Topsail Island Bridge Replacement
(Bridge No. 16 over Intracoastal Waterway)
Surf City, Pender County

Federal Aid Project No. BRSTP-50(10)
WBS No. 40233.1.1
TIP Project No. B-4929

ADMINISTRATIVE ACTION

ENVIRONMENTAL ASSESSMENT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N.C. DEPARTMENT OF TRANSPORTATION

Submitted pursuant to 42 U.S.C. 4332(2) (c)

APPROVED:

10/24/11
Date

FOR **Gregory J. Thorpe, Ph.D., Manager**
Project Development and Environmental Analysis Branch, NCDOT

10/24/11
Date

for **John F. Sullivan, III, PE, Division Administrator**
Federal Highway Administration

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ENVIRONMENTAL ASSESSMENT

Documentation Prepared By:

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PROJECT COMMITMENTS

Topsail Island Bridge Replacement
(Bridge No. 16 over Intracoastal Waterway)
Surf City, Pender County

Federal Aid Project No. **BRSTP-50(10)**
State Project No. **40233.1.1**
TIP Project No. **B-4929**

Project Development and Environmental Analysis Branch:

1. Construction activities will adhere to the guidelines outlined in Precautions for Construction in Areas which May be Used by the West Indian Manatee in North Carolina (2003 USFWS).

2. NCDOT is investigating re-use options for the existing riveted Warren through truss swing span (eligible for the National Register of Historic Places). Results from these investigations will be included in subsequent documentation. Upon selection of the LEDPA/Preferred Alternative, FHWA will initiate Adverse Effects Process and identify further minimization/mitigation efforts, which will be included in the Section 106 Memorandum of Agreement.

3. NCDOT is coordinating the potential Soundside Park impacts and mitigation measures with the Town of Surf City. Determination of de minimis impacts will be further investigated and described in the project's subsequent documentation.

4. NCDOT will continue to coordinate with the Town of Surf City on appropriate cost sharing agreement for sidewalk improvements in the Project Study Area.

5. Throughout project development, final design, and construction, NCDOT will coordinate with the regulatory agencies to obtain the necessary permits. The following is a list of permits that may be required for this project. Final determination of permit applicability lies with the regulatory agencies.
    - Section 404 (Impacts to Waters of the United States - Clean Water Act)
    - Section 401 General Water Quality Certification (Clean Water Act)
    - Section 9 (Bridge Permit)
    - Section 10 (Permit for Work in Navigable Waters - Rivers and Harbors Act)
    - CAMA Major Development Permit
    - United States Coast Guard (USCG)Bridge Closure Permit
    - State Stormwater Permit
    - Public Water Supply

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E.0 EXECUTIVE SUMMARY

E.1 Type of Action

This Environmental Assessment (EA) has been prepared to evaluate the potential impacts associated with the replacement of the Topsail Island Bridge (Bridge No. 16). From this assessment, the North Carolina Department of Transportation (NCDOT) and Federal Highway Administration (FHWA) do not anticipate any significant environmental impacts as a result of this project. The findings contained within this document and subsequent public review of this document shall determine if the proposed action has significant impacts.

NCDOT initiated studies for this replacement project in accordance with the requirements set forth in the National Environmental Policy Act (NEPA) of 1969, as amended. The general vicinity of Bridge No. 16, relative to Pender County and Topsail Island, is shown in Figures 1-1 and 1-2 (all referenced figures herein are included in Appendix A).

E.2 Description of Action

NCDOT, in consultation with FHWA, proposes to replace the existing Topsail Island Bridge (Bridge No. 16) along NC 50/210 over the Intracoastal Waterway (Topsail Sound) in Pender County, North Carolina. Bridge No. 16 is located within the town limits of Surf City and consists of a main channel swing span with concrete deck girder approach spans. The existing length of the bridge is 463 feet, with a main channel swing span length of 254 feet. This bridge opens for commercial vessel traffic on demand and for daytime recreational vessels at the top of each hour. The existing vertical waterway clearance under the moveable bridge span is approximately 13 feet.

NCDOT inspects their bridges a minimum of every two years. Bridge No. 16 was last inspected in 2010 and the corresponding report indicates that the bridge is in poor condition, with a sufficiency rating of six out of 100 and restricted loads of 14 tons for single vehicles and 18 tons for truck tractor with semi-trailer.

This project is included in the 2011-2020 North Carolina State Transportation Improvement Program (STIP). The STIP budget allocation is approximately $3 million for right-of-way acquisition and $31 million for construction costs. The current estimated construction costs based on preliminary design plans range between $45.6 and $68.5 million. Right-of-way acquisition costs range between $5.0 and $22.3 million. Right-of-way acquisition is scheduled to begin in Federal Fiscal Year (FFY) 2014, with construction scheduled for FFY 2016.

E.3 Summary of Purpose and Need

- The purpose of the proposed project is to improve bridge safety and functionality.
- The need for the project is to replace the structurally deficient, functionally obsolete bridge.

E.4 Alternatives Considered

NCDOT evaluated numerous design alternatives for this project, including a No Build Alternative; Repair and Rehabilitate Existing Bridge Alternative; Alternative Modes of Transportation; and 20 Build Alternatives. During the early stages of the study, the No Build Alternative, Repair and Rehabilitate Existing Bridge Alternative, and Alternative Modes of Transportation were dropped from consideration.

For the 20 Build Alternatives considered, NCDOT evaluated three types of bridges: a low-level moveable, a mid-level moveable, and a high-level fixed, with vertical navigational clearances (VNC) of 15, 30, and 65 feet respectively.

Using the functional design plans, NCDOT prepared qualitative impacts and costs for all 20 Build Alternatives and presented them to the project stakeholders during the second Citizens Informational Workshop (CIW #2) held on October 21, 2010. The same information was presented on December 14, 2010, to the Section 404/NEPA Merger Team members (Merger Team). Based on input received from the project stakeholders and Merger Team, NCDOT selected the following seven alternatives as the Detailed Study Alternatives Carried Forward:

- Northern Alternatives Group: Alternatives 4, 5, and 5R (high-level fixed bridges)
- Central Alternatives Group: Alternatives 6 and 7 (low/mid-level moveable bridges, respectively)
- Southern Alternatives Group: Alternatives 11 and 17 (high-level fixed bridges)

Depending on the alternative chosen, Bridge No. 16 will be replaced with a new 500 to 4,000-foot long bridge. The new bridge will accommodate two-way traffic with two 12-foot travel lanes, two four-foot bike lanes, and two 5.5-foot sidewalks. Curb and gutter will provide a two-foot separation between the bicycle lanes and sidewalk. The approach roadway section will match the new bridge section, with the exception that sidewalks will not be provided. Instead, a ten-foot earth berm will be constructed behind the curb and gutter.

E.5 Summary of Environmental Effects and NCDOT Recommended Alternative

Preliminary design plans, along with detailed quantitative impact and cost analyses, were developed for the seven Detailed Study Alternatives. Table E-1 provides a summary of the resulting environmental effects, which are further discussed in Chapter 5 of this EA.

Currently, NCDOT has not chosen a recommended alternative. Before making an alternative recommendation, the environmental effects discussed in this EA will be presented to the community and local project stakeholders at the corridor public hearing. Copies of EA will also be distributed to federal, state and local project stakeholders. Subsequent to the corridor public hearing, a recommended alternative will be identified based on the design information prepared and public outreach comments received. This recommended alternative will be presented to the Merger Team at Concurrence Point 3 meeting. At this meeting, the Least Environmentally Damaging Practicable Alternative (LEDPA)/Preferred Alternative will be chosen.

Table E-1: Detailed Study Alternatives Environmental Effects Summary

Category	Alt 4	Alt 5	Alt 5R	Alt 6	Alt 7	Alt 11	Alt 17
Project Description							
Project Length (miles) - including permanent bridge length	1.1	1.0	1.0	0.5	0.5	1.1	0.9
Permanent Bridge Length (ft) - fixed length/moveable length	4,250	4,076	4,054	319/201	819/201	4,180	3,725
Detour Bridge Length (ft) - fixed length/moveable length	-	-	-	1,331/156	1,331/156	-	-
Human Environment Effects							
Community Facilities Impacted	-	-	-	-	-	-	-
Church (Faith Harbor United Methodist Church - property only)	1	1	1	-	-	1	-
Total Residential Relocations (number)	4	2	13	-	-	4	1
Total Business Relocations (number)	5	4	7	1	3	1	3
Property Only (number)	32	38	32	18	18	30	43
Low Income / Minority Residential/Business Relocations	-	-	-	-	-	-	-
Physical Environment Effects							
Section 4(f) Resources Soundside Park property impacts -- permanent/temporary (acres)	-	-	-	0.03[+]/0.4[*]	0.01[+]/0.4[*]	-	0.2[++]
Bridge No. 16 (also recognized as a Historic Architecture Resource)	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect
Farmlands	-	-	-	-	-	-	-
Archaeological Sites	TBD[**]	TBD[**]	TBD[**]	TBD[**]	TBD[**]	TBD[**]	TBD[**]
Known or Potential Hazardous Material Sites (number)	-	1	2	1	1	-	3
Superfund Sites	-	-	-	-	-	-	-
Natural Environment Effects							
Ponds	-	-	-	-	-	-	-
Stream Crossings (number)[#]	2	2	2	1	1	1	1
Wetlands: non-riparian/CAMA (acres)	1.1/ -	1.1/ -	1.1/ -	- /0.3	- /0.1	1.0/-	0.8/ 0.4
Federally Protected Species	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]
Costs ($M 2011)							
Construction Costs (includes relocation costs for water and sewer utilities)	$51,100,000	$48,800,000	$48,500,000	$50,200,000	$55,900,000	$50,200,000	$44,600,000
Utility Pole Relocation Costs	$939,090	$1,361,538	$1,430,662	$12,580,030	$12,580,030	$1,040,170	$1,015,778
Right-of-Way Costs	$12,625,000	$13,975,000	$22,250,000	$4,975,000	$6,875,000	$9,925,000	$8,125,000
Sub Total	$64,664,090	$64,136,538	$72,180,662	$67,755,030	$75,355,030	$61,165,170	$53,740,778
Bridge Operations and Maintenance Costs (75 Years)	$3,631,500	$3,631,500	$3,631,500	$25,964,500	$25,964,500	$3,631,500	$3,631,500
Total	$68,295,590	$67,768,038	$75,812,162	$93,719,530	$101,319,530	$64,796,670	$57,372,278

Note: Impacts are calculated from slope stake to slope stake, plus an additional 25 feet outside of each limit as determined from the May, 2011 preliminary design plans for each alternative.

[+] Represents fill slope impacts to the northern side of Soundside Park.
* Represents temporary impacts to Soundside Park as a result of the detour bridge.
[++] Represents minimal impacts to the southern end of Soundside Park.
[**] To be determined based on surveys to be completed after LEDPA/Preferred Alternative is chosen
[#] Both streams in the Project Study Area will be bridged, therefore no permanent stream impacts are anticipated.
[***] MA/NLAA – May Affect/Not Likely to Adversely Affect the following two species: West Indian manatee (Trichechus manatus) and Loggerhead sea turtle (Caretta caretta)

E.6 Anticipated Permit Requirements

The following is a list of permits that may be required for this project. Final determination of permit applicability lies with the regulatory agencies. Throughout project development process, NCDOT will coordinate with the regulatory agencies to obtain the necessary permits.

- Section 404 (Impacts to Waters of the United States - Clean Water Act)
- Section 401 General Water Quality Certification (Clean Water Act)
- Section 9 (Bridge Permit)
- Section 10 (Permit for Work in Navigable Waters - Rivers and Harbors Act)
- CAMA Major Development Permit
- United States Coast Guard (USCG) Bridge Closure Permit
- State Stormwater Permit
- Public Water Supply

E.7 Project Initiation

During project initiation, NCDOT provided "start of study" letters to the following federal, state and local agencies. Written comments were received and considered from agencies noted with an asterisk (*) during the preparation of this EA. These "start of study" letters, along with the agencies' initial concerns, are included in Appendix B.

US Army Corps of Engineers (USACE)
USCG, 5th District
US Environmental Protection Agency (USEPA)
* US Fish and Wildlife Service (USFWS)
National Marine Fisheries Service (NMFS
* North Carolina Department of Environment and Natural Resources (NCDENR)
* North Carolina Division of Coastal Management (NCDCM)
North Carolina State Clearing House
* North Carolina Department of Cultural Resources (NCDCR)
North Carolina Department of Public Instruction
* North Carolina Division of Water Quality (NCDWQ)
* North Carolina Wildlife Resources Commission (NCWRC)
North Carolina Natural Heritage Program (NCNHP)
Region "O" Planning Agency
NCDOT Division 3 Board Member
Region "O" Planning Agency
NCDOT Division 3 Board Member
* Mayor of Town of Surf City
Mayor of Topsail Beach
Mayor of North Topsail Beach

E.8 Coordination

For many NCDOT projects, the Section 404/NEPA Merger Process (Merger Process) is initiated to streamline agreements between NCDOT, state and federal permitting agencies, and local units of government. To this effect, the Merger Process provides a forum for appropriate agency representatives to discuss and reach consensus on ways to facilitate meeting the regulatory requirements of Section 404 of the Clean Water Act during the NEPA decision-making phase of transportation projects. Cooperating agencies included in the Merger Process of this project are as follows:

- USACE
- USEPA
- USCG
- USFWS
- NMFS
- FHWA
- NCDOT
- NCWRC
- North Carolina Division of Marine Fisheries (NCDMF)
- NCDCM
- NCDWQ
- NCDCR
- United States Forest Service (USFS)
- Cape Fear Rural Planning Organization (non-signatory)

Copies of this EA will be distributed to the above listed agencies and public. Comments received will be considered in the selection of the LEDPA/Preferred Alternative and will be incorporated into the subsequent documentation.

E.9 Additional Information

The following persons may be contacted for additional information concerning this document:

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Chapter 1

Description of Proposed Action

1.0 DESCRIPTION OF PROPOSED ACTION

1.1 General Description

The North Carolina Department of Transportation (NCDOT) proposes to replace the existing Topsail Island Bridge (Bridge No. 16) along NC 50/210 over the Intracoastal Waterway (Topsail Sound) in Pender County, North Carolina. Bridge No. 16 is located within the town limits of Surf City. NCDOT initiated studies for this replacement project in accordance with the requirements set forth in the National Environmental Policy Act (NEPA) of 1969, as amended. The general vicinity of Bridge No. 16, relative to Pender County and Topsail Island, is shown in Figures 1-1 and 1-2 (all referenced figures herein are included in Appendix A).

The replacement of Bridge No. 16 over the Intracoastal Waterway entails the removal and replacement of an existing swing span bridge currently providing access to Topsail Island. This bridge is one of only two access points onto Topsail Island, the other bridge being located approximately seven miles north, in the Town of North Topsail Beach.

More than 20 design alternatives were initially evaluated for this project. These alternatives included options to construct a new high-level fixed bridge or moveable bridge. The new bridge would be built either in the same location, to the north, or to the south. A No Build Alternative, Repair and Rehabilitate Existing Bridge Alternative, and Alternative Modes of Transportation were also evaluated.

Depending on the alternative chosen, Bridge No. 16 will be replaced with a new 500 to 4,000-foot long bridge. The new bridge will accommodate two-way traffic with two 12-foot travel lanes, two four-foot bicycle lanes, and two 5.5-foot sidewalks. Curb and gutter will provide a two-foot separation between the bicycle lanes and sidewalk. The approach roadway section will match the new bridge section, with the exception that sidewalks will not be provided. Instead, a ten-foot earth berm will be constructed behind the curb and gutter.

1.2 Schedule and Cost

This project is included in the 2011-2020 North Carolina State Transportation Improvement Program (STIP). The STIP budget allocation is approximately $3 million for right-of-way acquisition, and $31 million for construction costs. The current estimated construction costs based on preliminary design plans range between $45.6 and $68.5 million. Right-of-way acquisition costs range between $5.0 and $22.3 million. Right-of-way acquisition is scheduled to begin in Federal Fiscal Year (FFY) 2014, with construction scheduled for FFY 2016.

Chapter 2

Purpose and Need for Project

2.0 PURPOSE AND NEED FOR PROJECT

2.1 Purpose of Project

The purpose of the proposed project is to improve bridge safety and functionality.

2.2 Need for Project

The need for the project is to replace the structurally deficient, functionally obsolete bridge.

2.2.1 Description of Existing Conditions

2.2.1.1 Functional Classification

NC 50/210 is classified as a major collector roadway and has been designated as both hurricane evacuation and bicycle routes.

2.2.1.2 Project History

Bridge No. 16, also known as the Sears Landing Bridge, was completed in 1955 to replace a pontoon bridge previously utilized by the United States Navy during World War II. This bridge replacement project was first placed on the NCDOT TIP in 2005 after structural inspections indicated a very poor bridge sufficiency rating.

2.2.1.3 Physical Description of Existing Facility

The existing bridge cross-section consists of a main channel swing span with concrete deck girder approach spans. The existing length of the bridge is 463 feet, with a main channel swing span length of 254 feet. This bridge opens for commercial vessel traffic on demand and for daytime recreational vessels at the top of each hour. The existing vertical waterway clearance under the moveable bridge span is approximately 13 feet.

Structures
Bridge No. 16 is the only major structure in the project vicinity. NCDOT inspects their bridges a minimum of every two years. Bridge No. 16 was last inspected in 2010 and the corresponding report indicates that the bridge is in poor condition, with a sufficiency rating of six out of 100 and restricted loads of 14 tons for single vehicles and 18 tons for truck tractor with semi-trailer.

Roadway Cross-Section
The existing bridge has two 12-foot lanes and is abutted on each side by three-foot sidewalks. The existing roadway approaches along NC 50/210 are three-lane open shoulder

sections with an opposing left-turn center lane and shoulder widths ranging from two to five-feet wide. There are no sidewalks along the existing roadway approaches.

Horizontal and Vertical Alignment

The existing bridge and approach roadways are located along a horizontal tangent section of NC 50/210. Each end of the existing bridge has adequate vertical curvature with no sight distance concerns.

Right-of-Way and Access Control

The existing right-of-way along NC 50/210 varies from 80 to 100 feet, with no control of access.

Speed Limit

The posted speed limit on NC 50/ 210 west of Bridge No. 16 is 45 miles per hour (mph). To the east of the bridge, the speed limit is 35 mph.

Intersections and Interchanges

A list of the 14 study intersections included in the Project Study Area (PSA) are shown in Figure 2-1 and listed in Table 2-1 below. No interchanges are located in the project vicinity.

Table 2-1: Study Intersections

No.	Intersection Location
1	NC 50/Roland Avenue at NC 210/Belt Road
2	NC 50/210 at J H Batts Road
3	Roland Avenue at Little Kinston Road/Atkinson Point Road
4	Roland Avenue at New River Drive/NC 210
5	Roland Avenue at Topsail Drive/NC 50
6	New River Drive/NC 210 at Greensboro Avenue
7	New River Drive/NC 210 at Goldsboro Avenue
8	New River Drive/NC 210 at New Bern Avenue
9	Topsail Drive at Greensboro Avenue
10	Topsail Drive at Goldsboro Avenue
11	Topsail Drive at New Bern Avenue
12	Topsail Drive/NC 50 at Kinston Avenue
13	Topsail Drive/NC 50 at Raleigh Avenue
14	Topsail Drive/ NC 50 at Charlotte Avenue

Bicycle and Pedestrian Facilities

NC 210 is designated as NC Bike Route 3 (Ports of Call Route). No dedicated bicycle lane currently exists on Bridge No. 16 or along the roadway approaches. On Topsail Island, NC 50 has a dedicated bicycle lane in both directions.

The existing bridge has three-foot sidewalks in both directions. There are no sidewalks along the roadway approaches. The roadway approaches have open shoulders ranging in width from two to five feet.

Utilities

The following provides a brief summary of utilities in the vicinity of Bridge No. 16. Locations of utilities in the project vicinity are shown in Figure 2-2.

Electric: Jones-Onslow Electric Membership Corporation (JOEMC) has a transmission line along the south side of NC 50/210. This line supplies power to Surf City and extends from the eastern coast to the utility station located on the mainland side (approximately 0.5 miles from the bridge). In addition, JOEMC has several energized electrical boxes underground. These boxes are used to feed power to docks and boat slips.

Telephone and Fiber Optics: Embarq has telephone and fiber optics lines located either underground or on the Jones-Onslow transmission poles.

Cable: Charter Communications has cable lines located on the JOEMC transmission poles.

Water Lines: The Town of Surf City has an existing 12-inch water main parallel to Roland Avenue, approximately 450 feet north, beneath the Intracoastal Waterway. The water main intersects with NC 50/210 at Kinston Road to the west and approximately 400 feet beyond the existing bridge to the east, where it reduces to a ten-inch water main.

Sewer Lines: The Town of Surf City has an existing 12-inch sanitary sewer main parallel to Roland Avenue on the north, which switches to the south side of Bridge No. 16 as it crosses the Intracoastal Waterway. In addition, on the mainland side, the town also has a ten-inch gravity sewer line, parallel to Roland Avenue on the north.

2.2.1.4 School Bus Usage

North Topsail Elementary School, Topsail Middle School, and Topsail High School are located in Hampstead, approximately ten miles south of Bridge No. 16. Combined, these schools have four buses, with one additional bus available on an as-needed basis. During the school year, the students are transported by two daily round-trip crossings on the bridge.

2.2.1.5 Traffic Volumes and Capacity Analysis

According to the traffic forecasts for this project, the 2010 Existing Conditions traffic demand along Bridge No. 16 is approximately 12,000 vehicles per day (vpd) and the 2035 No Build Conditions traffic demand is projected to be approximately 29,100 vpd. This represents an approximate 6% rate of increase per year for the next 25 years.

The 2010 Existing Conditions intersection capacity analysis indicates that the existing traffic demand at the 14 study intersections operates at Level of Service D or better throughout the day, which is an acceptable rate of traffic flow.

The 2035 No Build Conditions intersection capacity analysis indicates that five out of the 14 study intersections will either approach or exceed the roadway capacity limits, operating at Level of Service E or F during at least one of the daily peak hours. The remaining nine intersections will function at Level of Service D or better throughout the day, which is an acceptable rate of traffic flow.

2.2.1.6 Airports

The nearest commercial passenger service airports are located approximately 30 miles from the Bridge No. 16: one to the south in Wilmington, North Carolina, and the other to the north in Jacksonville, North Carolina. Two other small airports/airstrips are located approximately seven miles from Bridge No. 16: Holly Ridge/Topsail Island Airport and Camp Davis.

2.2.1.7 Other Highway Projects in the Area

The NCDOT 2011-2020 STIP does not list any other funded major highway projects in the PSA. One feasibility study (FS-0703A) is listed in the STIP and consists of the widening of a 5.3-mile section of NC 210 from US 17 to Bridge No. 16. The nearest funded major STIP project is Hampstead Bypass (R-3300), which proposes construction of a fourteen-mile bypass from US 17 in New Hanover County to US 17 north of Hampstead in Pender County.

2.2.2 Transportation and Land Use Plans

2.2.2.1 NCDOT State Transportation Improvement Program

This bridge replacement project is included in the NCDOT 2011-2020 STIP. Right-of-way acquisition is scheduled to begin in FFY 2014, with construction beginning in FFY 2016.

2.2.2.2 Local Thoroughfare Plans

NCDOT's Transportation Planning Branch has developed the Topsail Area Comprehensive Transportation Plan (CTP). The CTP was adopted by the NCDOT Board of Transportation in November 2009, and lists the replacement of Bridge No. 16 as an important element in meeting transportation needs and providing access for the area residents.

2.2.2.3 Land Use Plans

The Towns of Surf City and Topsail Beach completed land use plans in 2005. The Town of North Topsail Beach completed their land use plan in 2010.

2.2.2.4 Safety

As stated in Section 2.2.1.3, according to NCDOT's 2010 inspection report, Bridge No. 16 is in poor condition, with a sufficiency rating of six out of 100 and restricted loads of 14 tons for single vehicles and 18 tons for truck tractor with semi-trailer. The existing 24 feet of travel width is abutted on each side by three-foot sidewalks. These narrow widths and close proximity of vehicles, bicycles, and pedestrians create an unsafe multimodal travel condition.

2.2.2.5 Maintenance

NCDOT routinely performs maintenance on Bridge No. 16. These costs have escalated through time as the bridge has aged and correspondingly, the sufficiency rating has decreased. Recent five-year historical NCDOT maintenance costs are included below in Table 2-2.

Table 2-2: Historically Incurred Maintenance Costs for Bridge No. 16

Year	Incurred Maintenance Costs
2010	$109,900
2009	$37,800
2008	$85,400
2007	$157,700
2006	$109,300

Bridge No. 16 has experienced occurrences of mechanical or electrical failure that have left the bridge inoperable. During these failure periods, the resulting inconvenience to vehicle and vessel crossing has been substantial. As the bridge continues to age, these failure occurrences are expected to increase.

2.2.3 System Linkage

Bridge No. 16 is one of only two access points onto Topsail Island. The second bridge is located in the Town of North Topsail Beach, approximately seven miles north of the project site. The absence of a connecting link between Topsail Island and the Surf City mainland would result in an inefficient transportation system separating Surf City town services and have economic impacts to the surrounding communities. In addition, not replacing the bridge at this site would be inconsistent with the Topsail Area CTP.

2.2.4 Travel Time

NC 50/210 is a designated hurricane evacuation route and Bridge No. 16 is a vital link in providing hurricane evacuation for the Topsail Island communities. Without Bridge No. 16 in place, all evacuees would be forced to use the North Topsail Bridge, which may result in disorderly evacuations, evacuation delays, and jeopardize the safety of Topsail Island residents. The detour required would include

approximately 25 miles of additional travel, resulting in an approximate 30 to 45 minute delay under good traffic conditions.

Bridge No. 16 opens for commercial vessel traffic on demand and for daytime recreational vessels at the top of each hour. On average, the bridge opens about six to eight times a day. During peak months, these openings increase to approximately 20 per day. Each opening results in vehicular traffic delays, which can delay emergency services between the mainland and island. During the peak vacation months, the bridge tender has documented more than 400 waiting vehicles when the bridge is opened for vessel traffic on numerous occasions.

2.2.5 Access Needs

The connectivity of Topsail Island to the mainland is imperative for the economic vitality of the area and commutes associated with daily living. Business interaction between the island and mainland is apparent given the limited basic goods and services on the island. Residents travel to the mainland for items, including healthcare, groceries, postal services, retail shopping, and other needs. Likewise, mainland populations travel to the island to take advantage of the recreational opportunities offered at the beach. Furthermore, mainland residents of Surf City and Topsail Beach travel to the island for municipal government-related activities, including utility bill payments.

NC 50/210 is a designated bicycle route and Bridge No. 16 provides a pedestrian and bicycle connection between the mainland and island. A public park and boat landing are immediately adjacent to the bridge, reinforcing the need for pedestrian and bicycle accommodations on the bridge.

2.3 Study Area Defined

To evaluate the environmental consequences of the proposed bridge replacement project to the immediate surrounding area, a PSA was defined, as shown in red on Figure 1-2. Environmental field studies were performed within this area. In addition, a larger Demographic Study Area was also defined to provide a study boundary of the demographic characteristics surrounding the project. This Demographic Study Area is also shown on Figure 1-2 in yellow.

2.3.1 Project Study Area

The PSA is defined as the area surrounding a construction project that is likely to be directly affected during construction and after project completion. The PSA defined for this project is entirely within the town limits of Surf City. The PSA limits extend along NC 50/210 away from the current bridge site approximately one mile to the west, past the J H Batts Road (SR 1612) intersection; approximately 0.5 miles to the east, past the NC 50 intersection; and up to 2,500 feet north and south of Bridge No. 16 (See Figure 1-1).

2.3.2 Demographic Study Area

The Demographic Study Area is a broader area that includes all communities that may be affected directly or indirectly by the proposed project. Since this bridge services all of Topsail Island, the entire island has been included in the Demographic Study Area, corresponding to Pender County Census Tract 98.01-001 Block Group and Onslow County Census Tract 0.04-005 Block Group. Also included in the Demographic Study Area is the mainland portion of Surf City between the Intracoastal Waterway and US 17, which is included in the Pender County Census Tract 98.01-002 Block Group. To the west, US 17 is a logical boundary of the Demographic Study Area, given that the Block Group boundary coincides with US17 and the Surf City town limits, which extends to US 17.

The purpose of this Demographic Study Area is to expand Bridge No. 16's immediate area to provide accurate demographic characteristics that will provide a clear understanding of the broader community characteristics and concerns of surrounding residents and businesses.

2.4 Benefits of Proposed Project

The proposed bridge replacement project will address the purpose and need stated above. In summary, the following are the primary benefits of this project:

- Improve the bridge's safety by increasing the structural capacity of the bridge and providing adequate travel widths for multimodal traffic crossing the bridge.
- Maintain current system linkage between the island and mainland, and accommodate needs for emergency service vehicles, as well as other vehicular, bicycle, pedestrian, and vessel traffic.
- Depending on the alternative chosen, the number of bridge openings can be reduced by 20% (low-level moveable bridge) to 100% (high-level fixed bridge), minimizing the delay for all means of travel.

Chapter 3

Alternatives

3.0 ALTERNATIVES

NCDOT evaluated numerous design alternatives for this project, including a No Build Alternative; Repair and Rehabilitate Existing Bridge Alternative; Alternative Modes of Transportation; and Build Alternatives, including construction of a new moveable or high-level fixed bridge either in the same location, to the north, or to the south.

Provided below is a summary of the alternatives considered, along with a description of the evaluation process utilized in the selection of the Detailed Study Alternatives. Environmental impacts associated with the Detailed Study Alternatives are presented in Chapter 5 of this document.

3.1 No Build Alternative

The No Build Alternative serves as a basis of comparison between not replacing the bridge and the associated impacts with the other study alternatives. If the bridge is not replaced, it is expected that the moveable sections of the bridge will be in disrepair within a few years, resulting in closure and detouring of vehicular traffic to the North Topsail Bridge, located approximately seven miles to the north.

The No Build Alternative would result in no new construction costs; no impacts to streams, wetlands, or other natural or cultural resources; and no residential or business relocations. However, this alternative would result in increased maintenance cost for a period of a few years prior to complete bridge closure. The eventual closure would result in delays in emergency services, delays in travel to and from the island, and detrimental impacts to the local economy. The No Build Alternative would not meet the purpose of the proposed project to improve bridge safety. This alternative was dropped from consideration.

3.2 Repair and Rehabilitate Existing Bridge Alternative

Bridge No. 16 was constructed in 1955 with a design load of HS-15, which is much less than the current standards (design load of HS-25). It is comprised of a 250-foot through truss swing span and six reinforced concrete deck girder approach spans, each 35 feet long.

NCDOT's State Bridge Management Unit (SBMU) completed an evaluation of the repair/rehabilitation alternative for Bridge No. 16 (see memorandum dated November 1, 2010). The existing bridge is rated "fair" and has areas of deterioration throughout. This bridge is also "structurally deficient," "functionally obsolete," and "fracture critical," and has a sufficiency rating of six out of a possible 100.

The SBMU recommends that the repair/rehabilitation alternative be dropped from consideration for the following reasons:

- The repair/rehabilitate alternative will cost approximately $13.5 million and will only extend the bridge life by 25 years; however, annual maintenance will be required after the tenth year.

- Even after the repairs, the repaired and rehabilitated bridge will remain "functionally obsolete" and be classified as "fracture critical" due to the condition of the truss swing span. Therefore, the repaired and rehabilitated bridge would not meet the purpose of the proposed project to improve bridge safety.
- These repairs are expected to improve the bridge's sufficiency rating only to 28 out of possible 100, which is substantially below the required 80 to qualify for Federal Highway Bridge Program funds.
- During rehabilitation, the bridge would be out of service for approximately nine months, requiring a temporary detour bridge and resulting in additional costs.

3.3 Alternative Modes of Transportation

3.3.1 Alternative Modes of Travel

Currently, there is no fixed route transit service in the study area. Were alternative modes of transportation (such as bus or rail) to be provided in the future between the mainland and island, these transportation modes would neither meet the purpose of this project, nor provide an efficient means of travel to and from Topsail Island. A ferry system in lieu of a bridge crossing would be impractical given the large amount of traffic volumes crossing the bridge. A ferry system would not meet the purpose of the project, to improve the bridge functionality. This alternative was dropped from consideration.

3.3.2 Traffic Management Alternative

No traffic management alternatives, including Travel Demand Management (TDM) or Transportation Systems Management (TSM), exist that alone would reduce the volume of traffic to a level where a bridge crossing is not required. This alternative was dropped from consideration.

3.4 Build Alternative Corridors

NCDOT evaluated three types of bridge replacements for this project: a low-level moveable, a mid-level moveable, and a high-level fixed, with vertical navigational clearances (VNC) of 15, 30, and 65 feet, respectively. It should be noted that, under open condition, moveable bridges provide unlimited VNC (except vertical lift bridge). All bridge types considered in this project provide a minimum horizontal navigational clearance of 90 feet. At the first Citizens Informational Workshop (CIW #1) held on June 25, 2009, attendees were asked to draw their alignment ideas on large study area aerial maps. Based on these ideas and input from other project stakeholders, 20 build alternative corridors were developed, as shown in Figure 3-1. Included below are descriptions of these 20 build alternative corridors.

3.4.1 Low-Level Moveable Bridge Alternatives

The existing bridge has a VNC of approximately 13 feet and is considered a low-level bridge. Only a small percentage of the vessel traffic can pass underneath this bridge unimpeded. The United States Coast Guard (USCG) has established the minimal VNC for bridge replacements to be 15 feet. In addition,

NCDOT requires the bridge machinery platform elevation to be five feet above the 100-year storm event. Given that the 100-year storm event at Bridge No. 16 is elevation 7.7 feet, a 15-foot VNC meets both criteria. Additional information regarding these guidelines and analysis are included in the project's Preliminary Design Technical Report, dated July 2011.

One alternative corridor utilizing the low-level bridge type was developed:

- **Alternative 6** replaces the bridge in the same location as the existing bridge. This alternative requires an adjacent temporary detour bridge during construction. The temporary detour bridge has approximately 15-foot VNC, similar to the existing bridge.

3.4.2 Mid-Level Moveable Bridge Alternatives

Raising the VNC of a moveable bridge will result in taller vessels passing under the bridge unimpeded, with fewer bridge openings and less vehicular delays. However, as the roadway is elevated to allow for increased VNC, surrounding environmental impacts will increase.

An optimal VNC, which would minimize the number of bridge openings with consideration for the environmental impacts, was investigated. Vessel height surveys were performed in May and October of 2010 at the existing bridge site. Based on analysis of the survey data, an optimal 30-foot VNC was determined. The 30-foot VNC allows approximately half of vessels to pass underneath unimpeded, thus eliminating one out of every three bridge openings. Additional information regarding the survey methodology, analysis, and results are included in the project's Vessel Height Survey Report, dated July 2011.

NCDOT developed four alternative corridors utilizing the mid-level bridge type as follows:

- **Alternative 5A** is located approximately 500 feet north of the existing bridge location, beginning on the mainland side just west of Atkinson Point Road, and ending on the island side at Roland Avenue.
- **Alternative 7** replaces the bridge in the same location as the existing bridge. This alternative requires an adjacent temporary detour bridge during construction. The temporary detour bridge would have approximately 15 feet of VNC, similar to the existing bridge.
- **Alternative 9** is located approximately 200 feet south of the existing bridge location, beginning on the mainland side just east of Little Kinston Road, and ending on the island side at Roland Avenue.
- **Alternative 10A** is located approximately 400 feet south of the existing bridge location, beginning on the mainland side just west of Little Kinston Road, and ending on the island side at Topsail Drive (NC 50). This alternative forms a new island tie-in location along Topsail Drive (NC 50), approximately 500 feet south of Roland Avenue.

3.4.3 High-Level Fixed Bridge Alternatives

USCG regulations dictate that high-level fixed bridge types provide a minimum 65 feet of VNC spanning the Intracoastal Waterway. This bridge type eliminates bridge openings and thereby accommodates both vessel and vehicular traffic unimpeded. Increased environmental impacts are usually associated with these longer, elevated bridge structures. As described below, 15 alternative corridors were developed for this bridge type. None of these alternatives (with the exception of Alternative 8) require either a detour bridge or a temporary closure of the existing bridge.

- **Alternative 1** is located approximately 2,300 feet north of the existing bridge location. The geometry consists of a sweeping curved alignment with an island tie-in that is parallel to New River Drive (NC 210).
- **Alternative 2** is located approximately 2,100 feet north of the existing bridge location, beginning on the mainland side just west of J H Batts intersection, and ending on the island side at New Bern Avenue. This alternative forms a new island tie-in location along New River Drive (NC 210), approximately 2,100 feet north of Roland Avenue.
- **Alternative 3** is located approximately 1,700 feet north of the existing bridge location with a sweeping curved alignment, beginning on the mainland side just west of J H Batts Road, and ending on the island side at Roland Avenue.
- **Alternative 4** is located approximately 800 feet north of the existing bridge location, beginning on the mainland side just east of Sea Oaks Drive and ending on the island side at Goldsboro Avenue. This alternative forms a new island tie-in location along New River Drive (NC 210), approximately 1,100 feet north of Roland Avenue.
- **Alternative 5** is located approximately 500 feet north of the existing bridge location, beginning on the mainland side just west of Atkinson Point Road, and ending on the island side at Roland Avenue.
- **Alternative 5R** is a small alignment adjustment to Alternative 5 that was developed after CIW #2 to address marina access comments received from the community. This alternative is located approximately 400 feet north of the existing bridge location, beginning on the mainland side just west of Atkinson Point Road, and ending on the island side at Roland Avenue. The small alignment adjustment will avoid the navigable water channel leading to the marina at the island terminus.
- **Alternative 8** is located in the existing bridge location. This alternative would require utilization of the North Topsail Island Bridge as a detour during the demolition and construction of the new bridge. The detour would be approximately 25 miles.
- **Alternative 10** is located approximately 450 feet south of the existing bridge location, beginning on the mainland side just west of Little Kinston Road, and ending on the island side at Topsail Drive (NC 50). This alternative forms a new island tie-in location along Topsail Drive (NC 50), approximately 450 feet south of Roland Avenue.

- **Alternative 11** is located approximately 1,200 feet south of the existing bridge location, beginning on the mainland side just west of Little Kinston Road, and ending on the island side between Raleigh Avenue and Durham Avenue. This alternative forms a new island tie-in location along Topsail Drive (NC 50), approximately 1,500 feet south of Roland Avenue.
- **Alternative 12** is located approximately 2,000 feet south of the existing bridge location, beginning on the mainland side just west of Little Kinston Road, and ending on the island side with a realignment of Charlotte Avenue slightly south of its existing location. This alternative forms a new island tie-in location along Topsail Drive (NC 50), approximately 2,200 feet south of Roland Avenue.
- **Alternative 13** is located approximately 1,800 feet south of the existing bridge location with a sweeping curved alignment, beginning on the mainland side just west of Little Kinston Road, and ending on the island side at Roland Avenue.
- **Alternative 14** is located approximately 2,100 feet south of the existing bridge location with a sweeping curved alignment, beginning on the mainland side just west of Little Kinston Road, and ending on the island side with a realignment of Charlotte Avenue slightly south of its existing location. This alternative forms a new island tie-in location along Topsail Drive (NC 50), approximately 2,200 feet south of Roland Avenue.
- **Alternative 15** is located approximately 2,100 feet south of the existing bridge location with a sweeping curved alignment, beginning on the mainland side just west of J H Batts Road, and ending on the island side with a realignment of Charlotte Avenue slightly south of its existing location. This alternative forms a new island tie-in location along Topsail Drive (NC 50), approximately 2,200 feet south of Roland Avenue.
- **Alternative 16** is located approximately 2,400 feet south of the existing bridge location with a sweeping curved alignment, beginning on the mainland side just west of J H Batts Road, and ending on the island side at Roland Avenue.
- **Alternative 17** is located approximately 1,100 feet south of the existing bridge location. This alignment begins on the mainland side just west of Little Kinston Road and ends on the island side at Topsail Drive (NC 50), forming a new island tie-in location along Topsail Drive, approximately 300 feet south of Roland Avenue. This alternative was developed after CIW #2 in an effort to minimize impacts to Southside Park

3.4.4 Initial Screening (Alternatives Eliminated)

NCDOT performed an initial screening and eliminated four alternatives as follows:

- **Alternative 1** was eliminated due to the high right-of-way impacts, longer bridge length with associated higher construction costs, and substantial alterations to travel patterns to and from North Topsail Beach.
- **Alternative 8** was eliminated due to the high amount of property impacts. Design of the approximately 70–foot high bridge along the existing bridge alignment impacted the

corridor's central business district. In addition, the requirement for an off-site detour during construction added costs and detrimental impacts to travel patterns and local business access.

- **Alternative 9** was eliminated due to the impacts associated with Soundside Park, which is a property protected by Section 4(f) of the US Department of Transportation Act of 1966.
- **Alternative 12** was eliminated due to the similarity with Alternative 14. Alternative 12 right-of-way impacts were higher than Alternative 14.

3.5 Alternatives Evaluation

3.5.1 Corridor Alternatives Grouping

To effectively communicate the remaining 16 alternative corridors with project stakeholders, the three alternative groupings are described below and are shown in Figure 3-2.

Northern Alternatives Group – Alternatives 2, 3, 4, 5, and 5R are included in the Northern Alternatives Group. All alternatives in this grouping replace the existing bridge with a high-level fixed bridge having a 65-foot VNC.

Central Alternatives Group – Alternatives 5A, 6, 7, and 10A are included in the Central Alternatives Group. All alternatives in this grouping replace the existing bridge with a moveable bridge. Alternative 6 is a low-level moveable bridge alternative having a VNC of 15 feet. Alternatives 5A, 7, and 10A are mid-level moveable bridge alternatives having a VNC of 30 feet.

Southern Alternatives Group - Alternatives 10, 11, 13, 14, 15, 16, and 17 are included in the Southern Alternatives Group. All alternatives in this grouping replace the existing bridge with a high-level fixed bridge having a 65-foot VNC.

3.5.2 Alternatives Evaluation Matrix

Functional design plans for all the 16 corridor alternatives under study were developed. Preliminary impact and qualitative cost analysis were compiled based on the functional design plans and are summarized in the Alternatives Evaluation Matrix shown in Table 3-1. For each of the alternatives grouping (Northern, Central, and Southern), the highest impact or cost alternative is highlighted in red and the lowest impact or cost alternative is highlighted in green.

