FEASIBILITY STUDY
Wilmington Southern Bridge from US17 Bypass near Bishop to US 421

Brunswick and New Hanover Counties

Division 3

FS-0103D

Prepared For:

N.C. Department of Transportation

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I. General Description

This feasibility study describes a proposed roadway all on new location south of Wilmington from US 17 Bypass to US 421, in the vicinity of the North Carolina State Ports. This facility would provide a "high rise" bridge built on new location over the Cape Fear River. The project would serve the North Carolina State ports, as well as the traveling public in and around the Wilmington area. This study will address the need for this roadway as an additional connector south of the Ports. The proposed roadway will have an approximate length of 9.5 miles. See Figure 1 for a vicinity map showing the project's location.

Two alternatives were studied for the subject project with the difference in alternatives being the vertical clearance for the Southern Bridge over the Cape Fear River. Alternative number 1 assumes a vertical clearance of 225 feet, which allows for larger cruise ships. Alternative number 2 assumes a vertical clearance of 185 feet. A detailed description of the proposed alignment is included below.

The design speed for the roadway will be 60 mph with a recommended 4-lane cross section designed to freeway standards with a 46 foot medien. The proposed right-of-way will be fully controlled with a total width of approximately 350 feet. See Figure 2 for the proposed typical sections. The project will begin at the proposed US 17 Bypass interchange with existing US 17. This interchange will be modified to provide for all movemants to and from the proposed roadway. This new roadway will extend from the US 17 Bypass interchange eastward approximately 5.5 miles to existing NC 133. This section of roadway will include seven bridges for spanning wetlands and US Army Railroad. The project cost allows for an intermediate grade-separated interchange between US 17 and NC 133 in the vicinity of Goodland Branch. The specific type of interchange is not known at this time. However, this interchange will provide access to a currently planned "urban-type" development in this area. A "full movement" interchange will be constructed at existing NC 133. This interchange will consist of two ramps and two loops on the west side of NC 133 with a bridge on the new freeway over existing NC 133. The structure over NC 133 will continue eastward spanning high quality wetlands and then the Cape Fear River before terminating at existing Independence Boulevard in Wilmington. The section of roadway between NC 133 and US 421 will also include bridges for spanning two additional wetlands adjacent to the Port area. The distance from NC 133 to US 421 along the project is approximately 4 miles with the total distance for the proposed roadway being approximately 9.5 miles.

II. Naed for Project

The purpose and need of this project, according to the Wilmington Urban Area Transportation Plan adopted on August 2, 1999, is as follows:

- Provide another access to the North Carolina Ports.
- Serve the inter-modal needs of the North Carolina Ports by providing direct access to the west side of the Cape Fear River for truck traffic coming to and from the Port of Wilmington.

- Allow the movement of ocean going vessels to access the Port of Wilmington.
- Address the needs of commuter end tourists trips.
- Provide en unimpeded gateway to the city. The Cape Fear River Memorial Bridge, located 2 miles north of the new project, is a drawbridge. Therefore, commuter traffic consistently backs up on this bridge when it is opened for shipping purposes.
- The new bridge would allow for emergency vehicles to travel across the Cape Fear River without the possibility of being delayed by the drawbridge. This new bridge would also allow a safer end quicker evacuetion of New Hanover County in the event of a hurricane or an accident et either the Brunswick County Nuclear Plant or the General Electric Nuclear Fuel processing plant on Castle Hayne Road.
- Provide improved access to Military Oceen Terminel, Sunny Point, N.C.
- Provide improved access to Port Facilities for military deployments from Camp Lejeune and Fort Bragg.

III. Traffic Operations

The purpose of this section is to explain the status of future treffic operetions for the proposed facility and to recommend additional measures needed to ensure that traffic operates at acceptable levels of service.

According to the Wilmington Urban Area Transportation Plen adopted on August 2, 1999, traffic, especielly commuter traffic, consistently backs up on the Cape Fear River Memorial Bridge. The current traffic volume on the Cape Fear River Memorial Bridge is approximately 54,000 vpd. Projections for traffic in 2025 at the Cepe Fear River Memorial Bridge estimate volumes of 93,700 vehicles per day (vpd) even with the US 17 Bypass, currently under construction, in place. Projections for traffic on the Southern Bridge in 2025 anticipate that it will accommodate 30,500 vpd. Providing the edditional crossing of the Cape Fear River under this project reduces the projected volumes on the Cape Faar River Memorial Bridge to 76,100 vpd in the year 2025.

