

FEASIBILITY STUDY

**NC 904
FROM US 17 (OCEAN HIGHWAY) TO NC 179-904 (BEACH DRIVE)
AT NC 179 BUSINESS (SUNSET BOULEVARD) AND
SR 1162 (SEASIDE ROAD)**

Brunswick County

Division 3

WS-41492



**Prepared by
Sepi Engineering and Construction
for the
N. C. Department of Transportation**

A handwritten signature in black ink, appearing to read "Steven L. Scott".

**Steven L. Scott, P.E.
Project Manager**

A handwritten signature in blue ink, appearing to read "Patrick Riddle".

**Patrick Riddle
Division 3 Project Manager**

3-11-2010

Date

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From US 17 (Ocean Highway) to NC 179-904 (Beach Drive)
at NC 179 Business (Sunset Boulevard) and SR 1162 (Seaside Road)**

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I. General Description

This feasibility study addresses the proposed improvements to NC 904 (Seaside Road) from its intersection with US 17 (Ocean Highway) to the NC 179/904 (Beach Drive) intersection with NC 179 Business (Sunset Boulevard) and SR 1162 (Seaside Road) in Brunswick County. The study will describe the proposed project and provide a general overview of the environmental and design issues. This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of the study is to identify project challenges, describe the project challenges, and recommend potential treatment(s) that deserve consideration in the planning and design phases. Estimated project costs are also included.

For this study, NC 904 has been divided into two segments due to different surrounding circumstances that affect the project.

Segment A: The northern portion of NC 904, from Grissettown at the US 17 intersection to the NC 179 and SR 1163 (Old Georgetown Road) intersection, is solely designated as NC 904. The existing typical cross section for this segment of NC 904 is primarily a two (2) lane roadway with 2-foot paved shoulders. In some areas, NC 904 has been widened to accommodate left turn or right turn lanes into businesses, churches, and developments.

Segment B: The southern portion of NC 904 is a shared route with NC 179. The shared route begins at the NC 904, NC 179 and SR 1163 (Old Georgetown Road) intersection and continues south to its intersection with NC 904/NC 179 (Beach Drive), NC 179 Business (Sunset Boulevard), and SR 1162 (Seaside Road). The typical cross section for this southern portion of NC 904 is primarily a three (3) lane facility with the center left turn lane and 2-foot paved shoulders. There is the occasional widening to accommodate right turn lanes into businesses, churches, developments, and shopping areas.

Although a portion of this 3.68 mile corridor of NC 904 is a shared route, for purposes of this study, this route from US 17 to NC 179 Business will be referred to as NC 904.

II. Need for Project

The primary purpose of this project is to identify and study improvements for traffic safety and operation of NC 904 by widening the existing 2-lane and 3-lane sections to a multilane facility.

This area of the state is experiencing a tremendous amount of growth and is a heavily used corridor carrying large volume of beach traffic. Consequently, improvements to the road will be critical for the operation of NC 904 and the safety of the motoring public.

III. Background

NC 904 is designated as a major collector in the North Carolina Statewide Functional Classification System and in the 2001 Brunswick County Transportation Plan.

This project was requested by the Brunswick County and the Brunswick County Commissioners with the recommendation that NC 904 be upgraded to a four-lane divided facility. No recommended improvements were included in the 2001 Brunswick County Transportation Plan for NC 904. The 2001 Brunswick County Transportation Plan in cooperation with the Shallotte Transportation Plan, recommended improvement for NC 179, relocating NC 179 onto Old Georgetown Road. This relocation has been completed. NC 179 now travels from the South Carolina state line westward along Old Georgetown Road until it intersects and merges with NC 904 heading south.

Segment A of the project includes an existing typical cross section of approximately 28-foot wide. The roadway consists primarily of two 12-foot lanes with 2-foot paved shoulders and occasional widening to accommodate a right turn or left turn lane into various facilities.

Segment B of the project includes an existing typical cross section that averages 40-foot in width and includes a three-lane roadway section with 12-foot lanes and 2-foot paved shoulders. Additional widening at some locations along this portion of the project is provided in order to accommodate right turn lane(s).

