

FEASIBILITY STUDY

**Widening of NC 210
from US 17 to NC 172
and
NC 172
from NC 210 to USMC Gate**

Onslow County

Division 3

FS-1003C



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

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I. General Description

This feasibility study describes the proposed widening of NC 210 from US 17 to NC 172, a distance of approximately 4.2 miles and the proposed widening of NC 172 from NC 210 to USMC Gate, a distance of approximately 3.8 miles. The project location is shown on Figure 1. As part of the study, the following cross-section was investigated, the details of which are as follows:

- ◆ Four-lane divided shoulder section on 150 feet of right-of-way.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including cost, and to identify potential problems that may require consideration in the planning and design phases.

II. Background

The purpose of this project is to improve the traffic safety and operations along NC 210 and NC 172.

NC 210 is designated as a major collector in the North Carolina Statewide Functional Classification. NC 210 is currently a two-lane shoulder section with varying pavement widths from 20-24 feet from edge of pavement to edge of pavement.

NC 172 is designated as a major collector in the North Carolina Statewide Functional Classification. NC 172 is currently a two-lane shoulder section with varying pavement widths from 22-24 feet from edge of pavement to edge of pavement.

There are several bridges in the project study area. Please see Table 1 for detailed bridge information.

III. Traffic and Safety

There are existing traffic signals located at the following intersections within the project study area:

- NC 210 and US 17
- NC 210 and Rifle Range Road/Manchester Lane
- NC 210 and NC 172

The current year Average Daily Traffic (ADT) along NC 210 ranges from 14,100 vehicles per day (vpd) to 16,000 vpd. For the design year 2035, the traffic volume along NC 210 is estimated to range between 23,600 vpd to 26,700 vpd. Truck traffic is estimated to make up approximately 6 percent of the daily traffic.

The current year Average Daily Traffic (ADT) along NC 172 ranges from 12,000 vehicles per day (vpd) to 17,200 vpd. For the design year 2035, the traffic volume along NC 172 is estimated to range between 20,800 vpd to 28,500 vpd. Truck traffic is estimated to make up approximately 6 percent of the daily traffic.

The existing segment of NC 210 operates at a level of service (LOS) E under current traffic volumes. If no improvements are made in the 2035 design year, it is projected that NC 210 will operate at a LOS F. With the proposed improvements, NC 210 is projected to operate at a LOS D or better.

The existing segment of NC 172 operates at a LOS E under current traffic volumes. If no improvements are made in the 2035 design year, it is projected that NC 172 will operate at a LOS F. With the proposed improvements, NC 172 is projected to operate at a LOS D or better.

Between 2008 and 2010, 118 total crashes were reported along NC 210. The crash rate for NC 210 is 210.59 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is higher than the statewide rate of 173.02 crashes/100MVM and the critical rate of 202.83 crashes/100MVM for rural two-lane undivided North Carolina (NC) routes. There were 2 fatal crashes, 28 non-fatal injury crashes, and 88 property damage only crashes. The most prevalent types of crashes were Rear End (38%), Left Turn (21%), Animal (13%), and Fixed Object (12%).

Between 2008 and 2010, 113 total crashes were reported along NC 172. The crash rate for NC 172 is 180.50 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is higher than the statewide rate of 173.02 crashes/100MVM for rural two-lane undivided NC routes. There were 2 fatal crashes, 46 non-fatal injury crashes, and 65 property damage only crashes. The most prevalent types of crashes were Rear End (44%) and Left Turn (30%).

IV. Description of Alternatives

It is proposed to widen NC 210 to a multilane facility from US 17 to NC 172, a distance of approximately 4.20 miles and to widen NC 172 to a multilane facility from NC 210 to USMC Gate, a distance of approximately 3.8 miles. The project location is shown on Figure 1.

NC 210 - ALTERNATIVE 1: This alternative includes the widening on NC 210 only. Included in the costs shown below is the replacement of Bridge No. 19 over Stones Creek.

Cross-section: Four-lane divided shoulder section, 79 feet from edge of pavement to edge of pavement, with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) on 150 feet of right-of-way.

With this proposed cross-section, it is anticipated that there will be one (1) residence and zero (0) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$26,900,000.

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|--|---------------------|
| Right-of-way..... | \$2,600,000 |
| Utility Relocation..... | \$2,300,000 |
| <u>Construction.....</u> | <u>\$22,000,000</u> |
| Total Cost (NC 210 – Alternative 1)..... | \$26,900,000 |

NC 210 - ALTERNATIVE 2: This alternative includes the widening on NC 210, a trumpet interchange at the intersection of US 17 and NC 210, and a flyover at the intersection of NC 210 and NC 172. Included in the costs shown below is the replacement of Bridge No. 19 over Stones Creek.

