

FEASIBILITY STUDY

FS-0203B

**Widening NC 211 from
SR 1500 (Midway Road) to NC 87,
City of Southport and Town of St. James**

Brunswick County

Division 3



Prepared by the
Program Development Branch
N. C. Department of Transportation

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2/19/07
Date

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City of Southport and Town of St. James**

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I. General Description

This feasibility study describes the multilane widening of NC 211 from SR 1500 (Midway Road) to NC 87, a distance of 6.6 miles. The project location is shown on Figures 1 and 2. As part of this study, two different alternatives were investigated the details of which are described below:

ALTERNATE – 1, Segment A: Four-lane divided shoulder section, 79-foot wide edge to edge of pavement with a 23-foot raised grass median and 4-foot paved shoulder from SR 1500 (Midway Road) to NC 133 (western intersection), a distance of 4.9 miles. The construction is symmetrical about the existing NC 211 centerline on 150-foot right of way.

Segment B: Four-lane divided curb and gutter section, 79-foot wide face to face of curbs with a 23-foot raised grass median, from NC 133 (western intersection) to NC 87, a distance of 1.7 miles. This segment is both symmetrical and asymmetrical about the existing NC 211 centerline on 120-foot right of way.

ALTERNATE – 2, Segment A: Five-lane shoulder section, 68-foot wide edge to edge of pavement with 4-foot paved shoulder from SR 1500 (Midway Road) to NC 133 (western intersection), a distance of 4.9 miles. The construction is symmetrical about the existing NC 211 centerline on 150-foot right of way.

Segment B: Five-lane curb and gutter section, 68-foot wide, face to face of curbs from NC 133 (western intersection) to NC 87, a distance of 1.7 miles. This segment is both symmetrical and asymmetrical about the existing NC 211 centerline on 120-foot right of way.

This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of the study is to describe the problem, recommend a treatment including costs, and identify potential problem areas that deserve consideration in the planning and design phases.

II). Background

The primary purpose of this project is to improve the traffic safety and operations of NC 211 by widening the existing two-lane section to a multilane facility.

This project was requested by the City of Southport and is supported by the Town of St. James.

NC 211 is designated as a major thoroughfare in the Brunswick County Thoroughfare Plan, the City of Southport Thoroughfare Plan as well as the Oak Island Thoroughfare Plan. NC 211 is also designated as a major collector in the North Carolina Statewide Functional Classification System.

This section of NC 211 is primarily a two-lane shoulder section with a pavement width of 29-feet. Additional widening at some locations along the project is provided in order to accommodate left turn lane(s).

The land surrounding the project area at the east terminal is best described as mix of commercial and industrial development with scattered single-family homes. The west project terminal is mostly woodland with no significant development except for the entrance to the Town of Saint James.

This project intersects three TIP projects described below:

TIP project R-2245 is proposed new route (a.k.a. the second bridge to Oak Island) from SR 1104 (Beach Drive) to NC 211. It includes the widening of SR 1105 (Middleton Avenue) from SR-1104 to SR 1190. The Replacement of Bridge No 206 over Davis Creek is also included as well as the construction of a multilane facility on new location from SR 1190 (Oak Island Drive) to the NC 211/Midway Road intersection.

TIP project R-3434 is the widening of SR 1500 (Midway Road) from NC 211 to US 17 business. Finally, TIP project R-3324 proposes to construct a new connector from NC 211 to NC 87 at the SR 1525 intersection.

Two of the three existing bridges located along the project route are to be reconstructed while the third bridge is to be widened. These structures are described as follows:

Bridge No. 76 is located approximately 2.1 miles west of NC 133 and carries NC 211 over Beaver Dam Creek. This structure has a clear roadway width of 26.3-feet and is 20-feet long. It was constructed in 1922 and has a sufficiency rating of 55.5 points (out of a possible 100.0 points). This report recommends that structure No. 76 will be reconstructed.