IV. Project Cost

As previously stated, two alternatives were evaluated for this project. The associated costs for each of the alternatives ere as follows:

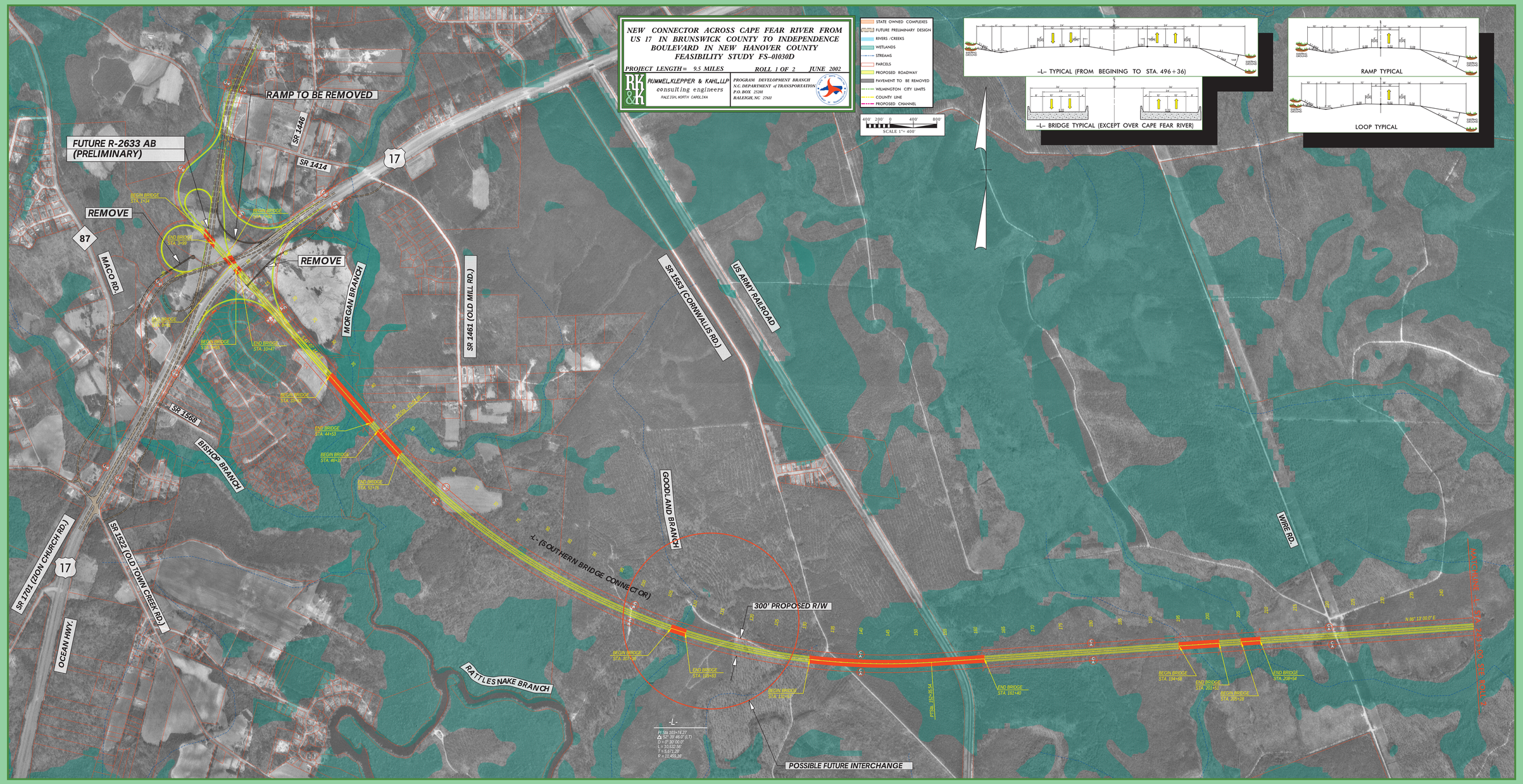
Alternative	Right-of-Way Cost	Construction Cost	Total Project Cost
One (225' Clearance)	$15,200,000	$329,600,000	$344,800,000
Two (185' Clearance)	$15,200,000	$323,000,000	$338,200,000

The costs for each of these alternatives include provisions for an intermediate grade-separeted interchange in the vicinity of Goodland Branch. As well, this project will displace approximately thirty residences and four businesses. The majority of the relocates ere located in the vicinity of the US 17 Bypass interchange and at the eastern end of the proposed Wilmington Southern Bridge. The costs of these relocetions are included above.