Table 3-1: Alternatives Evaluation Matrix

Category		Northern Group					Central Group				Southern Group						
		Alt 2	Alt 3	Alt 4	Alt 5	Alt 5R	Alt 5A	Alt 6	Alt 7	Alt 10A	Alt 10	Alt 11	Alt 13	Alt 14	Alt 15	Alt 16	Alt 17
Project Description																	
Project Length (miles) - including permanent bridge length		1.4	1.5	1.1	1.1	1.1	1.1	0.4	0.4	0.9	0.9	1.1	1.4	1.3	1.6	1.9	1.0
Bridge Length (ft) - fixed length/moveable length		5,515	5,500	3,990	4,116	4,054	3,996/120	400/120	1,180/120	2,997/120	3,300	4,240	5,005	5,175	6,176	7,250	3,318
Bridge Structure (sf)	· fixed area	287,618	275,000	203,346	205,800	202,700	199,800	20,000	59,000	153,956	169,347	218,960	250,250	264,782	314,832	362,500	165,900
	· moveable area	-	-	-	-	-	6,000	6,000	6,000	6,000	-	-	-	-	-	-	-
Detour Bridge Length (ft) - fixed length/moveable length		-	-	-	-	-	-	1,367/120	1,392/120	-	-	-	-	-	-	-	-
Detour Bridge Structure	· fixed area	-	-	-	-	-	-	53,313	54,288	-	-	-	-	-	-	-	-
	· moveable area	-	-	-	-	-	-	4,680	4,680	-	-	-	-	-	-	-	-
Human Environment Impacts																	
Community Facilities Impacted (number)		-	1	2	-	-	-	-	-	1	1	-	1	-	-	1	-
Agricultural Lands (number)		1	1	-	-	-	-	-	-	-	-	-	-	-	1	1	-
Section 4(f) Resource	Soundside Park property impacts -- permanent/temporary (acres)	-	-	-	-	-	-	0.07[+]/0.36*	0.07[+]/0.33*	<0.1[++]	<0.1[++]	-	-	-	-	-	0.16[**]
	Bridge No. 16	TBD[***]	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***	TBD***
Church (Faith Harbor United Methodist Church)		1	-	1	1	1	1	-	-	-	-	1	1	1	1	1	-
Total Residential Relocations (number)		7	6	3	2	2	2	-	-	-	-	4	6	6	7	2	-
Total Business Relocations (number)		2	2	7	2	4	2	-	1	3	3	-	3	-	4	7	1
Property Only (number)		40	24	51	36	34	36	11	11	50	50	24	31	38	46	44	26
Natural/Physical Environment Impacts																	
Wetlands: CAMA / 404 (non-riparian) (acres)		0.28/3.03	0/1.41	0/1.68	0/1.34	0/1.34	0/1.34	0.05/0	-	0.48/0.52	0.24/0.52	0/0.97	0.10/1.15	0.24/1.07	0.19/0.80	0.11/0.94	1.14/0.04
Stream Crossings (#/linear feet)		1/145'	1/145'	1/190'	-	-	-	-	-	-	-	-	-	-	-	-	-
Known or Potential Hazardous Material Sites (number)		-	2	-	2	2	2	1	1	1	1	-	2	-	-	2	1
Costs/Public Feedback																	
Initial Construction Costs		Very High	Very High	High	High	High	Very High	Medium	High	High	Medium	High	Very High	Very High	Very High	Very High	Medium
Operations & Maintenance Costs (75 Years)		Medium	Medium	Medium	Medium	Medium	Very High	Very High	Very High	Very High	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Public Preference at CIW #2 (% for Alternatives in each group)		15%	15%	18%	41%	[+++]	12%	13%	45%	17%	43%	16%	14%	3%	6%	6%	[+++]

Represents alternative with least impacts/costs in each group

Represents alternative with highest impacts/costs in each group

[+] Represents fill slope impacts caused to the northern side of Soundside Park.

* Represents temporary impacts to Soundside Park as a result of the detour bridge.

[++] Represents impacts caused by spanning over Soundside Park.

[**] Represents minimal impacts caused to the southern end of Soundside Park.

[+++] Represents alternatives developed based on CIW #2 feedback from the public and local officials.

[***] To be determined based on coordination with FHWA and SHPO

Notes: 1) No impacts to riparian wetlands, archaeological sites, superfund sites, or ponds are expected. Therefore, these impact categories are not provided.
2) Impacts are based on functional design right-of-way and easement limits, December 2010.

3.5.3 Community Feedback

On October 21, 2010, NCDOT held CIW #2 and presented the functional design plans and alternative impact comparisons to local elected town officials and citizens. Attendees reviewed the available information and completed comment cards that included their alternative preference in each of the three groupings. Additional information concerning the public outreach and stakeholder's involvement is included in Chapter 6.

Alternative preference results indicate that Alternatives 5, 7, and 10 were the preferred alternatives for the Northern, Central, and Southern groupings, respectively. Alternatives 5R and 17 were developed subsequent to CIW #2 and because of comments received from the citizens and review agencies.

3.5.4 Evaluation Criteria Summary

To carry forward the most practical alternatives for further study, the 16 corridor alternatives under study were evaluated using information derived from Table 3-1. The evaluation criteria used for each alternative is summarized below.

3.5.4.1 Northern Alternatives Group (High-Level Fixed Bridge Alternatives)

- **Alternative 2**:
  - Moderate support – 15% of respondents chose this as the preferred northern alternative
  - Similar to Alternative 4, but with more bridge length and project costs
  - Further from the existing alignment and Central Business District than Alternative 4
- **Alternative 3**:
  - Moderate support – 15% of respondents chose this as the preferred northern alternative
  - Sweeping curved alignment requires a fully superelevated section on the bridge leading to challenging constructability and drainage conditions
  - More bridge length and project costs than other northern Alternatives 4 and 5
- **Alternative 4**:
  - Moderate support – 18% of respondents chose this as the preferred northern alternative
  - Lowest expected cost and shortest bridge alternative for the Northern Alternatives Group
  - If Alternative 2 is eliminated, then Alternative 4 is the only remaining off-alignment northern alternative

- **Alternative 5**:
  - Significant support – 41% of respondents chose this as the preferred northern alternative
  - One of the lowest cost and shortest bridge length alternatives
  - Closest northern alternative to the existing bridge site
  - Roundabout intersection design is consistent with the Topsail Area CTP
- **Alternative 5R**:
  - A small alignment adjustment to Alternative 5 that maintains navigable water channel access leading to the island side marina, the only private marina on the island
  - One of the lowest cost and shortest bridge length alternatives
  - Closest northern alternative to the existing bridge site
  - Roundabout intersection design is consistent with the Topsail Area CTP

3.5.4.2 Central Alternatives Group (Moveable Bridge Alternatives)

- **Alternative 5A**:
  - Moderate support – 12% of respondents chose this as the preferred central alternative
  - Significant support for the high-fixed bridge alternative (Alternative 5) in this location
  - Roundabout intersection design is consistent with the Topsail Area CTP
- **Alternative 6**:
  - Moderate support – 13% of respondents chose this as the preferred central alternative
  - Most similar alternative to the existing conditions with a similar horizontal and vertical alignment
  - Least overall project impacts and costs
- **Alternative 7**:
  - Significant support – 45% of respondents chose this as the preferred central alternative
  - Similar to existing conditions with the vertical alignment raised by approximately 15 feet, which allows approximately half of vessels to pass underneath unimpeded
  - One out of every three bridge openings will be eliminated with a mid-level moveable bridge

- **Alternative 10A**:
  - Moderate support – 17% of respondents chose this as the preferred central alternative
  - Alternative 10A bisects Soundside Park and thereby uses property that is protected under Section 4(f) of the US Department of Transportation Act of 1966.

3.5.4.3 Southern Alternatives Group (High-Level Fixed Bridge Alternatives)

- **Alternative 10**:
  - Significant support – 43% of respondents chose this as the preferred southern alternative
  - Alternative 10 bisects Soundside Park and thereby uses property that is protected under Section 4(f) of the US Department of Transportation Act of 1966.
- **Alternative 11**:
  - Moderate support – 16% of respondents chose this as the preferred southern alternative
  - Second lowest expected cost and second shortest bridge alternative for the Southern Alternatives Group
  - Fewest property impacts for the Southern Alternatives Group
- **Alternative 13**:
  - Moderate support – 14% of respondents chose this as the preferred southern alternative
  - Sweeping curved alignment requires a fully superelevated section on the bridge leading to challenging constructability and drainage conditions
  - High project costs and bridge length
  - Roundabout intersection design is consistent with the Topsail Area CTP
- **Alternative 14**:
  - Very low support – 3% of respondents chose this as the preferred southern alternative
  - High project costs and bridge length
- **Alternative 15**:
  - Low support – 6% of respondents chose this as the preferred southern alternative
  - High project costs and bridge length
- **Alternative 16**:
  - Low support – 6% of respondents chose this as the preferred southern alternative

- Sweeping curved alignment requires a fully superelevated section on the bridge leading to challenging constructability and drainage conditions
- High project costs and bridge length
- Roundabout intersection design is consistent with the Topsail Area CTP

- **Alternative 17**:
  - Capitalizes on many of the design features preferred by citizens and FHWA:
    - Closer to the existing bridge location than the other Southern Group Alternatives
    - Minimizes impacts to Soundside Park, a section 4(f) protected property
    - Following coordination with the Town of Surf City, FHWA currently considers this alternative to have a *de minimis* impact to Soundside Park and in compliance with section 4(f) regulations as outlined in 23 CFR 774
    - Incorporates a roundabout intersection at the island terminus, allowing for improved traffic flow operations from all approaches
    - Provides a shorter bridge and re-alignment length
    - Sweeping curved alignment requires a fully superelevated section on the bridge leading to challenging constructability and drainage conditions
  - Roundabout intersection design is consistent with the Topsail Area CTP

3.6 Detailed Study Alternatives

On December 14, 2010, the Section 404/NEPA Merger Team (Merger Team) met for the Concurrence Point 2 (CP 2) meeting to discuss Detailed Study Alternatives. During the meeting, the 16 corridor alternatives were presented, along with a summary of the alternative's impacts and costs. In addition, the results from CIW #2 were presented, along with other citizen and agency comments that were received. Subsequent to the presentation and corresponding discussions, the Merger Team concurred on Concurrence Point 2, Detailed Study Alternatives Carried Forward. Seven Detailed Study Alternatives were selected for additional study:

- Northern Alternatives Group: Alternatives 4, 5, and 5R (high-level fixed bridges)
- Central Alternatives Group: Alternatives 6 and 7 (low/mid-level moveable bridges, respectively)
- Southern Alternatives Group: Alternatives 11 and 17 (high-level fixed bridges)

3.7 NCDOT Recommended Alternative

Currently, NCDOT has not chosen a recommended alternative. Preliminary design plans were developed for the seven Detailed Study Alternatives. A more detailed quantitative impact and cost analysis was prepared, as compared with the previous functional design plans. Results of this more detailed analysis are discussed in Chapter 5.

This information will be presented to the community and local project stakeholders at the corridor public hearing. Copies of EA will also be distributed to federal, state and local project stakeholders. Subsequent to the corridor public hearing, a recommended alternative will be identified based on the design information prepared and public outreach comments received. This recommended alternative will be presented to the Merger Team at the CP 3 meeting. At this meeting, the Least Environmentally Damaging Practicable Alternative (LEDPA)/Preferred Alternative will be chosen.

Chapter 4

Proposed Improvements

4.0 PROPOSED IMPROVEMENTS

The seven Detailed Study Alternatives were described in Chapter 3. Depending on the alternative chosen, Bridge No. 16 will be replaced with a new 500 to 4,000 foot-long bridge either in the same location, to the north, or to the south. This chapter provides a summary of improvements associated with the Detailed Study Alternatives.

4.1 Roadway Cross-Section and Alignment

The new bridge will accommodate two-way traffic with two 12-foot travel lanes, two four-foot bike lanes, and two 5.5-foot sidewalks. Curb and gutter will provide a two-foot separation between the bicycle lanes and sidewalks. The approach roadway section will match the new bridge section, with the exception that sidewalks will not be provided. Instead, a ten-foot earth berm will be constructed behind the curb and gutter. Both the new bridge and roadway approach typical sections are provided in Figure 4-1.

4.2 Right-of-Way and Access Control

The existing right-of-way width along NC 50/210 ranges between 80 and 100 feet, with no control of access. The proposed right-of-way width is as follows:

- Bridge – 120 feet
- Roadway approaches – varies between 60 to 75 feet
- Connecting cross-streets – varies between 70 to 100 feet

All seven Detailed Study Alternatives will impact residential and/or business properties, requiring acquisition of additional right-of-way. The new bridge, as well as the roadway approaches immediately adjacent to the bridge ends, will not require control of access.

4.3 Speed Limit

The new bridge, roadway approaches, and most of the connecting cross-streets will be designed using a 40 mph design speed and each facility is anticipated to be posted at a 35 mph speed limit. Kinston Avenue, Charlotte Avenue, and Goldsboro Avenue will be designed using a 30 mph design speed and are anticipated to be posted at a 25 mph speed limit, which is consistent with the existing conditions. The temporary detour bridges required for Alternatives 6 and 7 will be designed for a 30 mph design speed and are anticipated to be posted at a 25 mph speed limit.

4.4 Anticipated Design Exceptions

No design exceptions are anticipated for this project.

4.5 Intersections and Interchanges

Intersection improvements or new intersection facilities will be required for each of the Detailed Study Alternatives. To provide more efficient traffic operations, utilization of signalized intersections or roundabout facilities will be designed as described below:

- **Alternative 4:**
  - Mainland tie-in:
    - Roland Avenue between J H Batts Road and Little Kinston Road – new unsignalized intersection
  - Island tie-in:
    - New River Drive at Goldsboro Avenue – new traffic signal
- **Alternatives 5 & 5R:**
  - Mainland tie-in:
    - Roland Avenue between J H Batts Road and Little Kinston Road – new unsignalized intersection
  - Island tie-in:
    - Roland Avenue west of New River Drive – new roundabout
- **Alternatives 6 & 7:**
  - Mainland tie-in:
    - Roland Avenue east of Little Kinston Road/Atkinson Point Drive – no changes to existing intersection at Little Kinston Road/ Atkinson Point Drive
  - Island tie-in:
    - Roland Avenue at New River Drive – new traffic signal
- **Alternative 11:**
  - Mainland tie-in:
    - Roland Avenue between J H Batts Road and Little Kinston Road – new unsignalized intersection
  - Island tie-in:
    - New River Drive between Raleigh Avenue and Durham Avenue – traffic signal will be required at new intersection
- **Alternative 17:**
  - Mainland tie-in:
    - Little Kinston Road – add new turn-lanes to this unsignalized intersection

- Realigned Roland Avenue at Atkinson Point Road – new unsignalized intersection

- Island tie-in:
  - South of Roland Avenue at New River Drive and Topsail Drive – new roundabout

No interchanges are located in the project vicinity.

4.6 Roundabouts

Roundabouts are an intersection type that allows traffic yield conditions prior to entering into a circular loop connecting to other cross streets. This circular flow allows for improved traffic operations given that the traffic is not delayed by a mandated stop condition prior to entering the intersection. Alternatives 5, 5R, and 17 include a single lane roundabout on new location, intersecting the new bridge replacement alignment with the existing NC 50/210 roadways on the island. In addition to the intersection traffic flow condition improvements, the roundabouts also offer the unique opportunity to add landscaping and aesthetic features as well as other improvements that encourage economic and social activity. A schematic of these roundabouts is shown in the artistic renderings of Alternatives 5, 5R, and 17, which are included in Appendix G.

4.7 Service Roads

With the exception of Alternative 7, no service roads are recommended or currently exist in the study area. Under Alternative 7, a service road will be built adjacent to Roland Avenue in the northeast quadrant of the proposed bridge. This service road will provide access to businesses and the RV campground.

4.8 Structures

Bridge No. 16 is the only existing major structure in the project vicinity. As described in Section 3.4, three types of replacement bridges were evaluated for this project: a low-level moveable bridge with 15 feet VNC; a mid-level moveable bridge with 30 feet VNC, and a high-level fixed with 65 feet VNC. All three bridge types would provide a minimum horizontal navigational clearance of 90 feet.

4.8.1 Low-Level\Mid-Level Moveable Bridge

Generally, three moveable bridge types are utilized where vehicle and vessel traffic conflict. These bridge types include: Bascule, Vertical Lift, and Swing Span. The clearance above water for each of these bridges can be increased to accommodate additional vessel traffic with fewer bridge openings. Bridges that are designed at a lower elevation (< 15 feet VNC) are known as low-level and those that are more accommodating to vessels are known as mid-level (15 to 35 feet VNC). The advantages for these three moveable bridge types are outlined below:

4.8.1.1 Bascule Bridge

Bascule bridges are comprised of mechanical platforms known as leaves that are open by fixing one end and raising the other end to a vertical position such that vessels can pass through the roadway crossing. Advantages associated with this bridge type include; fast operating times, economical, unlimited vertical clearance in vertical position, and most often viewed as aesthetically pleasing.

4.8.1.2 Vertical Lift Bridge

Vertical lift bridges are comprised of two columns that support a span member that is raised to allow vessel passage underneath. The primary advantage associated with this bridge type is that they are easy to erect, accelerating construction schedules.

4.8.1.3 Swing Span Bridge

Swing span bridges are comprised of a center column that supports a truss span, swinging open and closed by pivoting on the center support. When compared with the bascule type, the swing span has no advantages other than longer spans can be accommodated and possible aesthetic preference.

4.8.1.4 Recommended Permanent Moveable Bridge Type

Due to the advantages listed above along with less anticipated impacts on the environmentally sensitive area and adjacent properties, a double leaf bascule bridge is recommended as the permanent moveable bridge type for both Alternatives 6 and 7.

4.8.1.5 Recommended Temporary Moveable Bridge Type

Given the ease of construction associated with a vertical lift bridge, this bridge type is commonly used for temporary conditions; therefore, for the required temporary detour bridge associated with Alternatives 6 and 7, a vertical lift bridge is recommended.

4.8.2 High-Level Fixed Bridge

Five of the seven Detailed Study Alternatives propose a high-level fixed bridge. Based on preliminary evaluation of structural considerations, these high-level fixed bridges will most likely be designed with a precast concrete beam superstructure of approximate depth 7.5 feet and a cast-in-place deck. Additional information regarding evaluations of this bridge type is included in the project's Preliminary Design Technical Report, dated July 2011.

4.8.3 Operations and Maintenance Costs

A comparison of the operations and maintenances costs for all Detailed Study Alternatives over a 75-year period (assumed to be life-span of a bridge) is documented below.

4.8.3.1 Movable Bridge Alternatives

Operations: Alternative 6 and 7 will require a bridge tender on site at all times, opening the bridge for vessels unable to pass underneath the new bridge. Based on historic NCDOT moveable bridge records, operations costs for Alternatives 6 and 7 are estimated to be $150,000 per year.

Maintenance: Alternatives 6 and 7 will require routine maintenance and inspections, as well as periodic replacement of the fender system, machinery, controls and coating on the bascule bridge. During a 75-year life cycle, these costs are estimated to be approximately $26 million. Table 4-1 provides details associated with these costs.

4.8.3.2 Fixed Bridge Alternatives

In comparison with moveable bridges, fixed bridges (Alternatives 4, 5, 5R, 11, and 17) incur lower maintenance and negligible operations costs. The maintenance costs for the fixed bridges include routine maintenance and inspections, as well as replacement of the fender system. During a 75-year life cycle, these costs are estimated to be approximately $3.6 million. Table 4-2 shows additional breakdown of these costs.

Table 4-1: Estimated Operations and Maintenance Costs for Moveable Bridges (75 years)

Item	Estimated Cost Per Year	Estimated Cost Per Occurrence	Multiplier (per Year or Occurrence)	Total Cost
Average Maintenance Cost, first 10 years	$25,000	-	10	$250,000
Average Maintenance Cost, after 10 years	$55,000	-	65	$3,575,000
Replace Machinery (1 in 75 years)	-	$3,000,000	1	$3,000,000
Replace Controls (2 in 75 years)	-	$1,500,000	2	$3,000,000
Replace Coating Bascule Span (2 in 75 yrs)	-	$750,000	2	$1,500,000
Fender System Replacement (2 in 75 years)	-	$1,500,000	2	$3,000,000
Routine Bridge Inspection (Every 2 Years)	-	$3,000	38	$114,000
Fender System Inspection (Every 2 Years)	-	$1,500	38	$57,000
Machinery Inspection (Every 2 Years)	-	$3,500	38	$133,000
Underwater Inspection (Every 4 Years)	-	$4,500	19	$85,500
Bridge Operation	$150,000	-	75	$11,250,000
Total				**$25,964,500**

Table 4-2: Estimated Operations and Maintenance Costs for Fixed Bridges (75 Years)

Item	Estimated Cost Per Year	Estimated Cost Per Occurrence	Multiplier (per Year or Occurrence)	Total Cost
Average Maintenance Cost	$5,000	-	75	$375,000
Fender System & Replacement (2 in 75 years)	-	$1,500,000	2	$3,000,000
Routine Bridge Inspection (Every 2 Years)	-	$3,000	38	$114,000
Fender System Inspection (Every 2 Years)	-	$1,500	38	$57,000
Underwater Inspection (Every 4 Years)	-	$4,500	19	$85,500
Total				**$3,631,500**

4.9 Bicycle and Pedestrian Facilities

The new bridge will accommodate four-foot bicycle lanes and five-foot sidewalks in each direction. The approach roadway section will include four-foot bicycle lanes with no sidewalks. The project will replace existing bicycle lanes and sidewalks on the existing corridors; however, new bicycle lanes and sidewalks will not be added to any other facility within the study area.

4.10 Utilities

Major utilities in the vicinity of Bridge No. 16 include water, sanitary sewer, electrical power, and fiber optic service. This project will result in utility relocations as described in Chapter 5 of this document.

4.11 Noise Barriers

No noise abatement measures are proposed as part of this project.

4.12 Work Zone, Traffic Control, and Construction Phasing

Traffic will be maintained on the existing bridge during construction of the new location Alternatives (4, 5, 5R, 11, and 17). Traffic will be maintained on a new temporary detour bridge, which will be constructed south of the existing bridge during construction of the replace on existing location Alternatives (6 and 7).

Shifting of traffic to provide adequate construction clearance may be required during construction of the roadway approaches and connecting cross-streets. Traffic shifts may require temporary pavement widening and traffic control separation devices, such as temporary barriers or delineators; however, no off-site detours are anticipated.

Chapter 5

Environmental Effects of Proposed Action

5.0 ENVIRONMENTAL EFFECTS OF PROPOSED ACTION

The environmental effects described below include the potential impacts on the existing human, physical, and natural environments. The inventory of existing conditions are based on information currently available from federal, state, and local agencies; field observations; and meetings with local officials and citizens. Reference is made to the PSA, shown in red on Figure 1-2, and to the preliminary design plans for the seven Detailed Study Alternatives described in Chapter 3 and shown in Figures 5-1 through 5-7.

5.1 Natural Resources

5.1.1 Biotic Resources

5.1.1.1 Terrestrial Communities

Five terrestrial communities were identified in the PSA: maintained-disturbed, maritime evergreen forest, mesic mixed hardwood forest (coastal plain subtype), salt marsh, and pine flatwoods. Table 5-1 summarizes the coverage areas and Figure 5-8 graphically displays the location of these terrestrial communities. A brief description of each community is provided below.

Table 5-1: Terrestrial Communities

Terrestrial Community Name	Coverage Area (acres)
Maintained-Disturbed	229.51
Maritime Evergreen Forest	9.89
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	43.66
Salt Marsh	153.22
Pine Flatwoods	68.50
Total	**504.78**

Maintained-Disturbed

Maintained-disturbed areas are scattered throughout the PSA in places where the vegetation is periodically mowed, such as roadside shoulder, utility rights-of-way, and residential areas. The vegetation in this community is comprised of low growing grasses and herbs, including Bahia grass, centipede grass, clover, wild onion, chalky bluestem, sawtooth blackberry, and pennywort. There are also scattered trees, including loblolly pine, black willow, and eastern red cedar; shrubs include wax myrtle, eastern baccharis, and winged sumac; and vines, such as Japanese honeysuckle, poison ivy, muscadine, and trumpet creeper.

Maritime Evergreen Forest

The maritime evergreen forest occurs on the spoil islands in Intracoastal Waterway (Topsail Sound). This upland community is bordered by salt marsh and comprised of a canopy of loblolly pine and live oak, with an understory of wax myrtle, eastern baccharis, gallberry, and red cedar. Vines present include poison ivy and greenbrier.

Mesic Mixed Hardwood Forest

This community is dominated by sweetgum, tulip poplar, red maple, and loblolly pine. The understory is dominated by saplings and shrubs, such as sweetgum, devil's walking stick, wax myrtle, and red maple. The herbaceous layer is dominated by bracken fern; vines found throughout include greenbrier and Japanese honeysuckle.

Salt Marsh

This wetland community within the PSA is predominately vegetated with smooth cordgrass, black needlerush, big cordgrass, and saltmeadow cordgrass. Other species that were observed include saltgrass, Virginia glasswort, and sea lavender. This community grades to an upland fringe and is characterized as a salt scrub community. This community is dominated by shrubs, including wax myrtle, eastern baccharis, Jesuit's bark, yaupon, and eastern red cedar. Bushy seaside tansy, switchgrass, and seaside goldenrod are also present.

Pine Flatwoods

This community occurs inland of the salt marsh and its canopy is dominated by loblolly pine. Due to the absence of fire, it has a well-developed midstory of red maple, redbay, loblolly bay, sweet bay, and horse sugar; and an understory dominated by shrubs, such as wax myrtle, gallberry, and fetterbush. The herbaceous layer, where present, is dominated by giant cane, cinnamon fern, royal fern, and Virginia chain fern; vines found throughout include greenbrier, poison ivy, and muscadine.

5.1.1.2 Terrestrial Community Impacts

Table 5-2 summarizes the acreage of terrestrial community impacts under each Detailed Study Alternative. Alternative 6 would have the least impacts – approximately 7.2 acres, while Alternative 4 would result in the highest impacts – approximately 11.4 acres. Terrestrial community impacts for the remaining five alternatives would range between 7.6 and 11.3 acres.

Table 5-2: Impacts to Terrestrial Communities

Alternative No.	Terrestrial Community Impact Area (acres)					
	Maintained Disturbed	Maritime Evergreen Forest	Mesic Mixed Hardwood Forest	Salt Marsh	Pine Flatwoods	Total Impacts
4	9.0	-	0.1	-	2.3	11.4
5	8.1	-	0.1	-	2.3	10.5
5R	8.0	-	0.1	-	2.3	10.4
6	7.0*	-	-	0.2	-	7.2
7	7.5*	-	-	0.1	-	7.6
11	7.7	-	1.5	-	2.1	11.3
17	8.6	-	-	0.3	0.8	9.7

* Includes approximately 0.5 acres of temporary impacts caused by detour bridge

5.1.1.3 Terrestrial Wildlife

Terrestrial wildlife in the PSA is comprised of both natural and disturbed habitats that may support a diversity of wildlife species. Mammal species that commonly exploit forested habitats and stream corridors found within the PSA include the eastern cottontail, raccoon, Virginia opossum, and white-tailed deer. Birds that commonly use forest and forest edge habitats include the American crow, blue jay, Carolina chickadee, tufted titmouse, and yellow-rumped warbler. Birds that may use the open habitat or water bodies within the PSA include the brown pelican, least tern, willet, indigo bunting, boat-tailed grackle, northern cardinal, great egret, and laughing gull. Reptile species that may use terrestrial communities located in the PSA include the corn snake, eastern box turtle, five-lined skink, anole, and rat snake. Invertebrates, such as fiddler crab and marsh periwinkle, are common in the salt marsh community.

5.1.1.4 Aquatic Communities

Aquatic communities in the PSA consist of those found in Topsail Sound and tidal pools in the marsh. These communities could support fish and shellfish, such as the Atlantic silverside, spot, Atlantic croaker, flounder, menhaden, shrimp, blue crab, eastern oyster, and clams, as well as various benthic macroinvertebrates.

5.1.1.5 Invasive Communities

Three species from the NCDOT Invasive Exotic Plant list are present in the PSA. The species identified were Chinese privet (Threat level 1), common reed (Threat level 1), and Japanese honeysuckle (Threat level 2). NCDOT will manage invasive plant species in accordance with their standard guidelines.

5.1.2 Waters of the United States

5.1.2.1 Ponds

Two ponds with a combined area of 2.7 acres are located within the PSA. These ponds consist of artificially excavated pits that are sustained by high groundwater levels and have no surface water connection to jurisdictional stream features. None of the seven Detailed Study Alternatives would result in direct impacts to the ponds.

5.1.2.2 Streams

As shown in Table 5-3, two jurisdictional streams were identified in the PSA: Topsail Sound and an unnamed tributary to Topsail Sound. Both streams are within the Cape Fear River basin (USGS Hydrologic Unit 03030001).

Topsail Sound is classified as High Quality Waters (HQW). Topsail Sound's Stream Index Number is 18-87-10 and Best Usage Classification is SA; HQW. No waters classified as Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds) or Outstanding Resource Waters (ORW) occur within 1.0 mile of the PSA. No waters listed on the North Carolina 2010 Final 303(d) list of impaired waters for sedimentation or turbidity occur within 1.0 mile of the PSA.

All seven Detailed Study Alternatives would span over the Topsail Sound. Similarly, three of the seven Detailed Study Alternatives (4, 5, and 5R) would span over the unnamed stream. The remaining four Detailed Study Alternatives are located south of the unnamed stream with no impacts.

Table 5-3: Jurisdictional Streams

Map ID	Length (feet)	Classification	Compensatory Mitigation Required (if impacted)	River Basin Buffer
Topsail Sound	5,350	Perennial	Yes	Not Applicable
SA	1,385	Perennial	Yes	Not Applicable

5.1.2.3 Wetlands

Four jurisdictional wetlands were identified within the PSA. Wetland classification and North Carolina Department of Water Quality's (NCDWQ) quality rating data are presented in Table 5-4. All wetlands are within the Cape Fear River basin (USGS Hydrologic Unit 03030001). Figures 5-1 through 5-7 graphically show the location of these three wetlands.

Table 5-4: Jurisdictional Wetlands

Map ID	NCWAM Classification	Hydrologic Classification	NCDWQ Wetland Rating	Area (acres)
WA	Pine Flat	Non-Riparian	55	9.6
WB	Headwater Forest	Riparian	47	0.6
WC	Estuarine Woody Wetland	Riparian	60	2.1
WD	Salt/Brackish Marsh	Tidal/CAMA	Not Applicable	89.4
Total				101.7

None of the Detailed Study Alternatives would result in impacts to riparian wetlands. All seven Detailed Study Alternatives would result in impacts to CAMA and/or non-riparian wetlands. Table 5-5 provides a listing of potential direct impacts to wetlands. These impacts are calculated from slope stake to slope stake, plus an additional 25 feet outside of each limit as determined from the May 2011 preliminary design plans for each alternative. The totals are rounded to the nearest 0.1 acre.

Table 5-5: Impacts to Jurisdictional Wetlands

Detailed Study Alternative No.	CAMA Wetland Impacts (acres)	Non-Riparian Wetland Impacts (acres)
Alt 4	-	1.1
Alt 5	-	1.1
Alt 5R	-	1.1
Alt 6	0.3	-
Alt 7	0.1	-
Alt 11	-	1.0
Alt 17	0.4	0.8

5.1.2.4 Avoidance, Minimization, and Mitigation

Mitigation is defined in NEPA regulations (40 CFR Section 1508.20 and 40 CFR Part 230) as efforts that a) avoid, b) minimize, c) rectify, d) reduce or eliminate, or e) compensate for adverse impacts to the environment. Mitigation of wetland impacts is recommended in accordance with Clean Water Act Section 404(b)(1) Guidelines (40 CFR Part 230); FHWA step down procedures (23 CFR Sections 777.1 et seq.); mitigation policy mandates articulated in the United States Army Corps Engineers (USACE) / United States Environmental Protection Agency (USEPA) Memorandum of Agreement (MOA; Page and Wilcher 1990); Executive Order 11990 (42 FR 26961 [1977]); and US Fish and Wildlife Service (USFWS) mitigation policy directives (46 FR 7644-7663 [1981]).

Section 404(b)(1) Guidelines, the USACE/USEPA MOA, and Executive Order 11990 stress avoidance and minimization as primary considerations for protection of Waters of the United States. Practical avoidance alternatives analyses must be fully evaluated before compensatory mitigation can be discussed.

The FHWA policy stresses that all practicable measures should be taken to avoid or minimize harm to wetlands affected by federally funded highway construction. A sequencing (step-down) procedure is recommended in the event that avoidance is not practicable. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

Avoidance, minimization, and mitigation measures that may be implemented later in the design process in consultation with the USACE are described below.

Avoidance and Minimization

Due to the location of wetlands, streams, and surface waters within the PSA, avoidance of all jurisdictional impacts is not possible. As mentioned in Chapter 3, alternatives with higher impacts to jurisdictional waters were eliminated (in specific, Alternatives 1 and 2) during or before Concurrence Point 2 meeting. During preliminary design, NCDOT has implemented best efforts to avoid and minimize impacts to several wetlands. Wherever possible, wetlands were bridged and the alignments were shifted to minimize impacts, including the CAMA wetlands located on the mainland and south of the bridge near Little Kinston Road and on the island side near Kinston Avenue.

The approved jurisdictional delineation would be utilized to minimize wetland impacts of the preferred alternative during final design. Utilization of BMP would be coordinated in an effort to minimize impacts, including avoidance of construction staging areas within wetlands.

Compensatory Mitigation of Impacts

The purpose of compensatory mitigation is to replace the lost functions and values to Waters of the United States. Mitigation could include restoration, creation, enhancement, or preservation of Jurisdictional Waters. A specific mitigation plan would be dependent upon the LEDPA/Preferred Alternative selected by the NCDOT and the reviewing agencies.

Mitigation should be implemented as close to the impacts as possible. The amount of mitigation required is determined on a case-by-case basis. Typical mitigation ratios (amount of mitigation required compared to amount impacted) for wetland mitigation are 2:1 for restoration (two acres must be restored for every one acre impacted), 3:1 for creation, 4:1 for enhancement, and 10:1 for preservation.

If on-site opportunities are not sufficient to mitigate for potential wetland and stream impacts, or are not available for mitigation, off-site compensatory mitigation would be accomplished through coordination with the North Carolina Ecosystem Enhancement Program (NCEEP). In accordance with the "Memorandum of Agreement, agreed to by the USACE, USEPA, USFWS, North Carolina Wildlife Resource Commission (NCWRC), and North Carolina Department of Environment and Natural Resources (NCDENR)," NCEEP, upon request, will provide off-site mitigation to satisfy the federal Clean Water Act compensatory mitigation requirements.

5.1.2.5 Anticipated Permit Requirements

A list of permits that may be required is provided below.

- **Section 404 (Impacts to Waters of the United States - Clean Water Act)** – Impacts to Waters of the United States are regulated by USACE. Discharges of dredge or fill material into jurisdictional wetlands, streams, or open waters associated with the construction of the proposed bridge or other roadway improvements will require a Section 404 permit from USACE. A Nationwide Permit (NWP) 14 may be applicable to cover the impacts to the jurisdictional wetlands and streams within the PSA. A Section 404 Individual Permit would be required if the project impacts exceed the NWP impact thresholds (300 linear feet of single jurisdictional stream and/or 0.5 acres of jurisdictional features). Any required compensatory mitigation would be coordinated with NCEEP.

- **Section 401 General Water Quality Certification (Clean Water Act)** – A Section 401 General Water Quality Certification (WQC) will be required for any activity that may result in a discharge into Waters of the United States or for which an issuance of a federal permit is required. The issuance of a Section 401 certification is a prerequisite to the issuance of a Section 404 permit. A NCDWQ WQC that corresponds to NWP 14 is General Certification (GC) No. 3820. If the project impacts exceed the NWP impact thresholds stated in the above section, a Section 401 Individual WQC would be required.

- **Section 9 (Bridge Permit)** – The Intracoastal Waterway is considered navigable waters of the United States. USCG has jurisdiction over bridge construction spanning navigable waters. A Section 9 permit from the USCG will most likely be required for the construction of the proposed bridge. This permit would cover both the bridge structure and fender system, as required.

- **Section 10 (Permit for Work in Navigable Waters - Rivers and Harbors Act)** – USACE requires a Section 10 permit for the construction of any structure in, over, or under a navigable water of the United States. Overhead utility lines spanning navigable waters and utility lines that are constructed in or under navigable waters require a Section 10 permit. A Section 10 permit will likely be required for the project's anticipated utility relocations.

- **CAMA Major Development Permit** – The Topsail Sound is designated as Estuarine Waters by the NCDCM and regulated as an Area of Environmental Concern (AEC). The proposed project would impact coastal wetlands and Estuarine Waters; therefore, a CAMA major development permit would be required for impacts to designated AECs.

- **USCG Bridge Closure Permit** – Well in advance of establishing a channel closing schedule, a permit would be required from USCG.

- **State Stormwater Permit** – A Stormwater Management Plan will be prepared using NCDOT's Stormwater BMP Toolbox dated March 2008. Stormwater control measures will conform to the bridge and roadway approach layout, as well as the surrounding environmental context.

- **Public Water Supply** – Public water supply relocations and impacts would require coordination with the Town of Surf City and possibly NCDENR.

Final determination of permit applicability lies with the regulatory agencies. Throughout project development process, NCDOT will coordinate with the regulatory agencies to obtain the necessary permits.

5.1.3 Rare and Protected Species

5.1.3.1 Federally Protected Species

As of September 22, 2010, USFWS lists 12 federally protected species for Pender County. A brief description of each species' habitat requirements, along with the Biological Conclusion rendered based on the PSA survey results is provided below. Habitat requirements for each species are based on the current best available information as per referenced literature and USFWS correspondence. Table 5-6 lists the 12 federally protected species and the associated survey results.

American alligator

In North Carolina, alligators have been recorded in nearly every coastal county and many inland counties. The alligator is found in rivers, streams, canals, lakes, swamps, and coastal marshes. Adult animals are highly tolerant of salt water, but the young are apparently more sensitive, with salinities greater than five parts per thousand considered harmful. USFWS's optimal survey window for American alligator is year-round (only warm days in winter).

Biological Conclusion: No Survey Required

Table 5-6: Federally Protected Species Listed for Pender County

Scientific Name	Common Name	Federal Status*	Habitat Present	Biological Conclusion**
Alligator mississippiensis	American alligator	T (S/A)	Yes	Not Required
Charadrius melodus	Piping plover	T	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	Yes	No Effect
Acipenser brevirostrum	Shortnose sturgeon	E	No	No Effect
Trichechus manatus	West Indian manatee	E	Yes	MA/NLAA
Caretta caretta	Loggerhead sea turtle	T	Yes	MA/NLAA
Chelonia mydas	Green sea turtle	T	No	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	Yes	No Effect
Carex lutea	Golden sedge	E	Yes	No Effect
Schwalbea americana[+]	American chaffseed	E	Yes	No Effect
Amaranthus pumilus	Seabeach amaranth	T	No	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	Yes	No Effect

* E – Endangered; T – Threatened; T(S/A) – Threatened due to similarity of appearance

** MA/NLAA – May Affect/Not Likely to Adversely Affect

[+] Historic record (the species was last observed in the county more than 50 years ago)

Piping plover

The piping plover breeds along the entire eastern coast of the United States. North Carolina is uniquely positioned in the species' range, being the only state where the piping plover's breeding and wintering ranges overlap and the birds are present year-round. Most commonly, they nest where there is little or no vegetation, but some may nest in stands of beach grass. The nest is a shallow depression in the sand that is usually lined with shell fragments and light-colored pebbles. USFWS's optimal survey window is year-round.

Suitable habitat for the piping plover does not exist in the PSA. A review of North Carolina Natural Heritage Program (NCNHP) records, updated August 2011, indicates there are no known piping plover occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

Red cockaded woodpecker

The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine, for foraging and nesting/roosting habitat. The RCW excavates cavities for nesting and roosting in living pine trees, aged 60 years or older, that are contiguous with pine stands at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than 0.5 miles. USFWS's optimal survey window is November through early March.

During a field survey on March 15, 2011, the closest "known" active cluster was found approximately five miles from the PSA. No suitable nesting habitat was identified within a 0.5 miles of the PSA.

Biological Conclusion: No Effect

Shortnose sturgeon
The short-nosed sturgeon occurs in the lower sections of large rivers and in coastal marine habitats. The short-nosed sturgeon prefers deep channels with a lower salinity than seawater. It feeds benthicly on invertebrates and plant material, and is most active at night. The short-nosed sturgeon requires large fresh water rivers that are unobstructed by dams or pollutants to reproduce successfully. An anadromous species that spawns upstream in the spring, it spends most of its life within close proximity of the rivers mouth. At least two entirely freshwater populations have been recorded in South Carolina and Massachusetts. Generally, surveys are not required, as this species is assumed present in appropriate waters

Based on coordination with the North Carolina Division of Marine Fisheries [NCDMF] on August 18, 2010, suitable habitat for shortnose sturgeon does not exist in the PSA. A review of NCNHP records, updated August 2011, indicates there are no known shortnose sturgeon occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

West Indian manatee
West Indian manatees have been observed in all the North Carolina coastal counties. West Indian manatees are found in canals, sluggish rivers, estuarine habitats, salt water bays, and as far off shore as 3.7 miles. They utilize freshwater and marine habitats at shallow depths of 5 to 20 feet. Mantees concentrate in areas with warm water in the winter (between October and April). During other times of the year, habitats appropriate for the West Indian manatee are those with sufficient water depth, an adequate food supply, and in proximity to freshwater. West Indian manatees require a source of freshwater to drink. West Indian manatees are primarily herbivorous, feeding on any aquatic vegetation present, but they may occasionally feed on fish. USFWS's optimal survey window is year-round.

Suitable habitat for West Indian manatee does exist in the PSA. Topsail Sound is of sufficient size to support West Indian manatee. A review of NCNHP records, updated August 2011, indicates there are no known West Indian manatee occurrences within 1.0 mile of the PSA. Construction activities will adhere to the guidelines outlined in Precautions for Construction in Areas which May be Used by the West Indian Manatee in North Carolina (2003 USFWS).

Biological Conclusion: May Affect/Not Likely to Adversely Affect

Loggerhead turtle
The loggerhead turtle is widely distributed within its range and is found in three distinct

habitats during their lives. These turtles may be found hundreds of miles out in the open ocean, in neritic (near shore) areas, or on coastal beaches. In North Carolina, this species has been observed in every coastal county. Loggerheads occasionally nest on North Carolina beaches and are the most common of all the sea turtles that visit the North Carolina coast. They nest nocturnally, at two to three year intervals and between May and September, on isolated beaches that are characterized by fine-grained sediments. In near shore areas, loggerheads have been observed in bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and shipwrecks are often used as foraging areas. USFWS's optimal survey window is April through August.

Suitable habitat for the loggerhead turtle does exist in the PSA. However, a review of NCNHP records, updated August 2011, indicates there are no known loggerhead turtle occurrences within 1.0 mile of the PSA.

Biological Conclusion: May Affect/Not Likely to Adversely Affect

Green sea turtle

The green sea turtle is found in temperate and tropical oceans and seas. Nesting in North America is limited to small communities on the east coast of Florida, requiring beaches with minimal disturbances and a sloping platform for nesting (they do not nest in North Carolina). The green sea turtle can be found in shallow waters. They are attracted to lagoons, reefs, bays, mangrove swamps, and inlets where an abundance of marine grasses can be found, as this is the principle food source for the green turtle. USFWS's optimal survey window is April through August.