Bridge No. 24 is located approximately 0.5 miles east of NC 133 and carries NC 211 over Dutchman's Creek. This structure has a clear roadway width of 28.9-feet and is 31-feet long. It was constructed in 1922 and has a sufficiency rating of 54.8 points (out of a possible 100.0 points). This report recommends that structure No. 24 will be reconstructed.

Bridge No. 93 is located approximately 0.4 miles east of Dutchman's Creek and carries NC 211 over the Progress Energy Discharge Canal. This structure has a clear roadway width of 44.3-feet and is 326-feet long. It was constructed in 1972 and has a sufficiency rating of 96.2 points (out of a possible 100.0 points). This report recommends that structure No. 93 be widened.

III). Traffic and Safety

Currently, NC 211 is operating at LOS F. However, if improvements are made under the current 2006 volume, then the roadway will operate at LOS C or better. In the design year 2030 the improved NC 211 corridor will operate at LOS D or better.

The current year Average Daily Traffic (ADT) along NC 211 within the project limits ranges from 12,600 vehicles per day (vpd) on the west end of the project to 20,600 vpd on the east end. For the design year 2030 build conditions, the estimated traffic volumes on the east end within the project limits ranges from 31,400 vehicles per day (vpd) to 41,400 vpd. In the design year 2030, the minimum and maximum traffic volumes are anticipated to occur at the midpoint of the project, due to the anticipated construction of the second bridge to Oak Island and the new connector from NC 211 to NC 87. Truck traffic is estimated to make up 6% of the average daily traffic.

During the three-year period from January 1st 2000 to December 31st 2002, there were 167 accidents reported within the project limits. 104 of these crashes were property damage only accidents, 63 were injury crashes of which 2 were fatalities. The accident rate for this 6.6 miles portion of roadway was 215.2 accidents per 100 million vehicle miles of travel (acc/100mvm), which was higher than the 2000-2002 statewide rate of 182.95 accidents/100 mvm for two-lane undivided rural North Carolina routes.

The most prevalent accident types along this corridor are as follows: approximately 43 percent of accidents were rear end, slow or stop, and 23 percent involved left turn movements. All other accident types account for the remaining thirty-four (34) percent. The proposed cross-section improvements to upgrade this section of roadway to a multilane facility should reduce the likelihood of these types of accidents.

Signal modifications will be necessary at the NC 211/NC 133 (western) intersection and at the NC 211/NC 87 (eastern) intersection.

IV). Description of Alternatives

Both alternatives discussed are similar in alignment, with standard 12-foot lanes. Widening is both symmetrical and asymmetrical about existing NC 211 centerline and the proposed right-of-way along the project corridor is between 120-feet to 150-feet as described in each alternative. Two bridges are also to be reconstructed. The first bridge will be constructed over Beaverdam Creek and the second over Dutchman Creek. The existing

bridge over the Progress Energy Discharge Canal will be widened to accommodate the proposed multilane improvements.

The construction cost estimate shown below for each alternative includes the installation of a five (5) foot sidewalk, on both sides of NC 211 between NC 133 (western intersection) and NC 87. This sidewalk is estimated to cost an additional \$162,000 per side.

ALTERNATE 1. This alternative is sub-divided into two segments due to the development at the eastern end of the project. Segment A, on the western end of the project is a four-lane divided shoulder section, 79-foot wide edge to edge of pavement, with a 23-foot raised grass median and 4-foot paved shoulders from SR 1500 (Midway Road) to NC 133 (western intersection), a distance of 4.9 miles. Construction is symmetrical about existing NC 211 centerline and the proposed right-of-way is 150-feet.

Segment B, the eastern end of the project is a four-lane divided curb and gutter section, 79-foot wide face to face of curbs with a 23-foot raised grass median and 15-foot berms between NC 133 to NC 87, a distance of 1.7 miles. This segment is both symmetrical and asymmetrical about existing NC 211 centerline and the proposed right-of-way for this segment is 120-feet.

