FEASIBILITY STUDY

NC 24-NC 11-NC 903
Beulaville to I-40
Duplin County
R-2211

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation

September, 1987

NC 24-NC 11-NC 903
Beulaville to I-40
Duplin County
R-2211

The subject project is included in the 1987-1995 Transportation Improvement Program for feasibility study and/or right-of-way protection. This report provides a brief, initial analysis of possible improvements. The project is not currently funded.

I. GENERAL DESCRIPTION

The proposed project consists of providing a multi-lane facility along the corridor of NC 24, NC 11, and NC 903 (see Figures 1 and 2) from Beulaville to I-40.

Construction of a Kenansville bypass is recommended to remove traffic from a congested urban area. Provision of a four-lane divided facility (with a 30-foot median) is desirable.

Improvements from Kenansville to Beulaville should be along the existing alignment. Provision of a four-lane divided facility is desirable.

II. PURPOSE OF PROJECT

The primary focus of highway improvements in the studied area is to provide a multi-lane facility along the general corridor of NC 24. NC 24 is classified as a principal arterial route in the North Carolina Functional Classification System. NC 24 traverses the State in an east-west direction from Morehead City to Charlotte. In the studied area, NC 24 connects Jacksonville with Warsaw, passing through Kenansville and Beulaville.

Other projects included in the Transportation Improvement Program reflect an NCDOT long range goal to multi-lane NC 24. These are shown in Figure 1 and described as follows:

1. R-2010 - Beulaville to US 258 - Construction in fiscal year 1991
2. R-1021 - US 258 to NC 111 - Construction in fiscal year 1988

Four lanes exist on NC 24 within Beulaville. Provision of the programmed projects described above, along with the improvements recommended in this report, would result in a multi-lane facility from Jacksonville to I-40.

In addition to NC 24, other routes are involved in the subject study. NC 11 (a major collector route) connects Kinston with Wallace in the studied area and passes through Kenansville and Pink Hill. NC 11 coincides with NC 24 for a short distance within Kenansville.

A third route, NC 903, is also involved. NC 903 begins at Magnolia, coincides with NC 11 and NC 24 within Kenansville, and extends northeast toward Kornegay.

Improvements outlined in this report follow a corridor described as follows (see Figure 2):

1. Existing NC 24 from Beulaville to Kenansville
2. New location (bypass) around the south side of Kenansville, connecting to I-40

Proposed improvements would require that NC 24 be rerouted south of Kenansville (along the proposed bypass). NC 24 would follow the general corridor of NC 903 to connect with I-40. NC 11 would also be rerouted from north of Kenansville, along the proposed bypass, to I-40.

The purpose of the project is to provide increased capacity and a higher level of service for NC 24-NC 11-NC 903 traffic. Provision of additional lanes would improve traffic flow and safety. The proposed bypass would alleviate traffic congestion within Kenansville and provide a higher level of service for through traffic.

III. EXISTING CONDITIONS

A description of existing roadways within the studied corridor is as follows:

NC 24, from Beulaville to Kenansville, is a two-lane facility consisting of a 24-foot pavement. Right-of-way varies from 60 to 150 feet. Current traffic volumes range from 3300 vpd to 5200 vpd, resulting in Level of Service C. Horizontal alignment is generally good. Vertical alignment is flat. Approximately 70 percent of the route has a passing sight distance greater than 1500 feet.

Within Kenansville, NC 24 and NC 11 consist of two and three lane curb and gutter facilities. The current traffic is 9100 VPD, resulting in Level of Service D. The posted speed limit within Kenansville is 35 MPH. Development is full-density commercial, industrial, and residential. The concentration and proximity of development prohibits widening of the existing route in town. There are a number of historical structures also located in close proximity to the existing highway and would be involved in any widening proposal through Kenansville.

NC 903, southwest of Kenansville is a two-lane rural facility with a current traffic volume of 2100 VPD. NC 903 consists of a 20-foot pavement within a 60-foot right-of-way. Although the alignment is good, pavement condition is poor.

