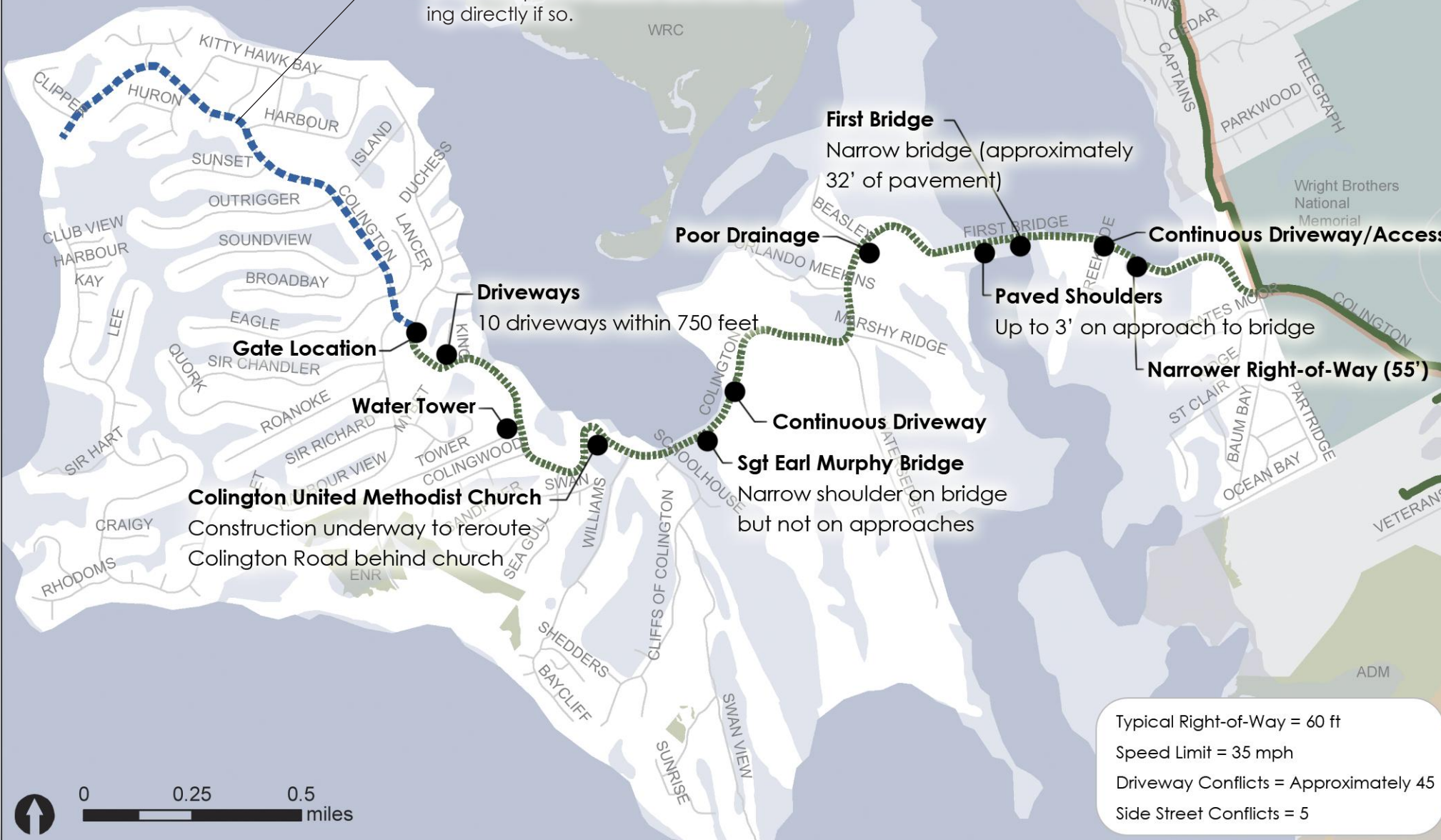
Planning Level Cost Estimate: \$5,265,000 (Additional contingency added to account for construction hardships)



Colington Road, Dare County

- Bicycle Lane, New
- Proposed Multi-Use Trail
- Corridor Improvements
- Paved Multi-Use Trail
- Signed Route

Colington Drive
 This road is privately owned, so residents should determine if a bicycle connection to the sidepath is desired and seek funding directly if so.



Typical Right-of-Way = 60 ft
 Speed Limit = 35 mph
 Driveway Conflicts = Approximately 45
 Side Street Conflicts = 5