With this alternative, zero (0) residential relocations and zero (0) business relocations are expected. The total cost of this alternative, including construction and right-of-way is estimated to be \$51,400,000

Construction	\$41,400,000
Right-of-Way and Utility.....	\$10,000,000
<hr/>	
Total Project Cost (Alternative #1).....	\$51,400,000

ALTERNATE 2. This alternative is also sub-divided into two segments due to the development at the eastern end of the project. Segment A, western end of the project is a five-lane shoulder section, 68-foot wide edge of pavement to edge of pavement, with 4-foot paved shoulders from SR 1500 (Midway Road) to NC 133. Construction is symmetrical about existing NC 211 centerline and the proposed right-of-way is 150-feet.

Segment B, the eastern end of the project is a five-lane curb and gutter section, 68-foot wide face to face of curbs and 15-foot berms between NC 133 to NC 87. Construction is both symmetrical and asymmetrical about existing NC 211 centerline and the proposed right-of-way for this segment is 120-feet.

With this alternative, zero (0) residential relocations and zero (0) business relocations are expected. The total cost of this alternative, including construction and right-of-way is estimated to be \$42,700,000

Construction	\$32,700,000
Right-of-Way and Utility.....	\$10,000,000
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Total Project Cost (Alternative #1).....	\$42,700,000

V). Recommendations

It is recommended to improve NC 211 to a multi-lane facility with new bridges across Beaverdam Creek and Dutchman Creek. Proposed improvement starts at SR 1500 (Midway Road) and ends at NC 87. Two different alternatives were investigated and the associated costs with the breakdowns are described in Section IV above.

Our analyses shows both the four-lane divided and five-lane sections with appropriate auxiliary turn lanes would accommodate the projected 2030 design year volumes with an acceptable level of service provided the adjacent TIP project R-2245 and R-3434 are in place.

The cost difference associated with the four-lane divided versus the five-lane sections is 8.7 million, in favor of the five-lane cross-section. However, five-lane sections tend to promote strip development and indiscriminate left turn movements, while four-lane divided sections minimize strip development, prevent indiscriminate left turn movements and provide refuge for pedestrians if needed. Therefore, due to these factors, the four-lane divided cross-section (Alternative #1) is preferred over the five-lane section at this times.

The total cost of the recommended four-lane divided section, including two new bridge structures over Beaverdam Creek and Dutchman Creek, the widening of the bridge over the Progress Energy Discharge channel and 5-foot sidewalks on both sides of NC 211 between NC 133 (western intersection) and NC 87 is \$51,400,000.

