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May 13, 1993

MEMORANDUM TO: Calvin W. Leggett, P.E.
Manager, Program Development Branch

FROM: Whitmel H. Webb, III, P.E. 
Head of Feasibility Studies

SUBJECT: Proposed widening of NC 179 in
Brunswick County, FS 09-93-010

The subject project consists of upgrading and widening NC 179 from the South Carolina state line to US 17 in Shallotte, a distance of approximately 16.5 miles (see Figure 1). Two alternative concepts, a three lane typical section and a five lane typical section, were evaluated. Combinations of curb and gutter and shoulder sections were considered throughout the project. The three lane alternative (Alternative 1) has a total estimated cost of \$34,700,000 and the five lane alternative (Alternative 2) has a total estimated cost of \$61,300,000.

In addition to the two options which considered widening the entire length of the project, a reduced cost/length alternative (Alternative 3) was studied. This option considered widening NC 179 between NC 904 and SR 1184 to a three lane roadway. The total cost of Alternative 3 is \$6,300,000.

The studied section of the existing NC 179 consists of a two-lane, 24-foot pavement with variable shoulders on a claimed 60 to 70-foot wide right-of-way with no control of access. Right-of-way width may be narrower in some locations. The surrounding terrain is flat, and development on NC 179 is a combination of commercial, rural residential, agricultural, and undeveloped land use. Seafood restaurants, retail shops, retirement/resort centers, and golf courses account for the commercial development. Salt marshes and wetlands account for most of the undeveloped land use.

Estimated 1993 Average Daily Traffic (ADT) on the existing NC 179 ranges from 11,400 vehicles per day (vpd), at Calabash, to 4,000 vpd, near US 17. In the year 2013, anticipated traffic on the existing NC 179 is expected to range from 20,600 vpd to 8,500 vpd. With the existing facility, traffic currently experiences a level of service (LOS) D, near the South Carolina state line, and a LOS B near US 17. With the three lane improvements, it is anticipated that traffic on NC 179 in the year 2013 would experience a LOS E. With the five lane option traffic would operate LOS B in 2013. Traffic projections were based on an approximate 3% per annum growth. Increased development in the area will cause level of service to degrade at a more rapid rate.

During the period from March 1, 1990 through February 28, 1993, a total of 213 accidents were reported along NC 179. This resulted in a accident rate of 207.36 accidents per 100 million vehicle miles (acc/100 mvm), compared to a statewide average of 193.9 acc/100 mvm for similar roadways. Rear-end accidents accounted for 32% of the accidents. The improvements are expected to reduce the accident rate.

This project will likely require a Section 404, Corps of Engineers Permit. No historical or architecturally significant sites are known to be in the vicinity of the proposed project.

The following is a description of the studied alternatives:

ALTERNATIVE 1:

Alternative 1 consists of widening the existing roadway to a three lane typical section with provision for bicycles (see Figure 1). The three lane typical section has a combination of curb and gutter and shoulder. One is a three lane, 44-foot face-to-face curb and gutter section with 8-foot berms on a 60 foot wide right-of-way without access control. This typical section has 14-foot outside lanes and a 12-foot center turn lane. The second typical section is a three lane, 36-foot roadway with 8-foot shoulders (including 4-foot paved shoulders) on a 100 foot wide right-of-way without access control.

It is estimated that this alternative would require the relocation of 10 residences, 9 businesses and 1 church.

The total cost of Alternative 1 is estimated to be \$34,700,000 (\$16,100,000 for right-of-way, and \$18,600,000 for construction).

From the South Carolina state line to the intersection of SR 1167, a distance of approximately 1.3 miles, the curb and gutter section will be utilized. Extensive drainage work is anticipated. Also, a retaining wall, 185 feet in length, should be considered for the north side of the existing roadway at the west end of the city limits. The estimated cost of this section is \$2,000,000 (\$500,000 for right-of-way, and \$1,500,000 for construction).

From the intersection of SR 1167 to the intersection of SR 1163 and SR 1164, a distance of approximately 0.9 miles, the shoulder section will be utilized. The estimated cost of this section is \$1,900,000 (\$1,000,000 for right-of-way, and \$900,000 for construction).