At the time of the field investigation for this project, the study area has approximately 12 unsignalized intersections, 3 signalized intersections and numerous residential and commercial driveways along this portion of NC 904. The unsignalized intersections are: Farm Loop Path; Koa Drive; Ocean Ridge Road; Harris Trail; Meadow Summit Drive; Saw Pit Road; Channel Road; Angels Club Drive/Asention Road; Leak Street; High Market Place; Dale Avenue; and, Westbrook Road. The signalized intersections include: US 17 (Ocean Highway); NC 179-SR 1163 (Old Georgetown Road); and NC 179 Business (Sunset Boulevard) at SR 1162 (Seaside Road) and NC 179/904 (Beach Drive).

The land uses surrounding the project area are best described as mixed use, including agricultural, residential and commercial properties. Segment A of NC 904 is primarily residential development. Included in this area is a scattering of single-family homes with one existing housing development comprised of densely located single and multiple-family homes. Segment B of NC 904 is primarily a mix of commercial development with a scattering of single-family homes and a small amount of agricultural land use.

There are no existing bridges located along the NC 904 project route.

There are three churches along this corridor within the project limits. These are Seaside Christian Fellowship Church, Pleasant View Baptist Church, and Seaside United Methodist Church.

NC 904 is not a designated bicycle highway. The southernmost intersecting roads on this project, NC 179/904 (Beach Drive) and NC 179 (Sunset Boulevard), are designated by the NCDOT Bicycle and Pedestrian Division as a Bicycling Highways.

IV. Adjacent Projects

There are no currently approved TIP projects that will affect this area.

TIP R-3436 is the construction of I-74 from SR 1585 (Union Valley Road) in Columbus County to the South Carolina State Line in Brunswick County. This TIP project is in the feasibility stage of planning with a number of alternatives being considered. Although this project is anticipated to have an effect on this portion of NC 904, the affect will be a result of the selected alternative which is still under debate. Therefore, the project will not be taken into consideration with regard to this feasibility study.

TIP R-3432 involves constructing two lanes of new roadway, extending Georgetown Road between SR 1184 (Ocean Beach Road) to NC 179.

In addition to the upcoming TIP projects, there are a large number of developments which have been approved by the Brunswick County Planning Department for this portion of NC 904 or that will directly affect this portion of NC 904.

V. Traffic Operations

The base year 2007 Average Daily Traffic (ADT) volumes along the study section of NC 904 range between 11,600 vehicles per day (vpd) and 12,900 vpd. The future 2035 design year traffic volumes are projected to range from 26,500 vpd to 29,500 vpd, using an annual growth rate of 3% along the NC-904 corridor. The collected tube count data provided truck traffic percentages of 5% duals and 1% TTSTs within the project limits.

A traffic capacity analysis was conducted for the study area section of NC 904 using 2035 projected traffic volumes. The capacity analysis assumed a four-lane cross-section with exclusive left-turn lanes at each Secondary Route. Each Secondary Route intersection with NC 904 was assumed to include full movement access. A superstreet design was assumed at the intersection of NC 904 and US 17.

Based on the described parameters, the intersection of NC 904 at US 17 (Ocean Highway) will require signal modifications to accommodate the proposed superstreet mitigation. The superstreet design is a necessary improvement to adequately service the projected traffic volumes at the intersection of NC 904 and US 17 (Ocean Highway). The intersections of NC 904 at NC 179/SR 1163 (Old Georgetown Road) and NC 904 at

NC 179 Business (Sunset Boulevard) / NC 179/904 (Beach Drive) / SR 1162 (Seaside Road) will require signalization and further geometric improvements to operate acceptably during the 2035 build-out year.