Cross-section: Four-lane divided shoulder section, 79 feet from edge of pavement to edge of pavement, with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) on 150 feet of right-of-way.

With this proposed cross-section, it is anticipated that there will be two (2) residences and eleven (11) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$62,400,000.

| | |
|--|---------------------|
| Right-of-way..... | \$17,400,000 |
| Utility Relocation..... | \$2,900,000 |
| <u>Construction.....</u> | <u>\$42,100,000</u> |
| Total Cost (NC 210 – Alternative 2)..... | \$62,400,000 |

US 17/NC 210 Trumpet Interchange: This option proposes converting the at grade intersection of US 17 and NC 210 into a trumpet interchange.

With this proposed alternative, it is anticipated that there will be zero (0) residences and zero (0) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$10,600,000.

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|--|---------------------|
| Right-of-way..... | \$100,000 |
| Utility Relocation..... | \$200,000 |
| <u>Construction.....</u> | <u>\$10,300,000</u> |
| Total Cost (US 17/NC 210 Trumpet Interchange)..... | \$10,600,000 |

NC 210/NC 172 Flyover: This option proposes a two-lane flyover at the intersection of NC 210 and NC 172 to improve traffic operations.

With this proposed alternative, it is anticipated that there will be one (1) residence and eleven (11) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$24,900,000.

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|---|--------------------|
| Right-of-way..... | \$14,700,000 |
| Utility Relocation..... | \$400,000 |
| <u>Construction.....</u> | <u>\$9,800,000</u> |
| Total Cost (NC 210/NC 172 Flyover)..... | \$24,900,000 |

NC 172 – ALTERNATIVE 1: This alternative along NC 172 is from NC 210 to SR 1681 (Lakeside Drive)/SR 1678 (Old Ferry Road), a distance of approximately 3.1 miles.

Cross-section: Four-lane divided shoulder section, 79 feet from edge of pavement to edge of pavement, with 12-foot lanes, a 23-foot raised grass median, and 8-foot shoulders (4 feet of which are paved) on 150 feet of right-of-way.

With this proposed cross-section, it is anticipated that there will be seven (7) residences and nine (9) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$22,600,000.

| | |
|--|---------------------|
| Right-of-way..... | \$6,700,000 |
| Utility Relocation..... | \$1,200,000 |
| <u>Construction.....</u> | <u>\$14,700,000</u> |
| Total Cost (NC 172 – Alternative 1)..... | \$22,600,000 |

NC 172 - ALTERNATIVE 2: This alternative along NC 172 is from NC 210 to USMC Gate, a distance of approximately 3.8 miles. Included in the costs shown below is the construction of one new two-lane bridge over the New River.

With this proposed cross-section, it is anticipated that there will be seven (7) residences and nine (9) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$44,400,000.

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|--|---------------------|
| Right-of-way..... | \$6,800,000 |
| Utility Relocation..... | \$1,200,000 |
| <u>Construction.....</u> | <u>\$36,400,000</u> |
| Total Cost (NC 172 – Alternative 2)..... | \$44,400,000 |

NC 172 - ALTERNATIVE 3: This alternative along NC 172 is from NC 210 to USMC Gate, a distance of approximately 3.8 miles. Included in the costs shown below is the construction of new dual bridges over the New River.

With this proposed cross-section, it is anticipated that there will be seven (7) residences and nine (9) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$68,300,000.

| | |
|--|---------------------|
| Right-of-way..... | \$6,800,000 |
| Utility Relocation..... | \$1,200,000 |
| <u>Construction.....</u> | <u>\$60,300,000</u> |
| Total Cost (NC 172 – Alternative 3)..... | \$68,300,000 |

V. Community Issues

A detailed investigation was not conducted for this feasibility study, however possible impacts to Dixon High School, Dixon Elementary School, and Marine Corps Base Camp Lejeune are anticipated. Several grave sites are located within the project study area. No impacts to parks, recreation areas, or community facilities are anticipated with this project.

Maps at the Survey and Planning Branch of the North Carolina State Historic Preservation Office were used to determine if any historic properties on the National Register of Historic Places (NRHP) or state study lists exist within the project study area. Yopps Meeting House was found to be potentially historic property.

VI. Natural Environment Issues

The following is a preliminary review of environmental issues that might have a potential impact to the project. The information obtained for the environmental screening is from a Geographic Information System (GIS) database. The purpose of the environmental screening is to identify potential environmental issues early in the process.