Suitable habitat for the green sea turtle does not exist in the PSA. A review of NCNHP records, updated August 2011, indicates there are no known green sea turtle occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

Cooley's meadowrue

Cooley's meadowrue occurs on circumneutral soils in grass-sedge bogs and wet pine savannahs and savannah-like areas. It may also grow along fire plow lines, in roadside ditches, woodland clearings, and powerline rights-of-way. Cooley's meadowrue needs some type of disturbance, such as fire or mowing, to maintain its open habitat.

Suitable habitat for Cooley's meadowrue does exist in the PSA; however, a survey conducted on June 28, 2010, concluded Cooley's meadowrue is not present within the PSA. In addition, a review of NCNHP records, updated August 2011, indicates there are no known Cooley's meadowrue occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

Golden sedge
Golden sedge grows in sandy soils overlying coquina limestone deposits, where the soil pH is unusually high for this region, typically between 5.5 and 7.2. Soils supporting the species are very wet to periodically shallowly inundated. The species prefers the ecotone between pine savanna and adjacent wet hardwood or hardwood/conifer forest. Most plants occur in the partially shaded savanna/swamp where occasional to frequent fires favor an herbaceous ground layer and suppress shrub dominance.

Suitable habitat for golden sedge does exist in the PSA; however, a survey conducted on June 28, 2010, concluded golden sedge is not present within the PSA. In addition, a review of NCNHP records, updated August 2011, indicates there are no known golden sedge occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

American chaffseed
American chaffseed generally occurs in habitats described as open, moist to dryish mesic pine flatwoods and longleaf pine flatlands, pine savannas, pine/scrub oak sandhills, sandhill seeps, and other open grass/sedge-dominated communities. This herb also occurs in the ecotonal areas between peaty wetlands and xeric sandy soils and on the upper ecotones of, or sites close, to Streamhead Pocosins. The species prefers sandy peat or sandy loam, acidic, seasonally moist to dry soils in sunny or partly sunny areas that are subject to frequent fires in the growing season. The plant is dependent on factors such as fire, mowing, or fluctuating water tables to maintain its required open to partly open habitat. Most extant populations, and all of the most vigorous populations, are in areas subject to frequent fire. This species is also known to occur on road cuts and power line rights-of-way that experience frequent mowing or clearing. Soil series that it is found on include Blaney, Candor, Gilead, Fuquay, Lakeland, and Vaucluse.

Suitable habitat for American chaffseed does exist in the PSA; however, a survey conducted on June 28, 2010, concluded American chaffseed is not present within the PSA, and no recent fires have occurred. In addition, a review of NCNHP records, updated August 2011, indicates there are no known American chaffseed occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

Seabeach amaranth
Seabeach amaranth occurs on barrier island beaches where its primary habitat consists of overwash flats at accreting ends of islands, lower foredunes, and upper strands of noneroding beaches (landward of the wrack line). In rare situations, this annual is found on sand spits 160 feet or more from the base of the nearest foredune. It occasionally establishes small temporary populations in other habitats, including sound-side beaches, blowouts in foredunes, interdunal areas, and on sand and shell material deposited for beach replenishment or as dredge spoil. The plant's habitat is sparsely vegetated with annual herbs

(forbs) and, less commonly, perennial herbs (mostly grasses) and scattered shrubs. It is, however, intolerant of vegetative competition and does not occur on well-vegetated sites. The species usually is found growing on a nearly pure silica sand substrate, occasionally with shell fragments mixed in. Seabeach amaranth appears to require extensive areas of barrier island beaches and inlets that function in a relatively natural and dynamic manner. These characteristics allow it to move around in the landscape, occupying suitable habitat as it becomes available. USFWS's optimal survey window is July through October.

Suitable habitat for seabeach amaranth does not exist in the PSA. A review of NCNHP records, updated August 2011, indicates there are no known seabeach amaranth occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

Rough-leaved loosestrife

Rough-leaved loosestrife, endemic to the coastal plain and sandhills of North and South Carolina, generally occurs in the ecotones or edges between longleaf pine uplands and pond pine pocosins in dense shrub and vine growth on moist to seasonally saturated sands and on shallow organic soils overlaying sand (spodosolic soils). This perennial herb specifically occurs in the ecotones between the following habitats: longleaf pine savanna and pocosin, longleaf pine flatwood and pocosin, longleaf pine savanna and mixed herb, longleaf pine/pond pine and evergreen shrub, longleaf pine/wiregrass savanna and Carolina bay pocosin, streamhead pocosin and pine/scrub oak sandhill, and sandhill seep and pine/scrub oak sandhill. Occurrences are also found in the following natural habitats: low pocosins, high pocosins, wet pine flatwoods, pine savannas, streamhead pocosins, sandhill seeps, riparian floodplains, boggy seeps and meadows, on deep peat in the middle of the low shrub community of large Carolina bays, and at the peaty margins of ponds and lakes. Occurrences are found in disturbed habitats, such as roadside depressions, maintained power and utility line rights-of-way, firebreaks, and trails. The species prefers full sunlight, is shade intolerant, and requires areas of disturbance (e.g., clearing, mowing, and periodic burning) where the overstory is minimal. However, it can persist vegetatively for many years in overgrown, fire-suppressed areas. Blaney, Gilead, Johnston, Kalmia, Leon, Mandarin, Murville, Torhunta, and Vaucluse are some of the soil series that occurrences have been found on. USFWS's optimal survey window is mid May through June.

Suitable habitat for rough-leaved loosestrife does exist in the PSA; however, a survey conducted on June 28, 2010, concluded rough-leaved loosestrife is not present within the PSA, and no recent fires have occurred. In addition, a review of NCNHP records, updated August 2011, indicates there are no known rough-leaved loosestrife occurrences within 1.0 mile of the PSA.

Biological Conclusion: No Effect

5.1.3.2 Bald and Golden Eagle Protection Act

Bald and golden eagles are not listed as a federally protected species; however, they are afforded protection under the Bald and Golden Eagle Protection Act. Golden eagles are not present in North Carolina. Habitat for the bald eagle primarily consists of mature forest in close proximity to large bodies of water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1.0 mile of open water. Suitable nesting and foraging habitat for the bald eagle is present within 1.0 mile of the PSA; however, during a March 16, 2010, survey, no bald eagles or nests were observed within the PSA or within 660 feet on all sides of the PSA.

5.1.3.3 Endangered Species Act Candidate Species

As of September 22, 2010, USFWS lists no candidate species for Pender County.

5.1.3.4 Essential Fish Habitat

NMFS has identified Intracoastal Waterway (Topsail Sound) as an Essential Fish Habitat. Table 5-7 lists the fish species and corresponding life stages that may occur in the PSA and are managed by NMFS.

Under the proposed project, Bridge No. 16 would be replaced with a 500 feet to 4,000 foot-long bridge either in the same location, to the north, or to the south. The new structure would only require footings to be placed within the Intracoastal Waterway (Topsail Sound). Given this limited in-water construction work, the proposed project would most likely result in a negligible net effect on available Essential Fish Habitat.

5.1.4 Topography and Soils

The PSA lies in the coastal plain physiographic region of North Carolina. Topography in the project vicinity is nearly level to gently rolling. Elevations in the PSA range from 5 to 30 feet above sea level. Land use in the project vicinity consists primarily of forest, commercial, and residential development. As shown in Table 5-8, the Pender County Soil Survey identifies ten soil types within the PSA.

Table 5-7: Commercial Fish Species

Species	Life Stage
Red Drum	Eggs, Larval, Juvenile, Adult
Bluefish	Juvenile, Adult
Summer Flounder	Larval, Juvenile, Adult
Brown Shrimp	Larval, Juvenile, Adult
Pink Shrimp	Larval, Juvenile, Adult
White Shrimp	Larval, Juvenile, Adult
Cobia	Juvenile, Adult
King Mackerel	Juvenile
Spanish Mackerel	Juvenile, Adult
Smooth Dogfish	Juvenile
Small Coastal Sharks	Juvenile, Adult
Black Sea Bass	Larval, Juvenile, Adult
Rock Sea Bass	Juvenile
Gag	Juvenile
Gray Snapper	Juvenile
Yellow Jack	Juvenile
Blue Runner	Juvenile
Crevalle Jack	Juvenile
Bar Jack	Juvenile
Sheepshead	Juvenile, Adult

Table 5-8: Soils

Soil Series	Mapping Unit	Drainage Class	Hydric Status
Alpin fine sand	AnB	Excessively drained	Hydric*
Bohicket silty clay loam	Bo	Very poorly drained	Hydric
Carteret fine sand	Ca	Very poorly drained	Hydric
Leon fine sand	LnA	Poorly drained	Hydric
Murville muck	Mu	Very poorly drained	Hydric
Newhan fine sand	NhC	Excessively drained	Hydric*
Newhan-Corolla complex	NkE	Excessively drained	Hydric*
Newhan-Corolla-Urban land complex	NmE	Excessively drained	Hydric*
Pender loamy fine sand	On	Moderately well drained	Hydric*
Pactolus fine sand	PaA	Moderately well drained	Hydric*

* Soils which are primarily nonhydric, but which contain hydric inclusions

5.2 Cultural Resources

5.2.1 Compliance

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

The project is also subject to compliance with Section 4(f) of the United States Department of Transportation Act of 1966, as amended, codified at 49 U.S.C. Section 303. Section 4(f) states that FHWA and other DOT agencies cannot approve the use of land from a significant publicly owned public park, recreation area, wildlife or waterfowl refuge, or any significant historic site unless there is no feasible and prudent alternative to the use of land and the action includes all possible planning to minimize harm to the property resulting from use.

5.2.2 Historic Architectural Resources

The North Carolina State Historic Preservation Office (NC HPO) requested additional coordination with their office for impacts to historic structures in their memo to NCDOT dated September 11, 2007. A field survey of the Area of Potential Effects (APE) was conducted in February 2010 by an NCDOT architectural historian and eighty-two structures over fifty years of age within the APE were recorded and evaluated according the National Register criteria. The photographs of these properties along with their National Register eligibility evaluations were shown to the NC HPO in a meeting on March 19, 2010. It was decided that a report would be needed to further evaluate the following two properties:

- Ward Realty Corporation, 116 South Topsail Drive, Surf City, Pender County
- Bridge No. 16, Surf City, Pender County

A report was prepared by NCDOT architectural historians in October 2010 which stated that Ward Realty was not eligible, but Pender County Bridge No. 16 remains eligible for the National Register. The report was forwarded to NC HPO for their concurrence and they concurred with the findings in a memorandum dated December 28, 2010, a copy of which is located in the Appendix C.

Bridge No. 16 was previously determined eligible for the National Register of Historic Places as part of the NCDOT's 1995 Historic Bridge Inventory Report as an early and intact example of a riveted Warren through truss, swing span bridge. Although moved from Sunset Beach to its current location in 1954, Pender County Bridge No. 16 remains in operable condition and retains c. 1930 gearing and mechanical systems. The historic boundary for the bridge includes the 254-foot long Warren through truss, operator's house, and concrete tee beam approach spans.

In a meeting between NCDOT and NC HPO on April 5, 2011 it was determined that all of the detailed study alternatives would have an adverse effect on Bridge No. 16 because it would be removed from its existing location. A copy of the concurrence form signed during the meeting is included in the Appendix C. Construction of any of the proposed alternatives would also require NCDOT to complete a Section 4(f) evaluation since it necessitates the use of land from the historic boundary associated with Pender County Bridge No. 16. These impacts, mitigation measures and associated coordination efforts are described in Section 5.3.1.

5.2.3 Archaeological Resources

In a letter dated September 11, 2007, the North Carolina Department of Cultural Resources (NCDCR) stated that there were no known archaeological sites within the PSA. Therefore, no archaeological investigations were conducted for this project.

5.3 Section 4(f) Resources

Section 4(f) of the Department of Transportation Act of 1966, as amended, (23 U.S.C. 138) states that the United States Department of Transportation (USDOT) "may not approve the use of land from a significant publicly-owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that: (1) there is no feasible and prudent alternative to the use of land from the property and (2) the action includes all possible planning to minimize harm to the property resulting from such use."

For Section 4(f), a "use" is defined as one of the following:

- A direct use – property is permanently incorporated into the right-of-way of the transportation project
- A temporary use – property is temporarily occupied in a way that is adverse to the property's purpose
- A constructive use – a use that occurs when "the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the property activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the property are substantially diminished." (23 CFR 774.15(a))

Two Section 4(f) properties exist within the PSA, including Bridge No. 16 and Soundside Park (owned and maintained by the Town of Surf City). All seven Detailed Study Alternatives would replace Bridge No. 16. These impacts, mitigation measures and associated coordination efforts are described in Section 5.3.1 below. Three of the seven Detailed Study Alternatives (6, 7, and 17) would result in temporary and/or permanent impacts to the Soundside Park. The corresponding impacts to Soundside Park and associated coordination efforts are described in Section 5.3.2 below.

5.3.1 Bridge No. 16

Although moved from Sunset Beach to its current location in 1954, Pender County Bridge No. 16 remains in operable condition and retains c. 1930 gearing and mechanical systems. As an early and intact example of a riveted Warren through truss, swing span bridge, Bridge No. 16 was determined eligible for the National Register of Historic Places. All seven Detailed Study Alternatives would replace this bridge.

Replacing Bridge No. 16 by all Detailed Study Alternatives is considered a Section 4(f) use as defined by section 4(f), thus requiring an evaluation. However, as an alternative to preparing an individual Section 4(f) evaluation, certain circumstances allow NCDOT/FHWA the option of preparing a programmatic evaluation; which includes the replacement of an historic bridge; however, in all cases, it is necessary to satisfy and confirm the following two Section 4(f) requirements:

i) There are no feasible and prudent alternatives to the use of the historic bridge structure to be replaced or rehabilitated with Federal funds; and

ii) The project includes all possible planning to minimize harm resulting from such use.

5.3.1.1 Avoidance Alternatives

No Build Alternative

As discussed in Section 3.1, the No Build Alternative (Do Nothing) would not meet the purpose of the proposed project to improve bridge safety.

Build on New Location Without Using the Old Bridge

All seven Detailed Study Alternatives would require replacing the existing bridge with a new bridge either to the north, to the south or in-place.

Repair and Rehabilitate Existing Bridge Alternative

As discussed in Section 3.2, repair/ rehabilitation alternative would increase the bridge's sufficiency rating only to 28 out of possible 100, which is substantially below the required 80 to qualify for Federal Highway Bridge Program funds. Even after the repairs, the rehabilitated bridge will remain "functionally obsolete" and be classified as "fracture critical" due to the condition of the truss swing span. Therefore, the repaired and rehabilitated bridge would not meet the purpose of the proposed project to improve bridge safety.

5.3.1.2 Measures to Minimize Harm

Currently, NCDOT is investigating options to reuse of the existing swing span at a different location. Resulting information on these options will be included in subsequent documentation.

5.3.1.3 Coordination

NCDOT met with NC HPO's representative on April 5, 2011, and concluded that all seven Detailed Study Alternatives would result in an "adverse effect" because the existing Bridge No. 16 would be removed. The draft programmatic Section 4(f) evaluation and concurrence form for effects to Bridge No. 16 are included in Appendix C.

5.3.2 Soundside Park

Soundside Park is a municipal park owned by the Town of Surf City and located adjacent to Bridge No. 16 in the southeast quadrant. The park has 45 parking spaces, boat access ramps, picnic facilities, a performance stage, a children's playground, bathroom facilities, and a boardwalk open to the public year-round.

5.3.2.1 Avoidance Alternatives

As previously stated, three of the seven Detailed Study Alternatives (6, 7, and 17) would cause a temporary and/or permanent impact to this park.

The remaining four Detailed Study Alternatives (4, 5, 5R, and 11) would completely avoid temporary or permanent impacts to park property.

5.3.2.2 Alternatives 6 and 7

Alternatives 6 and 7 require a temporary detour bridge, which will accommodate the bridge traffic during the construction of the permanent bridge. The detour bridge would temporarily impact approximately 0.4 acres of park land and require relocation of the performance stage and a picnic facility. Facilities currently located in the park's impacted area include picnic facilities and a performance stage. These facilities would not be available for public usage during the two-year construction period, resulting in temporary adverse impacts to Soundside Park and therefore considered a Section 4(f) use of the resource.

In addition to the temporary impacts, Alternatives 6 and 7 would result in 0.03 and 0.01 acres of permanent impacts to the park, respectively. This portion of the park land is undeveloped with no recreational facilities present.

On August 17, 2011, NCDOT met with the Town of Surf City officials to discuss Alternative 6 and 7's impacts to the Soundside Park. The Town officials agreed with NCDOT's determination of adverse impacts to Soundside Park. A summary of these meeting notes are included in Appendix D.

Figures 5-9 and 5-10 graphically show the temporary and permanent impacts of Alternatives 6 and 7 to the Soundside Park, respectively.

5.3.2.3 Alternative 17

During CIW#2, the community indicated significant support for alternatives terminating on the island at the NC 50/210 intersection. These alternatives included Alternative 5 and Alternative 10, each with over 40% support. Alternative 10 was subsequently eliminated due to Soundside Park impacts, and a replacement alternative, Alternative 17, was developed minimizing impacts to the park, while maintaining the NC 50/210 intersection location.

This alternative's footprint clips the southeastern corner of the park property resulting in 0.2 acres of permanent impacts (see Figure 5-11). The impacted area is undeveloped and marshy with no recreational facilities present. Park access would remain unchanged under Alternative 17. This Alternative would result in no temporary or permanent impacts to the park facilities.

Surf City Town Officials indicated at a meeting held August 17, 2011 that the impacts associated with Alternative 17 would be minimal (Appendix D). Currently, Alternative 17 is anticipated to have a *de minimis* impact as defined by section 4(f) regulations (23 CFR 774.17). Section 5.3.2.4 discusses regulations regarding *de minimis* impacts to section 4(f) resources. Following public review of the Environmental Assessment and further public involvement, a *de minimis* impact determination will be made for Alternative 17 and will be discussed in subsequent documentation.

5.3.2.4 Section 4(f) *De Minimis* Impact Background

In 2005, Congress amended Section 4(f) in its passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), specifically in Section 6009(a). An important change was the introduction of the *de minimis* procedures for processing minor impacts to Section 4(f) resources. Subsequent to the passage of SAFETEA-LU, FHWA amended the Section 4(f) regulations (23 CFR 774.3(b), 23 CFR 774.5(b) and 23 CFR 774.17) and issued guidance for determining *de minimis* findings (*Guidance for Determining De Minimis Impacts for Section 4(f) Resources)*.

Based on these regulations and guidance documents, the use of land from a publicly owned park, recreation area, or wildlife and waterfowl refuge may be determined to be *de minimis* if:

1. The transportation use of the park, together with any impact, avoidance, minimization, and mitigation or enhancement measures do not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f)
2. The official(s) with jurisdiction over the property is informed of FHWA's intent to make the *de minimis* impact finding, based on his/her written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f)
3. The public has been afforded an opportunity to review and comment on the affects of the project on the proposed activities, features, and attributes of the Section 4(f) resource

According to the provisions set forth in Section 6009(a) of SAFETEA-LU, once the USDOT determines that a transportation use of property from a Section 4(f) resource constitutes a *de minimis* impact, analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete.

5.4 Farmland

North Carolina Executive Order Number 96, Preservation of Prime Agricultural and Forest Lands requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the Natural Resources Conservation Service (NRCS). These soils are determined by the Soil Conservation Service and based on criteria, such as crop yield and level of input of economic resources. The Farmland Protection Policy Act (FPPA) requires that applicable environmental documents evaluate farmland impacts and comply with FPPA impact minimization guidelines.

Several properties are currently zoned as agricultural land use within the PSA; however, none of these properties are impacted by the seven Detailed Study Alternatives.

The NCDOT GIS Unit identified a Farmland of Unique Importance area (Figure 5-12) that may be impacted by four of the seven Detailed Study Alternatives (Alternatives 4, 5, 5R, and 11). Although identified as a GIS farmland, this area is zoned as Extended Commercial (C-3) by Surf City. During an October 9, 2011 discussion with the Planning Director, Town of Surf City, who indicated that this area had not been farmed in the last 30 years and was classified as C-3 since 1999 when it was originally annexed by Surf City.

As is required by the Farmland Protection Policy Act, Parts III and VI of the NRCS-CPA-106 form (for corridor projects) have been completed (included in Appendix E) according to FHWA guidelines. Since each of the four alternatives mentioned (4, 5, 5R, and 11) individually received total point values of less than 60 points, this site falls below the NRCS minimal criteria and will not be submitted to the NRCS and will not be evaluated further for farmland impacts. No other alternatives other than those already discussed in this document will be considered without a re-evaluation of the project's potential impacts upon farmland. This project will not have a significant impact to farmland.

5.5 Social Effects

5.5.1 Neighborhoods/Communities

As described in Chapter 2, the Demographic Study Area includes the entire 26-mile long Topsail Island, as well as Surf City's mainland limits extending west from the Intracoastal Waterway to US 17. The Town of Topsail Beach is located on the south end of Topsail Island extending approximately four miles north from the southern tip. Surf City abuts the north end of Topsail Beach and extends another five miles north to the Town of North Topsail Beach. North Topsail Beach town limits include the remaining northern part of the island.

5.5.2 Community Demographics

The population of the Demographic Study Area may be characterized as an aging, affluent, predominantly white population. The area's younger workforce is more likely to live on the mainland in Surf City, Holly Ridge, or Jacksonville, where more affordable housing is available.

According to local planners, affordable housing is scarce on Topsail Island. One affordable apartment complex was identified, Topsail Reef in North Topsail Beach. On the mainland, a number of manufactured housing parks offer affordability.

A summary of the Demographic Study Area's demographic data is provided below. Additional demographic details are provided in the project's Community Characteristics Report, dated February 2011.

- The 2007 United States Census estimates the permanent resident population of Surf City as 1,912; North Topsail Beach as 960; and Topsail Beach as 573. Between 2000 and 2007, the population growth for Surf City was 3.7%; Topsail Beach was 2.2%; and North Topsail Beach was 1.4%.

- The future population between 2010 and 2030 is estimated to grow at 2.4% per year for the three towns, while the state of North Carolina is estimated to grow at a rate of approximately 1.5% per year.

- The age profile reflects the increasing popularity of Topsail Island as a retirement community. The proportion of the population aged 65 and older is significantly higher for Topsail Island, ranging between 16.3% and 26.8% for the three towns, compared with Pender County at 5.1%, and the state at 12.0%.

- The minority population within the Demographic Study Area is small at 7.4%, and well below the county and state averages of 27.3% and 27.9%, respectively.

- The hispanic population within the Demographic Study Area is also small at 1.1%, and well below the Pender County (3.6%), Onslow County (7.2%) and state (4.7%) averages.

- Much of the Topsail Island's economy is based on leisure and development. Most retirees, seasonal residents, and vacationers are not locally employed. The majority of the island's workforce does not reside on the island. Island residents and visitors travel to the mainland for many goods and services. Similarly, many island workers travel from the mainland for retail, restaurant, and construction jobs.

- Generally, the households in the Demographic Study Area are more affluent than Pender/Onslow counties and the state overall. The median income for households in the Demographic Study Area is above county and state averages.

5.5.3 Relocation of Residences and Businesses

As shown in Table 5-9, Alternative 5R would impact highest number of properties (13 residences and seven businesses), whereas Alternative 6 would impact the least number of properties (zero residences and one business). This project would have no low income or minority property impacts. NCDOT's relocation reports are included in Appendix F.

Table 5-9: Residential and Business Relocations

Alternative No.	Residential Relocations	Business Relocations	Low Income / Minority Residential / Business Relocations
4	4	5	-
5	2	4	-
5R	13	7	-
6	-	1	-
7	-	3	-
11	4	1	-
17	1	3	-

5.5.4 Environmental Justice

Title VI of the Civil Rights Act of 1964 protects individuals from discrimination on the grounds of race, age, color, religion, disability, sex, and national origin. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," provides that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. Special populations may include the elderly, children, the disabled, low-income areas, American Indians, and other minority groups. Executive Order 12898 requires that Environmental Justice principles be incorporated into all transportation studies, programs, policies, and activities. The three environmental principles are:

1) Ensure the full and fair participation of all potentially affected communities in the transportation decision-making process
2) Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority or low income populations
3) Fully evaluate the benefits and burdens of transportation programs, policies, and activities upon low-income and minority populations

5.5.4.1 Environmental Justice Impacts

As defined by NCDOT, an Environmental Justice population is present whenever the following criteria are met:

- The non-white population or low income population is 10 percentage points higher than the county average OR;
- When either population exceeds 50 percent.

No notably adverse community impacts are anticipated with this project and no Environmental Justice populations appear to be affected; thus, impacts to minority and low income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the project are anticipated to be equitably distributed throughout the community, and no denial of benefit is expected. Public involvement and outreach activities must ensure full and fair participation of all potentially affected communities in the transportation decision-making process.

5.5.4.2 Other Populations

The Demographic Study Area analysis identified only the elderly as a special population area of concern with a higher than average concentration. Therefore, this population should be given special consideration during the environmental review process. To accommodate this elderly population, NCDOT scheduled the CIWs for longer periods and earlier in the day, beginning at 2:30 p.m./3:00 p.m. and ending at 7:00 p.m./7:30 p.m. In addition, NCDOT offered auxiliary aids and services for disabled persons who wish to participate in these workshops.

None of the Detailed Study Alternatives impact a senior housing community or an elderly assisted living facility. Residents, elderly or otherwise, of the few homes impacted can easily find replacement housing nearby. NCDOT's standard practice is to provide assistance with relocation. NCDOT also offers programs to assist with relocation moving expenses and replacement housing.

5.5.5 Bicycle and Pedestrian Facilities

The proposed project will accommodate bicycle lanes and/or sidewalks along the new bridge and roadway approach segments.

5.5.6 Recreational Facilities

Alternatives 6, 7, and 17 would impact the Soundside Park, as described in Section 5.3. No other recreational facilities would be impacted by the project alternatives.

5.5.7 Other Public Facilities and Services

Other public facilities and services include educational facilities, religious institutions, health care facilities, government offices and public safety facilities (police, fire, and rescue), cultural facilities (e.g., libraries, museums, historic sites, etc.), and parks/recreational and community center facilities. Several of these types of facilities are located throughout the Demographic Study Area, as indicated in Figures 5-1 through 5-7 and listed in Table 5-10.

None of the Detailed Study Alternatives would require relocation of any community facilities in the PSA. Four of the seven Detailed Study Alternatives would result in property impacts to the front parking area and change in access to Faith Harbor United Methodist Church. As there appears to be enough remaining parking in the property, this church would not need to be relocated.

Table 5-10: Community Facilities

Facility	Name	Location
Places of Worship	Faith Harbor United Methodist Church St. Marys Gate of Heaven Church	14201 NC 50, Surf City 420 N. Topsail Dr., Surf City
Local Historical Landmark	Topsail Island Bridge	NC 50/210, Surf City
Parks and Recreation	Soundside Park Surf City Fishing Pier	517 Roland Ave. Surf City 112 S. Shore Dr., surf City
Medical Facility	Surf City Urgent Care Facility Beach Care PA	1350 US 50, Surf City Treasure Coast Square, Surf City
Police Department	Topsail Beach Police Department Surf City Police Department	812 S Anderson Blvd. Topsail Beach 211 North Topsail Drive, Surf City
Fire Station	Surf City Fire Station Surf City Volunteer Fire Department	NC 210 at Empire N., Surf City NC 210 at Deer Run Rd., Surf City
Government Facility	Surf City Town Hall	214 N New River Dr., Surf City

Source: Field observation and discussions with local municipalities fall 2008.

5.6 Economic Effects

Businesses on the island consist of a grocery store and other local retail and restaurant businesses. These establishments service mostly the recreational beach population. Many more businesses are located on the mainland within the Demographic Study Area and include nationally recognized restaurants, pharmacies, hardware stores, grocery stores, and other businesses.

Potential economic impacts to the community include disturbance of commercial properties, increased traffic delays, interruption of economic activity/operations between the mainland and the island, and interruption of utility services. Section 5.5.3 provides a summary of the commercial property impacts.

Under the high-level fixed bridge alternatives (4, 5, 5R, 11, and 17), the existing Roland Avenue would terminate at each bridge end, serving only as a local road to area residents and businesses. This change in travel patterns could result in a loss of drive-by traffic to the existing businesses along Roland Avenue, potentially resulting in a corresponding loss of business. However, under these alternatives the new bridge would reduce the traffic delays in the area, thereby potentially improving the overall local economic activity. In addition, these alternatives would result in new development opportunities along existing Roland Avenue and adjacent bridge terminus locations.

Under Alternatives 6 and 7, the existing bridge would be replaced in place. Impacts under these alternatives include property takings and changes to the existing access; however, these two alternatives would most likely result in minimal permanent economic impacts to businesses along Roland Avenue, with only temporary impacts during construction.

5.7 Land Use

5.7.1 Existing Land Use and Zoning

The land use is generally retail/commercial development near Bridge No. 16 and mostly residential development farther from the PSA. Within the PSA, a general description of the land use is a residential townhome subdivision in the northwest quadrant; power lines in the southwest quadrant; Soundside Park in the southeast quadrant; and a seasonal manufactured housing park with adjacent restaurants in the northeast quadrant.

The Towns of Surf City and Topsail Beach completed land use plans in 2005, with the Town of North Topsail Beach's completed in 2010.

5.7.2 Future Land Use and Zoning

Future development in Surf City would be limited to redevelopment with no increase in density expected for the island. Island zoning regulations limit lot coverage to 12% of area and replacement housing to single-family dwellings no more than 48 feet in height. The zoning permits larger single-family homes, but eliminates any higher density multifamily development. On the mainland, new commercial development is occurring near the intersection of US 17 with NC 210 and at the NC 50/210 junction. No manufacturing or industrial development exists within the town.

In Topsail Beach, development over the next 20 years would be limited to in-fill housing, redevelopment of existing homes, and the re-subdividing of existing lots. Current zoning requires a minimum lot size of 5,000 square feet and height restrictions of 38 feet. The lack of sanitary sewer infrastructure would limit growth.

North Topsail Beach is more sparsely developed than the two towns to the south. Unlike the other towns, North Topsail Beach is encouraging higher density development exemplified by the vacation properties of St. Regis Resort, Villa Capriani, and Capri Isle. The 2010 "Build-Out and Non-Conforming Lot Study" counted 850 undeveloped residential lots and 24 undeveloped commercial lots in North

Topsail Beach. Zoning policy and available utility capacity encourage growth. Future land use is expected to include redevelopment of older housing and development of additional higher-density residential communities.

5.7.3 Community Character

Many of the island's residents and visitors consider the existing swing bridge an important part of the Topsail Island's character, generating social and economic activity for the area. Many citizens, along with the Town of Surf City, have requested that an in-place moveable bridge alternative of similar type be constructed to maintain the island's charm.

During the June 2009 CIW #1, several local residents expressed their concern that a high-level fixed bridge would result in substantial commercial development, changing the island's character and life style permanently. It should be noted that local zoning laws would most likely control growth potential. Results from CIW #1 indicate that over one-third of the attendees prefer for a high-level fixed bridge, citing emergency access and traffic delay reasons.

5.7.4 Visual Impacts

Directly related to the community character are the resulting visual impacts of the proposed bridge replacement. Potential visual impacts were presented at the October 2010 CIW #2 with artistic renderings. These renderings are included in Appendix G and show significant community and business features. Below is a summary of visual impacts for each Detailed Study Alternative:

5.7.4.1 Alternative 4

Alternative 4 would have a visual impact at the entrance to the Atkinson Point community, where the new structure would cross over Atkinson Point Road and to the adjacent waterfront community as it crosses the Intracoastal Waterway.

On the mainland at Atkinson Point Road, the bridge approach would form a visual barrier into the neighborhood create a short tunnel-like entranceway to the neighborhood. For the Sea Manor Drive, Harbor Sound Townhomes, and Atkinson Point communities, the high-level fixed bridge would be a distinctive addition to the viewscape; however, because the views from these neighborhoods are so expansive, the effect should be minimal except for properties directly adjacent to the structure.

The impacts to waterfront communities on Topsail Island would be minimal, as no residential community is located in the immediate vicinity of the proposed alignment.

5.7.4.2 Alternative 5

On the mainland side, the visual impacts for Alternative 5 would be similar to Alternative 4, with one exception. The exception would be a distinctive addition to the viewscape for the Harbor

Sound Townhomes and Sears Landing Grill properties, as they are located closer to the structure than under the Alternative 4.

On Topsail Island, the visual impacts on several businesses along Roland Avenue would be moderately high, as views are cut off from an RV park/campground, one waterfront restaurant, and other businesses.

5.7.4.3 Alternative 5R

Visual impacts for Alternative 5R would be similar to the Alternative 5 on the mainland and island side.

5.7.4.4 Alternative 6

Alternative 6 would have little visual impact on surrounding communities since the proposed structure is only about five feet higher than the existing bridge and is in the same location.

5.7.4.5 Alternative 7

Under Alternative 7, the proposed structure is about 15 feet higher than the existing bridge and is in the same location. This higher structure would have a visual impact to the Harbor Pointe Townhomes, RV park/campground, and other adjacent businesses relative to the height increase.

5.7.4.6 Alternative 11

Alternative 11 would have a visual impact at the Little Kinston Road, Diamond Point, and other waterfront communities, as the new structure crosses over Little Kinston Road and the Intracoastal Waterway to the south of the existing bridge.

On the mainland at Little Kinston Road, the bridge approach would form a visual barrier into the neighborhood and the structure would create a short tunnel-like entranceway. For the Diamond Point community, the high-level fixed bridge would be a distinctive addition to the landscape; however, because the views from these neighborhoods are so expansive, the effect should be minimal except for the properties directly adjacent to the structure.

The impacts to waterfront communities on Topsail Island should be minimal, as no residential community is located in the immediate vicinity of the proposed bridge approach.

5.7.4.7 Alternative 17

Alternative 17 would have a minor visual impact at the waterfront communities where the new structure crosses over the Intracoastal Waterway to the south of the existing bridge.

On the mainland along Roland Avenue at Little Kinston Road, the alignment would have a minimal effect as the approach and structure would be behind businesses and on vacant property. Because the views from these neighborhoods are so expansive, the effect should be minimal except for the properties directly adjacent to the structure.

The impacts to waterfront communities on Topsail Island should be minimal, as no residential community is located in the immediate vicinity of the proposed bridge approach.

The view from Soundside Park would be affected by the proximity of the structure at the back of the park; however, impacts to the park are considered minimal because of the expansive views in the area.

5.7.5 Project Compatibility with Local Plans

NCDOT's Transportation Planning Branch developed the Topsail Area CTP. The CTP, adopted by the NCDOT Board of Transportation in November 2009, lists replacement of Bridge No. 16 as an important element in meeting transportation needs and providing access for the area residents.

Roadway improvement projects shown in the CTP do not conflict with any of the seven Detailed Study Alternatives under study.

5.8 Indirect and Cumulative Effects

The indirect effects of the proposed project on future land use were determined using NCDOT pre-screening methodology. The categories listed in the Indirect and Cumulative Effects (ICE) Screening Tool have been shown to influence land development decisions in numerous areas statewide and nationally. Each characteristic is assessed individually and the results are reviewed collectively to determine the potential indirect and cumulative effects of the proposed project. Each of the following categories is weighted according to its importance in affecting land use changes: project scope and changes in accessibility are highly influential; public policy and environmental features moderately influential; and population and employment growth, available land, water/sewer availability and market for development have the least influence.

5.8.1 Indirect Summary Statement

All seven Detailed Study Alternatives have been assessed as "Not Likely," reflecting the fact that the project replaces an existing structure close to its existing location, which is unlikely to significantly affect the surrounding community beyond the project limits.

The proposed project is expected to have an insignificant effect on forecasted population and employment growth. In addition, given the limited land for development and public policies/environmental regulations limiting growth, the proposed bridge replacement project would have limited effects on the Topsail Island development. The following are the factors expected to be

affected by the proposed project and their degree of impact. More detailed analysis is provided in the project's Indirect Land Use Screening Report, dated August 2011.

5.8.2 Alternatives 4, 5, and 5R

Indirect Land Use impacts for Alternatives 4, 5, and 5R (Northern Alternatives Group) are rated as "Not Likely."

5.8.2.1 Scope of Project

The project is a minor bridge replacement project and is expected to have a minor impact on development potential only near the bridge approaches.

5.8.2.2 Change in Accessibility

A high-level fixed bridge would reduce travel times by an average of two to three minutes for most of the motorists and about five minutes for some motorists, who are delayed for bridge openings today.

5.8.2.3 Available Land

Undeveloped land is available in Surf City (on the mainland) and North Topsail Beach that may benefit from the proposed bridge replacement project.

5.8.2.4 Water/Sewer Availability

Surf City and North Topsail Beach have sufficient sewer capacity to support additional development.

5.8.2.5 Market for Development

Current development is occurring in the northern part of Topsail Island closer to the North Topsail Beach Bridge. On the mainland, development is occurring along NC 50/210 away from Bridge No. 16.

5.8.2.6 Public Policy

The Town of North Topsail Beach encourages development with its policies. Surf City encourages development on the mainland. Topsail Beach discourages new development.

5.8.2.7 Environmental Features

Although no targeted or threatened resources would be impacted by these alternatives, the project crosses wetlands and a high quality water zone.

5.8.3 Alternatives 6 and 7

Indirect Land Use impacts for the Alternatives 6 and 7 (Central Alternatives Group) are rated as "Not Likely."

5.8.3.1 Scope of Project

The project is a minor bridge replacement project and is expected to have little impact on surrounding development potential.

5.8.3.2 Change in Accessibility

As the vertical navigational clearance is increased under these alternatives, travel times would be slightly reduced for some motorists, who are delayed for bridge openings today.

5.8.3.3 Available Land

Undeveloped land is available in Surf City on the mainland that may benefit slightly from the Central Alternatives Group.

5.8.3.4 Water/Sewer Availability

Surf City has sufficient sewer capacity to support additional development.

5.8.3.5 Market for Development

There is a limited market for development in Surf City on Topsail Island. On the mainland, development is occurring along NC 50/210 away from Bridge No. 16.

5.8.3.6 Public Policy

Surf City encourages development on the mainland.

5.8.3.7 Environmental Features

Although no targeted or threatened resources would be impacted by these alternatives, the project crosses wetlands and a high quality water zone.

5.8.4 Alternatives 11 and 17

Indirect Land Use impacts for the Alternatives 11 and 17 (Southern Alternatives Group) are rated as "Not Likely."

5.8.4.1 Scope of Project

The project is a minor bridge replacement project and is expected to have a minor impact on development potential near the bridge approaches.

5.8.4.2 Change in Accessibility

A high-level fixed bridge would reduce travel times by an average of two to three minutes for most of the motorists and about five minutes for some motorists, who are delayed for bridge openings today.

5.8.4.3 Available Land

There is little undeveloped land near the bridge approaches on Topsail Island and some available land on the mainland.

5.8.4.4 Water/Sewer Availability

Surf City has sufficient sewer capacity to support additional development; Topsail Beach has limited capacity.

5.8.4.5 Market for Development

Little or no vacant land is available for development in the southern part of Topsail Island. On the mainland, land is available for development along NC 50/210. However, current development is occurring along NC 50/210 farther from Bridge No. 16.

5.8.4.6 Public Policy

Surf City encourages development on the mainland; Topsail Beach discourages development.

5.8.4.7 Environmental Features

Although no targeted or threatened resources would be impacted by these alternatives, the project crosses wetlands and a high quality water zone.

5.8.5 Cumulative Effects Summary Statement

Over the past decade, there has been limited public and private activity, including transportation and other infrastructure improvements, in the Future Land Use Study Area (FLUSA). The FLUSA study is the area surrounding the project that could be indirectly affected as a result of the proposed project and other actions. This study area encompasses all of the areas examined for potential increases in development pressure as a result of project construction. Although it is the focus for data collection and analysis contained within this report, it is not meant to infer that land use effects will be felt throughout the FLUSA (See Figure 5-13).

Past Transportation Projects: Recent transportation activity including upgrading US 17 and the opening of segments of Interstate 140 in Wilmington have reduced travel time between Topsail Island and Wilmington to less than an hour. No other roadway improvement project has occurred within the FLUSA in the last five years.

Future Transportation Projects: The NCDOT 2011-2020 STIP lists the proposed Bridge No. 16 replacement project (B-4929) as the only funded major highway project in the PSA. One feasibility study (FS-0703A) is listed in the STIP and consists of the widening of a 5.3-mile section of NC 210 from US 17 to Bridge No. 16. The nearest funded major STIP project is Hampstead Bypass (R-3300), which proposes construction of a fourteen-mile bypass from US 17 in New Hanover County to US 17 north of Hampstead in Pender County.

5.8.5.1 Past Development Projects

In Surf City, several development projects on the mainland that were approved earlier were under construction in 2011 or completed. The Promenade, an entertainment complex with 83,000 square feet of retail/ commercial space located at the intersection of NC 50 and NC 210, is under construction. On NC 210 near US 17, a new Harris Teeter supermarket opened recently and the Cape Fear Community College is planning to break ground on an extension in 2012. Several housing developments whose construction stalled during the recession have restarted construction, including Dogwood Lakes (about 50% of 130 lots vacant) and Turtle Creek (about 390 of 422 lots vacant). A new turtle rescue center and a 144- unit multi-family housing development are planned for construction on Charlie Medlin Drive on the mainland.

In the Town of Topsail Beach, development has been limited to in-fill housing, redevelopment of existing homes and the re-subdividing of existing lots.

Recent development in North Topsail Beach includes the higher density residential projects of St. Regis Resort, Villa Capriani, and Capri Isle. In 2010 the only new development projects were permits issued for 15 individual homes scattered throughout the Town.

5.8.5.2 Future Development Projects

Future growth is expected to remain sporadic. The amount of development is not expected to be affected by any of the proposed bridge replacement alignments; rather some vacation-oriented commercial development may choose to locate in the vicinity of the proposed project.

5.8.5.3 Notable Environmental Resources

The study area lies in the coastal plain physiographic region of North Carolina. Topography in the project vicinity varies from nearly level to gently rolling. Elevations in the study area range from 5' to 30' above sea level. Two ponds with a combined area of 2.7 acres are located within the immediate vicinity of the study bridge. Water resources in the study area are part of the Lower Cape Fear River Basin. The DWQ's maps for this area show three jurisdictional streams, Topsail Sound, Old Mill Creek, and one unnamed tributary to Topsail Sound. Topsail Sound and Old Mill Creek are classified as High Quality Waters (HQW). These maps show occurrences of impaired waters in FLUSA. Majority of the FLUSA is located in No Discharge Zone. No waters classified as Water Supply Watershed Critical/Protected Areas or ORW exist in the FLUSA. There are several wetlands associated with these surface waters in the FLUSA.

