Proposed NC 32 Connector
From US 64 to the Intersection of NC 32 and NC 94
Washington County
Federal Aid Project STP-000S(252)
WBS No. 34548.1.1
TIP No. R-3620

ADMINISTRATIVE ACTION

ENVIRONMENTAL ASSESSMENT

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N. C. DEPARTMENT OF TRANSPORTATION

Submitted pursuant to 42 U.S.C. 4332(2) (c)

APPROVED:

3/16/09 for
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3/31/09 for
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Federal Highway Administration

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North Carolina Department of Transportation

March 2009

Documentation Prepared in Project Development and Environmental Analysis Branch by:

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PROJECT COMMITMENTS

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There are currently no special commitments for this project.

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SUMMARY

A. Type of Action

This Environmental Assessment (EA) has been prepared to evaluate the potential impacts of this proposed transportation improvement project. From this evaluation, the North Carolina Department of Transportation (NCDOT) and Federal Highway Administration (FHWA) do not anticipate that significant impacts to the environment will occur as a result of this proposed project. A final determination will be made in supplemental documentation, likely a Finding of No Significant Impact (FONSI) document.

B. Description of Action

The North Carolina Department of Transportation (NCDOT), in consultation with the Federal Highway Administration (FHWA), proposes to construct a connector from US 64 to the intersection of NC 32 and NC 94 in Washington County (see Figure 1).

This project is included in the approved 2009-2015 State Transportation Improvement Program (STIP). The total cost in the STIP is $16,589,000, which includes $300,000 for right of way, $189,000 for mitigation and $16,100,000 for construction. The current estimated total costs vary from $19,367,000 to $27,572,000 based on the alternative chosen. Right of way acquisition is scheduled to begin in Federal Fiscal Year (FFY) 2012 and construction in FFY 2014.

C. Summary of Purpose and Need

The purpose of the proposed project is to improve connectivity in the study area.

D. Alternatives Considered

There were originally six (6) build alternatives considered for this project, Alternatives 1 through 6, a combination of new location alternatives and improvements to existing roadways. Alternatives 3 and 4 were dropped from consideration at the Concurrence Point 2 meeting on March 16, 2006. Alternatives 5 and 6 were dropped from consideration at the Concurrence Point 2A meeting on November 13, 2008. The remaining alternatives include Alternative 1 and Alternative 2.

Alternative 1 begins at the Tyson Farms interchange (US 64 at SR 1139 (Beasley Road)). It then follows Beasley Road for approximately 4500 feet north and continues northward on new location to the intersection of NC 32 and NC 94, which is locally referred to as the Pea Ridge Y.

Alternative 2 also starts at the Tyson Farms interchange, and continues north onto existing SR 1136 (Holly Neck Road). At the intersection of Holly Neck Road and NC 32, Alternative 2 follows NC 32 east and continues to the intersection of NC 32 and NC 94.

E. NCDOT Recommended Alternative

No alternative is recommended at this time. Comments received at the combined public hearing will be reviewed and additional coordination with other federal, state, and local agencies will occur before a final decision is made.

F. Summary of Environmental Effects

Adverse impacts to the human and natural environment were minimized through the development of alternatives. No adverse effect on the air quality of the surrounding area is anticipated as a result of the project. One property eligible for the National Register of Historic Places may be adversely affected if Alternative 2 is chosen as the preferred alternative. None of the alternatives will encroach upon any known archaeological sites on or eligible for listing in the National Register. Relocations range from one (1) to 18, depending on the alternative. Further information can be found in Table S-1.

There are only two federally protected species that are listed for Washington County, the American alligator and the red wolf. A biological conclusion was not required for the American alligator since Threatened Due to Similarity of Appearance [T (S/A)] species are not afforded full protection under the Endangered Species Act. The red wolf was found to have a biological conclusion of May Affect, Not Likely to Adversely Affect due to the fact that suitable habitat does exist within the project area. There have been documented occurrences of red wolves in the past and there are recent occurrences in the surrounding areas. Due to the Endangered, Experimental Nonessential [E(XN)] status for this species, it is only considered to have federal protection on public lands, none of which are contained within the project study area.