From the intersection of SR 1163 and SR 1164 to Oyster

Bay Resort Complex, a distance of approximately 1.8 miles, the shoulder section will be utilized. Bridge number 15, which carries NC 179 over Calabash River, is located 0.7 miles south of the intersection of SR 1164, SR 1163, and NC 179 (see Figure 1). The sufficiency rating of this bridge is 77.0 out of 100.0. Bridge number 15 will be widened to accommodate the proposed roadway section. Also, a 90 degree curve at Bonaparte Landing, 1.1 miles south of bridge 15, will be realigned to improve traffic flow (see Figure 1). The estimated cost of this section is \$4,400,000 (\$2,000,000 for right-of-way, and \$2,400,000 for construction).

From Oyster Bay Resort Complex to SR 1172, a distance of approximately 1.7 miles, the curb and gutter section will be utilized. TIP Project B-682, which is proposed to carry SR 1172 over NC 179 approximately 0.05 miles west of the existing SR 1172, is a proposed high-level bridge over the Intracoastal Waterway that will improve traffic flow to and from Sunset Beach. This project is currently under environmental study. The estimated cost of this section is \$3,200,000 (\$1,200,000 for right-of-way, and \$2,000,000 for construction).

From SR 1172 to SR 1143, a distance of approximately 6.7 miles, the shoulder section will be utilized. The shoulder section is recommended because of drainage. The estimated cost of this section is \$14,300,000 (\$8,500,000 for the right-of-way, and \$5,800,000 for construction).

From SR 1143 to SR 1145, a distance of approximately 2.7 miles, the shoulder section will be utilized. At SR 1143, the existing 90 degree curve will be realigned to facilitate improved traffic flow (see Figure 1). This realignment will require relocation of a portion of a cemetery. Bridge number 72, which carries NC 179 over Sauce Pan Creek, is located 0.4 miles north of SR 1143 (see Figure 1). The sufficiency rating of this bridge is 11.0 out of 100.0. Bridge number 72 will be removed and replaced with an adequate structure to accommodate the proposed roadway section. Also, the existing intersections at SR 1154 and SR 1145 will be realigned to improve traffic flow and sight distance. The estimated cost of this section is \$6,900,000 (\$2,600,000 for the right-of-way, and \$4,300,000 for construction).

From SR 1145 to US 17, a distance of approximately 1.4 miles, the curb and gutter section will be utilized. The estimated cost of this section is \$2,000,000 (\$300,000 for the right-of-way, and \$1,700,000 for construction).

ALTERNATIVE 2:

Alternative 2 consists of widening the existing roadway primarily to a five lane typical cross section with provision

for bicycles (see Figure 2). The five lane typical section has a combination of curb and gutter and shoulder. Because of lower traffic volumes west of SR 1143, a three lane section was studied for the westernmost 4.1 miles of the project.

The first cross section is a five lane, 68-foot face-to-face curb and gutter section with 8-foot berms on a 90 foot wide right-of-way without access control. This typical section has 14-foot outside lanes and 12-foot center and through lanes. The second cross section is a five lane, 60-foot pavement with 8-foot shoulders (including 4-foot paved shoulders) on a 120 foot wide right-of-way without access control. The limits of curb and gutter and of shoulder are the same for Alternative 2 as those in Alternative 1.

It is estimated that Alternative 2 would require the relocation of 100 residences, 71 businesses and 1 church.