5.8.5.4 Impacts on Environmental Resources

Due to the location of wetlands, streams, and surface waters within the FLUSA, avoidance of all jurisdictional impacts is not possible. During preliminary design, NCDOT has implemented best efforts to avoid and minimize impacts to several wetlands. Wherever possible, wetlands were bridged and the alignments were shifted to minimize impacts. The approved jurisdictional delineation would be utilized to minimize wetland impacts of the preferred alternative during final design. Utilization of BMP's would be coordinated in an effort to minimize impacts, including avoidance of construction staging areas within wetlands. Avoidance, minimization, and mitigation measures that may be implemented later in the design process in consultation with the USACE are described in Section 5.1.2.4 of this document.

Twelve federally protected species were identified in Pender County. The biological conclusion for all twelve species were categorized as not required, no effect, may affect- "Not Likely" to adversely affect. The National Marine Fisheries Service has identified Topsail Sound as an Essential Fish Habitat but the proposed project is likely to result in negligible net effect on the habitat.

5.8.5.5 Cumulative Effects Summary

The amount of development is not expected to be affected by any of the proposed bridge replacement alignments; rather some vacation-oriented commercial development may choose to locate in the vicinity of the proposed project rather than near the current alignment. The project will not contribute to cumulative impacts to any transportation or land use development project.

Direct project impacts to environmental resources will be addressed programmatically later in the merger and permitting processes in consultation with the natural resource agencies. This project is not expected to notably contribute to indirect or change in land use effects, and therefore should not result in notable cumulative impacts to threatened, impaired, or endangered natural resources in the context of all other past, present, and future actions by all parties. The direct natural environmental impacts by NCDOT projects would be addressed by avoidance, minimization, or mitigation, consistent with programmatic agreements with the natural resource agencies during the Merger and Permitting processes.

5.9 Flood Hazard Evaluation

The state of North Carolina, through the Federal Emergency Management Agency's (FEMA's) Cooperating Technical Community partnership initiative, was designated as the first Cooperating Technical State (CTS). As a CTS, the state has assumed primary ownership and responsibility of the Flood Insurance Rate Maps (FIRM) for all North Carolina communities (except Mecklenburg County) as part of the National Flood Insurance Program (NFIP). This effort includes conducting flood hazard analyses and producing updated, digital FIRMs (DFIRM). DFIRM data for Topsail Island area was downloaded from the North Carolina Floodplain Mapping Program (NCFMP) website and is shown in Figure 5-14. This data defines floodway boundaries as a tool for floodplain management. Based on this data, the entire PSA is in either a 100-year floodplain (Zone AE), an outside 500-year floodplain (Zone X), or a Coastal Base flood zone (Zone VE).

The new structure would only require footings to be placed within the Intracoastal Waterway (Topsail Sound). Given this limited in-water construction work, the proposed project would most likely result in a negligible net effect on these flood hazard zones. A more detailed impact analysis will be performed during the project's final hydraulic design. NCDOT will coordinate with FEMA and local authorities to ensure compliance with applicable floodplain ordinances.

5.10 Traffic Operations Analysis

This traffic operations analysis included capacity analysis of 14 study intersections under all seven Detailed Study Alternatives (4, 5, 5R, 6, 7, 11, and 17). The traffic operations analysis report documents the future traffic flow conditions to determine if there is sufficient capacity to meet the existing and future travel demand and further recommends improvements to the area roads as warranted by the proposed bridge replacement.

As indicated in Chapter 2 of this document, the project-specific traffic forecasts (dated November 2010) indicated that the traffic demand along the Bridge No. 16 would increase from 12,000 vpd (2010 Existing Conditions) to 29,100 vpd (2035 Future Conditions), increasing at a rate of approximately 6% per year.

In general, two-lane roadways with similar geometry and land use conditions have a capacity of approximately 18,000 to 20,000 vpd. Therefore, the 2035 Future Conditions forecasted traffic demand would be almost 150% of the existing roadway capacity. However, based on preliminary evaluations of environmental impacts and construction costs, NCDOT recommends a two-lane bridge only (one lane in each direction). This two-lane typical section would result in several intersections in the PSA experiencing congestion during peak hours. It should also be noted that congestion would be most prevalent during Topsail Island's peak vacation months of May through September.

Alternatives 6 and 7 would exceed the existing 13 feet VNC. The additional VNC would allow more vessels to pass underneath with fewer bridge openings, thereby improving overall vehicular traffic flow conditions in the Demographic Study Area.

Alternatives 4, 5, 5R, 11, and 17 would replace the existing bridge with a new high-level fixed bridge with 65 feet of VNC. For these high-level alternatives, all vessels would pass unimpeded with no bridge openings, thereby improving overall traffic flow conditions when compared with the existing swing bridge conditions or the other moveable bridge alternatives. The alignments of Alternatives 4 and 11 terminate at new locations on the island and are located approximately 1,100 feet north and 1,500 feet south of existing Roland Avenue, respectively. These new island terminus intersections result in changes in travel patterns between existing Roland Avenue and the new intersections. Alternative 5, 5R, and 17 each tie to existing Roland Avenue on the island and have been designed with a roundabout terminus intersection to improve traffic flow. Specifically, Alternative 17 would simplify the travel patterns on the island side by connecting the new bridge, NC 210, and Topsail Drive approaches to one roundabout intersection location.

Table 5-11 presents a summary of the overall intersection Level of Service under each Detailed Study Alternative. All seven Detailed Study Alternatives would result in similar traffic flow conditions during peak hours.

Figures 5-15 through 5-19 show the peak hour intersection traffic volumes and Level of Service for all seven Detailed Study Alternatives, respectively. More detailed traffic operations analysis is provided in the project's Traffic Operations Analysis Report, dated June 2011.

Table 5-11: 2035 Intersection Level of Service Summary

Intersection	Node ID*	Traffic Controller	2035 Intersection Level of Service (AM/PM Peak Hour)				
			Alt 4	Alt 5&5R	Alt 6&7	Alt 11	Alt 17
NC 50/Roland Avenue at NC 210/Belt Road	100	Signal	**F/F**	**F/F**	**F/F**	**F/F**	**F/F**
NC 50/210 at J H Batts Road	200	Stop Sign	**F/F**	**F/F**	**F/F**	**F/F**	**F/F**
NC 50/210 at Roland Avenue (new tie-in)	301	Stop Sign	**F/F**	**F/F**	--	**F/F**	A/A
Roland Avenue at Little Kinston Road	300	Stop Sign	B/B	B/B	**F/F**	B/B	**F/F**
Roland Avenue at New River Drive/NC 210	400	Stop Sign	**F/F**	--	**F/F**	**F/F**	C/C
		Roundabout	--	**F/E**	--	--	--
NC 50/210 at New River Drive/Topsail Drive	401	Roundabout[+]	--	**--**	--	--	**F/F**
Roland Avenue at Topsail Drive/NC 50	500	Signal	C/C	**E/E**	**F/F**	C/C	C/C
New River Drive at Greensboro Avenue	600	Stop Sign	**E/E**	B/B	B/B	B/B	B/B
New River Drive at Goldsboro Avenue	700	Stop Sign	--	C/C	C/C	C/B	C/C
		Signal	**F/F**	--	--	--	--
New River Drive at New Bern Avenue	800	Stop Sign	B/B	B/B	B/B	B/B	B/B
Topsail Drive at Greensboro Avenue	900	Stop Sign	B/B	B/B	B/B	B/B	B/B
Topsail Drive at Goldsboro Avenue	1000	Stop Sign	B/B	B/B	B/B	B/B	B/B
Topsail Drive at New Bern Avenue	1100	Stop Sign	B/B	B/B	B/B	B/B	B/B
Topsail Drive at Kinston Avenue	1200	Stop Sign	**F/F**	**F/F**	**F/F**	**F/F**	**F/F**
Topsail Drive at Raleigh Avenue	1300	Stop Sign	D/C	D/C	D/C	**F/F**	D/C
NC 50/210 at Topsail Drive	1301	Signal[++]	--	--	--	**E/D**	--
Topsail Drive at Charlotte Avenue	1400	Stop Sign	D/C	D/C	D/C	D/D	D/C

*ID used in figures 5-15 through 5-19

[+] Node 401 represents a new roundabout under Alternative 17. This intersection would not exist under other alternatives.

[++] Node 1301 represents a new signal under Alternative 11. This intersection would not exist under other alternatives.

5.11 Traffic Noise Analysis

5.11.1 Title 23 Code of Federal Regulations, Part 772 (23 CFR 772)

FHWA has developed Noise Abatement Criteria (NAC) and procedures for the planning and design of highways. The purpose of 23 CFR, Part 772 is:

> "…to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to Title 23 United States Code."

The abatement criteria and procedures are set forth in Title 23 CFR Part 772, which also states:

> "…in determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit."

5.11.2 NCDOT Traffic Noise Abatement Policy

The NCDOT Traffic Noise Abatement Policy, effective July 13, 2011, establishes official policy on highway noise. This policy describes the NCDOT process that is used in determining traffic noise impacts and abatement measures, as well as the equitable and cost-effective expenditure of public funds for traffic noise abatement. This policy applies to all Type I (new location or substantial horizontal/vertical alteration) federal, state, or federal-aid highway projects in the state of North Carolina, including federal projects that are administered by local public agencies. NCDOT does not participate in, nor fund, Type II (retrofit) projects. Noise analyses are not required for Type III (federal or federal-aid highway projects that do not meet the classifications of Type I or Type II) projects.

5.11.3 Ambient Noise Levels

Ambient noise is sound that is considered typically present in a particular area and that is all around us caused by natural and manmade events. Ambient noise includes household devices, commercial operations, grass mowing, and natural events, such as wind and thunderstorms. Traffic noise from NC 50/210 is the dominant noise source for receptors in the PSA.

For this traffic noise analysis, ambient noise monitoring data was collected at nine receptor locations in three noise sensitive areas. Loudest-hour existing noise levels were assessed to be either the Traffic Noise Model software (TNM)-predicted loudest-hour traffic noise levels or the ambient noise levels obtained at representative locations in the field.

5.11.4 Predicting Future Noise Levels

In accordance with industry standards and accepted best practices, detailed computer models were created using the FHWA Traffic Noise Model® (TNM v.2.5). Predicted traffic noise levels were validated to be within ±1.7 dB(A) at four ambient noise monitoring receptor locations. The validated TNM models were used to predict traffic noise levels at 360 modeled receptor locations in the vicinity of the seven Detailed Study Alternatives.

5.11.5 Traffic Noise Impacts

The two categories of traffic noise impacts are defined as 1) those that "approach" or exceed the FHWA Noise Abetment Criteria (NAC) and 2) those that represent a "substantial increase" over existing noise levels as defined by NCDOT. An impact that represents a "substantial increase" is based on a comparison of the existing noise level ($L_{eq(h)}$) with the predicted increase with respect to a change to noise levels in the design year of between 10 and 15 dB(A) or more.

Existing traffic noise does not impact any receptors in the vicinity of the PSA. All Design Year 2035 traffic noise impacts are predicted to occur as a result of loudest-hour equivalent noise levels that will meet or exceed NCDOT NAC thresholds. There are no predicted impacts that will occur as a result of a substantial increase over existing noise levels in the 2035 Design Year. The No Build condition is predicted to impact 18 noise receptors. The seven Detailed Study Alternatives are predicted to result noise impacts as shown below and in Figure 5-20.

- Alternative 4 – 16 impacts
- Alternatives 5 and 5R – 14 impacts
- Alternatives 6 and 7 – 16 impacts
- Alternative 11 and 17 – 18 impacts

5.11.6 Potential Traffic Noise Abatement Measures

FHWA and NCDOT require that feasible and reasonable measures be considered to mitigate noise impacts at the impacted receptors. Noise abatement measures must be considered for all receptors that are predicted to experience a noise impact. Measures considered include highway alignment selection, traffic systems management, vegetation, buffer zones, proper use of land controls, noise walls, and earth berms.

The preliminary analysis indicates that noise abatement measures, such as highway alignment selection, traffic system management measures, buffer zones, vegetation, and proper use of land controls, would not be practical and/or cost-effective.

The degree to which the access to the NC 50/210 highway will be uncontrolled in the vicinity of the predicted impacted receptors will prevent any noise barriers from meeting applicable feasibility or reasonableness criteria. Further investigation of potential traffic noise mitigation measures is not warranted in conjunction with the proposed bridge replacement project.

5.11.7 Construction Noise

Generally, low-cost and easy-to-implement construction noise control measures should be incorporated into the project plans and specifications (e.g. work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of “tail gate banging,” ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication/rapport).

5.11.8 Traffic Noise Analysis Summary

The traffic noise impacts are predicted as described in Section 5.11.5 above. However, based on this study, traffic noise abatement is not recommended and no noise abatement measures are proposed. During the construction, all reasonable efforts should be made to minimize exposure of noise sensitive areas. This analysis completes the traffic noise requirements of the Title 23 CFR Part 772 and NCDOT Traffic Noise Abatement Policy. Unless modifications to presently considered alignments occur, additional alignments are considered, or changes to Design Year 2035 traffic volumes are predicted, no additional noise reports are necessary for this project. More detailed traffic noise analysis is provided in the project’s Traffic Noise Analysis Report, dated July 2011.

5.12 Air Quality Analysis

Air pollution originates from various sources, with emissions from industry and internal combustion engines being the most prevalent sources. The impact from highway construction ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO), hydrocarbons (HC), particulate matter (PM), sulfur dioxide (SO_2), and lead (Pb) (listed in order of decreasing emission rate).

5.12.1 Attainment Status

The proposed bridge replacement project is located in Pender County, which has been determined to comply with the National Ambient Air Quality Standards (NAAQS). This project is located in an attainment area; therefore, 40 CFR Parts 51 and 93 are not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

5.12.2 Carbon Monoxide

Automobiles are considered the major source of CO in the PSA. To determine the ambient CO concentration at a receptor near a highway, two concentration components are used: local and background. The local concentration is defined as the CO emissions from cars operating on highways in the near vicinity (i.e., distances within 400 feet) of the receptor location. The background concentration is defined by the NCDENR as "the concentration of a pollutant at a point that is the result of emissions

outside the local vicinity; that is, the concentration at the upwind edge of the local sources." A microscale air quality analysis is performed to determine future CO concentrations resulting from the proposed highway improvements. "CAL3QHC – A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections" is used to predict the CO concentration near sensitive receptors. In accordance with 40 CFR 93.126, this project is an air quality neutral project. It is not required to be included in the regional emissions analysis (if applicable) and a project level CO analysis is not required.

5.12.3 Mobile Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/ncea/iris/index.html). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1, 3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE 6.2 model, even if vehicle activity in vehicle-miles travelled (VMT) increases by 145% as assumed, a combined reduction of 72% in the total annual emission rate for the priority MSAT is projected from 1999 to 2050.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

5.12.3.1 NEPA Context

NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. NEPA requires and FHWA is committed to the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA is prescribed by regulation in 23 CFR § 771.

5.12.3.2 Analysis of MSAT in NEPA Documents

FHWA developed a tiered approach for analyzing MSAT in NEPA documents, depending on specific project circumstances. FHWA has identified three levels of analysis:

1. No analysis for projects with no potential for meaningful MSAT effects
2. Qualitative analysis for projects with low potential MSAT effects
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

For projects warranting MSAT analysis, the seven priority MSAT should be analyzed. This project is included in level 2, previously described.

5.12.3.3 Qualitative MSAT Analysis

For both No Build and Build Alternatives (seven Detailed Study Alternatives), the amount of MSAT emitted would be proportional to VMT, assuming that other variables, such as fleet mix, are the same for each alternative. Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year because of EPA's national control programs that are projected to reduce annual MSAT emissions by 72% from 1999 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future for virtually all locations. Consequently, higher levels of MSAT are not expected from the selected Build Alternative compared to the No Build.

Certain project alternatives will move some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the selected alternative of NC 50/210. However, the magnitude and the duration of these potential increases compared to the No

Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for any of the Build Alternatives could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

5.12.3.4 Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, www.epa.gov/ncea/iris/index.html). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including HEI. Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease (Sources: pubs.healtheffects.org/view.php?id=282; pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by

technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's MOVES model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study (www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country - three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with National Ambient Air Quality Standards for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings (Sources: www.epa.gov/risk/basicinformation.htm#g ; pubs.healtheffects.org/getfile.php?u=395).

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks

from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable. Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

5.12.3.5 MSAT Conclusion

What we know about mobile source air toxics is still evolving. As the science progresses FHWA will continue to revise and update this guidance. To that end we expect that a number of significant improvements in model forecasting and air pollution analysis guidance with the MOVES model and the issuance of the PM 2.5 Hot Spot Modeling Guidance released by EPA.

5.12.4 Other Emissions

As a result of the recent laws/amendments or changes in auto industry technology, it is expected that this project would not cause the NO, HC, PM, SO_2, or PB to exceed NAAQS.

5.12.5 Burning of Debris

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition, or other operations will be removed from the project, burned, or otherwise disposed of by the contractor. Any burning will be done in accordance with applicable local laws and ordinances, as well as regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to ensure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance. During construction, measures will also be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents. This evaluation completes the assessment requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

5.12.6 Air Quality Summary and Results

The proposed bridge replace project will not add substantial new capacity or create a facility that is likely to meaningfully increase emissions. Therefore, this project would not cause any adverse effects to

the air quality of this attainment area. More detailed air quality analysis is provided in the project's Air Quality Analysis Report, dated July 2011.

5.13 Utilities

NCDOT estimated that Alternatives 6 and 7 would have the highest utility relocation and construction costs ($12.8 million), and Alternative 17 would have the least utility relocation and construction costs ($1.3 million). The remaining four alternatives would result in utility relocation and construction costs ranging between $1.5 and $1.9 million. More detailed information about this is provided in the project's Utility Estimate Worksheets, dated June 2011.

5.14 Hazardous Material

NCDOT conducted a field reconnaissance survey in February 2009 to identify properties within the PSA that are or may be contaminated by hazardous materials or waste, thus resulting in increased project costs and possible future liability if acquired by NCDOT. Hazardous areas of concern may include, but are not limited to, active and abandoned underground storage tank (UST)/above ground storage tank (AST) sites, hazardous waste sites, regulated landfills, and unregulated dumpsites. Based on this field survey and Geographic Information System (GIS) information, NCDOT identified five possible sites with petroleum UST/AST in the PSA, as shown in Table 5-12.

NCDOT also performed a preliminary evaluation of the seven Detailed Study Alternatives and their impacts on the hazardous material sites in the PSA. Through this evaluation, NCDOT concluded that four of the five sites would be impacted by one or more of the Detailed Study Alternatives. However, the Detailed Study Alternatives would result in limited low monetary and project scheduling impacts. Table 5-12 provides a summary of the hazardous material impacts for each of the seven Detailed Study Alternatives. More detailed information about this is provided in the project's Geotechnical Report, dated May 2011.

Table 5-12: Hazardous Sites

No.	Facility ID	Property Name and Address	Property Owner	UST Owner	Impact Level	Impacted Detailed Study Alternatives
1	0-018732	One Stop Bait & Tackle 805 Roland Ave Surf City, NC 28445	Mary Connor	Preston Warren	Low	Alternatives 6, 7
2	N/A	Beach House Marina 412 Roland Ave Surf City, NC 28445	Beach House Marina, LLC	Beach House Marina, LLC	Low	Alternative 17
3	N/A	Batt's Grill 306 Roland Ave Surf City, NC 28445	Kenneth & Libby Batts	Marine Oil Co., Inc.	Low	Alternatives 5, 5R, 17
4	0-000121	Atlantic Food Mart 301 Roland Ave Surf City, NC 28445	David Wayne Lanier, et al	Worsley Companies, Inc.	Low	Alternatives 5R, 17
5	N/A	Hot Diggity Dogz 103 S. Shore Drive Surf City, NC 28445	Archie D. Christopher	N/A	Low	--

5.15 Summary of Environmental Effects

Table 5-13 provides a summary of the environmental effects discussed in this section.

This information will be presented to the community, as well as federal, state, and local project stakeholders at the corridor public hearing. Subsequent to the corridor public hearing, a recommended alternative will be identified based on the design information prepared and public outreach comments received. This recommended alternative will be presented to the Merger Team at the CP 3 meeting. At this meeting, the LEDPA/Preferred Alternative will be chosen.

Table 5-13: Detailed Study Alternatives Environmental Effects Summary

Category	Alt 4	Alt 5	Alt 5R	Alt 6	Alt 7	Alt 11	Alt 17
Project Description							
Project Length (miles) - including permanent bridge length	1.1	1.0	1.0	0.5	0.5	1.1	0.9
Permanent Bridge Length (ft) - fixed length/moveable length	4,250	4,076	4,054	319/201	819/201	4,180	3,725
Detour Bridge Length (ft) - fixed length/moveable length	-	-	-	1,331/156	1,331/156	-	-
Human Environment Effects							
Community Facilities Impacted	-	-	-	-	-	-	-
Church (Faith Harbor United Methodist Church - property only)	1	1	1	-	-	1	-
Total Residential Relocations (number)	4	2	13	-	-	4	1
Total Business Relocations (number)	5	4	7	1	3	1	3
Property Only (number)	32	38	32	18	18	30	43
Low Income / Minority Residential/Business Relocations	-	-	-	-	-	-	-
Physical Environment Effects							
Section 4(f) Resources Soundside Park property impacts -- permanent/temporary (acres)	-	-	-	0.03[+]/0.4[*]	0.01[+]/0.4[*]	-	0.2[++]
Bridge No. 16 (also recognized as a Historic Architecture Resource)	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect
Farmlands	-	-	-	-	-	-	-
Archaeological Sites	TBD[**]	TBD[**]	TBD[**]	TBD[**]	TBD[**]	TBD[**]	TBD[**]
Known or Potential Hazardous Material Sites (number)	-	1	2	1	1	-	3
Superfund Sites	-	-	-	-	-	-	-
Natural Environment Effects							
Ponds	-	-	-	-	-	-	-
Stream Crossings (number)[#]	2	2	2	1	1	1	1
Wetlands: non-riparian/CAMA (acres)	1.1/ -	1.1/ -	1.1/ -	- /0.3	- /0.1	1.0/-	0.8/ 0.4
Federally Protected Species	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]	MA/NLAA[***]
Costs ($M 2011)							
Construction Costs (includes relocation costs for water and sewer utilities)	$51,100,000	$48,800,000	$48,500,000	$50,200,000	$55,900,000	$50,200,000	$44,600,000
Utility Pole Relocation Costs	$939,090	$1,361,538	$1,430,662	$12,580,030	$12,580,030	$1,040,170	$1,015,778
Right-of-Way Costs	$12,625,000	$13,975,000	$22,250,000	$4,975,000	$6,875,000	$9,925,000	$8,125,000
Sub Total	$64,664,090	$64,136,538	$72,180,662	$67,755,030	$75,355,030	$61,165,170	$53,740,778
Bridge Operations and Maintenance Costs (75 Years)	$3,631,500	$3,631,500	$3,631,500	$25,964,500	$25,964,500	$3,631,500	$3,631,500
Total	$68,295,590	$67,768,038	$75,812,162	$93,719,530	$101,319,530	$64,796,670	$57,372,278

Note: Impacts are calculated from slope stake to slope stake, plus an additional 25 feet outside of each limit as determined from the May, 2011 preliminary design plans for each alternative.

[+] Represents fill slope impacts to the northern side of Soundside Park.
* Represents temporary impacts to Soundside Park as a result of the detour bridge.
[++] Represents minimal impacts to the southern end of Soundside Park.
[**] To be determined based on surveys to be completed after LEDPA/Preferred Alternative is chosen
[#] Both streams in the Project Study Area will be bridged, therefore no permanent stream impacts are anticipated.
[***] MA/NLAA – May Affect/Not Likely to Adversely Affect the following two species: West Indian manatee (Trichechus manatus) and Loggerhead sea turtle (Caretta caretta)

Chapter 6

Public Involvement and Agency Coordination

6.0 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

6.1 Public Involvement

6.1.1 Mailing List and Newsletters

A mailing list of approximately 9,600 citizens and property owners; federal, state, and local environmental regulatory/resource agencies; local elected officials and governmental agencies; and interested persons was developed and continuously updated throughout the project development process. To date, NCDOT mailed four newsletters, which are included in Appendix H.

6.1.2 Phone and Email Correspondence

A project-specific toll-free hotline (1-877-392-5996) and an email address (topsailislandbridge@rsandh.com) were established at the onset of project development. To date, the dedicated phone number and email address have resulted in over 100 correspondences from the community.

6.1.3 Project Website

A project-specific public webpage was established at the onset of project development (http://www.ncdot.gov/projects/TopsailIslandBridge). This webpage provided information concerning the project's history, development process, contact information, as well as frequent updates of various public outreach activities, including information presented at CIWs.

6.1.4 Media

Notices of CIWs were posted in the local media. The project has been actively reported about by several local newspapers and television stations.

6.1.5 Citizens Informational Workshop #1

CIW #1 was conducted on June 25, 2009, in the Surf City Community Center. More than 350 citizens attended. Citizens were shown a voice-over PowerPoint presentation followed by a series of aerial mapping boards of the project site. Four stations were available and citizens interacted with NCDOT team members. Many citizens drew their alignment suggestions onto the aerial mapping. Citizens completed 170 comment cards and other comments were received via phone calls, email, or regular mail prior to and subsequent to the meeting. The comments have been categorized and tallied to provide an overall picture of the responses and the corresponding citizens' preferences.

6.1.6 Citizens Informational Workshop #2

A similar outreach location and format was chosen for CIW #2, conducted on October 21, 2010, with a Local Officials Meeting held immediately prior to the workshop. A series of maps displayed the 16 functional design alternatives with corresponding artistic renderings. For easier comparison, the study alternatives were divided into three groups, including alternatives north of existing location, at the existing location, and south of existing location.

More than 300 citizens attended CIW #2, from which over 200 questionnaire/comment cards were collected. Other comments were received via phone calls, email, or regular mail prior to and subsequent to the meeting.

6.2 Public Hearing

NCDOT will conduct a corridor public hearing following public circulation of the EA document. During this meeting, NCDOT will present the detailed designs and associated impacts for the seven Detailed Study Alternatives. The attendees will be invited to provide oral or written comments regarding the proposed project. Subsequent to the corridor public hearing, NCDOT will identify a recommended alternative based on the design information prepared and public comment.

6.3 Project Initiation

During project initiation, NCDOT provided "start of study" letters to the following federal, state and local agencies. Written comments were received and considered from agencies noted with an asterisk (*) during the preparation of this EA. These "start of study" letters, along with the agencies' initial concerns, are included in Appendix B.

- USACE
- USCG, 5th District
- USEPA
- * USFWS
- NMFS
- * NCDENR
- * NCDCM
- North Carolina State Clearing House
- * NCDCR
- North Carolina Department of Public Instruction
- * NCDWQ
- * NCWRC
- NCNHP
- Region "O" Planning Agency
- NCDOT Division 3 Board Member
- * Mayor of Town of Surf City
- Mayor of Topsail Beach
- Mayor of North Topsail Beach

6.4 Section 404/NEPA Merger Process

6.4.1 Agency Coordination

For most NCDOT projects, the Section 404/NEPA Merger Process (Merger Process) is initiated to streamline agreements between NCDOT, state and federal cooperating agencies, and local units of government. To this effect, the Merger Process provides a forum for appropriate agency representatives to discuss and reach consensus on ways to facilitate meeting the regulatory requirements of Section 404 of the Clean Water Act during the NEPA decision-making phase of transportation projects. Cooperating agencies included in the Merger Process of this project are as follows:

- USACE
- USEPA
- USCG
- USFWS
- NMFS
- FHWA
- NCDOT
- NCWRC
- NCDMF
- NCDCM
- NCDWQ
- NCDCR
- United States Forest Service (USFS)
- Cape Fear Rural Planning Organization (non-signatory)

6.4.2 Concurrence Point 1

On August 20, 2009, the Merger Team met to discuss concurrence on Purpose and Need and Study Area Defined – CP 1. During the meeting, NCDOT presented the existing conditions, PSA, project need, and project purpose to the participating environmental agencies. Subsequent to the presentation and discussion, the Merger Team reached a consensus and signed the formal Concurrence Point 1 form – Purpose and Need and Study Area Defined. The project purpose and need along with the study area, are described in Chapter 1 of this document. A copy of the CP 1 meeting minutes and signature form is included in Appendix I.

6.4.3 Concurrence Point 2

Functional design plans and preliminary impact and qualitative cost analysis was prepared for 16 feasible alternatives. A summary of this analysis was presented to the Merger Team members on December 14, 2010, at the CP 2 meeting. Based on this information, the Merger Team members eliminated nine alternatives and selected the following seven alternatives as the Detailed Study Alternatives:

- Northern Alternatives Group: Alternatives 4, 5, and 5R (high-level fixed bridges)
- Central Alternatives Group: Alternatives 6 and 7 (low-level/mid-level bridges, respectively)
- Southern Alternatives Group: Alternatives 11 and 17 (high-level fixed bridges)

A copy of the CP 2 meeting minutes and signature form is included in Appendix I.

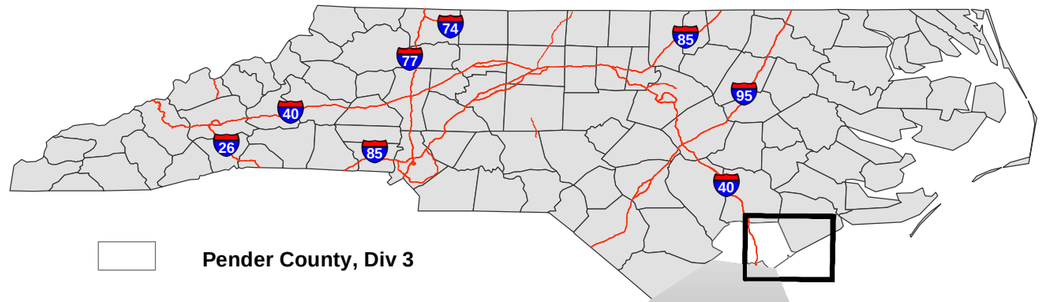
6.4.4 Future Section 404/NEPA Merger Process and Concurrence

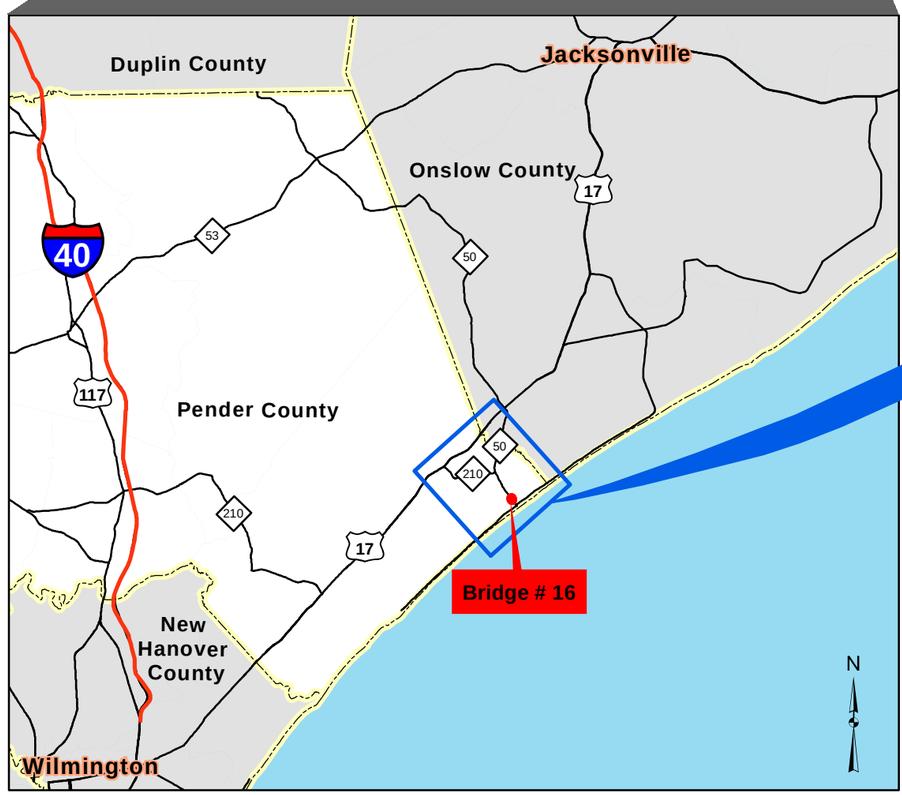
As project development continues, further Merger Team meetings will be held with subsequent concurrence on the following:

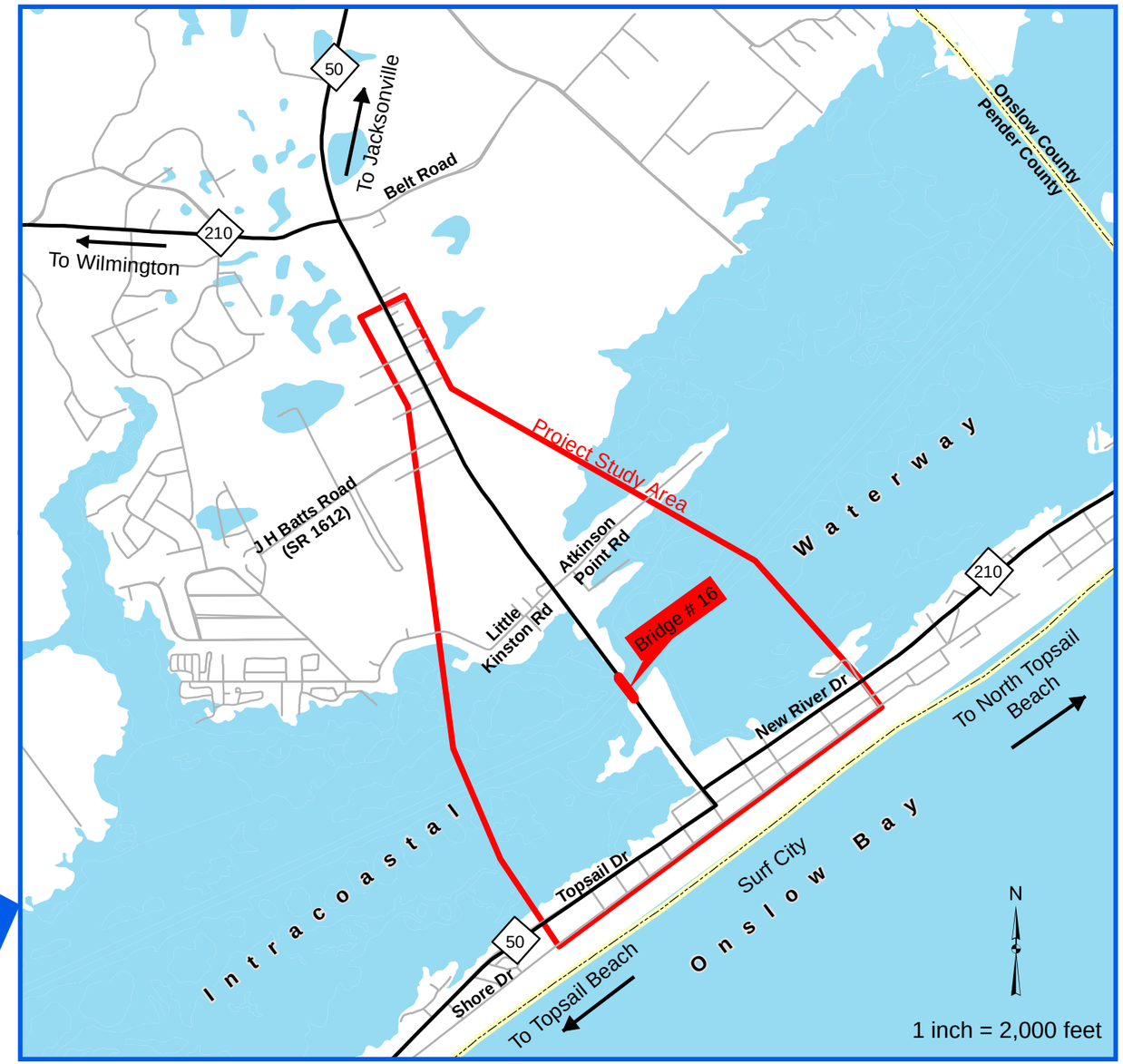
- CP 2A: Bridging Decisions and Alignment Review
- CP 3: LEDPA/Preferred Alternative Selection
- CP 4A: Avoidance and Minimization of Jurisdictional Waters
- CP 4B: 30% Hydraulic Review (Drainage System Layout and Cross Conveyance)
- CP 4C: Permit Drawings Review

NCDOT anticipates combining CP 2A and CP 3 meetings after the public hearing as this project involves bridging the Intracoastal Waterway (Topsail Sound) and the only other stream located in the PSA.

Appendix A – Figures







Project Vicinity

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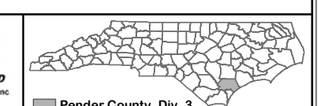
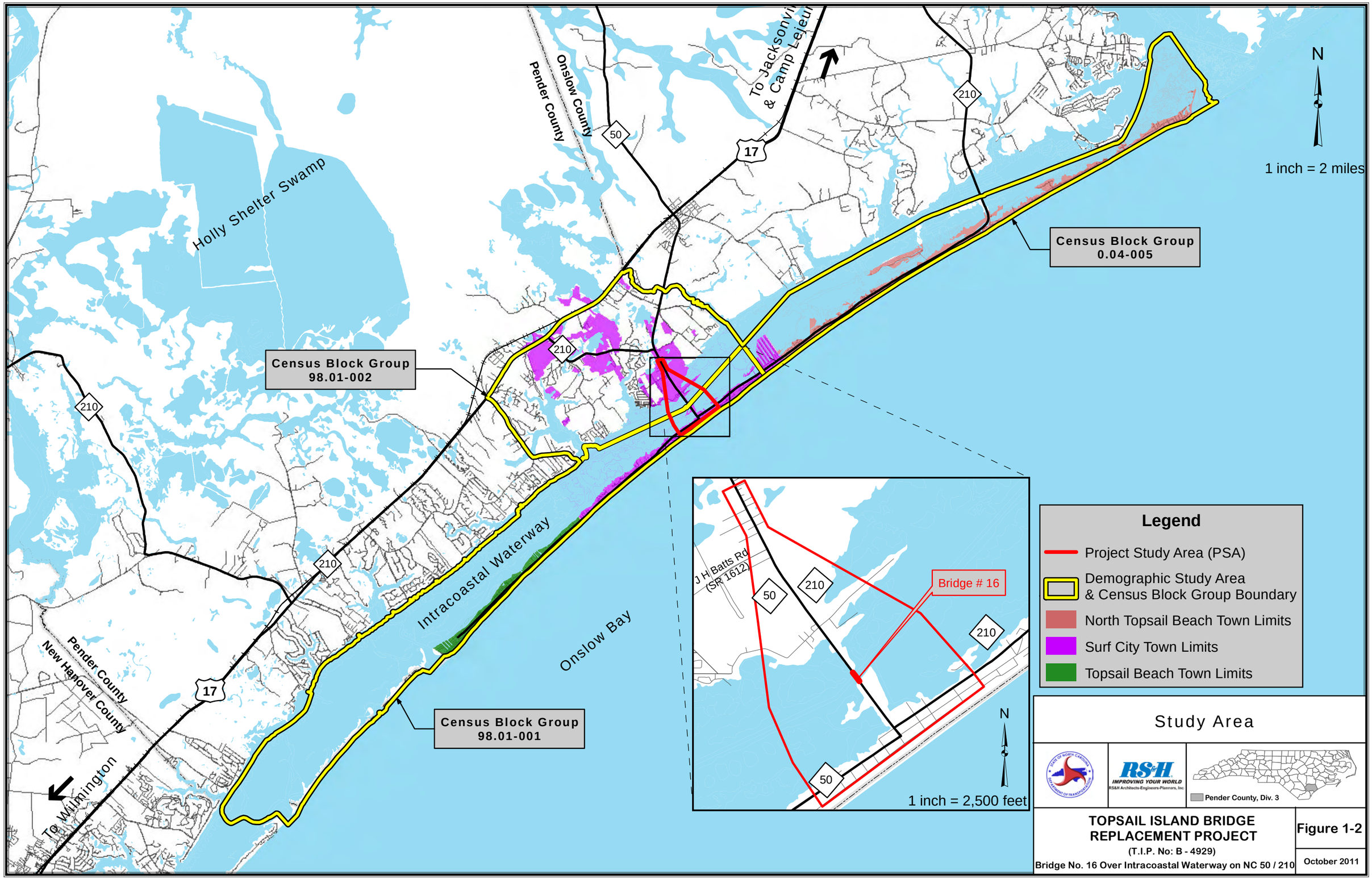


TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 1-1

October 2011


N
1 inch = 2 miles
Holly Shelter Swamp
Pender County
Onslow County
To Jacksonville & Camp Lejeune
50
17
210
Census Block Group 0.04-005
Census Block Group 98.01-002
Intracoastal Waterway
Onslow Bay
Pender County
New Hanover County
To Wilmington
Census Block Group 98.01-001
J H Batts Rd (SR 1612)
Bridge # 16
1 inch = 2,500 feet
Legend
Project Study Area (PSA)
Demographic Study Area & Census Block Group Boundary
North Topsail Beach Town Limits
Surf City Town Limits
Topsail Beach Town Limits
Study Area
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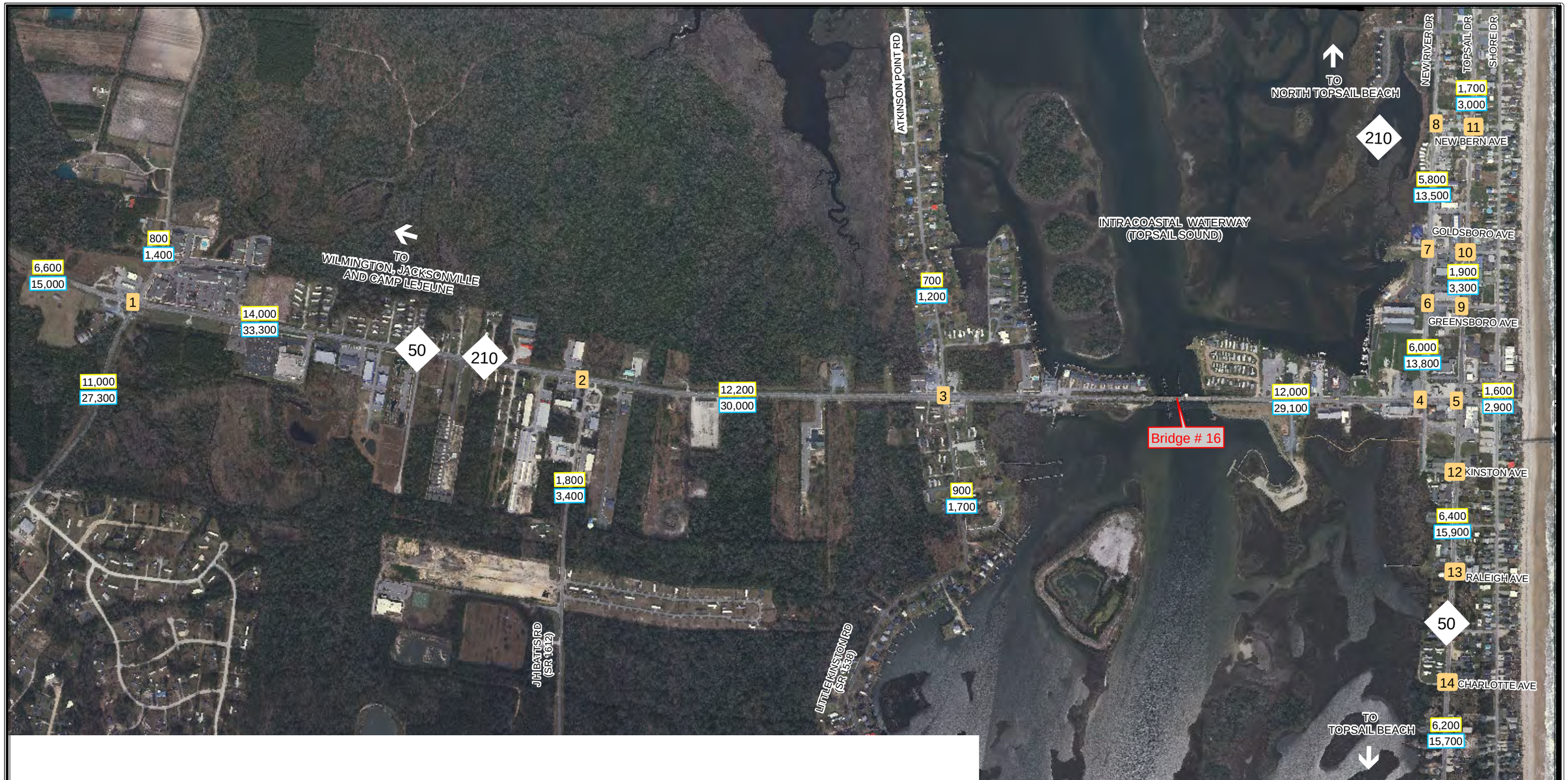
Pender County, Div. 3
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 1-2
October 2011



Legend

X	Study Intersections
X,XXX	2010 Existing Conditions Traffic Volumes (vehicles per day)
X,XXX	2035 No Build Conditions Traffic Volumes (vehicles per day)

N

1 inch = 750 feet

Study Intersections and Daily Traffic Volumes

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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 2-1

October 2011

Project Study Area

INTRACOASTAL WATERWAY (TOPSAIL SOUND)

TO NORTH TOPSAIL BEACH

TO WILMINGTON, JACKSONVILLE AND CAMP LEJEUNE

TO TOPSAIL BEACH

ATKINSON POINT RD

ROLAND AVE

JH BATTS RD

LITTLE KINSTON RD

NEW RIVER DR

TOPSAIL DR

SHORE DR

ONSLOW BAY

50

210

Fiber Optic Lines are located on Electric Transmission Poles from Little Kinston Rd. to the Hwy 210/50 split.