During the three-year period from April 1, 2004 to March 31, 2007, there were 114 crashes reported within the project limits. Of the 114 reported crashes, there were 76 property damage only crashes, 37 injury crashes and one fatal crash. There was no single prevalent crash type along this corridor, however, angle crashes comprised 18.42 %, rear end, slow or stop crashes comprised 15.79 %, and animal crashes and left turns same roadway each totaled 14.91 %. All other crash types account for the remaining 35.97 %. The crash rate for the project limits was 163.60 crashes per 100 million vehicle miles of travel (acc/100mvm), which was less than the 2003 -2005 statewide crash rate of 191.04 acc/100mvm for two-lane undivided rural North Carolina routes.

VI. Environmental Screening

The following information represents a preliminary review of environmental issues that have a potential impact to the project. The information obtained for the environmental screening is from readily available environmental database information only. No survey work has been performed other than a general field inspection. The environmental screening is not a substitute for the project planning/environmental documentation process. The purpose of the environmental screening is to identify potential environmental issues early in the process.

Historic Properties

As part of the environmental screening process, the database of NC State Historic Preservation Office (architecture and archaeology) were reviewed to determine if any historic resources on the National Register of Historic Places or state lists exists in the project study corridor. This database review noted no historic properties in the project corridor.

For the purposes of this screening, a cursory field inspection was conducted to identify properties within the study corridor that had the potential to be older than 50 years. Based on the field review, no structures were identified as being 50 years or older. If this project is programmed into the TIP, it is recommended that a survey of the corridors be conducted by an architectural historian to identify potentially eligible properties.

Floodplains

Brunswick County is a regular participant in the national Flood Insurance Program. Federal Emergency Management Act (FEMA) flood plain panels from the NC Flood Plain Mapping were reviewed. Panels of note include: 1057, 1056 and 1055. The proposed project does not cross any 100 year floodplains.

Stream Classification

The proposed project lies in the Lumber River Basin (8 digit hydrologic unit 03030005). The project crosses two named streams: Calabash Creek (or River) and Saw Pit Swamp. These streams are crossed at their headwaters. The best usage classification for Calabash Creek (NCDWQ Stream Index No. 15-25-13) is SA HQW. SA refers to tidal salt waters that are used for commercial shellfishing or marketing purposes. HQW refers to High Quality Waters, a supplemental usage classification noting that the water's quality is excellent based on biological and physical/chemical characteristics through NCDWQ monitoring or special studies.

The best usage classification for Saw Pit Swamp is C Sw. C refers to waters protected for secondary recreation fishing, wildlife, fish consumption, aquatic life including propagation, survival and maintenance of biological integrity, and agriculture. Sw is a supplemental classification noting streams with low velocities.

Wetlands

The National Wetlands Inventory (NWI) maps for Calabash and Shallotte quadrangle maps (USGS) were reviewed to determine whether the proposed corridor would impact any potential wetlands. These maps note the presence of wetlands in the project study corridor. During the preparation of any environmental assessment, it is recommended that these wetlands be delineated and surveyed. Coordination with the US Army Corps of Engineers should be conducted early in the planning stages to be implementing avoidance and minimization of any impacts to waters of the United States.

Federally Protected Species

The databases of the NC Natural Heritage Program (NCNHP) and the US Fish and Wildlife Service (USFWS) were reviewed to determine the presence of any threatened or endangered species within the project study corridor. Table 1 notes the current species listed for Brunswick County.

A review of Natural Heritage Element Occurrence GIS Data (July 2007) from the NC Natural Heritage Program and NC Center for Geographic Information and Analysis was conducted to determine if any federally listed species were within the NC 904 feasibility study area. Upon review, it was noted that one (1) federally listed species was depicted within 1 mile of the study area. This species, the red-cockaded woodpecker, was observed along the project study area approximately 2/3 mile northeast of the intersection of SR-1163 (Old Georgeotwn Rd) and NC 904. The population was observed in 1991. It is recommended that additional studies be included in future planning work to determine the existence of the red-cockaded woodpecker and its relative position and potential affect upon project planning for improvements to NC 904.

Additionally, one (1) Federal Species of Concern (FSC) was noted as existing within ½ mile of the feasibility study review area. FSC listing included one (1) site where a

population of venus flytraps was last observed in 2001. FSC species are not protected under the 1973 Endangered Species Act (ESA). Although FSC species are not protected under the 1973 Endangered Species Act, it is recommended that staff review the study area for these species when future studies are conducted to improve NC 904.