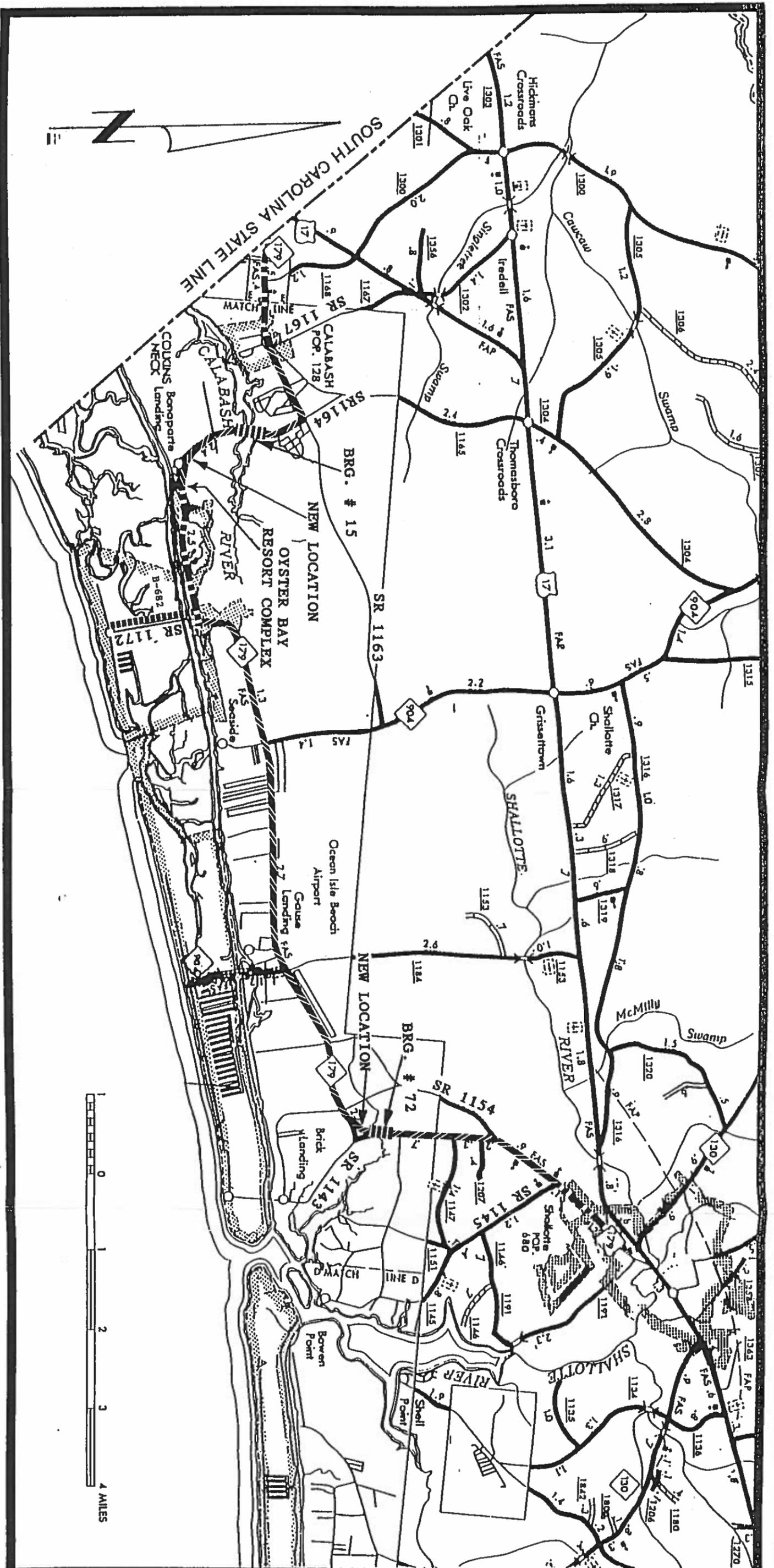
The total cost of Alternative 2 is estimated at \$61,300,000 (\$34,400,000 for right-of-way, and \$26,900,000 for construction).

ALTERNATIVE 3:

Alternative 3 was developed as a down scoping of Alternative 1 (See Figure 3). This alternative consists of widening NC 179 to a three lane shoulder section between NC 904 and SR 1184, a distance of 2.7 miles. The typical section for Alternative 3 is a three lane, 36-foot roadway with 8-foot shoulders (including 4-foot paved shoulders) on a 100 foot wide right-of-way without access control. A curb and gutter roadway was not studied because of drainage considerations in this area.

It is estimated that Alternative 3 would require the relocation of 2 residences and 4 businesses.

The total cost of Alternative 3 is estimated at \$6,300,000 (\$4,000,000 for right-of-way, and \$2,300,000 for construction).