VI). Additional Comments

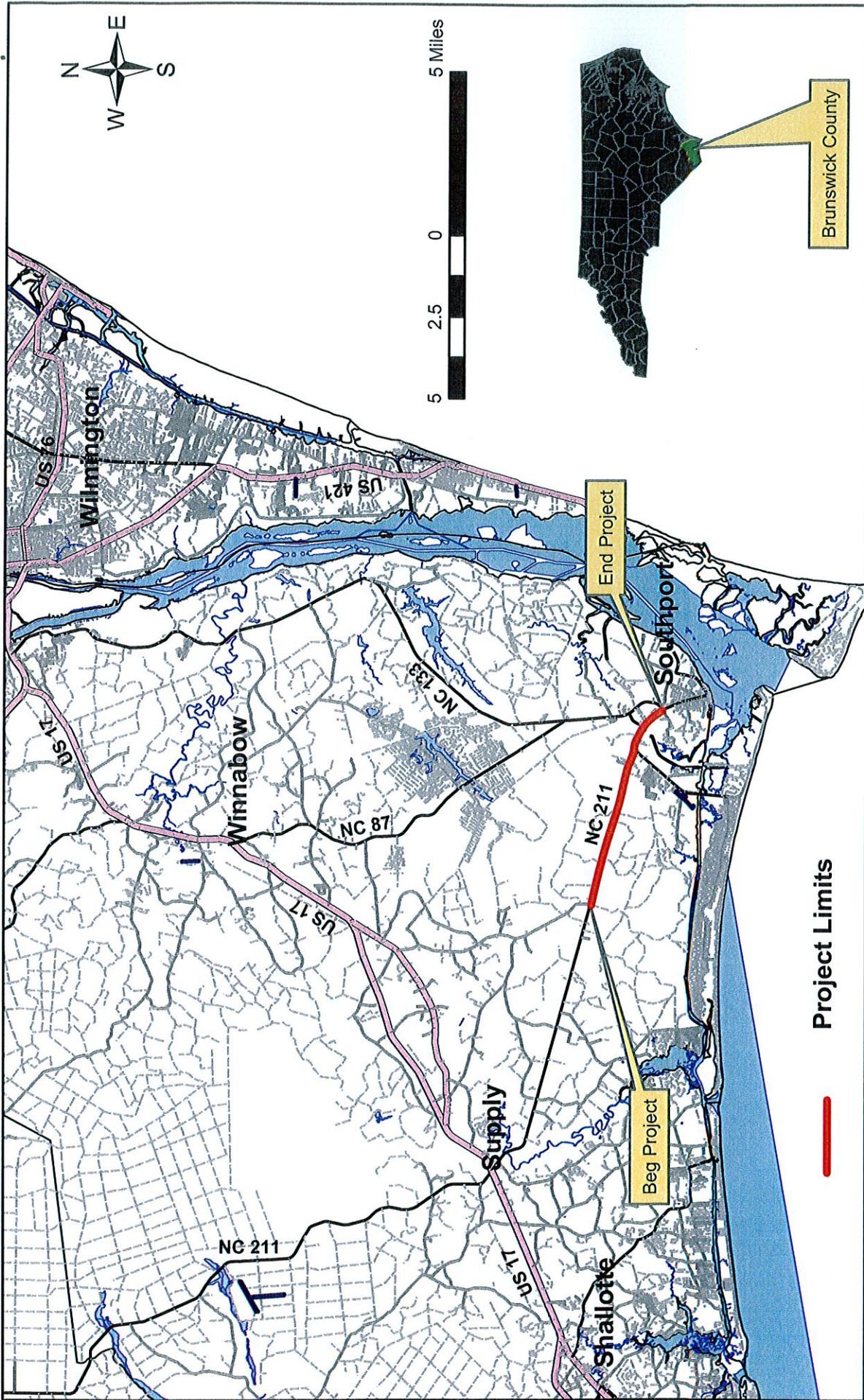
An exhaustive environmental screening was not conducted for this study. However, the following summarizes conclusions about the project study area based on the existing data.

There are no railroad crossings or existing bicycle or pedestrian facilities along this section of NC 211. However, this portion of NC 211 is designated as a North Carolina Bicycling Highway. The proposed cross sections in this report all provide for future bicycle accommodations should they be desired.

Due to the anticipated construction across Beaver Dam Creek, Dutchman's Creek and the Progress Energy Discharge Canal, wetland impacts are expected, and permits from the Army Corps of Engineers will be necessary.

According to the Natural Heritage Program GIS database, there is one Threatened or Endangered species, Shellfish Strata that may potentially exist in the immediate project area. Therefore, the creeks along NC 211 are considered a critical area for protection.

It should be noted that Smithville Log House, a landmark site on the National Historic Register, was located near NC 211 and NC 133 junction. However, no direct impacts to this historic property are anticipated as a result of this project.