Table 1 . Threatened and Endangered Species Found within Project Study Corridor

Common name	Scientific name	Federal status
American alligator	<i>Alligator mississippiensis</i>	T (S/A)
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGPA
Eastern puma (cougar)	<i>Puma concolor cougar</i>	E
Green sea turtle	<i>Chelonia mydas</i>	T
Kemp's (Atlantic) Ridley sea turtle	<i>Lepidochelys kempii</i>	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E
Loggerhead sea turtle	<i>Caretta caretta</i>	T
Piping plover	<i>Charadrius melodus</i>	T
Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E
West Indian manatee	<i>Trichechus manatus</i>	E
Wood stork	<i>Mycteria americana</i>	E
Cooley's meadowrue	<i>Thalictrum cooleyi</i>	E
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E
Seabeach amaranth	<i>Amaranthus pumilus</i>	T

Species Status: E refers to Endangered; T refers to Threatened; T (S/A) refers to Threatened due to Similarity of Appearance; and, BGPA refers to the Bald Eagle Protection Act which replaced the Eagle's Endangered status.

Note: all occurrences are current except the eastern puma which is historic.

Environmental Justice

Executive Order 12898 requires that Federal agencies identify and address disproportionately high and adverse effects of federally funded projects on minority and low-income populations. A review of the US Environmental Protection Agency Environmental Justice Geographic Assessment Tool noted that there are minority population blocks (40-100%) west of NC 904, north of the NC 904/NC 179 intersection and a below poverty population block (20-30%) in this same area. If this project is programmed into the TIP, it is recommended that a detailed review of environmental justice be implemented as it relates to the proposed project.

Hazardous Materials

A review of listed State Hazardous Waste Sites from North Carolina Department of Environmental and Natural Resources (NCDENR) was conducted in May 2009. Data reviewed included GIS shapefiles of NC State listed Hazardous Waste Sites. No listed sites were depicted within 5 miles of the NC 904 feasibility study area. The database review did not include a review of state listed above ground (AST)'s or underground storage tanks (UST)'s. It is recommended that additional studies be included in future planning work.

VII. Alternatives

There is only one alternative currently being considered. Widening will be symmetrical about NC 904 centerline and the proposed right-of way along the project corridor is 150-feet. The proposed segment is a four-lane divided shoulder section, 79-foot wide edge to edge of pavement with a 23-foot raised grass median and 10-foot paved shoulders. Additional widening at some locations along the project is provided to accommodate left turn and right turn lane(s).

This alternative will result in the relocation of eleven (11) residences and four (4) businesses. The total cost of this alternative, including construction and right-of-way is estimated to be \$34,400,000.