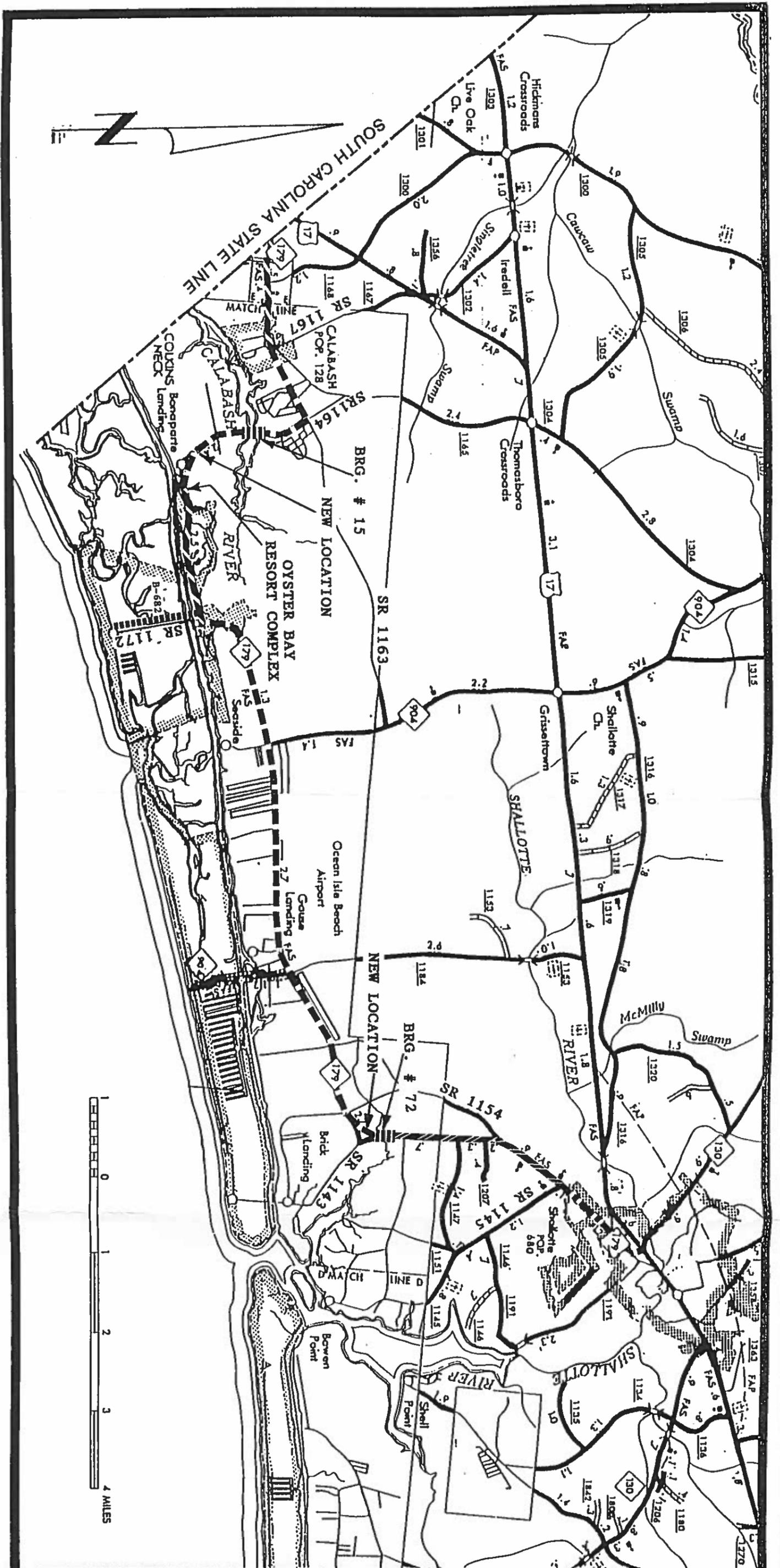


LEGEND

3 LANE CURB AND GUTTER SECTION
 3 LANE SHOULDER SECTION

FEASIBILITY STUDIES UNIT
FS 09-93-010
 ALTERNATIVE 1
 NC 179
 PROPOSED WIDENING FROM
 SOUTH CAROLINA STATE LINE
 TO US 17.
 BRUNSWICK COUNTY