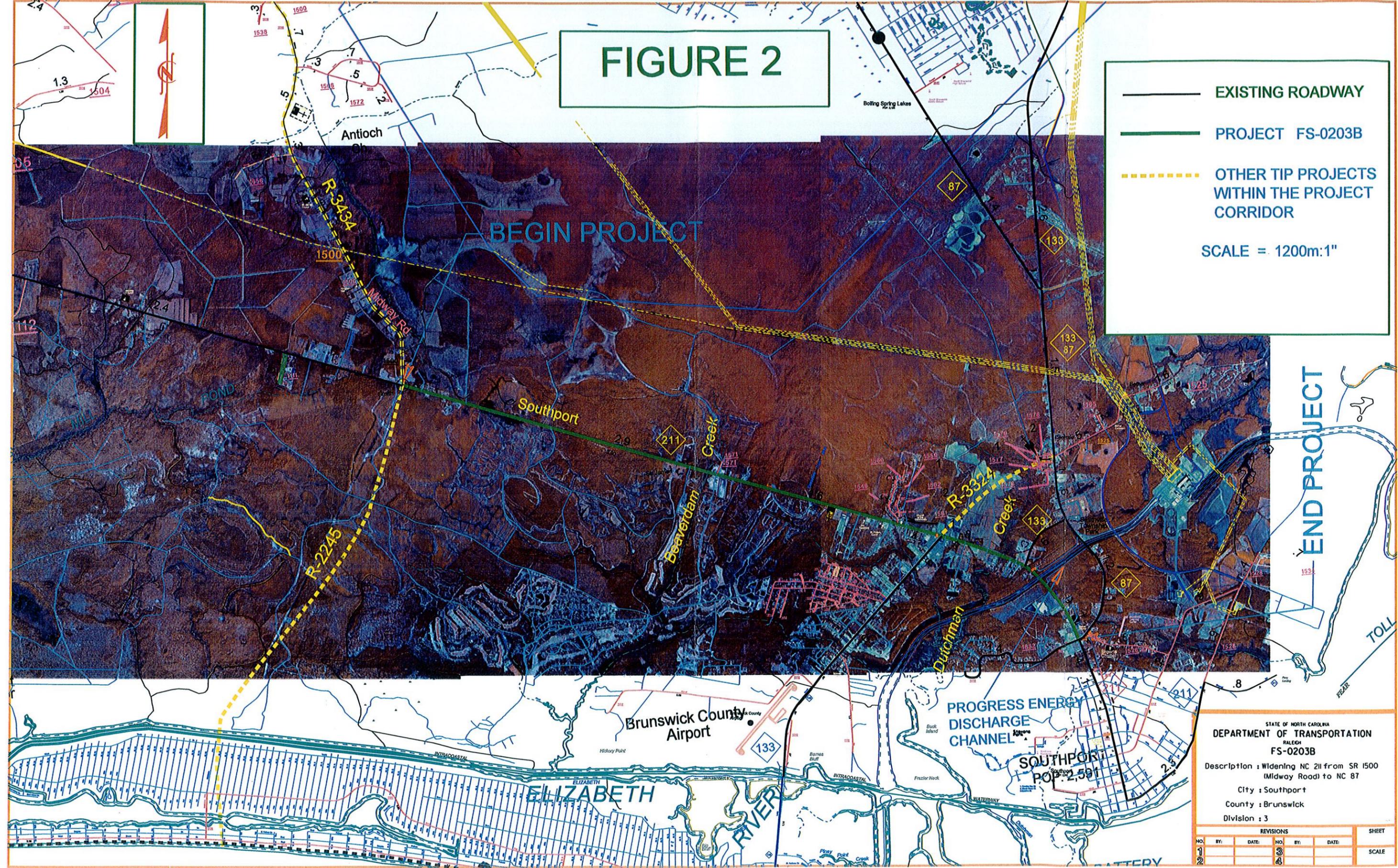
FS 0203B

Figure 1

FIGURE 2

-  EXISTING ROADWAY
-  PROJECT FS-0203B
-  OTHER TIP PROJECTS WITHIN THE PROJECT CORRIDOR

SCALE = 1200m:1"



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
FS-0203B
 Description : Widening NC 211 from SR 1500
 (Midway Road) to NC 87
 City : Southport
 County : Brunswick
 Division : 3

REVISIONS						SHEET
NO.	BY:	DATE:	NO.	BY:	DATE:	SCALE
1			3			
2			4			