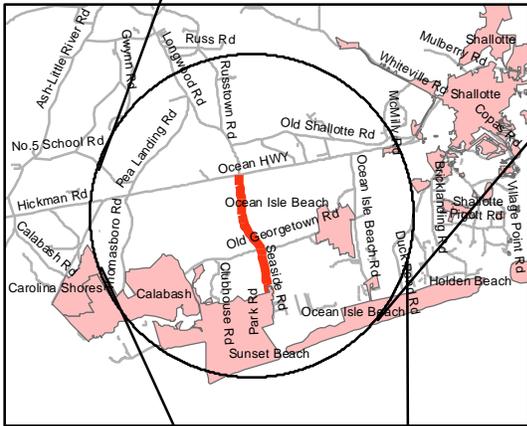
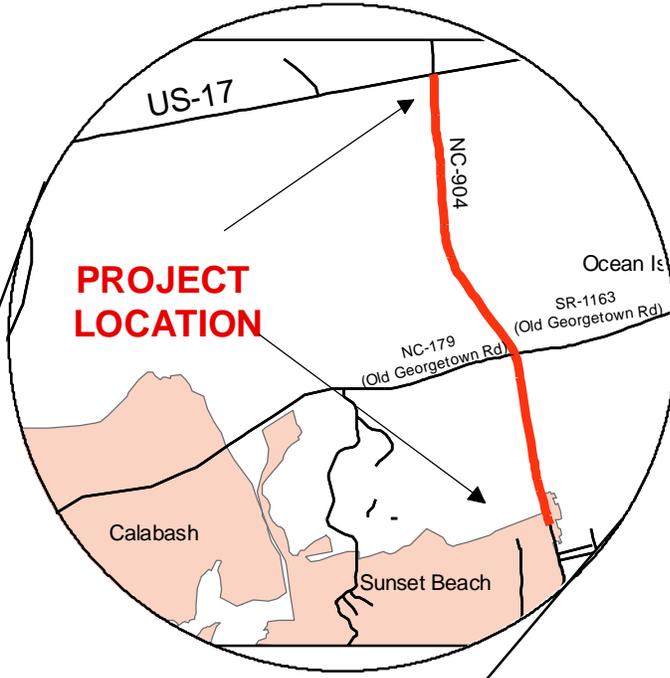
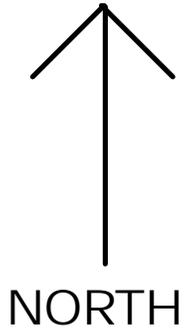
Relocations	
Residences	11
Businesses	4
Construction (including Utility Construction)	\$13,500,000
<u>Right-of Way (including Utility).....</u>	<u>\$20,900,000</u>
Total Project Cost	\$34,400,000

VIII. Recommendations

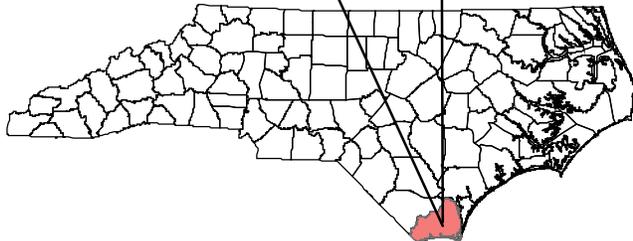
It is recommended that NC 904 be symmetrically widened to a multilane four-lane divided highway along the existing alignment. Traffic signals at the three (3) signalized intersections should be revised to accommodate traffic pattern changes.

It is further recommended in the areas of more dense commercial land use, specifically at the intersections of US 17 (Ocean Highway) with NC 904 and NC 179 Business (Sunset Road)/SR 1162 (Seaside Road)/NC 179-904 (Beach Drive) with NC 904, that other alternative designs be considered.