Fiber Optic Lines are located underground at Hwy 210/50 split.

Fiber Optic Lines are located underground west of Little Kinston Rd.

Power Substation

Bridge #16

Sanitary Sewer Pump Station

N

1 inch = 750 feet

Legend

- Fiber Optic, Telephone, & Cable (See Notes for Fiber Optic)
- Electric Transmission
- Water Distribution
- Sanitary Sewer Systems

Existing Utilities

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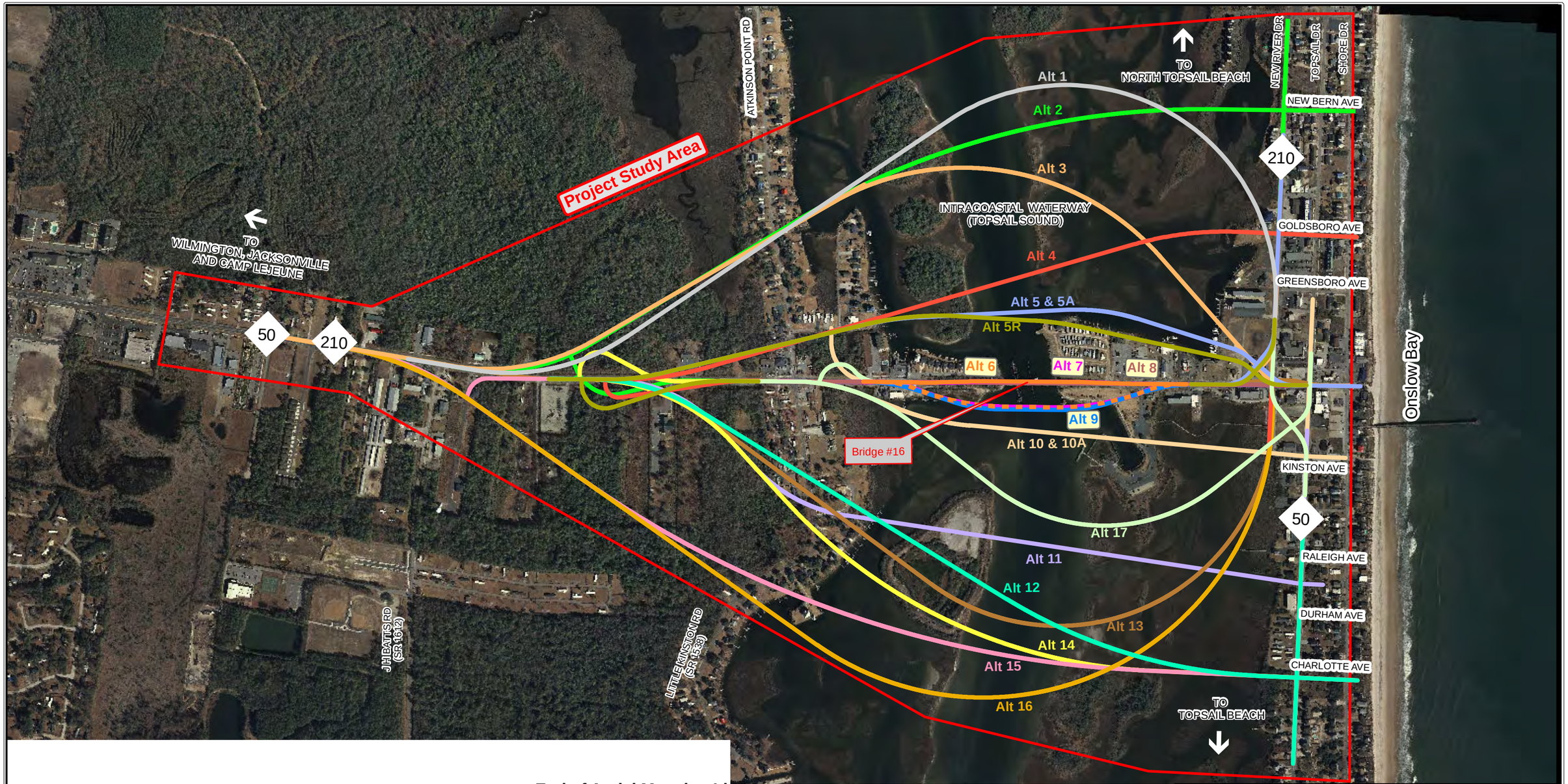
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 2-2

October 2011



---- End of Aerial Mapping Limits ----

N

1 inch = 750 feet

Preliminary Alternative Corridors

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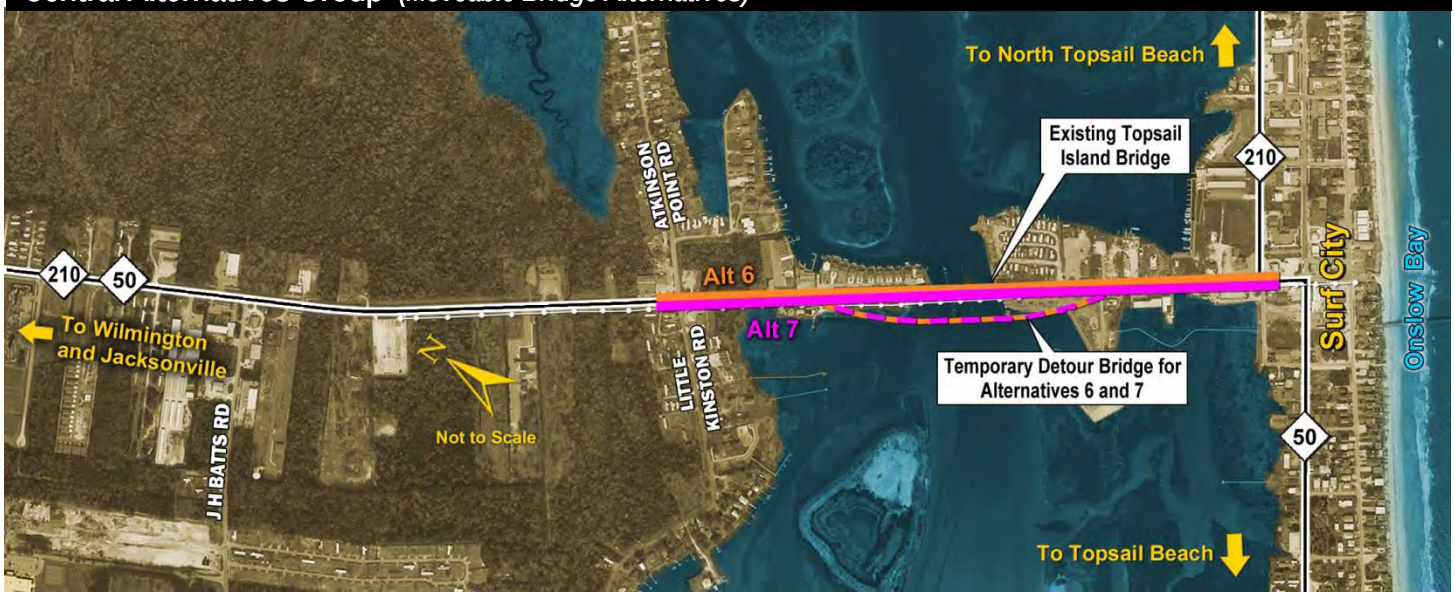
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 3-1

October 2011

Northern Alternatives Group *(High-Level Fixed Bridge Alternatives)*

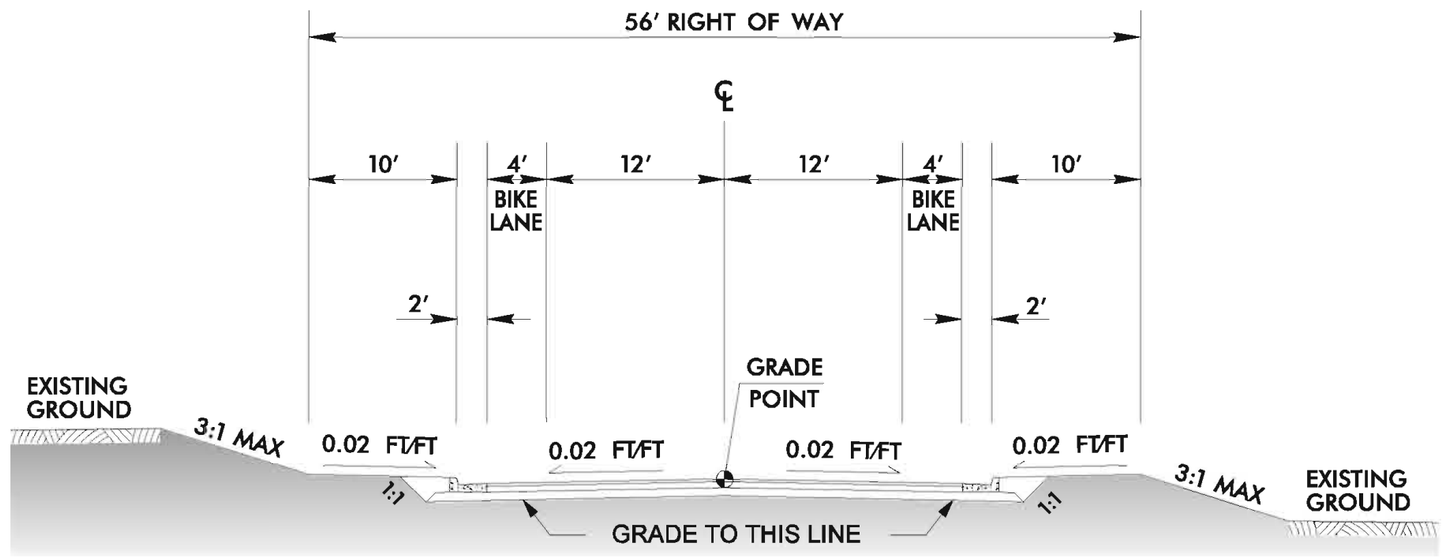
Central Alternatives Group *(Moveable Bridge Alternatives)*



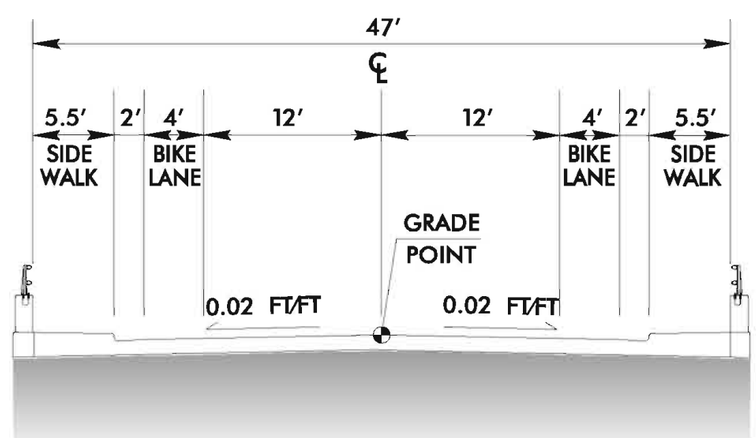
Southern Alternatives Group *(High-Level Fixed Bridge Alternatives)*

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	Pender County	RS&H IMPROVING YOUR WORLD RS&H Architect-Engineer-Planners, Inc.	**TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT** Bridge No. 16 Over Intracoastal Waterway on NC 50/210	**T.I.P. No:** B-4929 **WBS:** 40233.1.1 **Division:** 3	Figure 3-2: Preliminary Corridor Alternative Groups

PROPOSED ROADWAY TYPICAL SECTION



PROPOSED BRIDGE TYPICAL SECTION



Proposed Typical Sections

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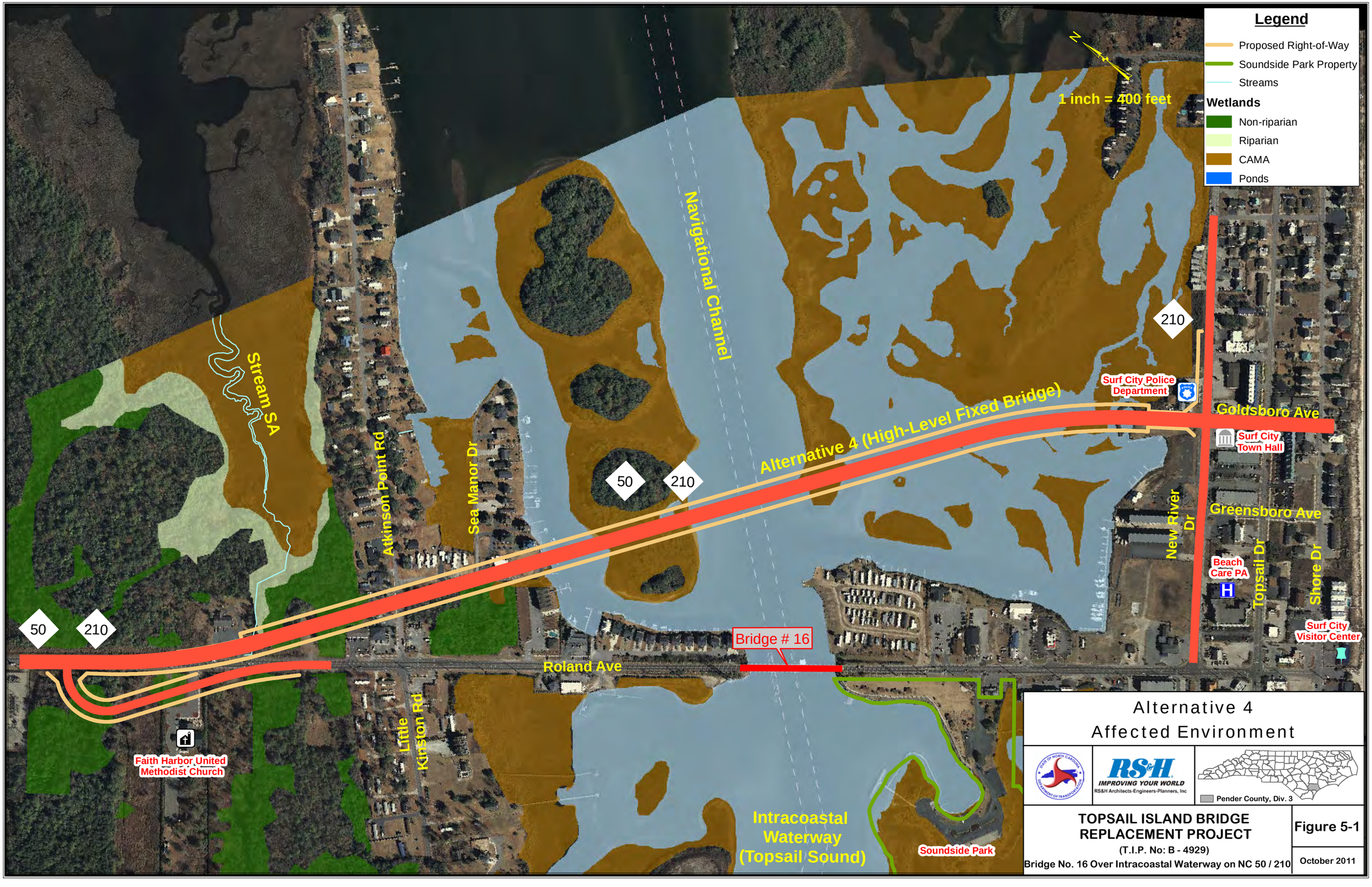
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 4-1

September 2011


Legend
Proposed Right-of-Way
Soundside Park Property
Streams
Wetlands
Non-riparian
Riparian
CAMA
Ponds
N
1 inch = 400 feet
Navigational Channel
Stream SA
Atkinson Point Rd
Sea Manor Dr
50
210
Alternative 4 (High-Level Fixed Bridge)
Surf City Police Department
Goldsboro Ave
Surf City Town Hall
New River Dr
Greensboro Ave
Beach Care PA
Topsail Dr
Shore Dr
Surf City Visitor Center
Bridge # 16
Roland Ave
Little Kinston Rd
Faith Harbor United Methodist Church
Intracoastal Waterway (Topsail Sound)
Soundside Park
Alternative 4
Affected Environment
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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-1
October 2011

Legend
Proposed Right-of-Way
Soundside Park Property
Streams
Ponds
Wetlands
Non-riparian
Riparian
CAMA
1 inch = 400 feet
N
Stream SA
Atkinson Point Rd
Sea Manor Dr
Navigational Channel
Alternative 5
(High-Level Fixed Bridge)
50
210
Surf City Police Department
Goldsboro Ave
Surf City Town Hall
New River Dr
Greensboro Ave
Beach Care PA
H
Surf City Visitor Center
Bridge # 16
Roland Ave
Little Kinston Rd
Faith Harbor United Methodist Church
Intracoastal Waterway (Topsail Sound)
Soundside Park
Kinston Ave
Topsail Dr
Shore Dr
Pond B
Alternative 5
Affected Environment
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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-2
October 2011

Alternative 5R
Affected Environment

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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-3

October 2011

Legend
Proposed Right-of-Way
Soundside Park Property
Streams
Ponds
Wetlands
Non-riparian
Riparian
CAMA
1 inch = 400 feet
N
Stream SA
Atkinson Point Rd
Sea Manor Dr
Navigational Channel
Surf City Police Department
Goldsboro Ave
Surf City Town Hall
New River Dr
Greensboro Ave
210
Beach Care PA
Surf City Visitor Center
50
210
Bridge # 16
Alternative 6 (Low-Level Moveable Bridge)
Roland Ave
Little Kinston Rd
Detour Bridge
Faith Harbor United Methodist Church
Kinston Ave
Topsail Dr
Shore Dr
Intracoastal Waterway (Topsail Sound)
Soundside Park
50
Pond B
Alternative 6
Affected Environment
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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-4
October 2011

Legend
Proposed Right-of-Way
Soundside Park Property
Streams
Ponds
Wetlands
Non-riparian
Riparian
CAMA
1 inch = 400 feet
N
Stream SA
Atkinson Point Rd
Sea Manor Dr
Navigational Channel
Surf City Police Department
Goldsboro Ave
Surf City Town Hall
New River Dr
Greensboro Ave
210
Beach Care PA
Surf City Visitor Center
50
210
Bridge # 16
Alternative 7 (Mid-Level Moveable Bridge)
Roland Ave
Little Kinston Rd
Detour Bridge
Faith Harbor United Methodist Church
Kinston Ave
Topsail Dr
Shore Dr
Intracoastal Waterway (Topsail Sound)
Soundside Park
50
Pond B
Alternative 7
Affected Environment
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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-5
October 2011

---- End of Aerial Mapping Limits ----

Alternative 11
Affected Environment

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(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-6

October 2011

Legend
Proposed Right-of-Way
Soundside Park Property
Streams
Ponds
Wetlands
Non-riparian
Riparian
CAMA
1 inch = 400 feet
N
Stream SA
Atkinson Point Rd
Sea Manor Dr
Navigational Channel
Surf City Police Department
Surf City Town Hall
New River Dr
Greensboro Ave
210
Beach Care PA
Surf City Visitor Center
Bridge # 16
Roland Ave
50
210
Faith Harbor United Methodist Church
Little Kinston Rd
Alternative 17 (High-Level Fixed Bridge)
Kinston Ave
Topsail Dr
Shore Dr
50
210
Pond B
Intracoastal Waterway (Topsail Sound)
Alternative 17
Affected Environment
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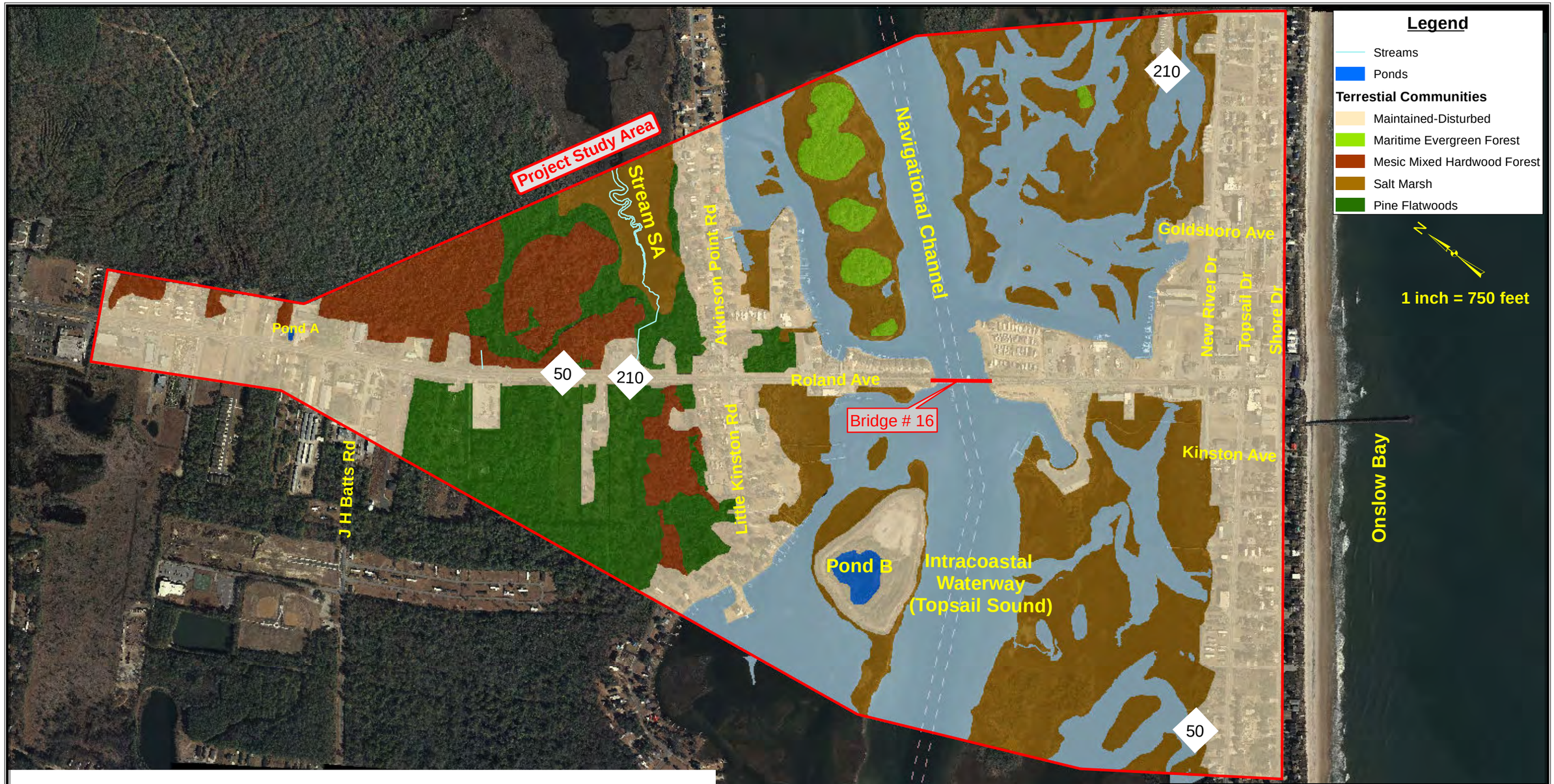
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-7
October 2011



---- End of Aerial Mapping Limits ----

Terrestrial Communities

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TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-8

October 2011

Alternative 6
Soundside Park Impacts

TOPSAIL ISLAND BRIDGE
REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-9

October 2011

Legend
Soundside Park Property
Temporary Park Impacts
Permanent Park Impacts
Topsail Sound
1 inch = 150 feet
Permanent Impacts = 0.01 acres
Alternative 7
(Mid-Level Moveable Bridge)
Bridge # 16
Detour Bridge
Temporary Impacts = 0.4 acres
Soundside Park
Intracoastal
Waterway
(Topsail Sound)
Alternative 7
Soundside Park Impacts
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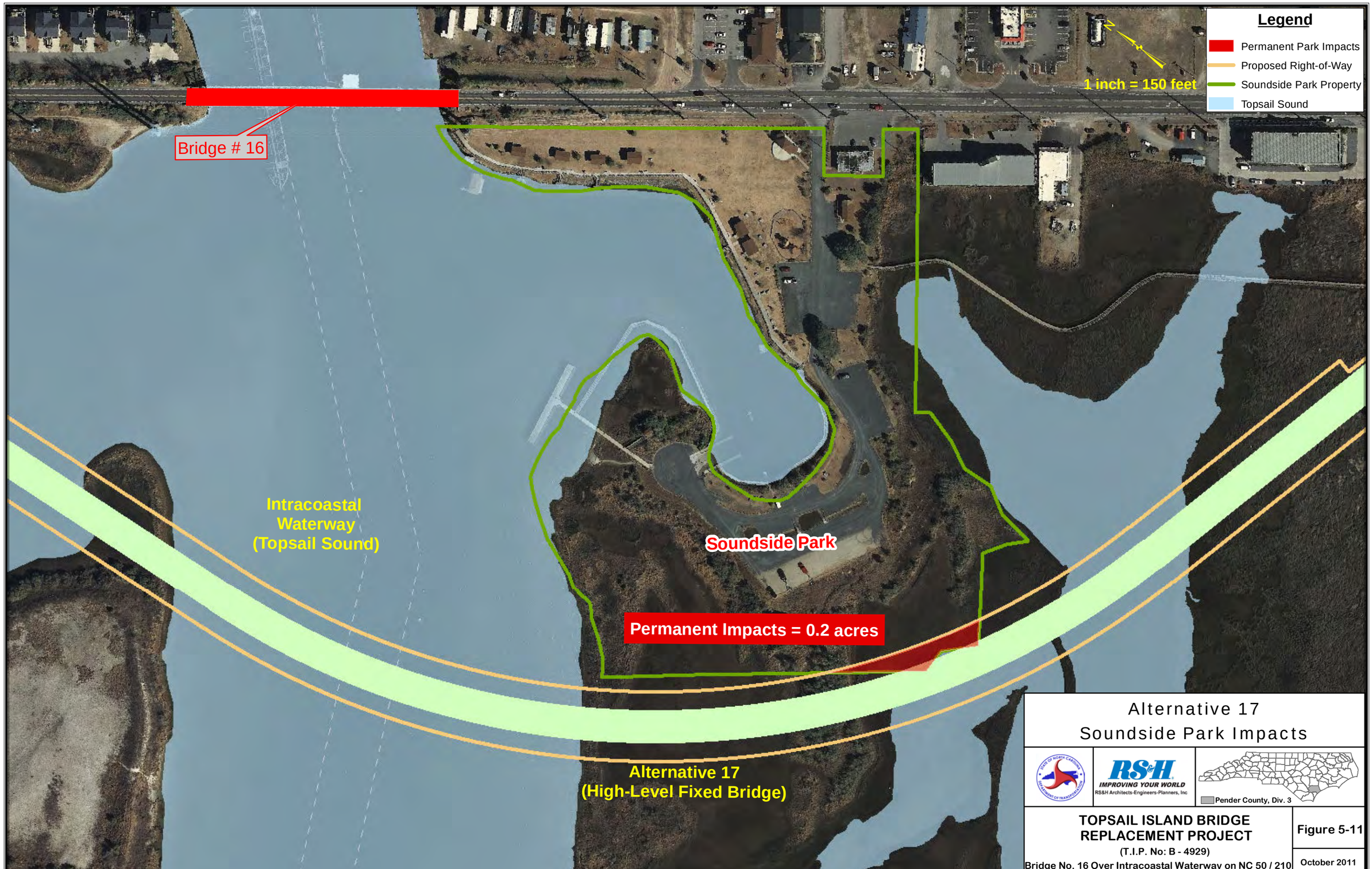
Pender County, Div. 3
TOPSAIL ISLAND BRIDGE
REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-10
October 2011


Legend
Permanent Park Impacts
Proposed Right-of-Way
Soundside Park Property
Topsail Sound
1 inch = 150 feet
Bridge # 16
Intracoastal
Waterway
(Topsail Sound)
Soundside Park
Permanent Impacts = 0.2 acres
Alternative 17
(High-Level Fixed Bridge)
Alternative 17
Soundside Park Impacts
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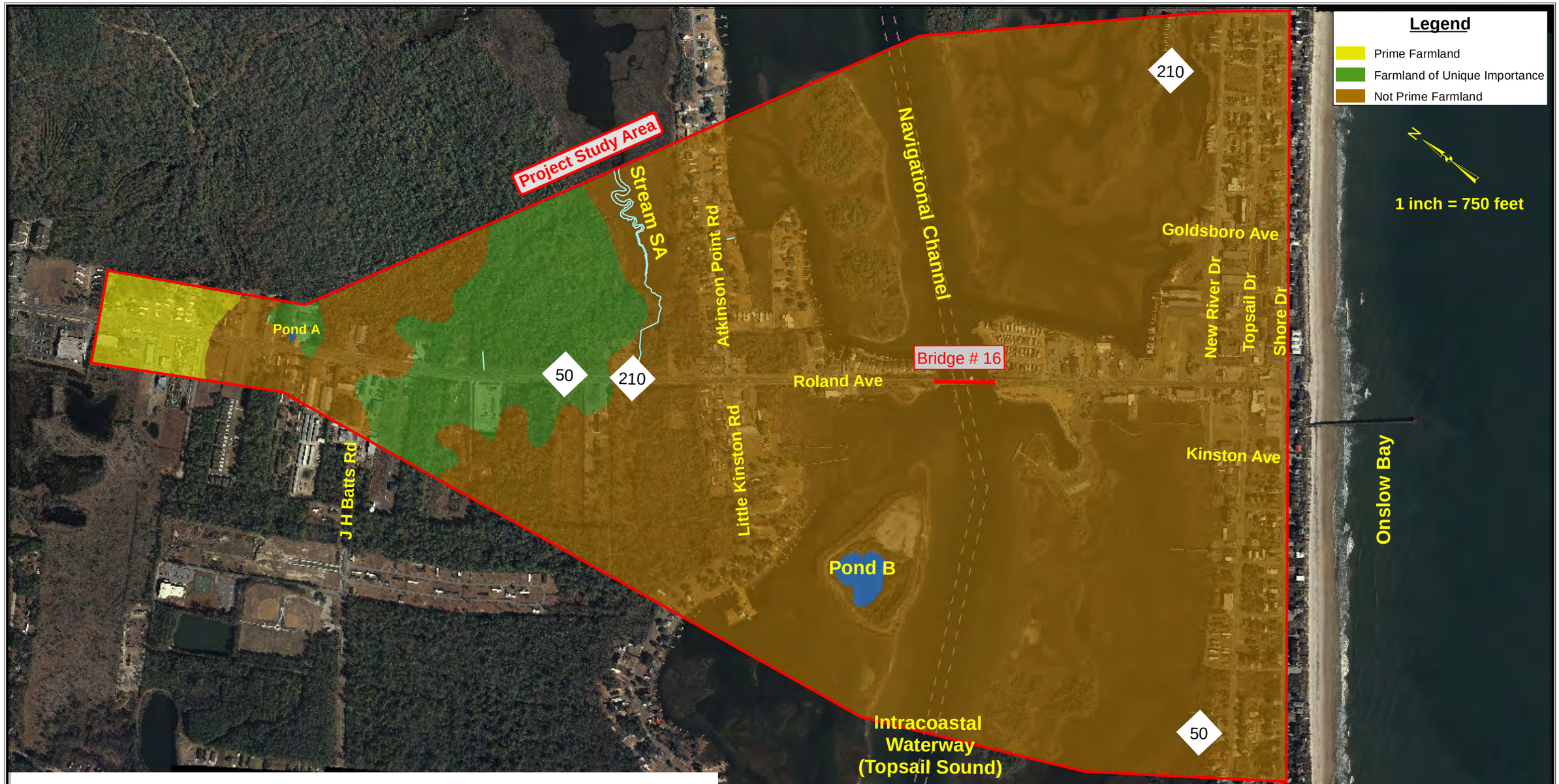
Pender County, Div. 3
TOPSAIL ISLAND BRIDGE
REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-11
October 2011



---- End of Aerial Mapping Limits ----

Farmland Classification

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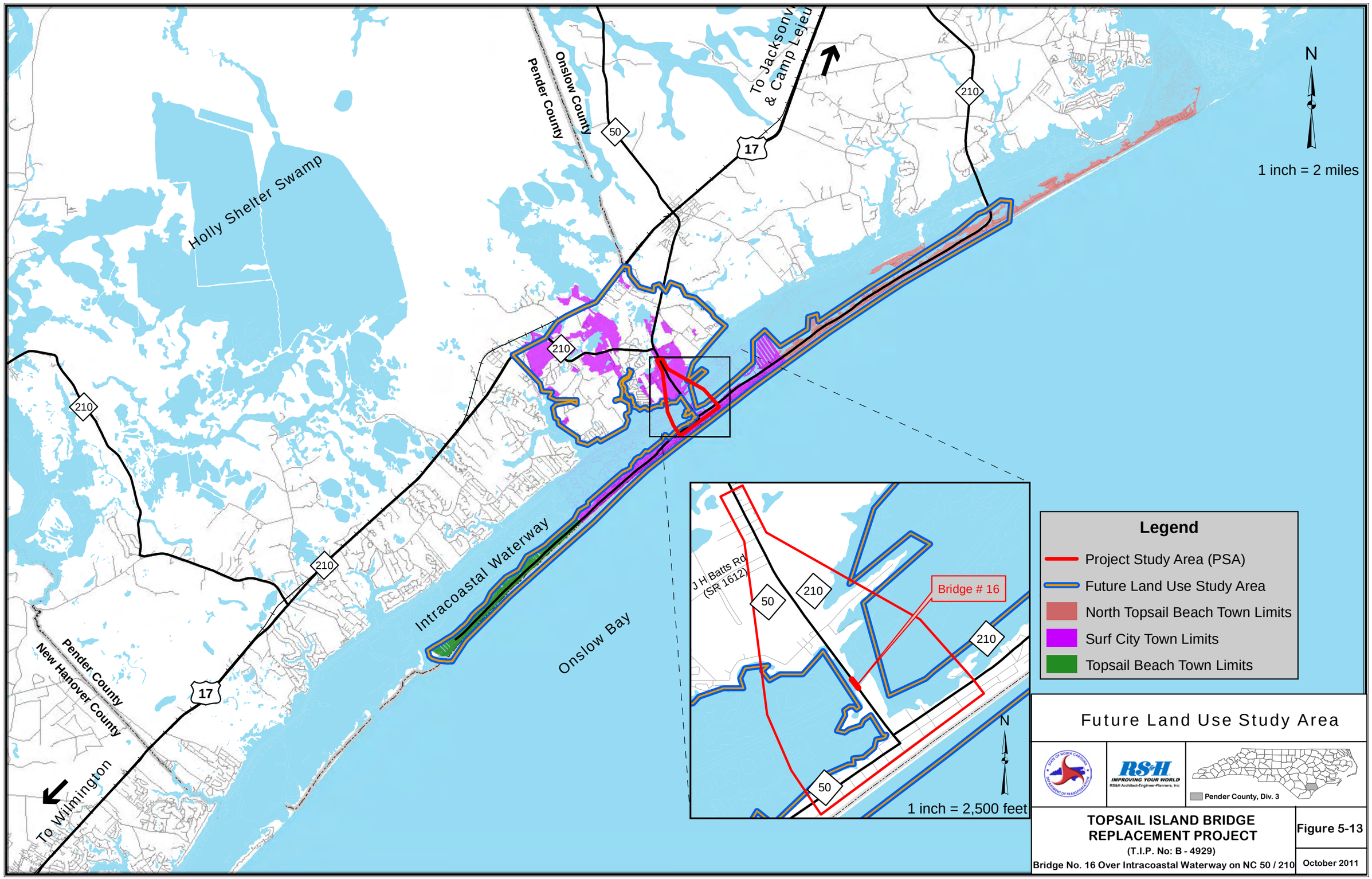
Pender County, Div. 3

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-12

October 2011

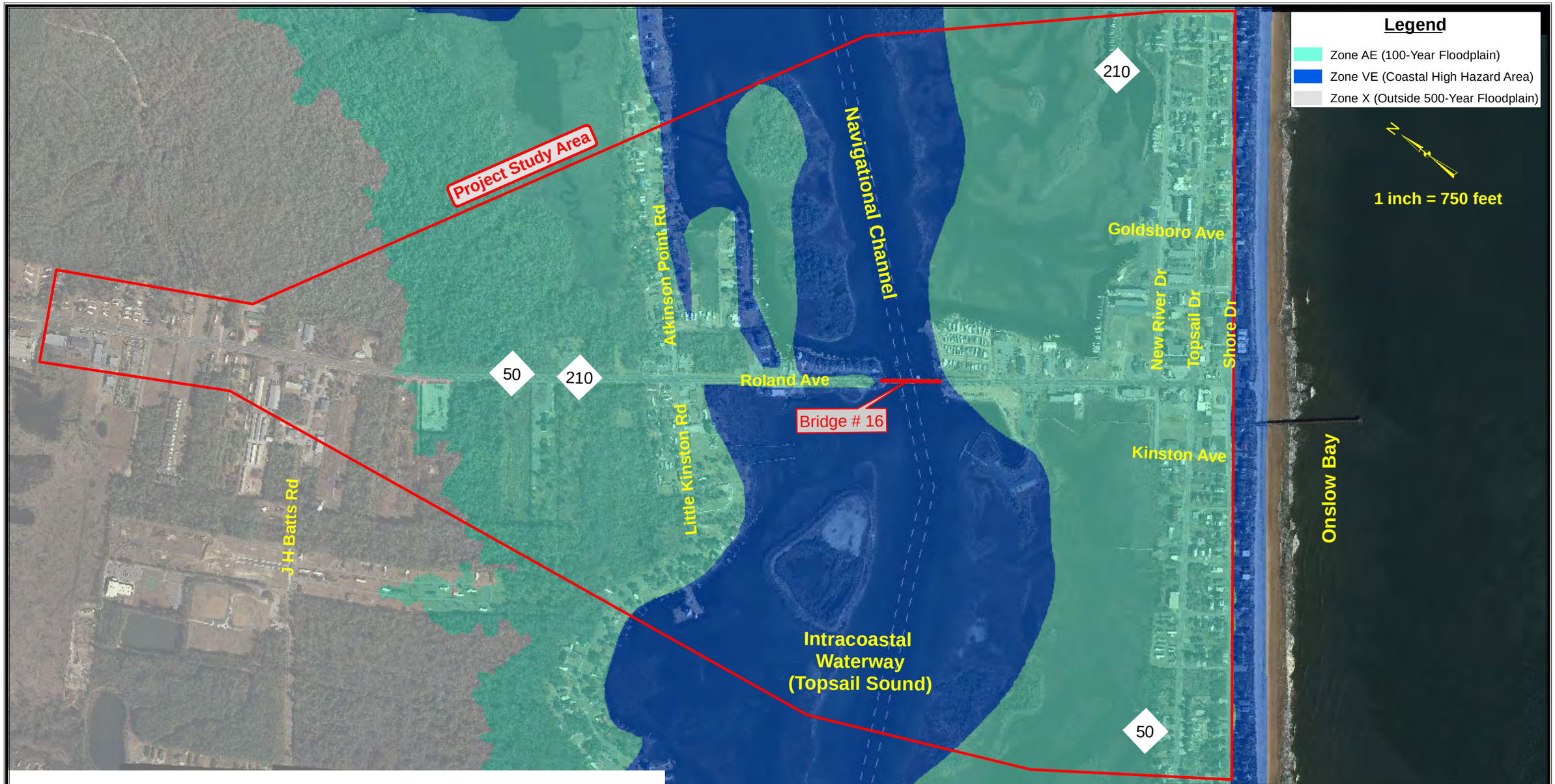


Future Land Use Study Area

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-13

October 2011



---- End of Aerial Mapping Limits ----

Floodplains

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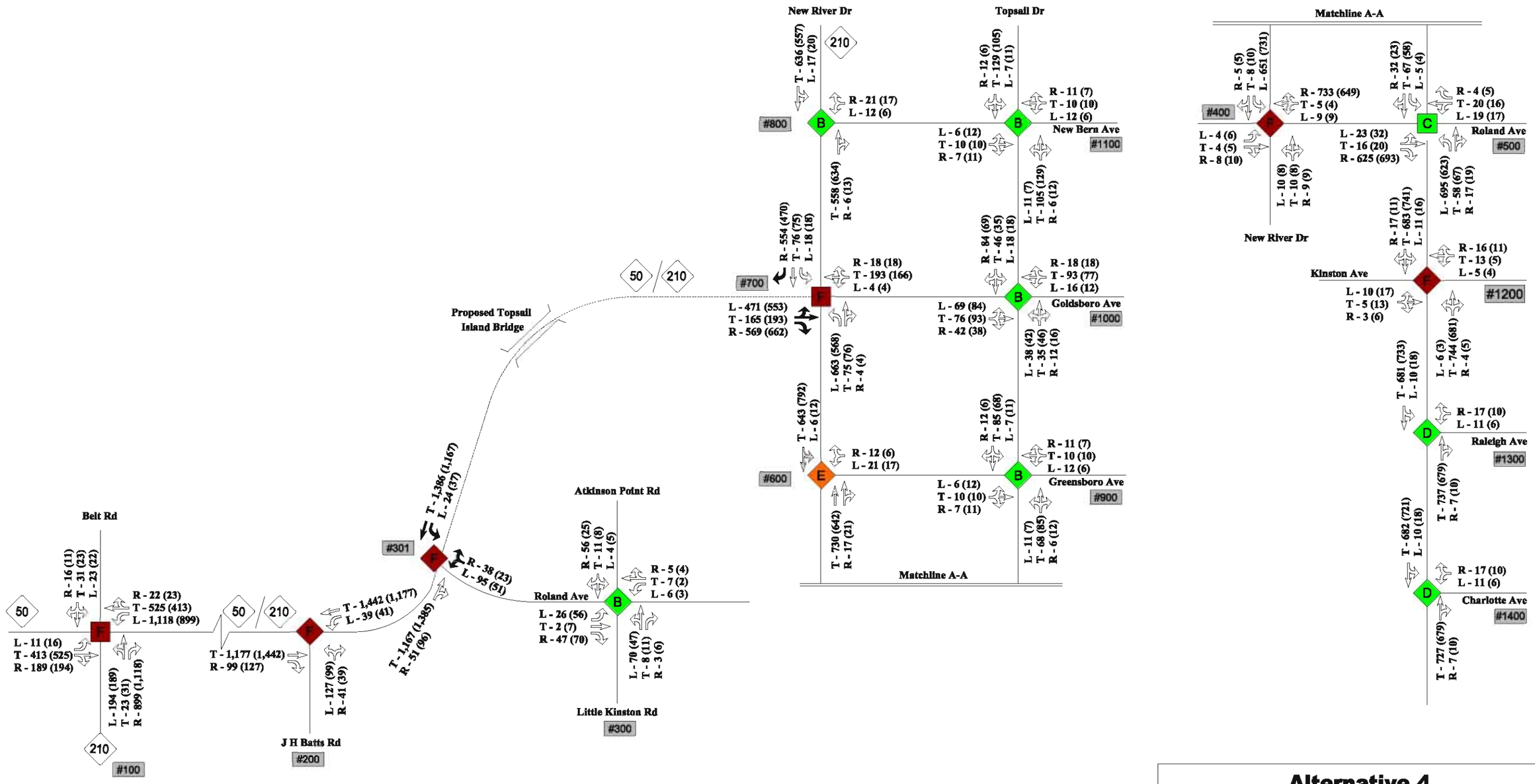
Pender County, Div. 3