Table S-1 gives a summary of the resources and impacts due to the recommended alternative. Figure 3 shows the alternatives currently under consideration.

Table S-1: Summary of Resources and Impacts

Resource	Alternative 1	Alternative 2
Length (miles)	3.7	5.7
Railroad Crossings	0	0
Schools	0	0
Recreational Areas and Parks	0	0
Churches	0	0
Cemeteries	0	1
Major Utility Crossings	1	1
National Register Eligible Properties		
• Hopkins House	N/A	No Effect
• Farm on NC 32	N/A	Adverse Effect
• Rehoboth Methodist Church	N/A	No Adverse*
• Albemarle Grill	No Effect	No Adverse*
Archaeological Sites	0	0
Federally-Listed Species within Corridor	1**	1**
100-Year Floodplain Crossings	Yes	Yes
Residential Relocations	0	17
Business Relocations	1	1
Hazardous Material Sites	0	0
Wetland Impacts (acres)	19.3	8.5
Stream Crossings	1	3
Stream Impacts (linear feet)	191	621
Substantial Noise Impacts	0	0
Water Supply Watershed Protected Areas	0	0
Wildlife Refuges and Game Lands	0	0
Section 4(f)/Section 6(f) Impacts	0	0
Low Income Population Impacts	Low	Low
Minority Population Impacts	Low	Low
Construction Cost	$16,300,000	$23,400,000
Right of Way Cost	$2,775,000	$3,716,000
Utilities Cost	$292,000	$456,000
Total Cost	**$19,367,000**	**$27,572,000**

*No adverse effect with specific conditions

**This project may affect, but is not likely to adversely affect the red wolf.

G. Permits Required

Due to the amount of potential wetland and stream impacts, it is anticipated that an individual Section 404 permit will be needed for this project. Moreover, in accordance with the

Clean Water Act, a Section 401 Water Quality General Certification must be obtained from the NC Division of Water Quality prior to issuance of the individual permit.

H. Coordination

Federal, state, and local agencies were consulted during the preparation of this Environmental Assessment. Written comments were received and considered from agencies noted with an asterisk (*) during the preparation of this assessment.

U.S. Army Corps of Engineers
* U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
* National Marine Fisheries Service
* State Clearinghouse
* N.C. Department of Cultural Resources
* N.C. Department of Environment and Natural Resources
* N.C. Wildlife Resources Commission
* N.C. Division of Coastal Management
* N.C. Division of Forest Resources
* N.C. Division of Marine Fisheries
* N.C. Division of Water Quality
Washington County
* Chowan County
* Southern Albemarle Association
* Town of Columbia

I. Contact Information

Additional information concerning the proposal and assessment can be obtained by contacting either of the following:

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I. DESCRIPTION OF PROPOSED ACTION

A. General Description

The North Carolina Department of Transportation (NCDOT), in consultation with the Federal Highway Administration (FHWA), proposes to construct a connector from US 64 to the intersection of NC 32 and NC 94 in Washington County (see Figure 1).

The proposed two-lane facility will have 12-foot lanes with 8-foot shoulders (2-foot paved). The length of the project varies from 3.7 to 5.7 miles, depending on the alternative chosen. There are currently two alternatives under consideration, one of which utilizes existing facilities and the other that is partially on existing location, partially on new location.

B. Historical Resume & Project Status

The scoping meeting for this project was originally held August 23, 2001. This project was included in the Merger process; Concurrence Point 1 meeting was held on July 23, 2003. A Citizens Informational Workshop was held on November 17, 2004 to update the public on the project. Concurrence Point 2 meeting took place on March 16, 2006, at which point the Merger team decided to drop Alternatives 3 and 4 and develop an additional route, Alternative 6, in response to the high wetland impacts on Alternative 1. Most recently, the Concurrence Point 2A meeting was held on November 13, 2008; at this point, the Merger team concluded that Alternatives 5 and 6 should be dropped from further study.