0 1 2 4 Miles



0 3 6 12 Miles

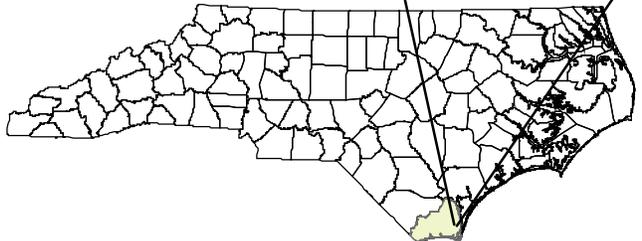
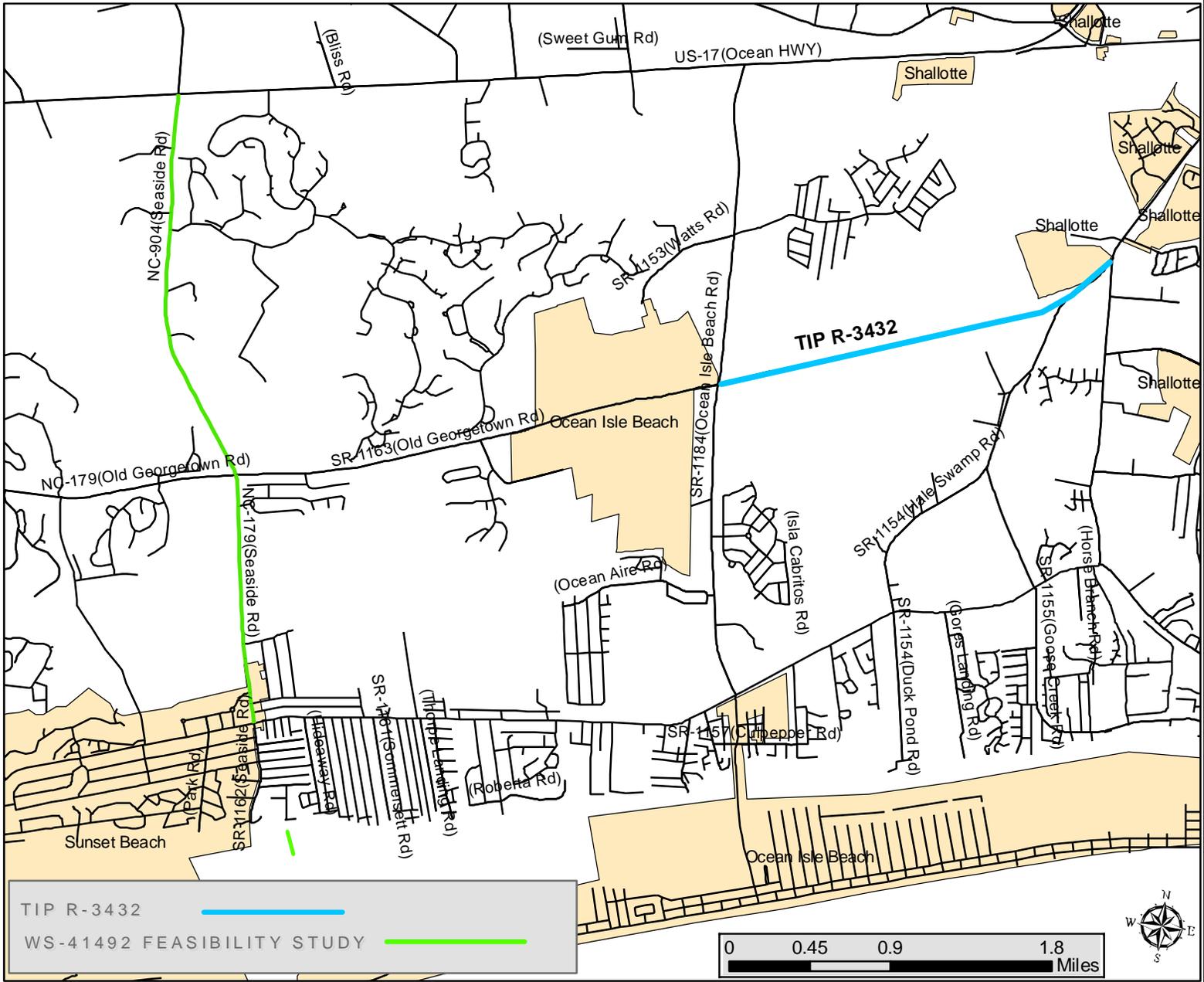