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-14

October 2011


New River Dr
Topsail Dr
Matchline A-A
#800
#1100
New Bern Ave
#700
Goldsboro Ave
#1000
#600
Greensboro Ave
#900
Matchline A-A
#400
Roland Ave
#500
New River Dr
Kinston Ave
#1200
Raleigh Ave
#1300
Charlotte Ave
#1400
Proposed Topsail Island Bridge
Atkinson Point Rd
#301
Roland Ave
Little Kinston Rd
#300
Belt Rd
#100
J H Batts Rd
#200
T - 636 (557)
L - 17 (20)
R - 21 (17)
L - 12 (6)
R - 12 (6)
T - 129 (105)
L - 7 (11)
R - 11 (7)
T - 10 (10)
L - 12 (6)
L - 6 (12)
T - 10 (10)
R - 7 (11)
T - 558 (634)
R - 6 (13)
L - 11 (7)
T - 105 (129)
R - 6 (12)
R - 554 (470)
T - 76 (75)
L - 18 (18)
R - 84 (69)
T - 46 (35)
L - 18 (18)
R - 18 (18)
T - 193 (166)
L - 4 (4)
R - 18 (18)
T - 93 (77)
L - 16 (12)
L - 471 (553)
T - 165 (193)
R - 569 (662)
L - 69 (84)
T - 76 (93)
R - 42 (38)
L - 663 (568)
T - 75 (76)
R - 4 (4)
L - 38 (42)
T - 35 (46)
R - 12 (16)
T - 643 (792)
L - 6 (12)
R - 12 (6)
T - 85 (68)
L - 7 (11)
R - 12 (6)
L - 21 (17)
R - 11 (7)
T - 10 (10)
L - 12 (6)
L - 6 (12)
T - 10 (10)
R - 7 (11)
T - 730 (642)
R - 17 (21)
L - 11 (7)
T - 68 (85)
R - 6 (12)
R - 5 (5)
T - 8 (10)
L - 651 (731)
R - 733 (649)
T - 5 (4)
L - 9 (9)
L - 4 (6)
T - 4 (5)
R - 8 (10)
L - 23 (32)
T - 16 (20)
R - 625 (693)
L - 10 (8)
T - 10 (8)
R - 9 (9)
R - 32 (23)
T - 67 (58)
L - 5 (4)
R - 4 (5)
T - 20 (16)
L - 19 (17)
L - 695 (623)
T - 58 (67)
R - 17 (19)
R - 17 (11)
T - 683 (741)
L - 11 (16)
R - 16 (11)
T - 13 (5)
L - 5 (4)
L - 10 (17)
T - 5 (13)
R - 3 (6)
T - 681 (733)
L - 10 (18)
L - 6 (3)
T - 744 (681)
R - 4 (5)
R - 17 (10)
L - 11 (6)
T - 737 (679)
R - 7 (10)
T - 682 (721)
L - 10 (18)
R - 17 (10)
L - 11 (6)
T - 727 (679)
R - 7 (10)
T - 1,386 (1,167)
L - 24 (37)
R - 38 (23)
L - 95 (51)
T - 1,442 (1,177)
L - 39 (41)
T - 1,167 (1,385)
R - 51 (96)
R - 56 (25)
T - 11 (8)
L - 4 (5)
R - 5 (4)
T - 7 (2)
L - 6 (3)
L - 26 (56)
T - 2 (7)
R - 47 (70)
L - 70 (47)
T - 8 (11)
R - 3 (6)
R - 16 (11)
T - 31 (23)
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T - 525 (413)
L - 1,118 (899)
L - 11 (16)
T - 413 (525)
R - 189 (194)
L - 194 (189)
T - 23 (31)
R - 899 (1,118)
T - 1,177 (1,442)
R - 99 (127)
L - 127 (99)
R - 41 (39)
50
210
Not To Scale
Legend
Level of Service
A - D (Below Capacity)
E (At Capacity)
F (Over Capacity)
Lane Use
Existing
Revised
Proposed
Traffic Volumes
00 AM Peak Hour (vph)
(00) PM Peak Hour (vph)
#XXX Node Number
Traffic Controller
Traffic Signal
Stop Sign
Roundabout
Alternative 4
2035 Peak Hour Traffic Volumes
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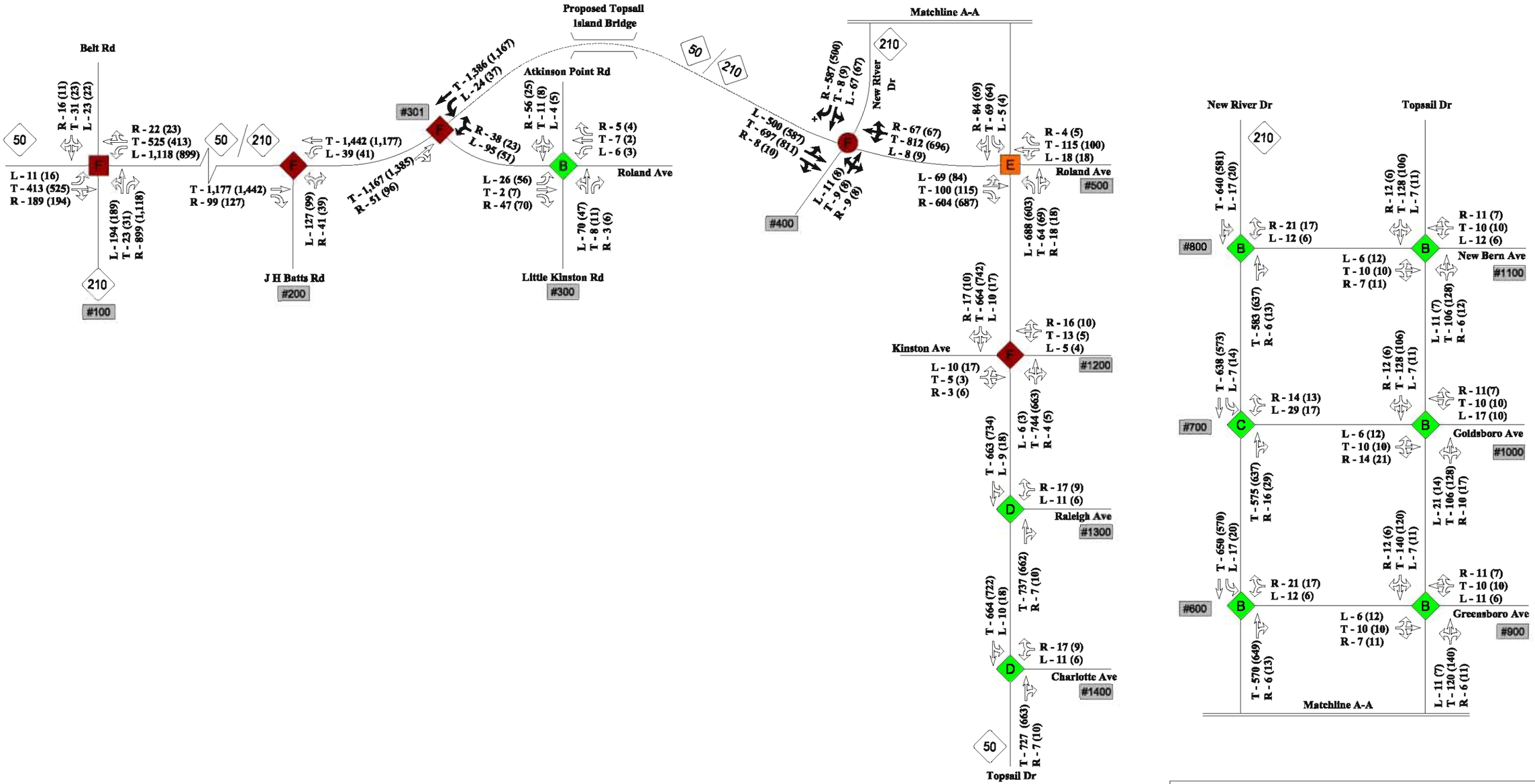
Pender County, Div. 3
TOPSAIL ISLAND BRIDGE
REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210
Figure 5-15
October 2011



Legend

Level of Service
- A - D (Below Capacity)
- E (At Capacity)
- F (Over Capacity)

Lane Use
- Existing
- Revised
- Proposed

Traffic Volumes
- 00 AM Peak Hour (vph)
- (00) PM Peak Hour (vph)
- #XXX Node Number

Traffic Controller
- Traffic Signal
- Stop Sign
- Roundabout

Not To Scale

+ SLIP LANE

Alternatives 5 & 5R
2035 Peak Hour Traffic Volumes

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Pender County, Div. 3

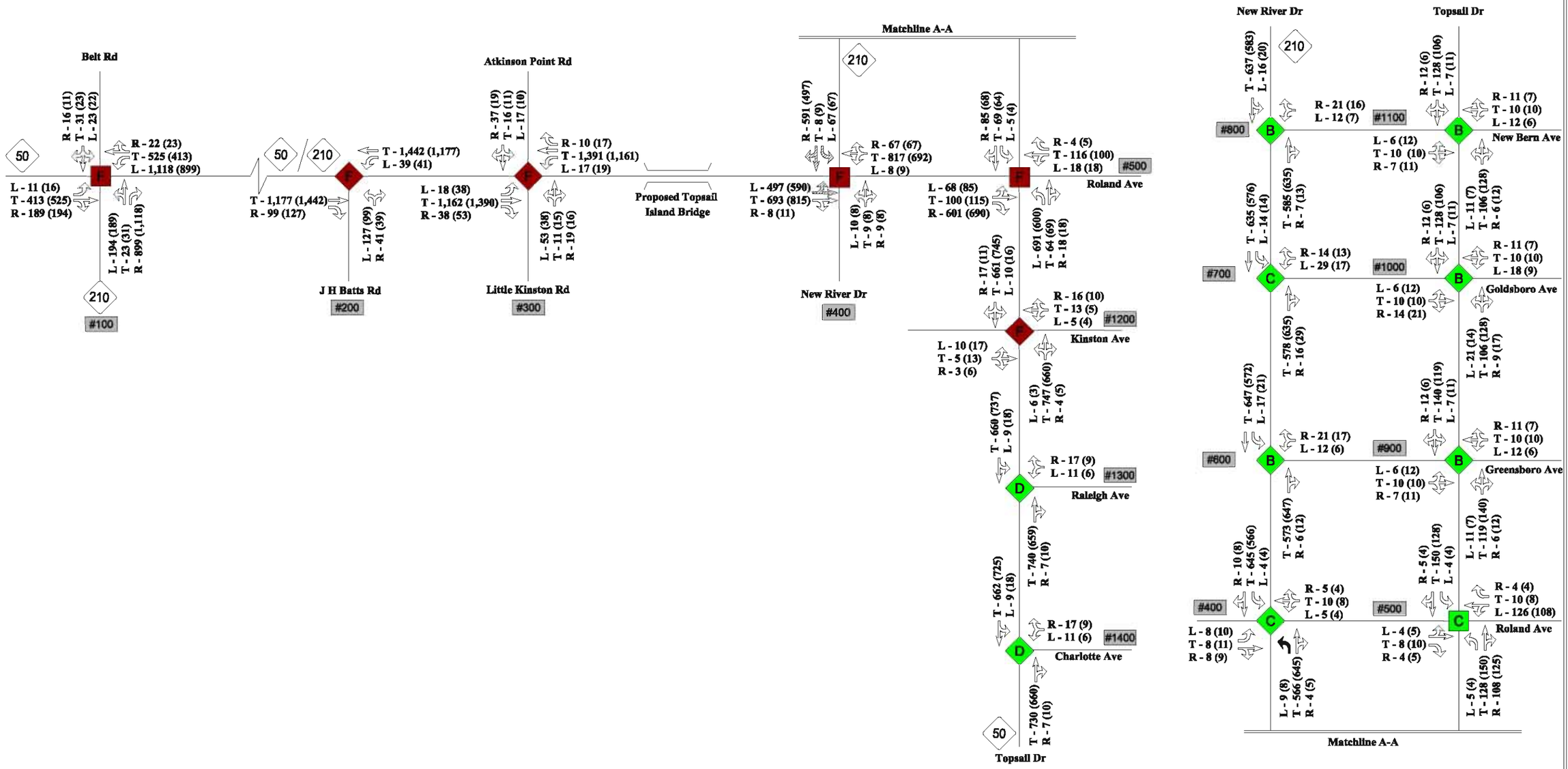
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-16

October 2011



Legend

Level of Service

- A - D (Below Capacity)
- E (At Capacity)
- F (Over Capacity)

Lane Use

- Existing
- Revised
- Proposed

Traffic Volumes

- 00 AM Peak Hour (vph)
- (00) PM Peak Hour (vph)
- #XXX Node Number

Traffic Controller

- Traffic Signal
- Stop Sign
- Roundabout

N E S W

Not To Scale

Alternatives 6 & 7
2035 Peak Hour Traffic Volumes

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Pender County, Div. 3

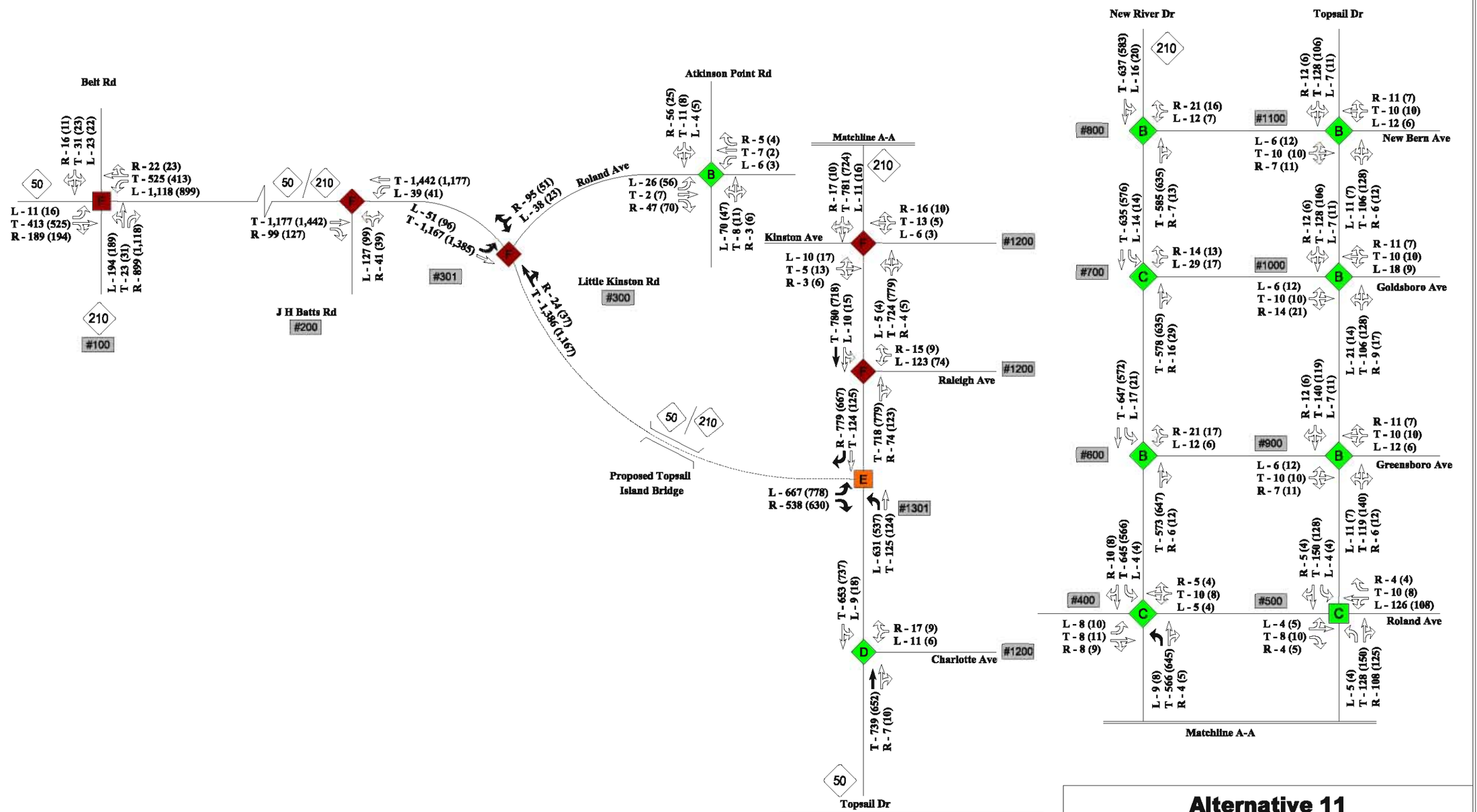
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-17

October 2011



Not To Scale

Legend

Level of Service
- A - D (Below Capacity)
- E (At Capacity)
- F (Over Capacity)

Lane Use
- Existing
- Revised
- Proposed

Traffic Volumes
- 00 AM Peak Hour (vph)
- (00) PM Peak Hour (vph)
- #XXX Node Number

Traffic Controller
- Traffic Signal
- Stop Sign
- Roundabout

Alternative 11
2035 Peak Hour Traffic Volumes

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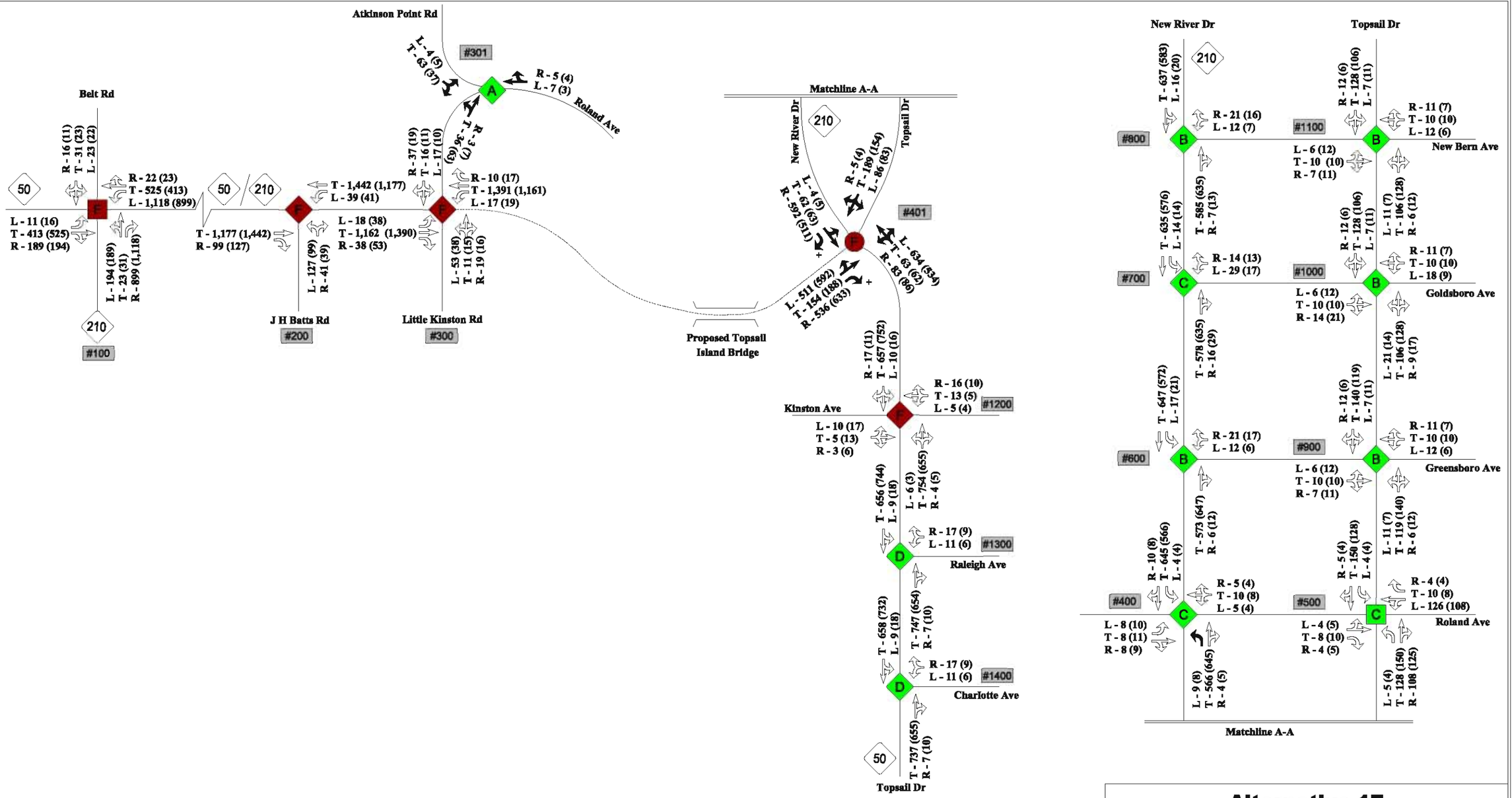
TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-18

October 2011



N E S W

Not To Scale

Legend

Level of Service
- A - D (Below Capacity)
- E (At Capacity)
- F (Over Capacity)

Lane Use
- Existing
- Revised
- Proposed

Traffic Volumes
- 00 AM Peak Hour (vph)
- (00) PM Peak Hour (vph)
- #XXX Node Number

Traffic Controller
- Traffic Signal
- Stop Sign
- Roundabout

+ SLIP LANE

Alternative 17
2035 Peak Hour Traffic Volumes

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Pender County, Div. 3

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT

(T.I.P. No: B - 4929)

Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-19

October 2011

---- End of Aerial Mapping Limits ----

Alternative Name	Noise Impacts	
	No. of Impacted Receptors	Receptor ID
2035 No Build Conditions	17	R-177 to R-180, R-182, R-184, R-187 to R-194, R-211, R-233, R-247
2035 Build Conditions Alternative 4	16	R-177 to R-180, R-187 to R-190, R-192 to R-194, R-211, R-247, R-249, R-254, R-255
2035 Build Conditions Alternatives 5 and 5R	14	R-177 to R-180, R-187 to R-190, R-192 to R-194, R-211, R-247, R-249
2035 Build Conditions Alternatives 6 and 7	16	R-177 to R-180, R-187 to R-190, R-192 to R-194, R-211, R-247, R-249, R-130A, R-305
2035 Build Conditions Alternative 11	18	R-177 to R-180, R-182, R-184, R-185, R-187 to R-194, R-211, R-247, R-249
2035 Build Conditions Alternative 17	18	R-177 to R-180, R-182, R-184, R-185, R-187 to R-194, R-211, R-247, R-249

Traffic Noise Impacts

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Pender County, Div. 3

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT
(T.I.P. No: B - 4929)
Bridge No. 16 Over Intracoastal Waterway on NC 50 / 210

Figure 5-20

October 2011

Appendix B – "Start of Study" Letters and Agency Responses

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

RECEIVED
Division of Highways

AUG 28 2007

Preconstruction
Project Development and
Environmental Analysis Branch

August 23, 2007

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental effects of the proposed replacement of Bridge No. 16 on NC 50-210 over the Intracoastal Waterway, Pender County, North Carolina (TIP No. B-4929). These comments provide information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;

2. If unavoidable wetland or stream impacts are proposed, a plan for compensatory mitigation to offset unavoidable impacts should be provided early in the planning process;

3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;

6. Best Management Practices (BMP) for Construction and Maintenance Activities should be implemented;

7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream; and

9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

Section 7(a)(2) of the Endangered Species Act requires that all federal action agencies (or their designated non-federal representatives), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed threatened or endangered species. A biological assessment/evaluation may be prepared to fulfill the section 7(a)(2) requirement and will expedite the consultation process. To assist you, a county-by-county list of federally protected species known to occur in North Carolina and information on their life histories and habitats can be found on our web page at http://nc-es.fws.gov/es/countyfr.html .

Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of listed species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of listed species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. If suitable habitat occurs within the project vicinity for any listed species, surveys should be conducted to determine presence or absence of the species.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a listed species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on listed species, then you are not required to contact our office for concurrence.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in

project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in indirect and cumulative effects to natural resources;

6. Design features and construction techniques which would be employed to avoid or minimize impacts to fish and wildlife resources, both direct and indirect, and including fragmentation and direct loss of habitat;

7. If unavoidable wetland or stream impacts are proposed, project planning should include a compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

Gary Jordan

for Pete Benjamin
Field Supervisor

cc: Chris Militscher, USEPA, Raleigh, NC

RECEIVED
Division of Highways

SEP 25 2007

Preconstruction
Project Development and
Environmental Analysis Branch

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

September 21, 2007

Mr. Gregory Thorpe
N.C. Dept. of Transportation
Proj. Dev. & Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Thorpe:

Re: SCH File # 08-E-4220-0060; EA; Replace bridge No. 16 on NC 50-210 over the Intracoastal waterway in Pender County. TIP No. B-4929

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Chrys Baggett/STC

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region O

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail Chrys Baggett@ncmail.net

Location Address:
116 West Jones Street
Raleigh, North Carolina

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NCDENR

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

Secretary's Office
DOA

SEP 19 2007

RECEIVED

MEMORANDUM

TO: Chrys Baggett
State Clearinghouse

FROM: Melba McGee
Project Review Coordinator

RE: 08-0060 Scoping, Replace Bridge No. 16 over the Intracoastal Waterway in Pender County

DATE: September 17, 2007

The Department of Environment and Natural Resources has reviewed the proposed project. The attached comments are a result of this review. More specific comments will be provided during the environmental review process.

Thank you for the opportunity to respond. If during the preparation of the environmental document, additional information is needed, the applicant is encouraged to notify our respective divisions.

Attachments

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

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NCDENR
North Carolina Department of Environment and Natural Resources
Division of Coastal Management
Michael F. Easley, Governor James H. Gregson, Director William G. Ross Jr., Secretary

MEMORANDUM

TO: Melba McGee, NCDENR

FROM: Steve Sollod, DCM SOS

DATE: September 5, 2007

SUBJECT: Proposal to Replace Bridge No. 16 on NC 50-210 over the Intracoastal Waterway in Pender County, TIP No. B-4929, Project Review No. 08-0060

The North Carolina Division of Coastal Management (DCM) has reviewed the scoping letter regarding the above referenced project, which was submitted to the NC State Clearinghouse for intergovernmental review. We appreciate the opportunity to provide information relevant to the potential permitting of the proposed project by our agency and offer the following comments, which should be considered in preparation of an environmental document.

Based on the information provided in the scoping letter, it appears that the project will impact CAMA Areas of Environmental Concern (AECs) with the crossing of the Atlantic Intracoastal Waterway. Therefore, a Coastal Area Management Act (CAMA) Major Development and/or Dredge & Fill Permit will likely be required for the project. A formal DCM review of the project to determine consistency with the state's Coastal Management Program will not occur until a CAMA Major Permit application is received. At that time, the CAMA Major Development Permit application will be placed on public notice and circulated to state agencies with an interest in the proposed project for review and comment.

We hope that you find these comments helpful and that they will be addressed during planning and preparation of the environmental document for this project. During future interagency project coordination and review, DCM may have additional comments on the project. The information provided in this letter shall not preclude DCM from requesting additional information throughout the interagency project coordination and review process, and following normal consistency review procedures.

If you have any questions or concerns, please contact me at (919) 733-2293 x 230, or via e-mail at steve.sollod@ncmail.net. Thank you for your consideration of the North Carolina Coastal Management Program.

400 Commerce Avenue, Morehead City, North Carolina 28557-3421
Phone: 252-808-2808 \ FAX: 252-247-3330 \ Internet: www.nccoastalmanagement.net

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North Carolina Wildlife Resources Commission

MEMORANDUM

TO: Melba McGee
Office of Legislative and Intergovernmental Affairs, DENR

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: September 17, 2007

SUBJECT: Response to the start of study notification from the N. C. Department of Transportation (NCDOT) regarding fish and wildlife concerns for the proposed replacement of bridge No. 16 on NC 50-210 over the Intracoastal Waterway, in Pender County, North Carolina. TIP No. B-4929, SCH Project No. 08-0060

This memorandum responds to a request from Gregory J. Thorpe of the NCDOT for our concerns regarding impacts on fish and wildlife resources resulting from the subject project. Biologists on the staff of the N. C. Wildlife Resources Commission (NCWRC) have reviewed the proposed improvements. Our comments are provided in accordance with certain provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our data indicates the presence of a colonial waterbird nesting site within the project area. NCDOT should conduct a survey to determine if the nesting site is located within the project study area, including a comprehensive list of colonial waterbirds utilizing the nesting site. Furthermore, to help facilitate document preparation and the review process, our general informational needs are outlined below:

1. Description of fishery and wildlife resources within the project area, including a listing of federally or state designated threatened, endangered, or special concern species. Potential borrow areas to be used for project construction should be included in the inventories. A listing of designated plant species can be developed through consultation with:

NC Natural Heritage Program
Dept. of Environment & Natural Resources

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • Fax: (919) 707-0028

1601 Mail Service Center
Raleigh, NC 27699-1601.
WWW.ncnhp.org

and.

NCDA Plant Conservation Program
P. O. Box 27647
Raleigh, N. C. 27611
(919) 733-3610

2. Description of any streams or wetlands affected by the project. The need for channelizing or relocating portions of streams crossed and the extent of such activities.

3. Cover type maps showing wetland acreages impacted by the project. Wetland acreages should include all project-related areas that may undergo hydrologic change as a result of ditching, other drainage, or filling for project construction. Wetland identification may be accomplished through coordination with the U. S. Army Corps of Engineers (COE). If the COE is not consulted, the person delineating wetlands should be identified and criteria listed.

4. Cover type maps showing acreages of upland wildlife habitat impacted by the proposed project. Potential borrow sites should be included.

5. The extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat (wetlands or uplands).

6. Mitigation for avoiding, minimizing or compensating for direct and indirect degradation in habitat quality as well as quantitative losses.

7. A cumulative impact assessment section which analyzes the environmental effects of highway construction and quantifies the contribution of this individual project to environmental degradation.

8 A discussion of the probable impacts on natural resources which will result from secondary development facilitated by the improved road access.

9 If construction of this facility is to be coordinated with other state, municipal, or private development projects, a description of these projects should be included in the environmental document, and all project sponsors should be identified.

Thank you for the opportunity to provide input in the early planning stages for this project. If we can further assist your office, please contact me at (919) 528-9886.

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

September 14, 2007

MEMORANDUM

TO: Melba MCGee, Environmental Coordinator

FROM: David Wainwright, NC Division of Water Quality, Office DWJ

SUBJECT: Scoping Review of NCDOT's Proposed Bridge Replacement Projects: B- 4929 (Pender County).

In reply to your correspondence dated August 16, 2007 (received September 6, 2007) in which you requested comments for the above referenced projects, the NC Division of Water Quality offers the following comments:

Project-Specific Comments

1. Review of the project reveals the presence of surface waters classified as SA;HQW; High Quality Waters of the State in the project study area. This is one of the highest classifications for water quality. Pursuant to 15A NCAC 2H .1006 and 15A NCAC 2B .0224, NC DOT will be required to obtain a State Stormwater Permit prior to construction.

General Comments Regarding Bridge Replacement Projects

2. DWQ is very concerned with sediment and erosion impacts that could result from this project. NC DOT shall address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.

3. If foundation test borings are necessary, it shall be noted in the document. Geotechnical work is approved under General 401 Certification Number 3624/Nationwide Permit No. 6 for Survey Activities.

4. If the old bridge is removed, no discharge of bridge material into surface waters is allowed unless otherwise authorized by the US ACOE. Strict adherence to the Corps of Engineers guidelines for bridge demolition will be a condition of the 401 Water Quality Certification.

5. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of NC DWQ *Stormwater Best Management Practices*.

6. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919-733-1786 / FAX 919-733-6893 / Internet: http://h2o.enr.state.nc.us/nsw/wetlands

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concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

7. If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas shall be seeded or mulched to stabilize the soil and appropriate native woody species shall be planted. When using temporary structures the area shall be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.

8. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.

9. In most cases, the DWQ prefers the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour shall be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure shall be removed and the approach fills removed from the 100-year floodplain. Approach fills shall be removed and restored to the natural ground elevation. The area shall be stabilized with grass and planted with native tree species. Tall fescue shall not be used in riparian areas.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact David Wainwright at (919) 715-3415.

cc. Jennifer Frye, US Army Corps of Engineers, Washington Field Office
Chris Militscher, Environmental Protection Agency
Travis Wilson, NC Wildlife Resources Commission
Gary Jordan, US Fish and Wildlife Service
Steve Soilod, Ecosystem Enhancement Program
Ken Averitte, DWQ Fayetteville Regional Office
File Copy

State of North Carolina
Department of Environment and Natural Resources

Reviewing Office: WIRO

INTERGOVERNMENTAL REVIEW - PROJECT COMMENTS

Project Number 08-0060 Due Date 8-22-07

After review of this project it has been determined that the ENR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to construct & operate wastewater treatment facilities, sewer system extensions & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts. On-site inspection. Post-application technical conference usual.	30 days (90 days)
☐	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	60-120 days (N/A)
☐	Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit	55 days (90 days)
☐	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100 thru 2Q.0300)	Application must be submitted and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
☐	Permit to construct & operate Transportation Facility as per 15 A NCAC (2D.0800, 2Q.0601)	Application must be submitted at least 90 days prior to construction or modification of the source.	90 days
☐	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
☐	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 2D.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950.		
☐	Complex Source Permit required under 15 A NCAC 2D.0800		
☐	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Section) At least 30 days before beginning activity. A fee of **$50** for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
X	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable stormwater conveyances and outlets.		(30 days)
☐	Mining Permit	On-site inspection usual. Surety bond filed with ENR. Bond amount varies with type mine and number of acres of affected land. Any are mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued	30 days (60 days)
☐	North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
☐	Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.C. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
☐	Oil Refining Facilities	N/A	90-120 days (N/A)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to ENR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A	30 days (60 days)

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with ENR running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to ENR rules and regulations.	10 days N/A
☐	Geophysical Exploration Permit	Application filed with ENR at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
☐	State Lakes Construction Permit	Application fees based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days N/A
☑	401 Water Quality Certification	N/A	60 days (130 days)
☐	CAMA Permit for MAJOR development	$250.00 fee must accompany application	55 days (150 days)
☐	CAMA Permit for MINOR development	$50.00 fee must accompany application	22 days (25 days)
☐	Several geodetic monuments are located in or near the project area. If any monument needs to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687 Raleigh, NC 27611		
☐	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☐	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☑	Compliance with 15A NCAC 2H 1000 (Coastal Stormwater Rules) is required.		45 days (N/A)
☐	Tar Pamlico or Neuse Riparian Buffer Rules required.		

* Other comments (attach additional pages as necessary, being certain to cite comment authority)

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
2090 US Highway 70
Swannanoa, NC 28778
(828) 296-4500

☐ **Mooresville Regional Office**
610 East Center Avenue, Suite 301
Mooresville, NC 28115
(704) 663-1699

☑ **Wilmington Regional Office**
127 Cardinal Drive Extension
Wilmington, NC 28405
(910) 796-7215

☐ **Fayetteville Regional Office**
225 North Green Street, Suite 714
Fayetteville, NC 28301-5043
(910) 433-3300

☐ **Raleigh Regional Office**
3800 Barrett Drive, Suite 101
Raleigh, NC 27609
(919) 791-4200

☐ **Winston-Salem Regional Office**
585 Waughtown Street
Winston-Salem, NC 27107
(336) 771-5000

☐ **Washington Regional Office**
943 Washington Square Mall
Washington, NC 27889

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

RECEIVED AUG 22 2007 HISTORIC PRESERVATION OFFICE

STATE NUMBER: 08-E-4220-0060 F02
DATE RECEIVED: 08/20/2007
AGENCY RESPONSE: 09/17/2007
REVIEW CLOSED: 09/20/2007

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORD
DEPT OF CUL RESOURCES
ARCHIVES-HISTORY BLDG - MSC 4617
RALEIGH NC

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DEHNR - COASTAL MGT
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DEPT OF AGRICULTURE
DEPT OF CUL RESOURCES
DEPT OF TRANSPORTATION

SEP 2007 RECEIVED Secretary's Office DOA

CH 07 - 1820
A- NC NCH/GJS 8/31/07
3- Applicant road on DOE NR eligibility from MPF RJE 9/9/07
9/12/07

PROJECT INFORMATION
APPLICANT: N.C. Dept. of Transportation
TYPE: National Environmental Policy Act
ERD: Environmental Assessment
DESC: Replace bridge No. 16 on NC 50-210 over the Intracoastal waterway in Pender County. TIP No. B-4929

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED:

☐ NO COMMENT

☒ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley

DATE: 9-12-07

AUG 27 2007

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

SEP 2007
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DOA

September 11, 2007

MEMORANDUM

TO: Gregory Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: Peter Sandbeck PBS for Peter Sandbeck

RE: Start of Study for Replacement of Bridge #16 on NC 50/210 over the Intracoastal Waterway, B-4929, Pender County, CH 07-1820

We are in receipt of your August 16, 2007, memorandum to Chrys Baggett of the State Clearinghouse, concerning the above referenced undertaking.

We have checked our maps and files and determined that Bridge #16 was determined eligible for listing in the National Register of Historic Places. Demolition and replacement of the bridge will have an adverse effect upon a historic property. Thus, additional coordination under Section 106 of the National Historic Preservation Act will be necessary.

There are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for inclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: SCH
Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

DS

DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

STATE NUMBER: 08-E-4220-0060 F02
DATE RECEIVED: 08/20/2007
AGENCY RESPONSE: 09/17/2007
REVIEW CLOSED: 09/20/2007

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WILMINGTON NC

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DEHNR - COASTAL MGT
DENR LEGISLATIVE AFFAIRS
DEPT OF AGRICULTURE
DEPT OF CUL RESOURCES
DEPT OF TRANSPORTATION

PROJECT INFORMATION
APPLICANT: N.C. Dept. of Transportation
TYPE: National Environmental Policy Act
ERD: Environmental Assessment
DESC: Replace bridge No. 16 on NC 50-210 over the Intracoastal waterway in Pender County. TIP No. B-4929

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED:

☐ NO COMMENT

☒ COMMENTS ATTACHED

SIGNED BY: J Michael Moore

DATE: 9-7-07

TOWN OF SURF CITY

P. O. BOX 2475 214 N. NEW RIVER DRIVE SURF CITY, NC 28445
Telephone: (910) 328-4131 Fax: (910) 328-4132
http://surfcity.govoffice.com

A. D. (Zander) Guy, Jr., Mayor
Nelva R. Albury, Mayor Pro-tem
Michael H. Curley, Council Member

Donald R. Helms, Council Member
Douglas C. Medlin, Council Member
William J. (Buddy) Fowler, Council Member

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September 7, 2007

N.C. State Clearinghouse for
Intergovernmental Review
1301 Mail Service Center
Raleigh NC 27699-1301

Re: Replace bridge No. 16 on NC 50-210 over the Intracoastal Waterway in Pender County. TIP No. B-4929

Dear Sir:

The Town of Surf City is extremely interested in this project and would very much like to be involved throughout this process. This bridge is the main access for our Island and is essential for commercial and residential. This bridge is also part of the Charm of Topsail Island even if it does cause delays while boat passage on the Intracoastal Waterway. Surf City has previously sent in information to DOT stating that we certainly do not wish a high rise bridge in this area due to the development that has occurred in this area.

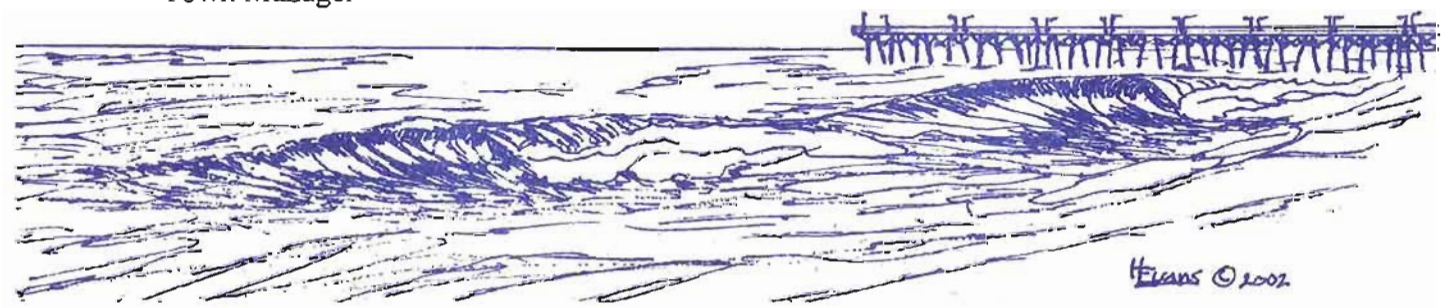
I realize this is going to be a long process and a very expensive project and could affect our current and future land use plans and development for the entire area.