C. Cost Estimates

This project is included in the approved 2009-2015 State Transportation Improvement Program (STIP). The total cost in the STIP is $16,589,000, which includes $300,000 for right of way, $189,000 for mitigation and $16,100,000 for construction. The current estimated costs vary from $19,367,000 to $27,572,000.

II. PURPOSE AND NEED FOR PROJECT

A. Purpose of Project

The purpose of this project is to improve connectivity within the project study area and does not preclude improving the existing facilities.

B. Need for Project

1. Description of Existing Conditions

a. Functional Classification

SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road) are both designated as local routes on the North Carolina Statewide Functional Classification System. NC 32 and NC 94 are both classified as major rural collectors.

b. Physical Description of Existing Facility

1. Roadway Cross-Section

SR 1139 (Beasley Road), SR 1136 (Holly Neck Road), NC 32, and NC 94 are all two-lane facilities with 12-foot lanes and 2-foot unpaved shoulders.

2. Horizontal and Vertical Alignment

The existing horizontal and vertical alignments along existing NC 32, NC 94, SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road) are suitable for the posted speed limits.

3. Right of Way and Access Control

The existing right of way along NC 32 and NC 94 is 100 feet. The existing right of way along SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road) is 60 feet.

4. Speed Limit

The posted speed limit along NC 32, NC 94, SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road) is 55 miles per hour (mph).

5. Intersections/Interchanges

There are five existing intersections included as a part of this project, including: SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road); SR 1136 (Holly Neck Road) and NC 32; NC 32 and NC 94; NC 94 and SR 1303 (Jones White Road); and NC 94 and SR 1304 (Scuppernong Road). All of these intersections are currently stop sign controlled. There are also two

interchanges located just beyond the project limits, US 64 and SR 1139 (Beasley Road) and US 64 and SR 1141 (Benson Road).

6. Railroad Crossings

There are no railroad crossings on the project.

7. Structures

There are three existing major hydraulic structures on this project. Table 1 gives further detail on these existing structures, while Figure 3 shows the location of each.

Table 1: Existing Hydraulic Structures

Hydraulic Site	Location	Stream	Type of Structure
2	Intersection of SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road)	Unnamed tributary (UT) to Chapel Swamp	Dual 6' x 4'metal pipe arches
3	NC 32, approx. 0.6 miles east of SR 1136 (Holly Neck Road) intersection	UT to Albemarle Sound	6' x 4' Reinforced Concrete Box Culvert (RCBC)
4	NC 32, approx. 0.4 miles west of intersection with NC 94	UT to Albemarle Sound	Dual 6' x 4' RCBCs

8. Bicycle and Pedestrian Facilities

A portion of NC 32 from the intersection with SR 1136 (Holly Neck Road) to the Albemarle Sound Bridge is designated as NC Bike Route 3 (Ports of Call Route). The bike route follows NC 32/NC 94 from Chowan County across the Albemarle Sound Bridge and west on NC 32 toward the Town of Plymouth.

9. Utilities

Major utilities on this project include existing water lines along NC 94 and a power transmission feeder line that would cross all alternatives.

c. School Bus Usage

The Washington County School District has four (4) school buses that travel twice daily along SR 1139 (Beasley Road), SR 1136 (Holly Neck Road), and NC 32 to the Pea Ridge Y. There are also three (3) school buses that have twice daily routes along NC 94 between the Pea Ridge Y and the US 64/NC 94 interchange.

d. Capacity Analysis (No Build Scenario)

1. Existing Traffic Volumes

According to the 2007 summer peak traffic counts, the Average Daily Traffic (ADT) on NC 32 varied from 2,000 vehicles per day (vpd) to 2,200 vpd, while the existing ADT on NC 94 ranged from 3,300 to 3,700 vpd. The existing ADT on SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road) was approximately 400 vpd.