Three structures are located on the studied segment of NC 24. The characteristics of these bridges are shown below:

	Bridge No. 26	Bridge No. 32	Bridge No. 43
Width (feet)	26.0	26.0	26.0
Length (feet)	200	265	126
Sufficiency Rating	54.2	21.7	52.9
Date Constructed	1950	1950	1950
Remaining Life (years)	15	3	15
Weight Limit	None	None	28 tons

Bridge No. 32 is currently being replaced (project I.D. No. B-1163).

On the rural segments of the studied route, a total of 60 accidents were reported in a recent 3½-year period. This resulted in an accident rate of 1.31 accidents per 100 million vehicle miles, which is lower than the statewide average of 197.7 accidents per 100 million vehicle miles for two-lane NC routes.

IV. RECOMMENDATIONS

Provision of a four-lane divided facility throughout the studied corridor is desirable. This can best be accomplished by implementing the following improvements:

1. Construct a new bypass south of Kenansville along the corridor shown in Figure 2. Provision of a four-lane divided facility with a 30-foot median is recommended. A right-of-way width of approximately 225 feet will be required. Full control of access should be acquired. Estimated cost is approximately $10,200,000.

2. Widen existing NC 24 from Kenansville to Beulaville. Provision of a four-lane divided facility (with a 30-foot median) is recommended. The two new lanes should transition from south side to north side to minimize property disruption. The existing lanes are to be resurfaced. Paved shoulders should be added. Approximately 100 feet of right-of-way (measured from centerline) would be required on the side to be widened. Estimated cost is approximately $14,500,000.

The improvement of NC 11 from Pink Hill to I-40 is also included in the 1987-1995 Transportation Improvement Program (for feasibility study and/or right-of-way protection) as project R-2204. The proposed Kenansville bypass (recommended in this subject report) will also be recommended in the feasibility study for R-2204. An additional short segment of the bypass to the north of NC 24 (see Figure 2) will also be proposed. If all of the proposed bypass is constructed, it will serve as a bypass for NC 24, NC 11, and NC 903.

Traffic volumes along the proposed improvement are shown in Figure 2 and are summarized as follows:

	Initial (1987)	Projected (2007)
NC 24, Kenansville to Beulaville	3300-5200 VPD	5400-8600 VPD
Kenansville Bypass	3600 VPD	5900 VPD
NC 903	3300 VPD	6000 VPD

V. ALTERNATIVES

The corridor shown in Figure 2 appears to be a logical location; however, other possible alignments should be evaluated in a detailed planning and environmental study.

Two alternative roadway cross sections have been considered for the existing segment of NC 24. These alternatives consist of a four-lane, median divided facility and a five-lane, undivided facility. These alternatives are discussed as follows:

1. Four-lane divided:

A new 24-foot pavement and a 30-foot median would be added to the north side of the existing roadway. The existing lanes would be resurfaced, with paved shoulders added.

Two travel lanes would be provided in each direction, with the grass median serving as a buffer between opposing traffic movements. Left turns would be accommodated by providing median openings and left-turn lanes at selected locations. Provision of a grass median would force turning movements to occur only at designated points and would result in U-turns at median openings.

The existing right of way would be expanded by acquiring 100 feet (measured from centerline) on the side to be widened. Provision of dual structures would be necessary at each of three stream crossings. Dual structures consist of a new structure (for proposed lanes) plus a replacement or rehabilitated structure (for existing lanes).

The estimated cost of providing a four-lane divided facility is approximately $24,700,000.

2. Five-lane undivided:

NC 24 would be widened to a 60-foot pavement with 10-foot useable shoulders. Widening would be symmetrical. A right-of-way width of 150 feet would be required. Existing bridges would be widened or replaced.