Stream Classification

The project study area is located in the White Oak Basin. NC 210 and NC 172 cross two water bodies within the project study area. Stones Creek and the New River have a stream classification of SA HQW. These water bodies will likely need to be surveyed and have the appropriate coordination with the North Carolina Department of Environment and Natural Resources (NCDENR) and the U.S. Army Corps of Engineers (USACE) during any environmental document study. The project study area is also located in a high quality water zone.

Wetlands

NC 210 and NC 172 cross wetlands associated with Stones Creek and the New River and several jurisdictional wetland areas. Permitting with the U.S. Army Corps of Engineers (USACE) will likely need to be obtained before construction of the project, and appropriate mitigation measures should be taken if deemed necessary.

Threatened and Endangered Species

The following threatened and endangered species were identified in the project study area:

- Pigmy Rattlesnake
- Awned Meadow-Beauty
- Venus Flytrap
- American Alligator
- Bald Eagle
- Shortnose Sturgeon

It is anticipated that shellfish strata, anadromous fish pawn, Stones Creek Game Land, Western Camp Lejeune Macrosite, a significant natural heritage area, and natural heritage managed areas will be impacted by this project.

VII. Recommendations

NC 210 – ALTERNATIVE 1: It was found that the four-lane divided shoulder section would be able to accommodate the projected 2035 design year traffic volumes. All of the intersections except for the intersections with US 17 and NC 172 will operate at an acceptable level of service.

NC 210 – ALTERNATIVE 2: It was found that the four-lane divided shoulder section would be able to accommodate the projected 2035 design year traffic volumes and operate at an acceptable level of service, when the interchange at US 17 and the flyover at NC 172 are also provided.

NC 172 – ALTERNATIVES 1, 2, & 3: It was found that the four-lane divided shoulder section would be able to accommodate the projected 2035 design year traffic volumes and operate at an acceptable level of service. However, providing only a two-lane access (Alternative 1) into Marine Corps Base Camp Lejeune would not be able to accommodate the projected 2035 design year traffic volumes. The existing Bridge No. 17 over the New River currently has a sufficiency rating of 64.6 out of 100.

The estimated project cost for the proposed widening of NC 210, with a four-lane divided shoulder section, 12-foot travel lanes, a 23-foot raised grass median, 8-foot shoulders (4 feet of which are paved) on 150 feet of right-of-way, an interchange at the intersection of US 17 and NC 210, new dual bridges over Stones Creek, and a flyover at the intersection of NC 210 and NC 172 is \$61,800,000. It is anticipated that two (2) residences and eleven (11) businesses will be relocated along NC 210.

The estimated project cost for the proposed widening of NC 172, with a four-lane divided shoulder section, 12-foot travel lanes, a 23-foot raised grass median, 8-foot shoulders (4 feet of which are paved) on 150 feet of right-of-way, and new dual bridges over the New River is \$68,300,000. It is anticipated that seven (7) residences and nine (9) businesses will be relocated along NC 172.