2. Existing Levels of Service

The capacity analysis was performed following the NCDOT Congestion Management Section's Capacity Analysis Guidelines for TIP Projects. Simulations were completed for both the build and no-build scenarios using the present year (2007) and the design year (2035) traffic forecasts. Fifteen different intersections were analyzed as part of this project, all of them unsignalized. Under current traffic conditions, the intersection of SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road) and the intersection of SR 1136 (Holly Neck Road) and NC 32 both operate at Level of Service (LOS) A during peak hours. The intersection of NC 32 and NC 94 is currently operating at LOS B during peak hours, while the intersection of NC 94 and SR 1303 (Jones White Road) also has a LOS B.

3. Future Traffic Volumes

Future year (2035) traffic volumes were predicted for the "no build" scenario as part of the planning process. Table 2 below shows the range of ADT for each roadway facility on the project.

Table 2: 2035 Traffic Volumes (vpd)

	No Build
NC 32	3,500
NC 94	6,600-7,100
SR 1139 (Beasley Road)	300-600
SR 1136 (Holly Neck Road)	200-600
New Location Connector	N/A

4. Future Levels of Service

Table 3 shows the predicted LOS and max queues for the major intersections and turning movements in the design year (2035) for the no build scenario.

Table 3: Peak Hour Levels of Service & Max Queue for No Build Scenario

East-West Route	North-South Route	Direction	Movement	Level of Service (LOS)	Max Queue (feet)
SR 1139 (Beasley Road)	SR 1136 (Holly Neck Road)	EB	LR	A	N/A
NC 32	SR 1136 (Holly Neck Road)	NB	LR	B	N/A
NC 32	NC 94 & NC 32/94	EB	L	D	226
To NC 32 and NC 94	NC 94	SB	L	B	222
NC 32 and to NC 94	NC 32	EB	L	A	N/A
		SB	R	A	N/A
SR 1303 (Jones White Road)	NC 94	WB	LR	B	N/A

e. Airports

The nearest airport to the project area is Northeastern Regional Airport, located approximately seven (7) miles away in Edenton.

f. Other Highway Projects in the Area

There are two other TIP projects in Washington County. R-4909 proposes to construct a new two-lane facility from SR 1126 (Newland Road) to SR 1125 (Millpond Road) near Roper. It is scheduled for right of way in FFY 2012 and construction in FFY 2013. B-4314, which is currently under construction, will replace Bridge No. 29 on SR 1163 (Spruill Town Road) over Maul Creek near Cherry.

2. Transportation and Land Use Plans

a. NC Transportation Improvement Program (TIP)

This project is currently included in the 2009-2015 TIP. Right of way acquisition is scheduled to begin in FFY 2012 and construction in FFY 2014.

b. Local Thoroughfare Plans

The Thoroughfare Plan Study Report for Washington County was completed by NCDOT's Transportation Planning Branch in October 2001. This transportation plan includes this project as a recommended transportation improvement.

c. Land Use Plans

Washington County is in the process of updating their land use plan and anticipates its completion by early 2009.

3. System Linkage/Travel Time/Access Need

The proposed NC 32 connector will provide a much needed link from the new US 64 to NC 32. Under TIP Project R-2548, US 64 was shifted south of its existing alignment and severed the existing connection between US 64 and NC 32. A freeway primarily on new location, the new US 64 provides a high-speed corridor serving Washington County and other areas of northeastern North Carolina. NC 32 currently provides a means of north-south movement throughout the county. However, there is no direct connection between the new US 64 and NC 32, leading to increased travel times via local roads for travelers wishing to travel from US 64 to the Albemarle Sound and Edenton, or vice versa. The location of the new US 64 creates the need for new and improved connections with the existing roadway system.

C. Benefits of Proposed Project

The proposed NC 32 connector will provide a more efficient connection between US 64 and NC 32 than currently exists. Vehicles traveling northeast to the Albemarle Sound and Edenton will experience a travel time savings over the existing route. The project would also help to separate local traffic on existing NC 32 and NC 94 from seasonal beach traffic using US 64/NC 32 to Edenton.