I understand the reported need for the replacement of the bridge but I believe all will want to follow this very closely since it could potentially drastically change many wonderful development and plans we have worked very hard to put in place.

Thank you for the opportunity to respond and are hopeful we will be kept in the loop. If you have any further questions or wish information please feel free to contact us.

Sincerely,

J. Michael Moore
Town Manager



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AUG 2 4 2007

Preconstruction
Project Development and
Environmental Analysis Branch

NCDENR
North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

August 22, 2007

MEMORANDUM

TO: Gregory J. Thorpe, DOT Project Development and Environmental Analysis

FROM: Harry LeGrand, Natural Heritage Program

SUBJECT: Replace Bridge No. 16 on NC 50-210 over the Intracoastal Waterway; Division 3, Pender County

REFERENCE: Federal Aid Project BRSTP-0050(10), WBS No. 40233.1.1, TIP No. B-4929

The Natural Heritage Program has records of several rare species in the general vicinity of the project area. However, locations for them are not precise. A nesting colony of 12 pairs of the State Special Concern least tern (*Sternula antillarum*) was found in 2004 (year of last census data available to our Program) on a dredge island in the Intracoastal Waterway (site # 29-01) "south of Surf City". However, coordinates for the site fall very close to the bridge; thus, we suspect that the colony might be (or have been) located on the dredge island immediately to the west of the bridge. The Department of Transportation should contact the N.C. Wildlife Resources Commission for more detailed data on this colony, or any other nearby bird nesting colonies that might have been found in the 2007 survey. The chief contact person is Sue Cameron <camerons@coastalnet.com>

The State Special Concern diamondback terrapin (*Malaclemys terrapin*) has been found "near Surf City" This turtle inhabits estuaries and would be assumed to occur in the project vicinity, despite the vague location.

You may wish to check the Natural Heritage Program database website at www.ncnhp.org for a listing of rare plants and animals and significant natural communities in the county and on the quad map.

Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.

cc: Sue Cameron, N.C. Wildlife Resources Commission

Appendix C – Programmatic Section 4(f) Evaluation

NORTH CAROLINA DIVISION
FINAL NATIONWIDE SECTION 4(f) EVALUATION AND APPROVAL
FOR FEDERALLY-AIDED HIGHWAY PROJECTS
THAT NECESSITATE THE USE OF HISTORIC BRIDGES

F. A. Project No. **BRSTP-50(10)**
W.B.S. No. **40233.1.1**
TIP No. **B-4929**

Description:

Bridge No. 16 was previously determined eligible for the National Register of Historic Places as part of the NCDOT's 1995 Historic Bridge Inventory Report as an early and intact example of a riveted Warren through truss, swing span bridge. Although moved from Sunset Beach to its current location in 1954, Pender County Bridge No. 16 remains in operable condition and retains c. 1930 gearing and mechanical systems. The historic boundary for the bridge includes the 254-foot long Warren through truss, operator's house, and concrete tee beam approach spans.

		Yes	No
1.	Is the bridge to be replaced or rehabilitated with Federal funds?	X	
2.	Does the project require the use of a historic bridge structure which is on or eligible for listing on the National Register of Historic Places?	X	
3.	Is the bridge a National Historic Landmark?		X
4.	Has agreement been reached among the FHWA, the State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP) through procedures pursuant to Section 106 of the National Historic Preservation Act (NHPA)?		*

ALTERNATIVES CONSIDERED AND FOUND NOT TO BE FEASIBLE AND PRUDENT

The following alternatives were evaluated and found not to be feasible and prudent:

1. Do nothing

Does the "do nothing" alternative:

	Yes	No
(a) correct the problem situation that caused the bridge to be considered deficient?		X
(b) pose serious and unacceptable safety hazards?	X	

2. Build a new structure at a different

* Further coordination to address Section 106 will be initiated after the LEDPA/Preferred Alternative is selected.

DRAFT

location without affecting the historic integrity of the structure.

(a) The following reasons were reviewed: (circle, as appropriate)

(i) The present bridge has already been located at the only feasible and prudent site

and/or (ii) Adverse social, environmental, or economic impacts were noted

and/or (iii) Cost and engineering difficulties reach extraordinary magnitude

and/or (iv) The existing bridge cannot be preserved due to the extent of rehabilitation, because no responsible party will maintain and preserve the historic bridge, or the permitting authority requires removal or demolition.

3. Rehabilitate the historic bridge without affecting the historic integrity of the structure.

(a) The following reasons were reviewed: (circle, as appropriate)

(i) The bridge is so structurally deficient that it cannot be rehabilitated to meet the acceptable load requirements and meet National Register criteria

and/or (ii) The bridge is seriously deficient geometrically and cannot be widened to meet the required capacity and meet National Register criteria

MINIMIZATION OF HARM	Yes	No
1. The project includes all possible planning to minimize harm.	**X**	

2. Measures to minimize harm include the following: (circle, as appropriate)

a. For bridges that are to be rehabilitated, the historic integrity of the bridge is preserved to the greatest extent possible, consistent with unavoidable transportation needs, safety, and load requirements.

DRAFT

b. For bridges that are to be rehabilitated to the point that the historic integrity is affected or that are to be removed or demolished, the FHWA ensures that, in accordance with the Historic American Engineering Record (HAER) standards, or other suitable means developed through consultation, fully adequate records are made of the bridge.

c. For bridges that are to be replaced, the existing bridge is made available for an alternative use, provided a responsible party agrees to maintain and preserve the bridge.

d. For bridges that are adversely affected, agreement among the SHPO, ACHP, and FHWA is reached through the Section 106 process of the NHPA on measures to minimize harm and those measures are incorporated into the project.

3. Specific measures to minimize harm are discussed below:

Currently, NCDOT is investigating options reuse of the existing swing span at a different location. Resulting information on these options will be included in subsequent documentation.

COORDINATION

The proposed project has been coordinated with the following (attach correspondence):

NCDOT met with SHPO's representative on April 5, 2011, and concluded that all seven Detailed Study Alternatives would result in an "adverse effect" because the existing Bridge No. 16 would be removed. This concurrence form is attached.

Upon selection of the Least Environmentally Damaging Practicable Alternative (LEDPA) \Preferred Alternative, FHWA will initiate Adverse Effects Process and identify further minimization efforts, which will be included in the Section 106 Memorandum of Agreement. This coordination will involve the following agencies:

a. State Historic Preservation Officer
b. Advisory Council on Historic Preservation
c. Local/State/Federal Agencies
d. US Coast Guard (for bridges requiring bridge permits)

SUMMARY AND APPROVAL

The project meets all criteria included in the programmatic 4(f) evaluation approved on July 5, 1983.

All required alternatives have been evaluated and the findings made are clearly applicable to this project.

There are no feasible and prudent alternatives to the use of the historic bridge. The project includes all possible planning to minimize harm, and there are assurances that the measures to minimize harm will be incorporated in the project.

All appropriate coordination has been successfully completed.

DRAFT

Approved:

Date	Manager, Project Development and Environmental Analysis Branch

Date	Division Administrator, FHWA

DRAFT

Federal Aid #: **BRSTP-50(10)** *TIP#:* **B-4929** *County*: **Pender**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: Replace Bridge No. 16 on NC 50/210 over the Intracoastal Waterway in Surf City

On 4/5/2011, representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [x] Federal Highway Administration (FHWA)
- [x] North Carolina State Historic Preservation Office (HPO)
- [ ] Other

Reviewed the subject project and agreed on the effects findings listed within the table on the reverse of this signature page.

Signed:

Mary Pope Furr — 4/5/2011

Representative, NCDOT — Date

Donald W Bruce — 4-5-11

FHWA, for the Division Administrator, or other Federal Agency — Date

Representative, HPO — Date

Renee Gledhill-Earley — 4/5/11

State Historic Preservation Officer — Date

Federal Aid #: **BRSTP-50(10)** *TIP#:* **B-4929** *County*: **Pender**

Property and Status	Effect Finding	Alternative	Reasons
Pender County Bridge No, 16 (DE) Criterion C	Adverse Effect	Alts 4,5, 5R, 6, 7, 11, 17	Bridge will be removed with all alternatives Rehabilitation will not increase sufficiency to a high enough level

Initialed: NCDOT MPA FHWA DB HPO Rye

☐ FHWA intends to use HPO's call of "No Adverse Effect" as the basis of a "de minimis" finding for the following properties, pursuant to Section 4(f): FHWA initials _____

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Division of Highways

JAN - 7 2011

Preconstruction
Project Development and
Environmental Analysis Branch

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

December 28, 2010

MEMORANDUM

TO: Mary Pope Furr, Architectural Historian
NCDOT/PDEA/HEU

FROM: Peter Sandbeck RLG for Peter Sandbeck

SUBJECT: Historic Architectural Resources Survey Report, Replace Bridge #16 over AIWW in Surf City, B-4929, Pender County, ER07-1820

We received the above referenced report, prepared by Courtney Foley, on October 21, 2010 and offer the following comments.

We concur that **Pender County Bridge #16**, which was determined eligible for listing in the National Register of Historic Places as part of the 1995 statewide bridge survey, is still eligible for listing.

We also concur that the **Ward Realty Corporation** (Bldg #63) at 116 S Topsail Drive is not yet eligible for listing in the National Register as it is not fifty years old and does not meet Criterion Consideration G. Please note that on page 6 of the report, this property is incorrectly referred to as Property 62. We have changed it to #63 in our copy.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and patience in awaiting our reply. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Ron Lucas, FHWA

create

HUMAN ENVIRONMENT UNIT
SEP 13 2007
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North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

September 11, 2007

MEMORANDUM

TO: Gregory Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: Peter Sandbeck PBS for Peter Sandbeck

RE: Start of Study for Replacement of Bridge #16 on NC 50/210 over the Intracoastal Waterway, B-4929, Pender County, CH 07-1820

We are in receipt of your August 16, 2007, memorandum to Chrys Baggett of the State Clearinghouse, concerning the above referenced undertaking.

We have checked our maps and files and determined that Bridge #16 was determined eligible for listing in the National Register of Historic Places. Demolition and replacement of the bridge will have an adverse effect upon a historic property. Thus, additional coordination under Section 106 of the National Historic Preservation Act will be necessary.

There are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for inclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: SCH
Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

Federal Aid # BRSTP-50(10) *TIP #* B-4929 *County*: Pender

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: Replace Bridge No. 16 on NC 50/210 over Intracoastal Waterway in Surf City

On 19 March 2010, representatives of the

☒ North Carolina Department of Transportation (NCDOT)
☐ Federal Highway Administration (FHWA)
☒ North Carolina State Historic Preservation Office (HPO)
☐ Other

Reviewed the subject project at historic architectural resources photograph review session/consultation and

All parties present agreed

☐ There are no properties over fifty years old within the project's Area of Potential Effects (APE).

☒ There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's APE.

☒ There are properties over fifty years old within the project's APE, but based on the historical information available and the photographs of each property, the properties identified as 1-22, 24-62, 64-82 are considered not eligible for the National Register and no further evaluation of them is necessary. Photographs of these properties are attached.

☐ There are no National Register-listed or Study Listed properties within the project's APE.

☐ All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.

☒ More information is requested on property numbers: 23: Bridge No. 16 (DOE) and 63: 116 S. Topsail Drive.

Signed:

Courtney Foley — 30 MARCH 2010
Representative, NCDOT — Date

FHWA, for the Division Administrator, or other Federal Agency — Date

Representative, HPO — Date

Renee Gledhill-Earley — 3/30/10
State Historic Preservation Officer — Date

If a survey report is prepared, a final copy of this form and the attached list will be included.

Appendix D - Summary of August 17, 2011 Meeting with the Town of Surf City (Soundside Park Impacts Coordination)

Meeting Notes Memorandum

RS&H Architects-Engineers-Planners, Inc.

Meeting Date: August 17, 2011

Subject: B-4929 – Soundside Park Impacts

Location: Town Hall, Surf City

Attendees:

Town of Surf City:
Zander Guy, Mayor
Michael Moore, Town Manager
Todd Rademacher, Planner

RS&H:
Chad Critcher
Ken Herring
Radha Krishna Swayampakala

NCDOT:
Charles Cox, PDEA
Michele James, PDEA
Tony Houser, Roadway Design Unit
Lee Moore, Roadway Design Unit
Allen Pope, Division 3

FHWA:
Ron Lucas

Meeting Purpose: The purpose of the meeting was to discuss impacts to Soundside Park and determine whether these impacts are considered as adverse or *de minimis*.

Introductions: Michele James opened the meeting and invited introductions from attendees. Michele then explained the purpose of the meeting and introduced Chad Critcher with the consultant firm of RS&H.

Presentation: Chad Critcher presented the PowerPoint presentation with the following outline:

- History of Study Alternatives
- Detailed Study Alternatives Carried Forward for Additional Study
- Temporary and Permanent impacts to Soundside Park
- Definition of Section 4(f) and *de minimis*

Note: A copy of the PowerPoint presentation is attached with these meeting notes.

The following is a summary of the items discussed in the meeting:

- With Alternatives 6 and 7, the temporary detour bridge will allow for access to the Soundside Park near the same location as the existing access.

- Alternatives 6 and 7 would have significant utility impacts as the large transmission poles located adjacent to the Intracoastal Waterway would need to be moved twice during the construction period (move once into the park area to accommodate temporary construction efforts and move back to the original location after construction is complete).

- With Alternative 6 and 7, the picnic area and amphitheater in the Soundside Park along with Bumble Bee Market would be impacted by the temporary detour bridge. The detour bridge would also result in travel pattern changes to a few businesses and residences in the area.

- Even though the detour alignment is temporary, impacts to facilities such as the amphitheater would be severe enough to render the Soundside Park unusable during construction. It should be noted that any facilities impacted by the temporary detour bridge would be restored once the permanent bridge is open to traffic.

- Based on the information provided by the NCDOT Project Team so far, the Town officials felt that the temporary detour bridge impacts to Soundside Park would be more adverse and thereby could not be considered as *de minimis* impacts.

- FHWA came to this meeting to seek input from the Surf City Town officials and determine whether the impacts should be considered as adverse or not. Based on the input from the Surf City Town officials and NCDOT Project Team, FHWA considers that Alternatives 6 and 7 would result in temporary adverse impact to Soundside Park. Therefore, these alternatives would have a 4(f) use.

- Alternative 17 would have a minor/non-adverse impact to a small unusable portion of the Park, which would be considered as a *de-minimis* impact.

- Alternative 17 would provide a good view of the business district and proper signage could be provided to help attract people to these businesses.

- FHWA also stated that if Alternative 17 wasn't considered *de minimis*, and Alternatives 6 and 7 result in adverse temporary impacts to 4(f) usage, the Project Team, by law, will be required to choose another feasible and prudent alternative (such as Alternatives 4, 5, 5R or 11, which avoid impacts to the Soundside Park).

- Construction of the new bridge, whether moveable or high-level fixed bridge, would take 2-3 years.

- The Town officials felt that of the seven Detailed Study Alternatives, Alternatives 6, 7 and 17 are considered as the only feasible alternatives. Alternative 6 does not appear to be desirable due to low-level clearance and number of required openings per day. Alternative 17 appears to result in lower impacts to businesses; where as Alternatives 6 and 7 appear to result in higher impacts along Roland Avenue (both during and after the construction period).

- Subject to input to be received from public, Town believes that Alternatives 6 and 7 would cause an adverse impact to the Soundside Park and Alternative 17 would cause a minor impact.

- In the preliminary design plans, it appears that Alternative 17 could potentially impact the wastewater pump station on the island side. Town requests the Project Team to avoid impacts to the wastewater pump station.

- NCDOT and Town officials discussed that several area business owners contacted the Project Team members outside the Citizens Informational Workshops with questions regarding the study alternatives and associated impacts. NCDOT plans to hold a Business Forum with business owners to further discuss project impacts and/or possible mitigation measures.

- The Town will identify affected property owners in the area and provide their contact information to NCDOT. Todd Rademacher, town planner will be the contact person for this effort.

- FHWA indicates that some monies to fund other improvements in the study area as mitigation for the park impacts might be available.
- The new bridge will have a standard railing along the bridge.
- The Town believes that the NCDOT Project Team has done a great job with informing the community since the project initiation.
- Based on the current TIP, right-of-way acquisition is expected to start in 2014.

Appendix E - NRCS-CPA-106 Form (Farmland Conversion Impact Rating Form)

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **10/20/11**	4. Sheet 1 of **1**
1. Name of Project **B - 4929 Topsail Island Bridge Replacement**	5. Federal Agency Involved **FHWA**	
2. Type of Project **Bridge Replacement**	6. County and State **Pender County, North Carolina**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction **Acres:** %	7. Amount of Farmland As Defined in FPPA **Acres:** %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*		Alternative Corridor For Segment _____			
		Alternative 4	Alternative 5	Alternative 5R	Alternative 11
A. Total Acres To Be Converted Directly		5	5	5	3
B. Total Acres To Be Converted Indirectly, Or To Receive Services		0	0	0	0
C. Total Acres In Corridor		5	5	5	3
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide And Local Important Farmland					
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value					
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*					
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	**Maximum Points**				
1. Area in Nonurban Use	15	10	10	10	10
2. Perimeter in Nonurban Use	10	6	6	6	6
3. Percent Of Corridor Being Farmed	20	0	0	0	0
4. Protection Provided By State And Local Government	20	0	0	0	0
5. Size of Present Farm Unit Compared To Average	10	5	5	5	5
6. Creation Of Nonfarmable Farmland	25	5	5	5	5
7. Availablility Of Farm Support Services	5	3	3	3	3
8. On-Farm Investments	20	0	0	0	0
9. Effects Of Conversion On Farm Support Services	25	0	0	0	0
10. Compatibility With Existing Agricultural Use	10	0	0	0	0
TOTAL CORRIDOR ASSESSMENT POINTS	160	29	29	29	29
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100				
Total Corridor Assessment (From Part VI above or a local site assessment)	160	29	29	29	29
TOTAL POINTS *(Total of above 2 lines)*	260	29	29	29	29

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☑

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

Appendix F – Relocation Reports

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate 4 of	Alternate
T.I.P. NO.:	B-4929				
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway				

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	4	0	4	0
Businesses	3	2	5	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	4

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	1	$ 0-150	0
20-40M	0	150-250	0	20-40M	8	150-250	0
40-70M	0	250-400	0	40-70M	33	250-400	15
70-100M	0	400-600	0	70-100M	68	400-600	25
100 UP	4	600 UP	0	100 UP	620	600 UP	50
TOTAL	4		0		730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available

4.Thomas Seafood Produce - SM - 6-8 employees
Starfish Gift Shop - SM - 2-4 employees
Linda's Family Affair - SM - 2-4 employees
Topics Design Computer Repair - SM - 4-6 employees

The Harbor Thrift Store - SM - 2-4 employees
6. Realtors, MLS, news papers, private market
8. As required by law
11. Pender County Section 8
12. There is an ample and active real estate market.
14. Same as Number 6 above.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

FRM15-E

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate 5 of	Alternate
T.I.P. NO.:	B-4929				
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway				

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	2	0	2	0
Businesses	3	1	4	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	2

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	1	$ 0-150	0
20-40M	0	150-250	0	20-40M	8	150-250	0
40-70M	0	250-400	0	40-70M	33	250-400	15
70-100M	0	400-600	0	70-100M	68	400-600	25
100 UP	2	600 UP	0	100 UP	620	600 UP	50
TOTAL	2		0		730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available
4. Thomas Seafood Produce - SM - 6-8 employees
Starfish Gift Shop - SM - 2-4 employees
Mainsail Bar & Restaurant - SM - 12-15 employees
Just Baked Bakery - SM - 2-4 employees
6. Realtors, MLS, news papers, private market

8. As required by law
11. Pender County Section 8
12. There is an ample and active real estate market.
14. Same as Number 6 above.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

FRM15-E

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate	***5R***	of Alternate
T.I.P. NO.:	B-4929					
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway					

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	3	10	13	0
Businesses	6	1	7	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	5	8

VALUE OF DWELLING

Owners		Tenants	
0-20M	0	$ 0-150	0
20-40M	0	150-250	0
40-70M	0	250-400	0
70-100M	0	400-600	0
100 UP	3	600 UP	10
TOTAL	3		10

DSS DWELLING AVAILABLE

For Sale		For Rent	
0-20M	1	$ 0-150	0
20-40M	8	150-250	0
40-70M	33	250-400	15
70-100M	68	400-600	25
100 UP	620	600 UP	50
	730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available
4. Thomas Seafood Produce - SM - 6-8 employees
Starfish Gift Shop - SM - 2-4 employees
Cheri's Restaurant - SM - 8-10 employees
Surf City Seafood Market - SM - 8-10 employees
Blackbeard's Campground Office - SM - 4-6 employees
Mainsail Bar & Restaurant - SM - 12-15 employees
Just Baked Bakery - SM - 2-4 employees
6. Realtors, MLS, news papers, private market
8. As required by law

11. Pender County Section 8
12. There is an ample and active real estate market.
14. Same as Number 6 above.
NOTE: 10 tenants are mobile homes in Blackbeard's Campground. Appear to be seasonal occupants.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate 6 of Alternate
T.I.P. NO.:	B-4929			
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway			

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	0	0	0	0
Businesses	1	0	1	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	1	$ 0-150	0
20-40M	0	150-250	0	20-40M	8	150-250	0
40-70M	0	250-400	0	40-70M	33	250-400	15
70-100M	0	400-600	0	70-100M	68	400-600	25
100 UP	0	600 UP	0	100 UP	620	600 UP	50
TOTAL	0		0		730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available
4.Bumble Bee Market Gift Shop - SM - 4-6 employees
6. Realtors, MLS, news papers, private market
8. As required by law
11. Pender County Section 8
12. There is an ample and active real estate market.

14. Same as Number 6 above.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

FRM15-E

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate 7 of	Alternate
T.I.P. NO.:	B-4929				
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway				

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	0	0	0	0
Businesses	3	0	3	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	1	$ 0-150	0
20-40M	0	150-250	0	20-40M	8	150-250	0
40-70M	0	250-400	0	40-70M	33	250-400	15
70-100M	0	400-600	0	70-100M	68	400-600	25
100 UP	0	600 UP	0	100 UP	620	600 UP	50
TOTAL	0		0		730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available
4. Bumble Bee Market Gift Shop - SM - 4-6 employees
   Max's Pizza - SM - 10-12 employees
   Century 21 Action Realty - SM - 12-15 employees
6. Realtors, MLS, news papers, private market
8. As required by law
11. Pender County Section 8
12. There is an ample and active real estate market.
14. Same as Number 6 above.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate *11* of	Alternate
T.I.P. NO.:	B-4929				
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway				

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	3	1	4	0
Businesses	1	0	1	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	1	3

VALUE OF DWELLING

Owners		Tenants	
0-20M	0	$ 0-150	0
20-40M	0	150-250	0
40-70M	2	250-400	0
70-100M	0	400-600	1
100 UP	1	600 UP	0
TOTAL	3		1

DSS DWELLING AVAILABLE

For Sale		For Rent	
0-20M	1	$ 0-150	0
20-40M	8	150-250	0
40-70M	33	250-400	15
70-100M	68	400-600	25
100 UP	620	600 UP	50
	730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available
4.Large warehouse - SM - 6-8 employees
6. Realtors, MLS, news papers, private market
8. As required by law
11. Pender County Section 8
12. There is an ample and active real estate market.

14. Same as Number 6 above.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

FRM15-E

EIS RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

X E.I.S. ☐ CORRIDOR ☐ DESIGN

WBS ELEMENT:	40233.1.1	COUNTY	Pender	Alternate *17* of	Alternate
T.I.P. NO.:	B-4929				
DESCRIPTION OF PROJECT:	Replacement of Bridge 16 over the Intracoastal Waterway				

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	1	0	1	0
Businesses	0	3	3	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	1

VALUE OF DWELLING

Owners		Tenants	
0-20M	0	$ 0-150	0
20-40M	0	150-250	0
40-70M	0	250-400	0
70-100M	1	400-600	0
100 UP	0	600 UP	0
TOTAL	1		0

DSS DWELLING AVAILABLE

For Sale		For Rent	
0-20M	1	$ 0-150	0
20-40M	8	150-250	0
40-70M	33	250-400	15
70-100M	68	400-600	25
100 UP	620	600 UP	50
	730		76

ANSWER ALL QUESTIONS

Yes	No	*Explain all "YES" answers.*
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
X		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? **12-18 months**

REMARKS (respond by number)

3. There is an ample supply of similar type businesses available
4.Crabby Mikes Restaurant - SM - 12-15 employees
Mystic Treasures Jewelry - SM - 2-4 employees
Topsail Art Gallery - SM - 2-4 employees
6. Realtors, MLS, news papers, private market
8. As required by law
11. Pender County Section 8
12. There is an ample and active real estate market.
14. Same as Number 6 above.

	6/26/11		6/30/11
Right of Way Agent	Date	Relocation Coordinator	Date

Appendix G – Artistic Renderings of Detailed Study Alternatives

High-Level Fixed Bridge

Bird's Eye View

Island Tie-in Location

Mainland Tie-in Location

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

High-Level Fixed Bridge

Bird's Eye View

Island Tie-in Location

Mainland Tie-in Location

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

High-Level Fixed Bridge

Bird's Eye View

Island Tie-in Location

Mainland Tie-in Location

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

Low-Level Moveable Bridge

Bird's Eye View

Island Tie-in Location

Mainland Tie-in Location

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

Mid-Level Moveable Bridge

Bird's Eye View

Island Tie-in Location

Mainland Tie-in Location

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

High-Level Fixed Bridge

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

High-Level Fixed Bridge

Bird's Eye View

Island Tie-in Location

Mainland Tie-in Location

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

ARTISTIC RENDERING
PRELIMINARY - SUBJECT TO CHANGE

RS&H
IMPROVING YOUR WORLD

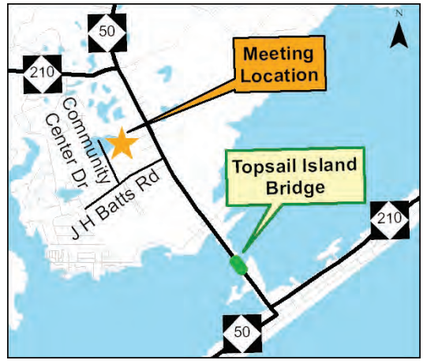
Appendix H – Project Newsletters

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT TEAM
8008 Corporate Center Drive, Suite 410
Charlotte, NC 28226

First Citizens Informational Workshop

When: Thursday, June 25, 2009 from 2:30 PM – 7:30 PM
Where: Surf City Community Center
201 Community Center Drive
Surf City, NC 28445

Maps denoting the proposed project area will be displayed and NCDOT representatives will be available to receive comments, discuss the project, and answer questions. Citizens may drop in anytime during the workshop hours.



CONTACT US

Toll-Free Project Hotline: 1-877-392-5996

Written comments and questions are welcomed and may be mailed or emailed to:

Topsail Island Bridge Replacement Project Team
8008 Corporate Center Drive, Suite 410
Charlotte, NC 28226

email: topsailislandbridge@rsandh.com
website: http://www.ncdot.gov/projects/TopsailIslandBridge/

Topsail Island Bridge Replacement Project

Issue 1 | June 2009

TIP No. B-4929

Project Schedule

- **June 25, 2009**
  Citizens Informational Workshop #1 – Project Information
- **Spring 2010**
  Citizens Informational Workshop #2 – Project Alternatives Evaluation
- **Fall 2010**
  Environmental Assessment Complete
- **Spring 2011**
  Project Public Hearing
- **Summer 2011**
  Selection of Recommended Alternative
- **Fall 2011**
  Finding of No Significant Impact (FONSI) Complete
- **2013**
  Right-of-Way Acquisition Begins
- **2015**
  Construction Begins

Project Overview

The North Carolina Department of Transportation (NCDOT) proposes to build a new bridge to replace the existing swing bridge over the Intracoastal Waterway on NC 50/210 in Surf City. This is one of two bridges providing access to Topsail Island.

Purpose and Need of the Project

The existing bridge is a steel truss swing span bridge that was built in the 1950's and is due for replacement. The new bridge will address the existing needs as follows:

- Provide a connecting structure between the mainland and the island with sufficient capacity allowing for emergency access, hurricane evacuation, and acceptable travel times.
- Improve the structural capacity of the bridge.
- Provide consistency with State/Local land use and transportation plans.

Your Input is Essential

The NCDOT will hold a Citizens Informational Workshop on Thursday, June 25, 2009 between the hours of 2:30 PM and 7:30 PM at the Surf City Community Center, located at 201 Community Center Drive, Surf City, 28445. The workshop will be informal. Citizens may drop in anytime during the workshop hours. In accordance with the Americans with Disabilities Act, NCDOT will provide auxiliary aids and services for disabled persons who wish to participate in the workshop. Persons requiring special services are requested to call 1-877-392-5996 as early as possible so that arrangements can be made.

The purpose of this workshop will be to listen to the community's issues, concerns, ideas and comments concerning the project and to introduce the NCDOT project team.

continued on page 2

CITIZENS INFORMATIONAL WORKSHOP ANNOUNCEMENT

Thursday, June 25, 2009
2:30 PM – 7:30 PM
Surf City Community Center
201 Community Center Drive
Surf City, NC 28445

Connecting people and places in North Carolina – safely and efficiently, with accountability and environmental sensitivity.

continued from page 1

Your answers to the following questions and others will help the NCDOT team as they move forward with project development.

- How often do you travel over the bridge (via automobile), or under/through the bridge (via boat)?
- How does the bridge support your community or business?
- If the bridge were closed short-term or long-term, how would this impact you?
- How are you affected by delays due to the opening of the draw bridge?
- Do you use the bridge at North Topsail to avoid delays at Surf City?
- Do you think a high span bridge similar to the bridge at North Topsail is appropriate for the existing bridge replacement? How about a bascule bridge (draw bridge)?
- Should the new bridge accommodate pedestrians and bicyclists?
- Do you have specific issues or ideas that you would like to share concerning the bridge replacement?

Now is the time for you to talk with the planners and engineers responsible for the proposed replacement of the bridge you use every day. We encourage you to bring your responses to the questions above to the workshop and we will have comment cards available for your use. Comments may be left at the workshop, mailed in, posted on the project website, or recorded on the project toll free number.

After the meeting, the project team will categorize the comments received to determine the community's highest concerns, preferences, and ideas. These items will be analyzed to determine how best to implement into the design process. Results from this analysis will be included at the next community workshop to be scheduled once design alternatives have been prepared.

The Project Development Process

The Topsail Island Bridge Replacement project development, environmental studies, and engineering will be conducted in accordance with the National Environmental Policy Act (NEPA). NEPA is a federal law enacted in 1970 that requires the Federal Government to consider the environmental impacts of, and alternatives to, major proposed actions in its decision-making processes. The act is the basic national charter for the protection of the environment. Under NEPA, an environmental document is required for any projects that receive federal funds.

As a part of this process, the project team will prepare several studies to evaluate the direct or indirect potential project impacts in the study area. The project study area will include the entire Topsail Island including the towns of Topsail Beach, Surf City and North Topsail Beach and the mainland portion of Surf City between the Intracoastal Waterway and US 17.

Over the next few months, you can expect to see different project team members visit the area. You may notice biologists, environmental scientists, engineers, planners, surveyors, and architectural historians surveying the area. Each has a different field of expertise that provides information the project team needs to develop an effective project as well as minimize the impacts to the community and environment.

Team members may snap photographs, take measurements, or mark important locations. However, these markers are only surveying and documentation guides and they do not necessarily indicate that your property will be impacted by the project.

As representatives of the State of North Carolina, we strive to treat you and your land, home or business with respect and courtesy. NCDOT kindly asks that you allow our staff on your property to conduct the necessary studies. If the highest standards of customer service are not observed, please contact the project team at 1-877-392-5996.

Project Location

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT TEAM
8008 Corporate Center Drive, Suite 410
Charlotte, NC 28226

What's Next?

The next step in the project development process is to prepare alternatives. Each alternative will be evaluated based on environmental impacts, costs and how well they meet the purpose and need. Results from the designs and comparisons will be presented to the public at the next Citizens' Informational Workshop scheduled for Fall 2010.

Be Informed...Be Involved

Continued public involvement and participation is a very important part of the project development process. The Project Team will continue to provide frequent project updates as major milestones are reached. Citizens are encouraged to stay involved and obtain project information from any of the following sources:

- Access the project web site at: http://www.ncdot.gov/projects/TopsailIslandBridge. All of the material presented at the CIW #1 is available on this website.
- Add your name to the project mailing list to receive future project correspondence.
- Contact the Project Team members to provide input or ask any questions via the Toll-Free Project Hotline at

1-877-392-5996

- Mail or email your comments and questions to:
  Topsail Island Bridge Replacement Project Team
  8008 Corporate Center Drive, Suite 410, Charlotte, NC 28226
  email: topsailislandbridge@rsandh.com

Topsail Island Bridge Replacement Project

Issue 2 / March 2010

TIP No. B-4929

Project Schedule

- **June 25, 2009**
  CIW #1 – Project Information
- **Fall 2010**
  CIW #2 – Evaluation of Alternatives
- **Fall 2011**
  Environmental Assessment Complete

  Corridor Public Hearing
- **Spring 2012**
  Selection of Preferred Alternative
- **Summer 2012**
  Finding of No Significant Impact (FONSI) Complete
- **Fall 2012**
  Design Public Hearing
- **2013***
  Right-of-Way Acquisition Begins
- **2015***
  Construction Begins

* Based on 2009-2015 NCDOT Transportation Improvement Program, which will be updated in summer 2010.

Project Overview and Public Outreach Efforts

The North Carolina Department of Transportation (NCDOT) proposes to build a new bridge to replace the existing swing bridge over the Intracoastal Waterway on NC 50/210 in Surf City. This newsletter provides an update on this public outreach process.

A series of Public Officials Meetings were held on June 24-25, 2009 with Topsail Beach, Surf City, and North Topsail Beach community representatives. The first Citizens' Informational Workshop (CIW #1) was held on June 25, 2009 at the Surf City Community Center.

The workshop was an informal open house with over 350 citizens in attendance. The attendees were first shown a video that provided an overview of the study bridge, potential bridge types, and the project schedule. They also had an opportunity to interact with Project Team members, ask questions, share ideas, draw new bridge alignments on aerial mapping, and complete comment cards. A summary of public comments is shown on page 2.

Coordination with Environmental Agencies

The feedback obtained from the CIW #1 was presented at the first public agency Merger meeting. The Merger process consists of a series of meetings devoted to streamlining the project development and permitting processes, agreed to by the US Army Corps of Engineers, NC Department of Environment and Natural Resources (Division of Water Quality, and Wildlife Resources Commission), Federal Highway Administration, and NCDOT and supported by other stakeholder agencies and local units of government. To this effect, the Merger process provides a forum for appropriate agency representatives to discuss and reach consensus on ways to facilitate and satisfy regulatory requirements.

The first Merger meeting was held on August 20, 2009. The intent of this meeting was to agree on the project's Purpose and Need and Study Area. The environmental agencies agreed on the following:

Need for Proposed Action – Structurally deficient, functionally obsolete bridge

Purpose of Proposed Action – Improve bridge safety and functionality

Design Study Area – This was developed based on feasible alternatives suggested during CIW #1 and developed by the Project Team. This study area is shown in Figure 1 on page 3 of this newsletter.

A bridge is structurally deficient when it has elements that need to be monitored and/or repaired to maintain its structural integrity. It does not mean that the bridge is unsafe. A bridge is functionally obsolete when its layout no longer meets current design standards for width shoulders, and rails.

The following are some of the additional comments, ideas, or concerns collected from the workshop attendees:

General Ideas

- Have public meetings on Saturday to allow more people to attend.
- Form a steering committee of local citizens.
- Speed up the process.
- Speak to affected landowners on a more personal one-on-one basis.

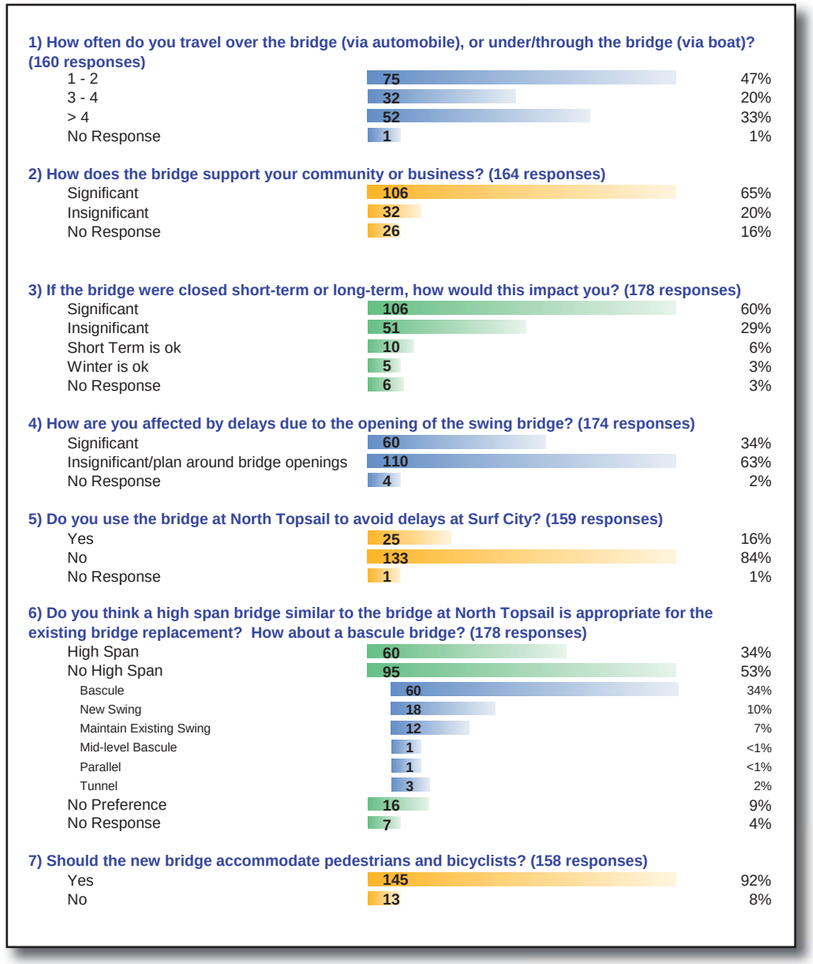
Citizens' Concerns

- Need to have access to the island during construction.
- What will happen to the park by the bridge?
- Avoiding disruption to property and business owners should be a major priority.
- The closing of the bridge for boat traffic has a horrible affect on traffic flow.

Design Suggestions

- New bridge should have four-lanes and should reflect the scenic community of Surf City.
- High-rise is the best economical choice. Without a high-rise bridge, congestion will only get worse.
- Bascule bridge is the answer.
- Repair existing bridge. Minimize long-term impact to property and business owners and maintain Surf City's character.
- Build a third bridge at the south end of island.
- Adapt the design of the Ocean Isle Beach bridge to fit Topsail.
- A draw bridge at a higher elevation would allow for fewer bridge openings.
- Replace the swing bridge with a new swing bridge.
- Provide a bridge that safely allows for walkers and bike riders.

At CIW#1, a total of 170 comment cards were collected at the workshop along with over 100 phone calls, emails, or written correspondence. These comments have been categorized and tallied to provide an overall picture of the responses and citizens' preferences, as shown below:



Project Location and Study Area

	Pender County	Topsail Island Bridge Replacement Project Replacement of NC 50/210 Bridge (No. 16) Over Intracoastal Waterway	T.I.P. No: B-4929 WBS: 40233.1.1 Division: 3	Figure 1: Study Area March 2010

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT TEAM
8008 Corporate Center Drive, Suite 410
Charlotte, NC 28226

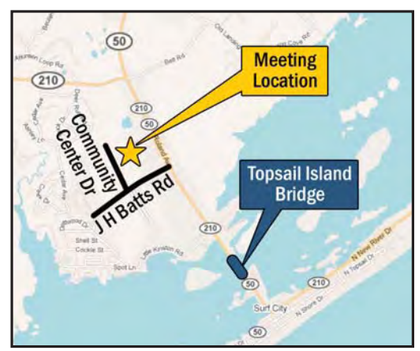
Citizens Informational Workshop #2

WHERE: **Surf City Community Center**
201 Community Center Drive, Surf City, NC 28445

WHEN: **Thursday October 21, 2010 from 3:00 PM to 7:00 PM**

The NCDOT Project Team members will be available to present large maps and renderings as well as impact comparisons and relative costs for the 14 study alternatives. Citizens may drop in anytime during the workshop hours.

All the information presented at the workshop will be posted on the project website immediately after the workshop. If you cannot attend the meeting in person, please check the project website to review the material and provide your feedback.



Contact Us

Toll-Free Project Hotline: 1-877-392-5996

Written comments and questions are welcomed any time and may be mailed or emailed to:

Topsail Island Bridge Replacement Project Team
8008 Corporate Center Drive, Suite 410, Charlotte, NC 28226
email: topsailislandbridge@rsandh.com
website: http://www.ncdot.gov/projects/TopsailIslandBridge

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA
BRIDGE AHEAD

9,600 copies of this public document were printed at a cost of $5,500, or .57¢ each.

Topsail Island Bridge Replacement Project

Issue 3 / October 2010

TIP No. B-4929

Project Schedule

- June 25, 2009
  CIW #1 – Project Information
- **October 21, 2010**
  CIW #2 – Corridor Alternatives Evaluation
  We Are Here
- **Fall 2011**
  Environmental Assessment Document Complete
- **Fall 2011**
  CIW #3 – Preliminary Design Alternatives Evaluation
- **Spring 2012**
  Selection of Preferred Alternative
- **Fall 2012**
  Anticipated Finding of No Significant Impact (FONSI) Document Complete
- **Fall 2012**
  Design Public Hearing
- **2014**
  Right-of-Way Acquisition Begins
- **2016**
  Construction Begins

We are Re-Visiting Your Community

The North Carolina Department of Transportation (NCDOT) will hold the Citizens Informational Workshop #2 (CIW #2) on Thursday, October 21, 2010 to provide an update on the Topsail Island Bridge Replacement Project. The workshop will be informal, with NCDOT Project Team members available to discuss the project. Citizens may drop in at anytime during the workshop hours.