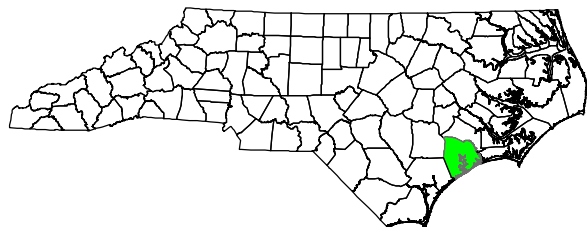
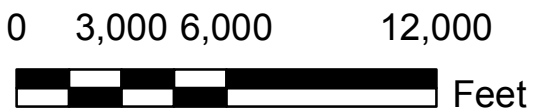
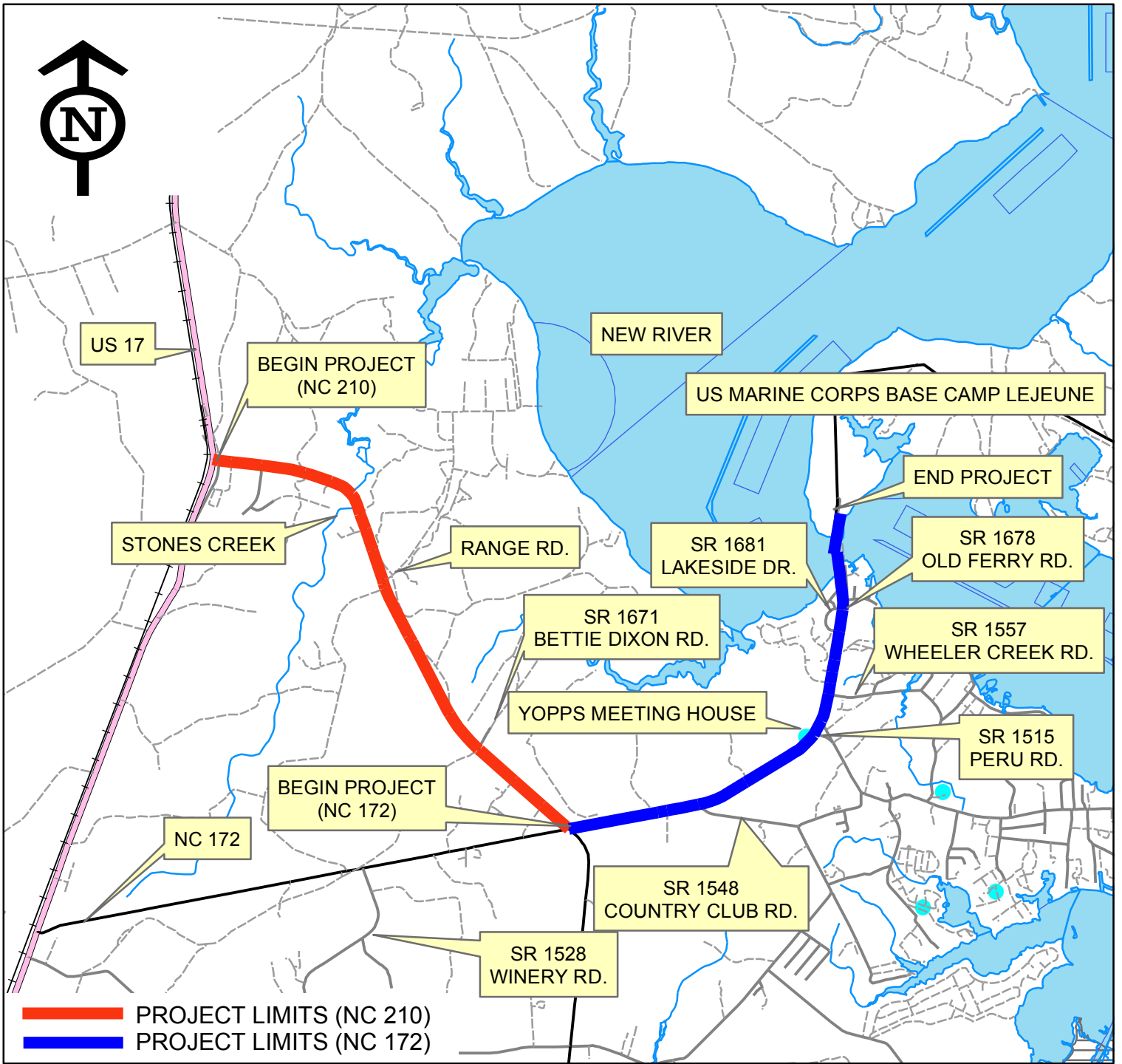
The total estimated project costs for the proposed widening on NC 210 and NC 172 is \$130,100,000, including \$24,200,000 for right of way, \$3,700,000 for utility relocation, and \$102,200,000 for construction. It is anticipated that nine (9) residences and twenty (20) businesses will be relocated along NC 210 and NC 172.

VIII. Other Alternatives Considered

- An asymmetrical widening 23 feet north of the existing centerline was considered. The estimated total cost for this alternative is \$57,000,000, which is a \$4.8 million reduction in right of way and construction costs.

FS-1003C: NC 210 from US 17 to NC 172 and NC 172 from NC 210 to USMC Gate

| Structure Number | Facility Carried | Feature Intersected | Structure Description | Structure Length | Vertical Clearance | Horizontal Clearance | Year Constructed | Sufficiency Rating |
|------------------|------------------|---------------------|---|------------------|--------------------|----------------------|------------------|--------------------|
| 17 | NC 172 | New River | RC FL/W PPC panels, stay in place form on PPC girders | 2781' | N/A | 32' | 1993 | 64.6 |
| 19 | NC 210 | Stone Creek | Precast prestressed conc. box beams | 130' | N/A | 44.9' | 2008 | 91.0 |
| 249 | US 17 NBL | Military Trail | RC Floor/PPC deck panels on PPC girder | 141' | N/A | 38.1' | 1998 | 82.0 |
| 269 | US 17 SBL | Military Trail | RC deck & PC deck panels/PPC girders | 141' | N/A | 37.8' | 1999 | 77.0 |



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FS-1003C

NC 210
FROM US 17 to NC 172

AND

NC 172
FROM NC 210 TO USMC GATE

ONSLOW COUNTY

DIVISION 3

FIGURE 1