III. ALTERNATIVES

A. Preliminary Study Alternatives

1. No-Build Alternative

The No-Build Alternative offers no improvements to the project area. This alternative will not allow for the upgrade of existing facilities along SR 1139 (Beasley Road), SR 1136 (Holly Neck Road), NC 32 or NC 94, nor will it provide a more efficient means of travel from US 64 to the Albemarle Sound. Travelers will continue to use the existing facilities and will not experience any reduction in travel times.

Since the No-Build Alternative does not address the purpose and need of the proposed action, it is not recommended. However, it is used as a basis for comparison of the other alternatives.

2. Alternative Modes of Transportation

Alternative modes of transportation, including transit options, would not meet the purpose and need of this project since they do not provide a more efficient means of travel between US 64 and the Albemarle Sound.

There are limited transit options currently available in this section of Washington County. Public transit is provided by the Washington County Human Services Center, which has services available for county residents by subscription, demand-responsive transit, and periodic out-of-county medical trips. Transportation is provided for employment, job training and education, aging programs, developmentally disabled programs, medical, and general public needs.

3. Transportation Systems Management

The Transportation Systems Management (TSM) alternative includes those types of limited construction activities designed to maximize the utilization and energy efficiency of an existing roadway. A possible TSM improvement option with this alternative includes improvements to existing roadways in the vicinity of the proposed project. However, intersection improvements alone do not adequately address the purpose of the project.

4. Build Alternatives

Alternatives range from upgrading existing facilities to constructing a new connector roadway. The following two existing location alternatives were considered for this project:

- **Alternative 2 –** This alternative begins at the Tyson Farms interchange (US 64 at SR 1139 (Beasley Road)). Alternative 2 continues north onto SR 1136 (Holly Neck Road). At the intersection of Holly Neck Road with NC 32, Alternative 2 follows NC 32 east and continues to the intersection of NC 32 and NC 94.

- **Alternative 3 –** This alternative begins at the Tyson Farms interchange (US 64 at SR 1139 (Beasley Road)). Alternative 3 continues north on SR 1139 (Beasley Road), then turns east on new location near the intersection of SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road). Alternative 3 ends at the intersection of NC 32 and NC 94.

- **Alternative 4 –** This alternative begins at the Roper interchange (US 64 at SR 1125 (Mill Pond Road)). Alternative 4 proceeds for approximately 3,000 feet on new location before tying into existing NC 32. This alternative continues to follow NC 32 east to its intersection with NC 94.

- **Alternative 5 –** This alternative begins at the Scuppernong Interchange (US 64 at SR 1304). Alternative 5 follows NC 94 northwestward to the intersection of NC 32 and NC 94.

Alternatives 3 and 4 were dropped from further consideration at the Concurrence Point 2 meeting held on March 16, 2006 because of the large number of impacts associated with each. Alternative 5 was removed from further consideration at the Concurrence Point 2A meeting held on November 13, 2008 since it did not meet the purpose and need of the project.

The following two new partially new location alternatives were considered for this project:

- **Alternative 1 –** This alternative begins at the Tyson Farms interchange (US 64 at SR 1139 (Beasley Road)). It then follows Beasley Road for approximately 4500 feet north and continues northward on new location to the intersection of NC 32 and NC 94.

- **Alternative 6** – This alternative begins at the Tyson Farms interchange (US 64 at SR 1139 (Beasley Road)). It then follows Beasley Road for approximately 4500 feet north and continues northward on new location to the intersection of NC 32 and NC 94. This alternative approximately parallels Alternative 1 to the east.

Alternative 6 was removed from further consideration at the Concurrence Point 2A meeting held on November 13, 2008 since it has such significant impacts to wetland and streams.

B. Detailed Study Alternatives

Two of the alternatives that were considered during the preliminary study were carried forward for detailed study (Alternatives 1 and 2). The impacts associated with each alternative are noted in Table 4 below.