V. Additional Comments

An exhaustive environmental screening was not conducted for this study. However, the following items were identified as needing more detailed analyses during future planning and/or design phases:

- Any Cape Fear River Buffer Rules will need to be considered.
- Wetland and Stream impacts.
- Socioeconomic Impacts.
- A hazardous materials screening is needed on the west side of the Cape Fear River.
- Protected species and an aquatic community study will be needed.
- Coordination with the U.S Coastguard and U.S. Army Corp of Engineers.
- Historic/Archeological screening will be needed.
- Impacts to the Lower Cape Fear/Town Creek Project Area


NEW CONNECTOR ACROSS CAPE FEAR RIVER FROM US 17 IN BRUNSWICK COUNTY TO INDEPENDENCE BOULEVARD IN NEW HANOVER COUNTY
FEASIBILITY STUDY FS-01030D
PROJECT LENGTH = 9.5 MILES
ROLL 1 OF 2
JUNE 2002
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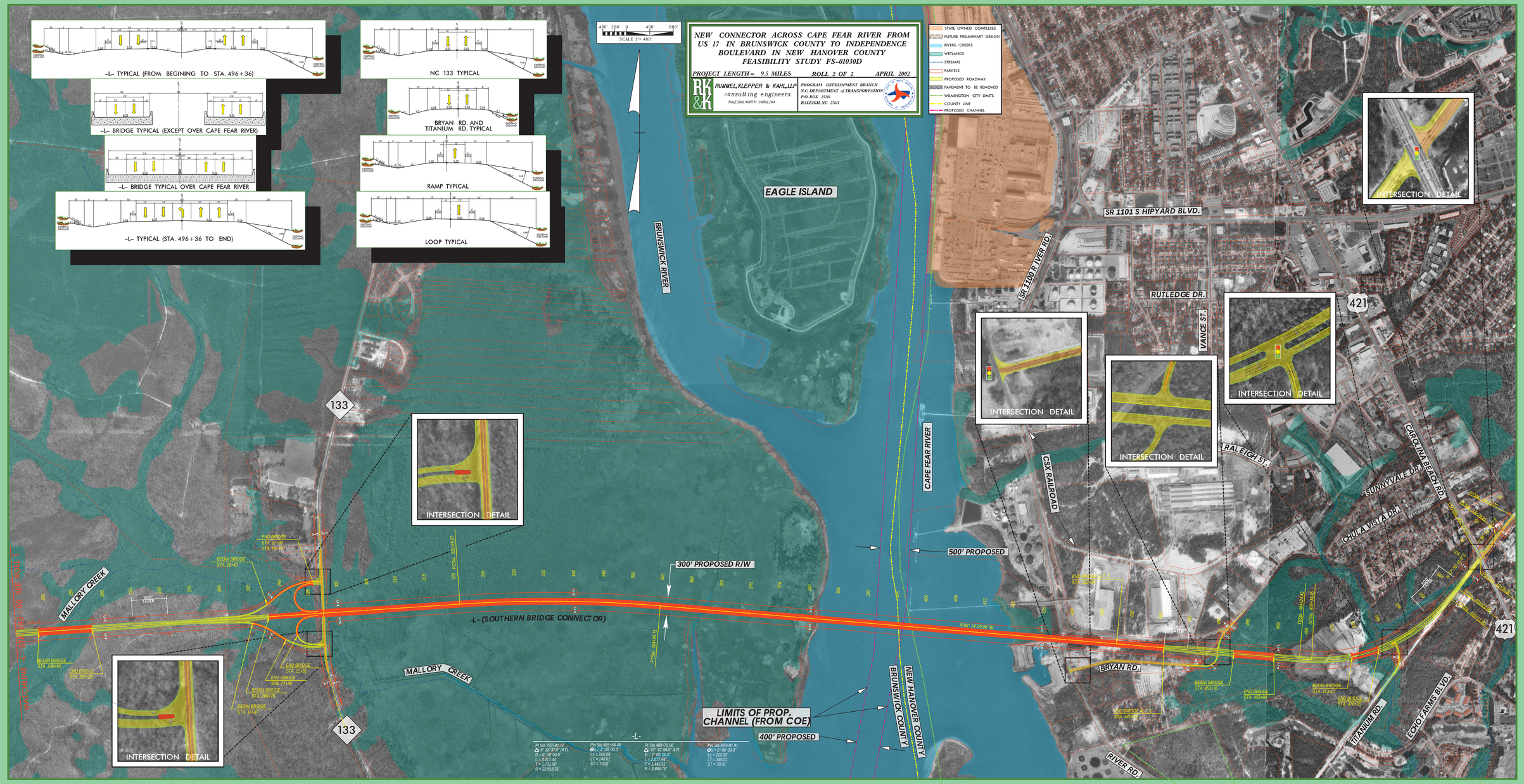
STATE OWNED COMPLEXES
FUTURE PRELIMINARY DESIGN
RIVERS /CREEKS
WETLANDS
STREAMS
PARCELS
PROPOSED ROADWAY
PAVEMENT TO BE REMOVED
WILMINGTON CITY LIMITS
COUNTY LINE
PROPOSED CHANNEL
SCALE 1" = 400'
-L- TYPICAL (FROM BEGINING TO STA. 496+36)
-L- BRIDGE TYPICAL (EXCEPT OVER CAPE FEAR RIVER)
RAMP TYPICAL
LOOP TYPICAL
RAMP TO BE REMOVED
FUTURE R-2633 AB (PRELIMINARY)
REMOVE
REMOVE
SR 1446
SR 1414
17
87
MACO RD.
MORGAN BRANCH
SR 1461 (OLD MILL RD.)
SR 1553 (CORNWALLIS RD.)
US ARMY RAILROAD
SR 1568
BISHOP BRANCH
GOODLAND BRANCH