Provision of shoulders (in lieu of curb and gutter) is desirable, since the area is rural in nature, and the curb and gutter is not needed to control driveway entrances.

Four through travel lanes, plus a center lane for alternating left turns in both directions, would be provided. As a result, left turns would be possible at virtually all points. U-turn movements would not be necessary.

The estimated cost of providing a five-lane undivided facility is approximately $24,100,000.

3. Comparison of Alternates:

A four-lane, median divided facility is desirable in view of the rural nature of this arterial route.

This cross section is preferable because the median physically separates opposing traffic, resulting in safer operating conditions and the potential for reduced accidents.

The estimated cost of a four-lane, divided facility is $24,700,000. Ten families and four businesses would be relocated.

The estimated cost of a five-lane, undivided facility is $24,100,000. Six families and two businesses would be relocated.

VI. ESTIMATED COSTS

The estimated costs of studied improvements are shown below.

Existing NC 24-Kenansville to Beulaville

4-LANE DIVIDED		5-LANE UNDIVIDED	
Construction	$12,000,000	Construction	$11,700,000
Right-of-Way	$ 2,500,000	Right-of-Way	$ 2,200,000
TOTAL	$14,500,000	TOTAL	$13,900,000

Proposed Kenansville Bypass

4-LANE DIVIDED

Construction	$ 7,350,000
Right-of-Way	$ 2,850,000
TOTAL	$10,200,000

TOTALS

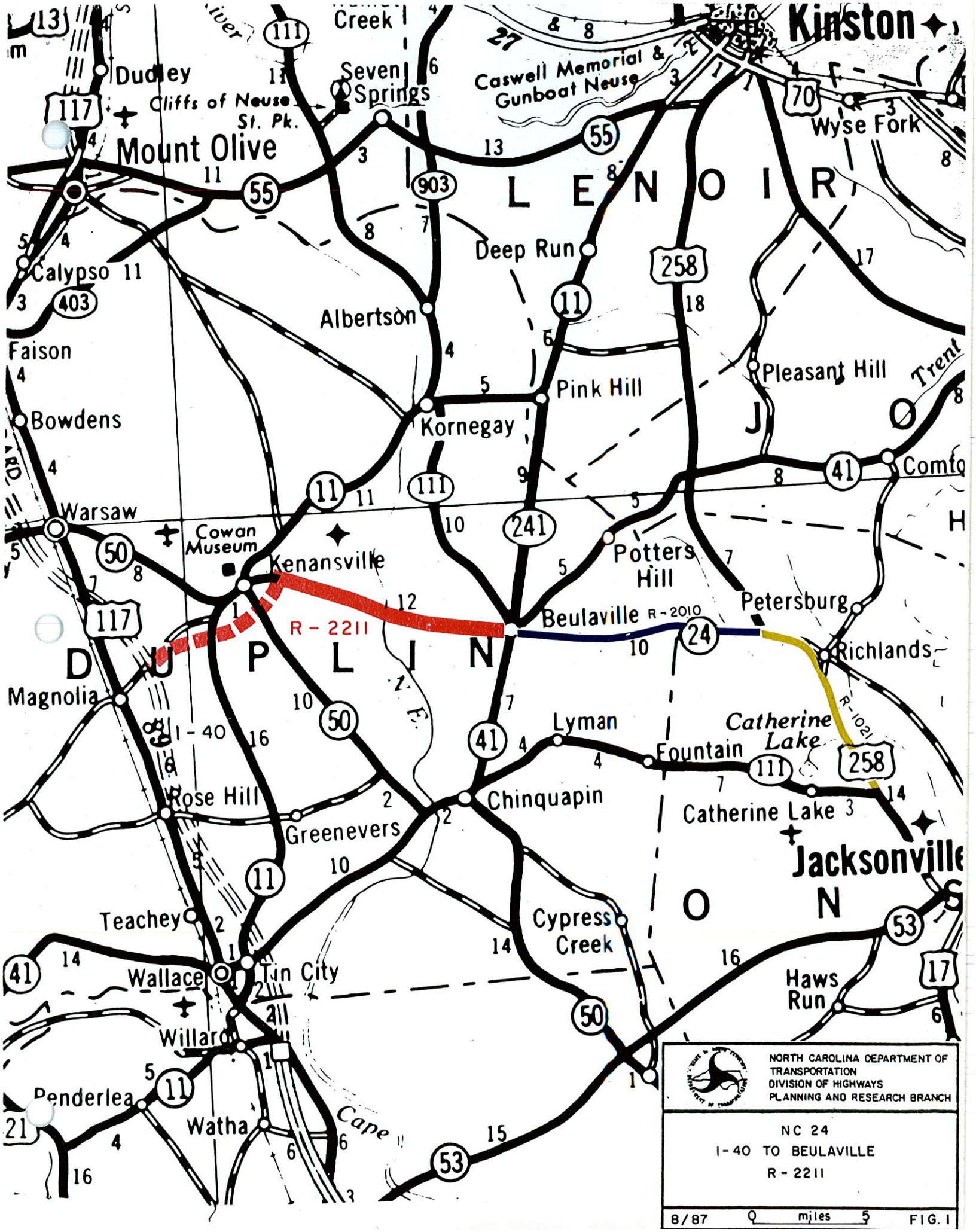
4-LANE DIVIDED ENTIRE PROJECT		4-LANE DIVIDED-BYPASS 5-LANE UNDIVIDED-EXISTING	
Construction	$19,350,000	Construction	$19,050,000
Right-of-Way	$ 5,350,000	Right-of-Way	$ 5,050,000
TOTAL	$24,700,000	TOTAL	$24,100,000