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION 3

*PROJECT WS- 41492
BRUNSWICK COUNTY
NC 904 FEASIBILITY STUDY
FROM US 17 AT GRISSETTOWN
TO NC 179*

VICINITY MAP

FIGURE 1

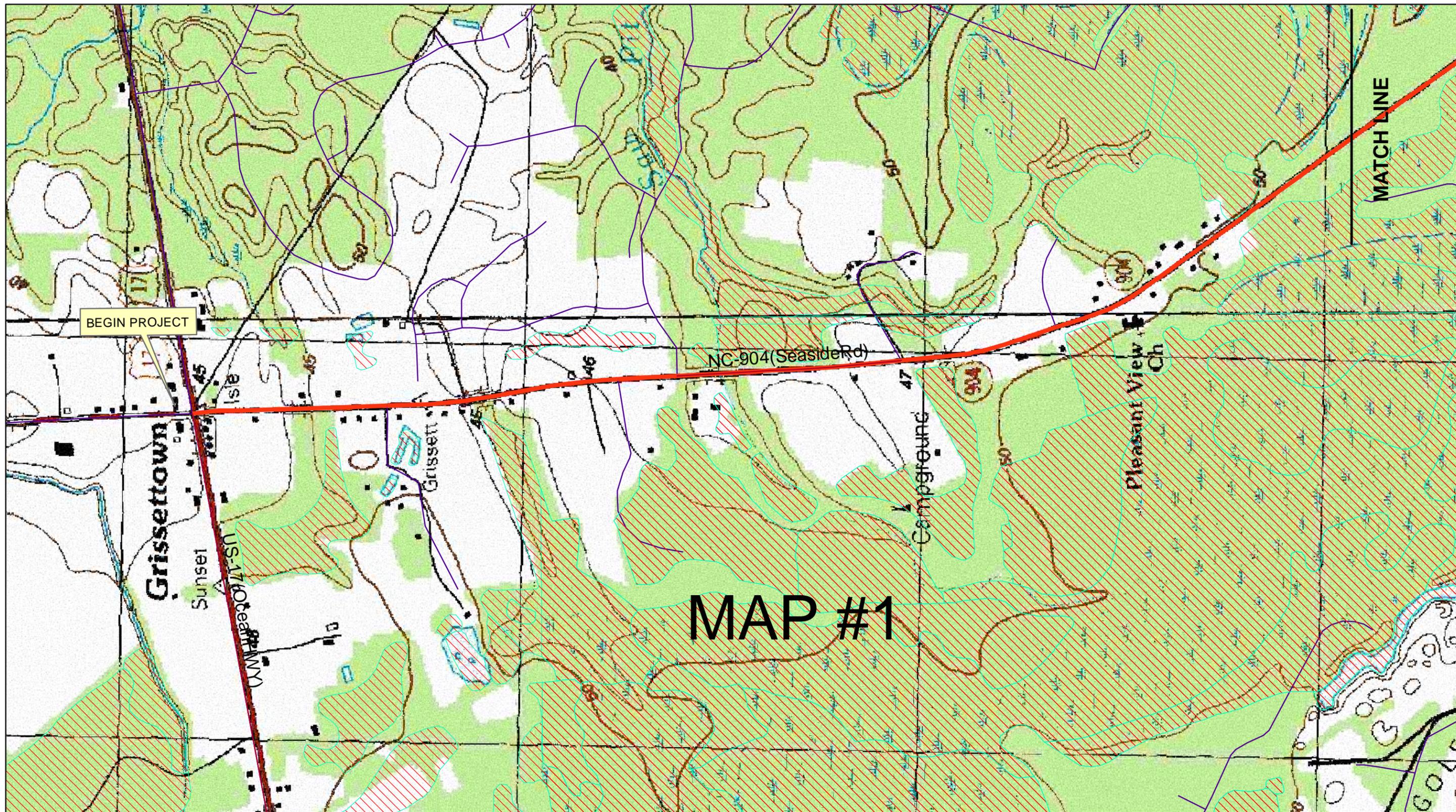



 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION 3

PROJECT WS- 41492
 TIP R-3432 (SR 1163 AND SR 1184)
 BRUNSWICK COUNTY

VICINITY MAP SHOWING ADJACENT TIP

FIGURE 2



MAP #1



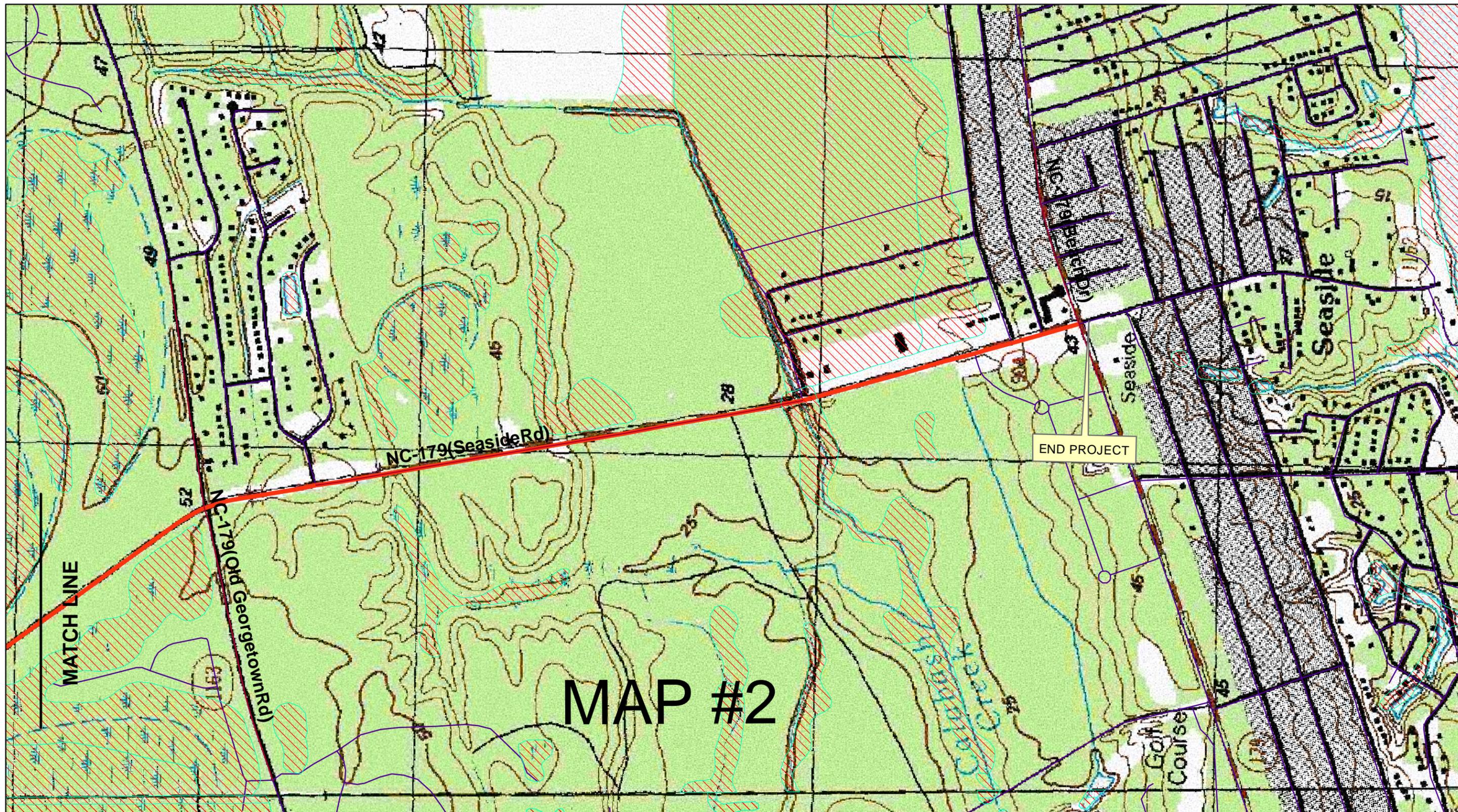
USGS MAP WITH NATIONAL WETLANDS INVENTORY
PROJECT WS- 41492 (NC 904 FROM US 17 TO NC 179)
BRUNSWICK COUNTY

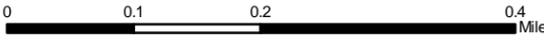
FIGURE 3(a)

- Feasibility Study Area
- NWI Wetlands



Data Source:
 FWS NWI Data 2008
 NCDOT USGS Shallotte
 & Calabash Quads



	<p>USGS MAP WITH NATIONAL WETLANDS INVENTORY PROJECT WS- 41492 (NC 904 FROM US 17 TO NC 179) BRUNSWICK COUNTY</p>	<p>— Feasibility Study Area  NWI Wetlands</p>	<p>Data Source: FWS NWI Data 2008 NCDOT USGS Shallotte & Calabash Quads</p> 
<p>FIGURE 3(b)</p>			