-L- (SOUTHERN BRIDGE CONNECTOR)
SR 1701 (ZION CHURCH RD.)
SR 1522 (OLD TOWN CREEK RD.)
OCEAN HWY.
RATTLESNAKE BRANCH
300' PROPOSED R/W
POSSIBLE FUTURE INTERCHANGE
WIRE RD.
N 86° 13' 00.0" E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APRIL 2002
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-L- BRIDGE TYPICAL (EXCEPT OVER CAPE FEAR RIVER)
-L- BRIDGE TYPICAL OVER CAPE FEAR RIVER
-L- TYPICAL (STA. 496+36 TO END)
NC 133 TYPICAL
BRYAN RD. AND TITANIUM RD. TYPICAL
RAMP TYPICAL
LOOP TYPICAL
EAGLE ISLAND
BRUNSWICK RIVER
CAPE FEAR RIVER
SR 1101 S HIPYARD BLVD.
SR 1100 RIVER RD.
RUTLEDGE DR.
VANCE ST.
RALEIGH ST.
CSX RAILROAD
SUNNYVALE DR.
CHULA VISTA DR.
CAROLINA BEACH RD.
BRYAN RD.
TITANIUM RD.
ECHO FARMS BLVD.
RIVER RD.
MALLORY CREEK
133
421
INTERSECTION DETAIL
300' PROPOSED R/W
500' PROPOSED
400' PROPOSED
-L- (SOUTHERN BRIDGE CONNECTOR)
LIMITS OF PROP. CHANNEL (FROM COE)
BRUNSWICK COUNTY
NEW HANOVER COUNTY
BEGIN BRIDGE STA. 18+40
END BRIDGE STA. 21+30
BEGIN BRIDGE STA. 248+90
END BRIDGE STA. 251+90
END BRIDGE STA. 15+00
BEGIN BRIDGE STA. 453+85
END BRIDGE STA. 455+84
BEGIN BRIDGE STA. 473+07
END BRIDGE STA. 474+07
600' TAPER
N 85° 14' 23.00" W
-L-
PI Sta 337+91.16
Δ = 32° 37' 0" (RT)
D = 0° 15' 00.0"
L = 2,417.44'
T = 1,211.90'
R = 22,918.31'
PCs Sta 405+64.46
Θs = 2° 06' 00.0"
Ls = 210.00'
LT = 140.01'
ST = 70.01'
PI Sta 480+79.96
Δ = 53° 32' 55.0" (LT)
D = 2° 00' 00.0"
L = 2,677.44'
T = 1,445.52'
R = 2,864.79'
PCs Sta 493+81.91
Θs = 2° 06' 00.0"
Ls = 210.00'
LT = 140.01'
ST = 70.01'