October 21, 2010

Citizens Informational Workshop #2

3:00 PM - 7:00 PM

Surf City Community Center
201 Community Center Drive
Surf City, NC 28445

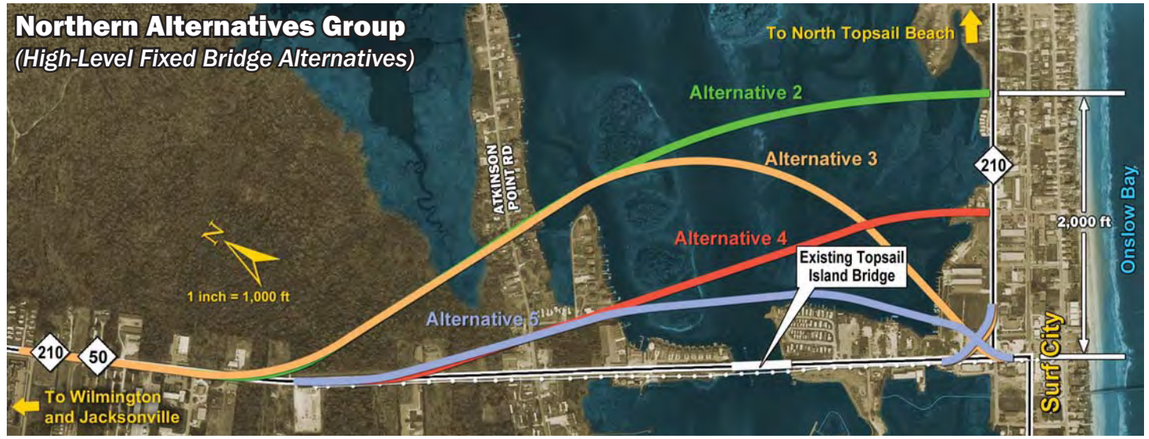
Project Update

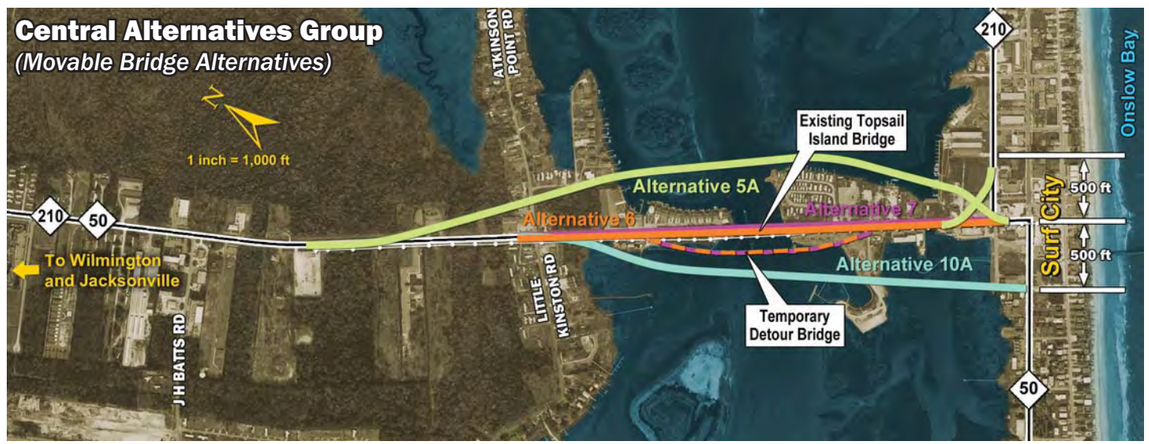
NCDOT proposes to replace the existing swing bridge over the Intracoastal Waterway on NC 50/210 in Surf City, as this bridge has been determined to be structurally deficient, and functionally obsolete. A bridge is structurally deficient when it has elements that need to be monitored and/or repaired to maintain its structural integrity. It does not mean that the bridge is unsafe. A bridge is functionally obsolete when its layout no longer meets current design standards for width of shoulders and rails.

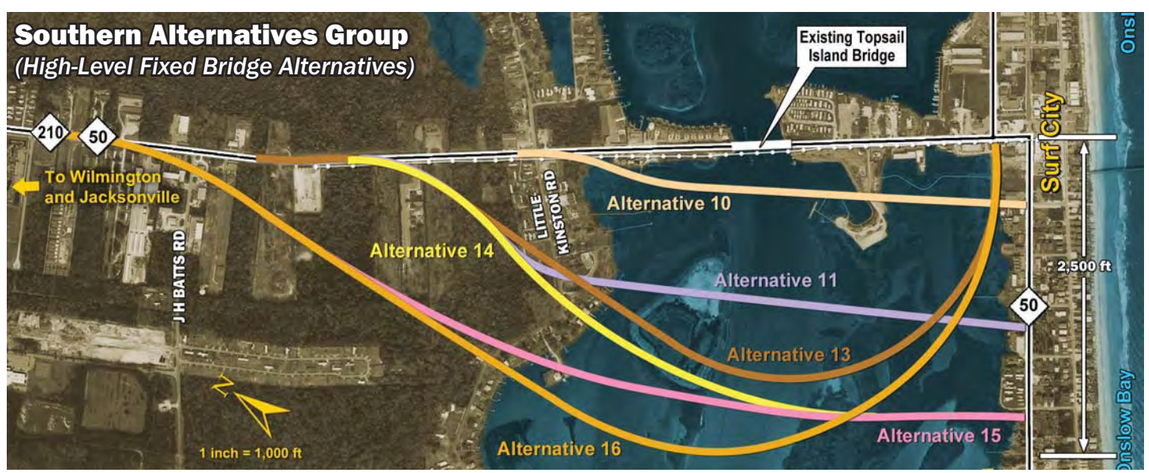
Based on citizens' feedback at the previous workshop, held on June 25, 2009, eighteen alternatives were developed to replace the existing bridge and to potentially realign the approaching NC 50/210 roadway.

Preliminary screening for environmental impacts was prepared for all the alternatives. The Project Team eliminated four alternatives from further study based on unacceptable environmental impacts. Alternatives eliminated include Alternatives 1, 8, 9, and 12. The remaining fourteen alternatives are shown on Page 2 of this newsletter. It should be noted that some of these fourteen study alternatives follow the same alignment, however they differ in elevation and type of replacement structure. For example, Alternative 5 is a high-level fixed bridge, where as Alternative 5A is a mid-level movable bridge.

Connecting people and places in North Carolina – safely and efficiently, with accountability and environmental sensitivity







Study Alternatives

Based on similarity and proximity, the Project Team has divided the fourteen study alternatives into three groups as follows: Northern Alternatives Group, Central Alternatives Group, and Southern Alternatives Group.

- The Northern Alternatives Group includes four alternatives, located between 500 feet and 2,000 feet north of the existing bridge. Under each northern alternative, the existing bridge would be replaced with a high-level fixed bridge; having waterway clearance of 65 feet.
- The Central Alternatives Group includes four alternatives, located within 500 feet north or south of the existing bridge. Under each central alternative, the existing bridge would be replaced with a movable bridge. Alternatives 5A, 7, and 10A are mid-level movable bridges with a waterway clearance of 30 feet. Alternative 6 is a low-level movable bridge with a waterway clearance of 15 feet, which is the same as the existing bridge.
- The Southern Alternatives Group includes six alternatives, located between 500 feet and 2,500 feet south of the existing bridge. Under each southern alternative, the existing bridge would be replaced with a high-level fixed bridge; having waterway clearance of 65 feet.

Questions for the Community

Now that alternatives have been developed, we need your continued input on narrowing the number of alternatives for further study. Following are a few sample questions we would like you to think about prior to arriving at the workshop on October 21st:

- Do you have property that will be directly impacted by one of the alternatives? If so, which alternative? What is the address of this property and how are you currently using the property (residential, business, vacation)?
- Do you prefer the bridge to be replaced to the north, south, or near the existing location?
- What is your preferred alternative in **EACH** of the three groups (Northern, Central, and Southern Group)?
- What are the reasons for choosing your preferred alternatives?
- Are there any other bridge alternatives that are not shown on the maps that you feel should be considered?
- Do you have other issues or ideas that you would like to share concerning the replacement of the bridge?
- What makes this community important to you?

What's Next?

Your input (along with potential environmental impacts and costs) associated with each alternative will be used by the Project Team as they continue narrowing the number of alternatives. Results of the detailed study of the remaining alternatives will be presented at the next Citizens Informational Workshop #3 tentatively scheduled for the Fall of 2011.

TOPSAIL ISLAND BRIDGE REPLACEMENT PROJECT TEAM
8008 Corporate Center Drive, Suite 410
Charlotte, NC 28226

What's Next?

The next step in the project development process is to prepare preliminary roadway designs for each alternative. With these design plans, the Project Team will start to develop cost estimates and determine the environmental impacts for each alternative. The results of this work will be included in the Environmental Assessment (EA) document scheduled for completion around Fall 2011. Upon completion of this EA, the Project Team will make the EA available for public review and also hold a Corridor Public Hearing to present these findings to the public for comments.

Be Informed... Be Involved

Continued public involvement and participation is a very important part of the project development process. The Project Team will continue to provide frequent project updates as major milestones are reached. Citizens are encouraged to stay involved and obtain project information from any of the following sources:

- Access the project web site at: http://www.ncdot.gov/projects/TopsailIslandBridge
  All of the material presented at the CIW #2 is available on this web site.
- Add your name to the project mailing list to receive future project correspondence.
- Contact the Project Team members to provide input or ask any questions via the Toll-Free Project Hotline at
  1-877-392-5996
- Mail or email your comments and questions to:
  Topsail Island Bridge Replacement Project Team
  8008 Corporate Center Drive, Suite 410, Charlotte, NC 28226
  email: topsailislandbridge@rsandh.com

TOPSAIL ISLAND BRIDGE REPLACEMENT
SURF CITY, NORTH CAROLINA

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Topsail Island Bridge Replacement Project

Issue 4 / April 2011

TIP No. B-4929

Project Schedule

- **June 25, 2009**
  CIW #1 – Project Information
- **October 21, 2010**
  CIW #2 – Corridor Alternatives Evaluation
- **Fall 2011**
  Environmental Assessment Document Complete
  Corridor Public Hearing
- **Spring 2012**
  Selection of Preferred Alternative
- **Fall 2012**
  Anticipated Finding of No Significant Impact (FONSI) Document Complete
  Design Public Hearing
- **2014**
  Right-of-Way Acquisition Begins
- **2016**
  Construction Begins

Project Overview and Public Outreach Efforts

The North Carolina Department of Transportation (NCDOT) proposes to build a new bridge to replace the existing swing bridge over the Intracoastal Waterway on NC 50/210 in Surf City. This newsletter is an update on the project status and NCDOT's public outreach process.

The Project Team held the second Citizens Informational Workshop (CIW #2) on October 21, 2010 at the Surf City Community Center. Similar to the first workshop held on June 25, 2009, the CIW #2 was an informal open house with over 300 citizens in attendance. Public officials from Topsail Beach, Surf City, and North Topsail Beach were also in attendance. The attendees were first shown a presentation that provided an overview of the project schedule as well as the 16 study alternatives, which were developed based on citizens' feedback at the previous workshop. Following the presentation, citizens viewed maps of the alternatives with corresponding artistic renderings. NCDOT Project Team members were available to answer questions and listen to citizens comments. Citizens were also encouraged to complete comment card questionnaires.

Results from the Public Outreach Effort

A summary of the citizens' comments provided during or subsequent to CIW #2 are shown on page 2. Based on citizens' comments and coordination with reviewing agencies, the Project Team has subsequently developed two additional study alternatives. The two study alternatives are Alternative 5R and Alternative 17.

Alternative 5R: Alternative 5R is very similar to Alternative 5 and is a high-level fixed bridge alternative; however, the revised alignment shifts slightly toward the south, allowing vessel access to the Beach House Marina to be maintained. Previously, Alternative 5 did not allow for the marina access, resulting in substantial business operations impacts.

Alternative 17: Alternative 17 combines design elements from Alternative 10 and Alternative 13. This high-level fixed bridge alternative was shifted slightly south to minimize impacts to Soundside Park.

Both Alternative 5R and Alternative 17 are included in the maps shown on page 3.

Environmental Planning Process Update

Alternative designs as well as comments received from CIW #2 were presented to the federal, state, and local environmental agencies at a meeting held on December 21, 2010. Agencies were provided an opportunity to question the potential impacts associated with each alternative. Based on the information obtained to date, the reviewing agencies and Project Team agreed to eliminate several alternatives, narrowing the alternatives to be carried forward to only the seven listed below (also shown on page 3):

- Northern Group: Alternatives 4, 5, and 5R (high-level fixed bridges)
- Central Group: Alternatives 6 and 7 (low/mid-level moveable bridges)
- Southern Group: Alternatives 11 and 17 (high-level fixed bridges)

Summary of Community Feedback

At CIW #2, a total of 220 comment cards were received during or subsequent to the workshop. These comments have been categorized and tallied to provide an overall picture of the responses and citizens' preferences, as shown below:

1) Where do you live? (216 responses)

Surf City Island	100	46%
Surf City Mainland	52	24%
Topsail Beach	25	12%
North Topsail Beach	17	8%
Hampstead	10	5%
Other	12	6%

2) Your relationship with the Island: (214 responses)

Permanent Resident	152	71%
Seasonal Resident	48	22%
Other	14	7%

3) Do you have property that will be directly impacted by one of the alternatives? (196 responses)

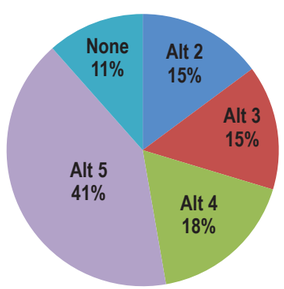
a.	Yes	129	66%
b.	No	67	34%

4) What is your property's use ? (176 responses)

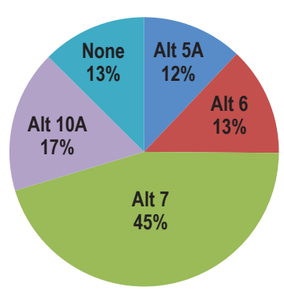
Residential	128	73%
Business	21	12%
Vacation	20	11%
Other	7	4%

5) What is your preferred alternative in EACH of the three groups?

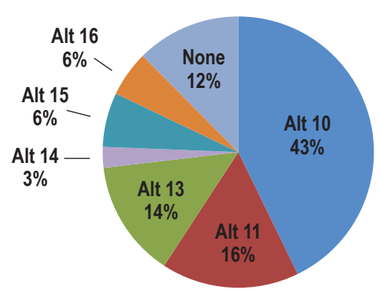
Northern Group (182 responses)



Central Group (199 responses)



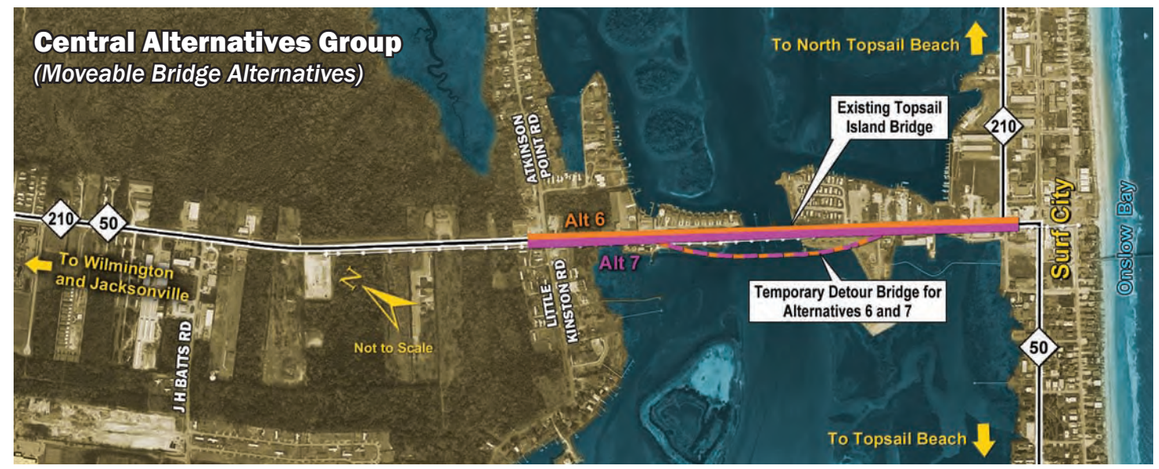
Southern Group (201 responses)



At CIW #2, citizens indicated that their preferences were based on reducing impacts associated with each alternative. Listed impacts of concern included:

- Disruption of business operations and effects on the local economy
- Property acquisition and access
- Vehicle and vessel safety and operations
- Emergency response times
- Bridge visibility and aesthetics
- Pedestrian and bicycle accessibility
- Future island development and growth

Detailed Study Alternatives



Note: In order to avoid impacts, alternative alignments shown above may be adjusted as more detailed designs are developed.

Appendix I - Section 404/NEPA Merger Team Meeting

(Concurrence Point) Minutes and Signature Forms

Meeting Notes Memorandum

FINAL VERSION

RS&H Architects-Engineers-Planners, Inc.
Architectural, Engineering, Planning and Environmental Services

NCDOT/RS&H Project Team

Meeting Date: August 20, 2009

Subject: NEPA/404 Merger Team Concurrence Point 1 Meeting for Topsail Island Bridge Replacement Project TIP Project No. B-4929

Location: Board Room, NCDOT Highway Building

Attendees:

Agencies:
Brad Shaver, US Army Corps of Engineers
Kim Garvey, US Army Corps of Engineers
Tom Steffens, US Army Corps of Engineers
Teresa Russell, US Army Corps of Engineers
Christopher Militscher, US EPA
Kathy Matthews, EPA
Ron Lucas, FHWA
Travis Wilson, Wildlife Resources Commission
David Wainwright, DWQ
Gary Jordan, Fish and Wildlife Service
Steve Sollod, Division of Coastal Management
Renee Gledhill-Earley, DCR-SHPO

Via Conference Call:
Rich Carpenter, Division of Marine Fisheries

Consultants:
Chad Critcher, RS&H
Radha Krishna Swayampakala, RS&H

NCDOT:
Don Idol, Bridge Management
Missy Pair, PDEA
Rob Hanson, PDEA
Charles Cox, PDEA
Michele James, PDEA
Drew Joyner, HEU
Ed Lewis, HEU
Herman Huang, HEU
Thomas Stoddard, TIP Development
Allen Pope, Division 3
Mason Herndon, Division 3
Mark Staley, Roadside Environmental
Lonnie Brooks, Structure Design
Ray Moore, Structure Design
Judy Joines, Right-of-way
Don Eggert, Cape Fear RPO
Tony Houser, Roadway Design
Tyler Stanton, NEU

Bill Brazier, US Coast Guard, and Ron Sechler, National Marine Fisheries Service were unable to attend the meeting.

A NEPA/404 Merger Team meeting for the subject project was held on August 20, 2009 in the Board Room of the NCDOT Highway Building. The purpose of this meeting was to reach agreement on Concurrence Point 1 - Purpose and Need/Study Area defined.

Introductions:

Mr. Brad Shaver opened the meeting and invited introductions from attendees. Mr. Sharer then explained the purpose of the meeting and introduced Michele James - NCDOT PDEA Project Manager. Ms. James welcomed the attendees, requested all the attendees to sign in and introduced Mr. Chad Critcher with the consultant firm of RS&H.

Presentation:

Mr. Chad Critcher offered a Concurrence Point 1 packet to the attendees that did not already have one. Mr. Critcher then presented the PowerPoint presentation of the proposed project's Purpose and Need and Study Area Defined. Following is the presentation outline:

- Project Vicinity and Description
- Project History
- Study Area and Communities
- Purpose & Need Community Outreach
- Agency Comments
- Need for Proposed Action
- Purpose of Proposed Action
- Project Schedule and Funding

A copy of the PowerPoint presentation is attached with these meeting notes.

Questions and Comments:

A question and answer session followed the presentation. Comments and answers are shown below:

Christopher Militscher asked if the NCDOT Project Team has any information on the current and future projected AADT on the Topsail Island Bridge?

Chad Critcher responded that the based on the existing data, the 2008 AADT is approximately 12,000 vehicles per day (vpd) and the 2035 projected AADT is 26,000 vpd.

Christopher Militscher asked if the island is mostly built out, what causes the projected traffic on the Topsail Island Bridge to double in the next 25 years?

Charles Cox responded that the island portion of Surf City is mostly built out. However, Surf City is growing more on the mainland side towards US Highway 17. Several residential and commercial developments are planned on the mainland portion of Surf City and most of the government facilities are located on the island portion of the town. As a result, residents/visitors of this area would commute more between the island and mainland via the study bridge, which is expected to add a lot more traffic.

Christopher Militscher inquired whether a two-lane bridge be sufficient to accommodate 26,000 vpd in year 2035? He also asked whether this traffic demand warrant more lanes on the bridge?

Charles Cox and Chad Critcher answered that a movable bridge with 26,000 vpd may require more than two lanes. Currently, the capacity of the bridge is limited by bridge openings to allow boats. These openings are causing delays to road traffic and thereby worsening the traffic flow conditions in the study area. A fixed span bridge would have more capacity compared to a movable bridge. As a part of the design process, NCDOT will perform a detailed traffic operations analysis which will determine the capacity needs for the proposed new bridge.

However, providing additional capacity is not a Purpose of Proposed Action NCDOT is presenting to the Merger Team.

Christopher Militscher asked why did the presentation indicate that bridge capacity is a problem?

Allen Pope responded that the presentation was referring to load carrying capacity of the bridge. Currently, the posted allowable load on the bridge is 14 tons for single vehicles and 19 tons for tractor trailers.

Christopher Militscher questioned whether the 19 tons load limit caused any issues? He also asked if there is any information about the number of trucks crossing this bridge every day?

Don Idol, Allen Pope and Chad Critcher said that the 19 tons load limit is causing issues. They also said that generally, fully loaded single vehicle and tractor trailer would weigh 42 and 45 tons respectively. According to the current standards new bridges are designed to carry these loads – 42 tons for single vehicles and 45 tons for tractor trailers. Over the years, the Topsail Island Bridge's structural capacity has deteriorated to 14 tons for single vehicles and 19 tons for tractor trailers.

At this point, the NCDOT Project Team does not have any specific information on the number of trucks on the Topsail Island Bridge. During field visits, the NCDOT Project Team members observed several trucks carrying higher than restricted load limits across the bridge every day causing a dangerous situation.

Christopher Militscher and Charles Cox mentioned that they do not expect higher truck traffic during the peak periods (summer time) across the bridge.

Renee Gledhill-Early said that the needs should be clearly stated in the Merger Team Meeting Agreement (Concurrence Form).

Charles Cox and Chad Critcher responded that the Needs for Proposed Action are included in the Concurrence Point 1 packet and they could be summarized and listed on the Concurrence Form.

Renee Gledhill-Early asked that as the existing bridge is narrow, is widening the bridge a Need for the Proposed Action?

Chad Critcher said that the existing Topsail Island Bridge is only 32' wide with two 12' lanes and 3' sidewalks. This narrow bridge is a safety concern for vehicular traffic, bicyclists and pedestrians. The NCDOT Project Team will design the new bridge with appropriate widths for travel lanes, bike lanes, and sidewalks to increase the safety conditions for commuters across the bridge.

Ron Lucas asked whether the NCDOT Project Team defined an appropriate travel width for this bridge?

Charles Cox and Chad Critcher responded that the desired width of travel lanes would be 12 feet. At this point, the NCDOT Project Team does not have any information on the proposed typical section. As a part of the design process, the NCDOT Project Team will develop a typical section for the proposed new bridge, which will meet the current AASHTO/NCDOT design standards.

Christopher Militscher stated that the Need for the Proposed Action should be something simple like – "bridge is structurally unsafe".

Missy Pair said that the Bridge is not "unsafe". NCDOT would not allow vehicular traffic on an unsafe bridge.

Brad Shaver and Gary Jordan said that the Need should be as simple as "Bridge is structurally deficient". All other needs shown in the Concurrence Point 1 packet should be secondary. The Purpose should be "Replace structurally deficient bridge".

Christopher Militscher said that he had a problem with the second point in the Purpose of Proposed Action: i. e. to "maintain current system linkage between the island and mainland". This infers that a new bridge should be built in the same location of the existing bridge, which may limit the possible alternatives for the proposed bridge. This should be a secondary purpose.

Subsequent to Mr. Militscher's statement, the merger team members further discussed the Purpose and Need being revised as follows:

Need for Proposed Action

- Structurally deficient, functionally obsolete bridge

Purpose of Proposed Action

- Improve bridge safety and functionality

Secondary purposes are included in the Concurrence Point 1 package discussed on August 20, 2009.

Study Area Defined

The study area is as shown on the attached Figure 3-1 of the Concurrence Point 1 package.

The Merger Team members in attendance signed the Concurrence Form with the above revised Purpose and Need statement. A copy of the signed Concurrence Form is included with these meeting notes.

If any recipient of the meeting notes would like to add comments or feels a comment is erroneous or needs to be expanded, please feel free to contact Michele James at (919) 733-7844 ext. 233 or by email at mjames@ncdot.gov.

Copies to:

Meeting Attendees
Bill Brazier, USCG
Ron Sechler, NMFS

Attachments:

Concurrence Form
PowerPoint Presentation

X:\P\1039608000\Correspondence and Communication\Agencies\Aug-2009 CP 1 Meeting Summary_10_07_09.doc

NEPA/404 Merger Team Meeting Agreement

Concurrence Point 1: Purpose & Need and Study Area Defined

Project Name/Description: Topsail Island Bridge Replacement, Pender County, NC

TIP Project No.: B-4929

Federal Aid Project No.: BRSTP-50 (10)

WBS No.: 40233.1.1

Need for Proposed Action

- Structurally deficient, functionally obsolete bridge

Purpose of Proposed Action

- Improve bridge safety and functionality

Secondary purposes are included in the Concurrence Point 1 package discussed on August 20, 2009.

Study Area Defined

The study area is as shown on the attached Figure 3-1 of the Concurrence Point 1 package.

The Project Team met and concurred on this date of August 20, 2009 with the Purpose & Need and Study Area Defined for the proposed project as stated above:

USACE		NCDOT	
USEPA		USFWS	
NCDCR		NCDWQ	
FHWA		NCWRC	
USCG		NCDCM	
NCDMF		NMFS	

Meeting Notes Memorandum

FINAL VERSION

RS&H Architects-Engineers-Planners, Inc.
Architectural, Engineering, Planning and Environmental Services

NCDOT/RS&H Project Team

Meeting Date: December 14, 2010

Subject: NEPA/404 Merger Team Concurrence Point 2 Meeting for Topsail Island Bridge Replacement Project TIP Project No. B-4929

Location: Board Room, NCDOT Highway Building

Attendees:

Agencies:
Brad Shaver, US ACE
Christopher Militscher, US EPA
Ron Lucas, FHWA
Brian Wrenn, DWQ
Steve Sollod, DCM
Renee Gledhill-Earley, DCR-SHPO

Via Conference Call:
Jessi O'Neal, DMF

Consultants:
Chad Critcher, RS&H
Ken Herring, RS&H
Radha Krishna Swayampakala, RS&H
Jan Anderson, JKA

NCDOT:
Dan Holderman, Bridge Management
Rob Hanson, PDEA
Charles Cox, PDEA
Michele James, PDEA
Herman Huang, HEU
Lee-Ann Billington, HEU
Thomas Stoddard, TIP Development
Allen Pope, Division 3
Stonewall Mathis, Division 3
Mark Staley, Roadside Environmental
Lonnie Brooks, Structure Design
Randy Henegar, Hydraulics
Reggie Abbott, Right-of-way
Don Eggert, Cape Fear RPO
Tony Houser, Roadway Design
Shane York, TPB
Chris Rivenbark, NEU
Elizabeth Lusk, NEU
Tyler Stanton, NEU

Travis Wilson (NC Wildlife Resources Commission), Gary Jordan (US Fish and Wildlife Service), Terens Knowles (US Coast Guard), and Ron Sechler (National Marine Fisheries Service) were unable to attend the meeting.

A NEPA/404 Merger Team meeting for the subject project was held on December 14, 2010 in the Board Room of the NCDOT Highway Building. The purpose of this meeting was to reach agreement on Concurrence Point 2 – Detailed Study Alternatives Carried Forward.

Introductions: Mr. Brad Shaver opened the meeting and invited introductions from attendees. Mr. Brad Shaver then explained the purpose of the meeting and introduced Michele James - NCDOT PDEA Project Manager. Ms. Michele James welcomed the attendees, requested all the attendees to sign in and introduced Mr. Chad Critcher with the consultant firm of RS&H.

Presentation: Mr. Chad Critcher offered additional Concurrence Point 2 packets and updated Alternatives Evaluation Matrix including a Study Alternatives map to the attendees. Mr. Chad Critcher then presented the PowerPoint presentation with the following outline:

- Concurrence Point 1 Summary
- Study Alternatives

- Community Outreach Summary
- Community Feedback
- Functional Design Alternatives Costs and Impacts Summary
- Detailed Study Alternatives Carried Forward - Project Team's recommendations

Note: A copy of the PowerPoint presentation, updated Alternatives Evaluation Matrix and Study Alternatives map are attached with these meeting notes.

Mr. Chad Critcher presented a total of 16 alternatives. These alternatives were divided into three groups: northern, central and southern groups. The northern group consisted of Alternatives 2, 3, 4, 5, & 5R. The central group consisted of Alternatives 5A, 6, 7, and 10A. The southern group consisted of Alternatives 10, 11, 13, 14, 15, 16, and 17. Mr. Chad Critcher methodically led a presentation of the costs and impacts for each alternative beginning with the northern group. As he led the presentation, he offered the Project Team's recommendation to "carry forward" or to "eliminate" each alternative. After the presentation of the alternatives in each of the three groups, Mr. Critcher asked that the question and answer discussion begin with the northern group alternatives, concurring on the northern group alternatives to carry forward first, then proceed to the other two groupings in the same manner.

Questions, answers, and discussions are provided below:

<u>Northern Group Alternatives:</u>

Brian Wrenn inquired whether the alternatives carried forward would require any utility relocations. He also asked, if they do require, whether that information was included in the Alternatives Evaluation Matrix prepared for this meeting.

> Chad Critcher responded that none of the study alternatives impact the large transmission poles on either side of the Intracoastal Waterway. Some of the alternatives do impact the smaller transmission poles but not to an extent for justifying an alternative be eliminated.

Steve Sollod asked if the riparian wetlands shown in the figures and tables of the CP 2 packet are the same as CAMA wetlands He also requested the NCDOT to continue their commitment to avoid impacts to CAMA Coastal Wetlands on this project.

> Tyler Stanton said that the riparian wetlands shown in the CP 2 packet are not the same as CAMA wetlands. NEU will perform further investigation to provide the additional wetland categories.

Christopher Militscher questioned why Alternative 4 would need to be carried forward in addition to Alternatives 5 and 5R He also commented that the Evaluation Matrix shows that Alternative 4 would have higher property, stream, and wetland impacts.

> Charles Cox and Chad Critcher indicated that the Project Team would like to study at least one alternative to the south and one alternative to the north of the current bridge location (offset from the Surf City Central Business District). If Alternatives 5 and 5R encounter a fatal flaw, then Alternative 4 is the only option remaining in the northern group.
>
> Impacts to the private marina could result in the elimination of Alternative 5; likewise, the property impacts along Roland Avenue may result in the elimination of Alternative 5R. These two Alternatives (5 & 5R) also include a roundabout at the island landing. Drainage issues may

present an issue to these alternatives. The Project Team considers Alternatives 5 and 5R as one alternative with minor adjustments.

Christopher Militscher inquired whether the feedback received during the Citizens Informational Workshop #2 (CIW #2) process was from business owners or residents He thought that the residents would prefer the new bridge away from the Central Business District (CBD) to avoid congestion.

Chad Critcher and Jan Anderson answered that the feedback was from both the permanent residents and the business owners in the area.

Steve Sollod indicated that in the figures, Alternative 5R appeared to impact a row of houses, not impacted by Alternative 5; however, the Alternatives Evaluation Matrix shows the same number of residential impacts for both the alternatives.

Jan Anderson responded that the houses Steve Sollod is referring to are trailers in the Blackbeard's Campground. They are not permanent houses, instead they are vacation houses for seasonal residents.

Steve Sollod said that Alternative 5R would impact the water access of several properties along Roland Avenue. He also asked if there was any thought to providing water access under the new bridge, or developing the area near the bridge with water access.

Chad Critcher, Jan Anderson, and Allen Pope indicated that the water access on the back side of the properties along Roland Avenue is private access. The Soundside Park has a public boat access, remaining unchanged under Alternative 5R. Some redevelopment options exist in this area, either under the bridge or near the current bridge (to be removed under Alternative 5R) and the details of this redevelopment would need to be explored as the project moves forward.

Charles Cox and Chad Critcher asked the Merger Team if they were in concurrence with carrying forward Alternatives 4, 5, and 5R into Detailed Design and eliminating Alternatives 2 and 3. The Merger Team verbally agreed with no further discussion.

<u>Central Group Alternatives:</u>

Renee Gledhill-Early indicated that the existing bridge was eligible for listing in the National Register of Historic Places. She inquired as to if the Project Team had considered any options to improve and keep the existing bridge.

At Chad Critcher's request, Don Holderman provided the following summary of the rehabilitation alternative:

- The State Bridge Management Unit (SBMU) estimated that the suggested repair/ rehabilitation work would cost approximately $13.5 million.
- This repair/rehabilitation option will extend the life of the bridge by approximately 25 years.
- Even after the repair/rehabilitation, this bridge will still be "functionally obsolete" and be classified as "fracture critical" due to the swing span being a truss.

- The suggested repair/rehabilitation option will increase the sufficiency rating of this bridge to approximately 28.
- It should be noted that the FHWA requires the bridge sufficiency rating be improved to at least 80 in order to qualify for the Federal Highway Bridge Program funds, the funds NCDOT normally utilizes for this type work.
- The suggested repair/rehabilitation work will necessitate the bridge being out of service for approximately nine months. This would require constructing a detour bridge, which would cost an additional $10-12 million.
- In summary, the SBMU does not recommend this option.

Chad Critcher and Ron Lucas added that even with these improvements, the rehabilitated bridge would not meet the Purpose and Need of this project.

Renee Gledhill-Early asked if there was significant support for the rehab option from the community.

Chad Critcher, Jan Anderson and Don Eggert responded that the Project Team received feedback with support for another moveable bridge but not specifically a rehab option.

Christopher Militscher questioned why Alternative 9 was eliminated before presenting to the Merger Team.

Chad Critcher explained that Alternative 9 was a high-level fixed bridge option, which resulted in significant impacts to the Soundside Park property. The FHWA would not consider these impacts as *de minimis Section 4(f)* impacts. Tony Houser added that this alternative would result in significant access issues for Soundside Park and other businesses along Roland Avenue.

Steve Sallod stated that the Department of Coastal Management would not support Alternative 9, as it would result in significant impacts to the coastal wetlands.

Christopher Militscher indicated that the Alternatives Evaluation Matrix shows Alternative 10A with less than 0.1 acres of impact to the park property. He asked why this alternative was recommended to be eliminated.

Chad Critcher and Ron Lucas indicated that the FHWA would not consider this alternative as a *de minimis Section 4(f)* impact. This alternative would divide the park into two parts, resulting in a significant visual impact.

Brad Shaver and Renee Gledhill-Early inquired whether there would be enough vertical clearance to accommodate the vehicular traffic under the bridge in the park. Brad Shaver also added that there is not much usage under the bridge in this area of the park.

Chad Critcher indicated that the vehicular traffic can travel under the bridge; however it would be NCDOT's right-of-way and therefore is not preferred. Ron Lucas visited the park and spoke to people in the area before concluding that Alternative 10A would not be a *de minimis Section 4(f)* impact. Initially, the Project Team was unsure, but after further investigation, the Project Team recommends dropping this alternative.

Christopher Militscher stated that the Project Team will need to maintain documentation on why the Alternatives 1, 8, 9 and 12 were eliminated early in the process.

Renee Gledhill-Early asked why the Project Team is recommending to carry forward Alternatives 5 and 5R, but drop 5A.

Chad Critcher explained that Alternative 5A received low support from the community as it is a moveable option away from the existing bridge. The feedback received by the Project Team indicated that for a moveable bridge option, the community preferred in-place replacement. Charles Cox added that Alternative 5A would also cause impacts to the channel connecting the Intracoastal Waterway to the private marina.

Dan Holderman stated that Alternatives 6 and 7 would require a temporary detour bridge. He also added that the NCDOT does not prefer any usage of the right-of-way under the bridge, whether it is for parking, pedestrian traffic or vehicular traffic. He is also not in favor of any alternatives going through the park.

Charles Cox stated that the Project Team would like to carry forward at least one moveable bridge and one high-level fixed bridge alternatives into detailed design. Based on the detailed design and associated impacts, these alternatives will be evaluated at Concurrence Points 2A and 3.

Christopher Militscher inquired which alternative received the Town of Surf City's support.

Chad Critcher responded that the Town of Surf City approved a resolution supporting Alternative 7 as the preferred alternative for the study location.

Christopher Militscher said that he is in favor of carrying Alternatives 6 and 7 forward for detailed design.

Charles Cox and Chad Critcher asked the Merger Team if they were in concurrence with carrying forward Alternatives 6, and 7 into Detailed Design and eliminating Alternatives 5A and 10A. The Merger Team verbally agreed with no further discussion.

<u>Southern Group Alternatives:</u>

Christopher Militscher questioned why Alternative 10 would need to be eliminated.

Ron Lucas responded that this alternative would cause impacts to the Soundside Park and would become a Section 4(f) impact. Under Alternative 10, the Soundside Park will be divided into two parts. Carrying this alternative forward would be a waste of effort.

Brad Shaver said that he understands the Section 4(f) impact; however, he does not understand carrying Alternative 17 forward, which would result in more wetland impacts than Alternative 10.

Chad Critcher explained that the wetland impact shown for Alternative 17 for the most part are a result of the modifications to the Roland Avenue tie-in on the mainland side. This tie-in was shown differently in Alternatives 10 and 17. During the preliminary design, the Project Team will evaluate these tie-ins and minimize the impacts as much as possible. Ron Lucas added that the FHWA will also review Alternative 17 closer as the project moves forward.

Steve Sollod asked how Alternative 17 would impact the park property.

Chad Critcher responded that Alternative 17 would span across the park on the backside, which is an unusable section of the park.

Renee Gledhill-Early inquired how the bridge would be accessed for routine maintenance and inspection activities.

Allen Pope answered that in situations like this, the routine activities are usually performed in "Top-Down" approach. If land access is possible, the NCDOT would need right-of-way to access the bridge.

Brad Shaver asked whether there is a mitigation option for Section 4(f) impacts on Alternative 10.

Ron Lucas responded that there is a possibility but only if we could prove that there was no other prudent alternative which would meet the "Purpose and Need Statement".

Christopher Militscher inquired as to where the piers would be located under Alternative 10 near the Soundside Park.

Chad Critcher showed Alternative 10 renderings and explained the pier locations in this area.

Rob Hanson said that if the FHWA is convinced that Alternative 10 would result in Section 4(f) impact, the NCDOT can not legally recommend carrying this alternative forward.

Christopher Militscher and Renee Gledhill-Early stated that the community liked this alternative the best and asked if the Project Team would study this alterative more and if needed, drop at Concurrence Point 3. They also asked whether Alternative 17 would cause visual impacts to the park Christopher Militscher added that his understanding was that for the Bonner Bridge project, the Preferred Alternative resulted in section 4(f) impacts.

Chad Critcher stated that Alternative 17 would impact an unusable section of the park property. The visual impacts caused by Alternative 17 are very minimal compared with the visual impacts on Alternative 10. Charles Cox added that even after eliminating Alternative 10, there will be seven alternatives for detailed study.

Rob Hanson added that even if the wetland impacts caused by Alternative 17 are not reduced, the NCDOT would recommend Alternative 17 over Alternative 10 due to the FHWA's ruling on the section 4(f)/*de minimis* impacts.

Renee Gledhill-Early asked why the Project Team eliminated Alternative 9 but not Alternative 10 earlier.

Charles Cox explained that Alternative 9 had definite section 4(f) impacts to the park. With respect to the impacts on Alternative 10, the Project Team was undecided until after visiting the site. Upon visiting the site in October, 2010, the FHWA determined that Alternative 10 would not be a *de minimis Section 4(f)* impact.

Christopher Militscher said that Alternative 4 had four business impacts, but the Project Team still carried it forward. He wanted to whether that would be considered as a fatal flaw or not.

Tony Houser answered that the Project Team will minimize the impacts for Alternative 4 in the preliminary design.

Renee Gledhill-Early suggested the FHWA to prepare a memo summarizing the Section 4(f)/de minimis impacts associated with Alternative 10, if it is not a significant effort. Brad Shaver requested the NCDOT to further differentiate the CAMA, riparian, and non-riparian wetlands and re-calculate the wetland impacts for these different categories for Alternatives 10 and 17.

Ron Lucas said that the FHWA will prepare a memo. Charles Cox added that the Project Team will update the wetland information as well.

Steve Sollod inquired whether the Project Team considered connecting Alternative 11 directly to the CBD.

Chad Critcher and Radha Krishna Swayampakala explained that the Project Team considered this option, however did not pursue it as it would result in much longer bridge and higher impacts compared with Alternative 17.

Charles Cox and Chad Critcher asked the Merger Team if they were in concurrence with carrying forward Alternatives 11, and 17 into Detailed Design and eliminating Alternatives 13, 14, 15, and 16. The Merger Team verbally agreed with no further discussion.

Once the Merger Team reviews the FHWA's section 4(f)/*de minimis* impacts memo for Alternative 10 and the updated wetlands information, a decision will be made whether to carry forward or eliminate Alternative 10. The official Concurrence Point 2 form will be signed subsequent to the Alternative 10 review.

If any recipient of the meeting notes would like to add comments or feels a comment is erroneous or needs to be expanded, please feel free to contact Michele James at (919) 733-7844 ext. 233 or by email at mjames@ncdot.gov.

Comments will be received through February 15, 2011. After such date, the meeting notes herein along with subsequent implemented comments will be considered final and an accurate record of the Concurrence Point 2 meeting.

Copies to:

Meeting Attendees
Travis Wilson, NC Wildlife Resources Commission
Gary Jordan, US Fish and Wildlife Service
Terens Knowles, US Coast Guard
Ron Sechler, National Marine Fisheries Service

Attachments:

Concurrence Form
PowerPoint Presentation
Meeting Handouts (Updated Alternatives Evaluation Matrix and Study Alternatives map)

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NEPA/404 Merger Team Meeting Agreement

Concurrence Point 2: Detailed Study Alternatives Carried Forward

Project Name/Description: Topsail Island Bridge Replacement, Pender County, NC

TIP Project No.: B-4929

Federal Aid Project No.: BRSTP-50 (10)

WBS No.: 40233.1.1

Detailed Study Alternatives Carried Forward

Detailed study alternatives to be carried forward are Alternatives 4, 5, 5R, 6, 7, 11, and 17 for the referenced project.

USACE	2-18-11	NCDOT	Michele L. James
USEPA		USFWS	Gary Jordan 2/17/2011
NCDCR	Renee Gledhill-Earley	NCDWQ	2/17/11
FHWA		NCWRC	2-17-11
USCG		NCDCM	
NCDMF	Jessi Baker	NMFS	