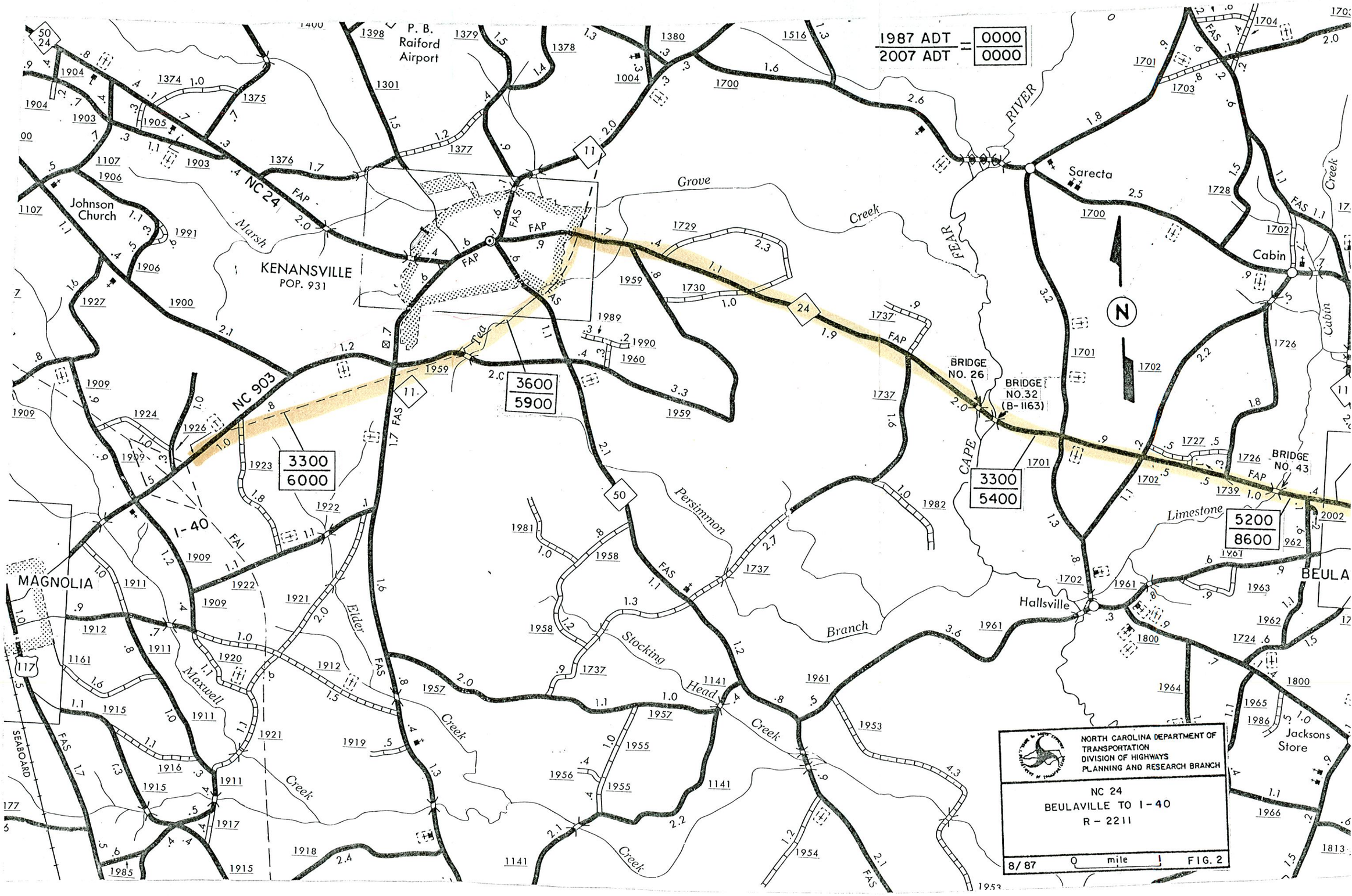
VII. ENVIRONMENTAL IMPACT

The most significant environmental impact is the relocation of 16 to 20 families and 2 to 4 businesses. Other impacts include some increase in noise levels, the possible loss of some wetlands at stream crossings, and the conversion of farmland to highway purposes.

If the project is to be implemented at a future date, all feasible alternatives and their associated impacts should be evaluated in a planning and environmental document prior to that time, and a final decision made as to the most appropriate improvement.

WE/rm


Kinston
Caswell Memorial & Gunboat Neuse
Creek
Seven Springs
Dudley
Cliffs of Neuse St. Pk.
Mount Olive
Wyse Fork
L E N O I R
Deep Run
Calypso
Albertson
Faison
Pleasant Hill
Trent
Pink Hill
Bowdens
Kornegay
J O
Comfo
Warsaw
Cowan Museum
Kenansville
Potters Hill
Petersburg
Beulaville
R-2010
R-2211
Richlands
D U P L I N
Magnolia
R-1021
Lyman
Catherine Lake
Fountain
I-40
Rose Hill
Chinquapin
Catherine Lake
Greenevers
Jacksonville
O N S
Teachey
Cypress Creek
Wallace
Tin City
Haws Run
Willard
Penderlea
Watha
Cape
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH
NC 24
I-40 TO BEULAVILLE
R-2211
8/87
0 miles 5
FIG. 1


1987 ADT / 2007 ADT = 0000 / 0000
P. B. Raiford Airport
Johnson Church
KENANSVILLE
POP. 931
NC 24
NC 903
I-40
MAGNOLIA
Sarecta
Cabin
Hallsville
BEULA
Jacksons Store
Grove Creek
Marsh
Tea
Persimmon
Branch
Stocking Head Creek
Elder Creek
Maxwell Creek
Limestone
CAPE FEAR RIVER
BRIDGE NO. 26
BRIDGE NO. 32 (B-1163)
BRIDGE NO. 43
3600 / 5900
3300 / 6000
3300 / 5400
5200 / 8600
N
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH
NC 24
BEULAVILLE TO I-40
R-2211
8/87
0 mile 1
FIG. 2