DIVISION 3 FIGURE 1

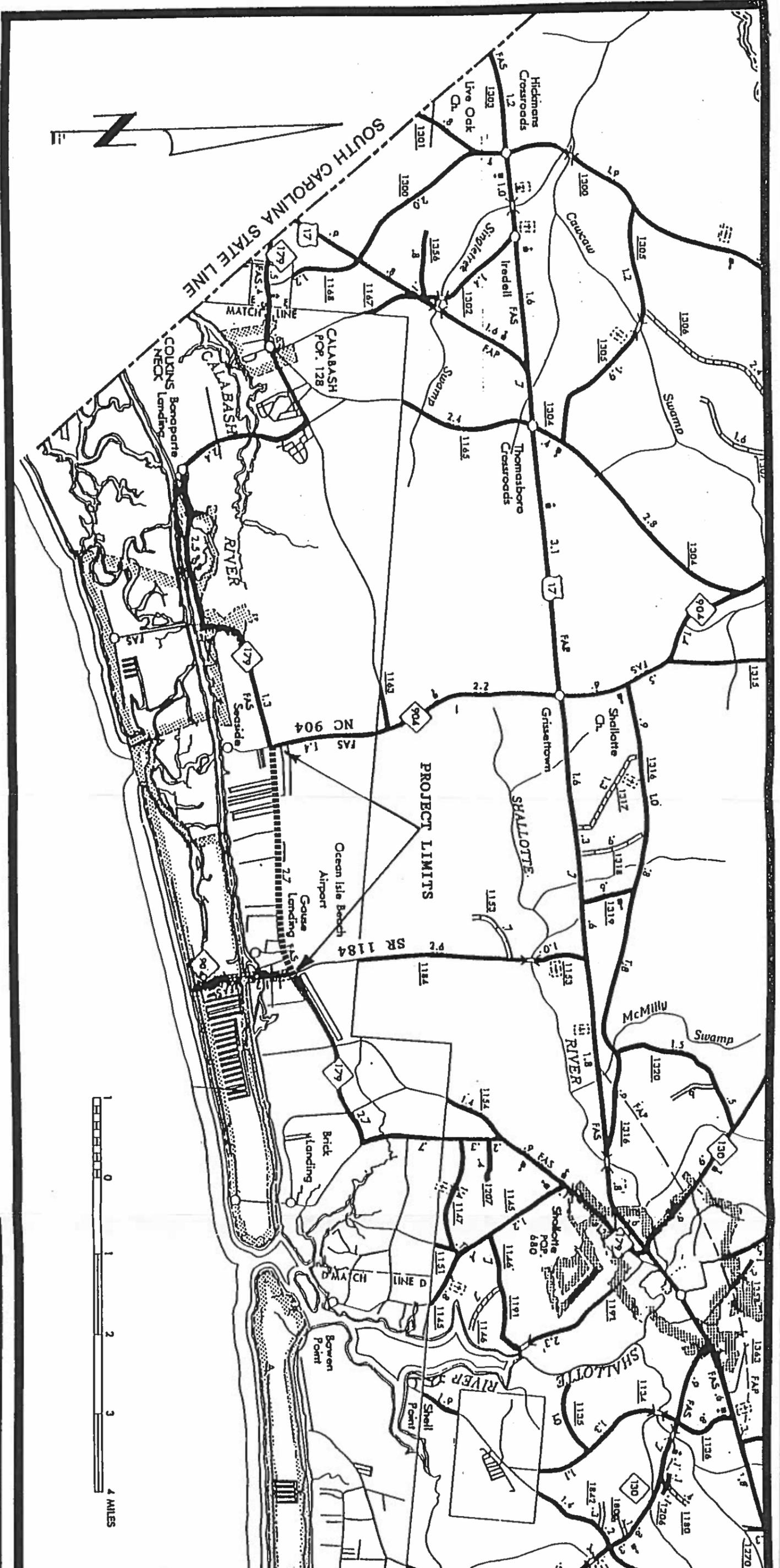


LEGEND

	5 LANE CURB AND GUTTER SECTION
	5 LANE SHOULDER SECTION
	3 LANE CURB AND GUTTER SECTION
	3 LANE SHOULDER SECTION

FEASIBILITY STUDIES UNIT
FS 09-93-010
ALTERNATIVE 2
 NC 179
 PROPOSED WIDENING FROM
 SOUTH CAROLINA STATE LINE
 TO US 17.
 BRUNSWICK COUNTY

DIVISION 3 FIGURE 2



FEASIBILITY STUDIES UNIT
FS 09-93-010
 ALTERNATIVE 3
 NC 179
 PROPOSED WIDENING FROM
 NC 904 TO SR 1184

BRUNSWICK COUNTY

DIVISION 3 FIGURE 3