One of the major design constraints on this project was the recommendation by the Geotechnical Engineering Unit to raise the grade of the existing roadway. A vertical distance of four (4) to six (6) feet was recommended between the subgrade of the road and the water table, even though the high water table is not always evident due to the drought experienced in this area and the slow recharging clay soils. The grade change will require NCDOT to construct a new facility adjacent to the existing roadway in all existing location sections of the project because it is

impossible to maintain traffic on the existing facility with such a substantial change in grade taking place. This will translate into an increase in wetland and stream impacts, relocatees, and consequently, project costs, along the existing location portion of the project.

Table 4: Summary of Resources and Impacts

Resources	Alternative 1	Alternative 2
Length (miles)	3.7	5.7
Railroad Crossings	0	0
Schools	0	0
Recreational Areas and Parks	0	0
Churches	0	0
Cemeteries	0	1
Major Utility Crossings	1	1
National Register Eligible Properties		
• Hopkins House	N/A	No Effect
• Farm on NC 32	N/A	Adverse Effect
• Rehoboth Methodist Church	N/A	No Adverse*
• Albemarle Grill	No Effect	No Adverse*
Archaeological Sites	0	0
Federally-Listed Species within Corridor	1**	1**
100-Year Floodplain Crossings	Yes	Yes
Residential Relocations	0	17
Business Relocations	1	1
Hazardous Material Sites	0	0
Wetland Impacts (acres)	19.3	8.5
Stream Crossings	1	3
Stream Impacts (linear feet)	191	621
Substantial Noise Impacts	0	0
Water Supply Watershed Protected Areas	0	0
Wildlife Refuges and Game Lands	0	0
Section 4(f)/6(f) Impacts	0	0
Low Income Population Impacts	Low	Low
Minority Population Impacts	Low	Low
Construction Cost	$16,300,000	$23,400,000
Right of Way Cost	$2,775,000	$3,716,000
Utilities Cost	$292,000	$456,000
Total Cost	**$19,367,000**	**$27,572,000**

* No adverse effect with specific conditions.

** This project may affect, but is not likely to adversely affect the red wolf.

A Prime Farmland Analysis is currently underway and is anticipated to be complete in April 2009.

C. Capacity Analysis (Build Scenario)

1. Future Traffic Volumes

Future year (2035) traffic volumes were predicted for both of the proposed alternatives. Table 5 shows the range of ADT for each roadway facility on the project.

Table 5: Traffic Volumes (vpd)

	Alternative 1	Alternative 2
NC 32	1,900	3,500-3,900
NC 94	3,600-4,100	6,800-7,300
SR 1139 (Beasley Road)	1,000-5,200	300-600
SR 1136 (Holly Neck Road)	300	100-600
New Location Connector	5,100	N/A

2. Future Levels of Service

For Alternative 1, Table 6 displays the predicted LOS and max queues for the major intersections and turning movements in the design year (2035).

Table 6: Peak Hour Levels of Service & Max Queue for Alternative 1

East-West Route	North-South Route	Direction	Movement	Level of Service (LOS)	Max Queue (feet)
SR 1139 (Beasley Road)	SR 1136 (Holly Neck Road)	WB	LR	A	N/A
		SB	LT	A	N/A
NC 32	SR 1136 (Holly Neck Road)	NB	LR	A	N/A
NC 32 and NC 94	NC 32 Connector & NC 32/94	EB	L	F	84
		EB	TR	C	N/A
		WB	LT	B	N/A
		WB	R	B	225
		SB	L	A	N/A
SR 1303 (Jones White Road)	NC 94	WB	LR	B	N/A

For Alternative 2, Table 7 displays the predicted LOS and max queue for the major intersections and turning movements in the design year (2035).

Table 7: Peak Hour Levels of Service & Max Queue for Alternative 2

East-West Route	North-South Route	Direction	Movement	Level of Service (LOS)	Max Queue (feet)
SR 1139 (Beasley Road)	SR 1136 (Holly Neck Road)	EB	LR	A	N/A
NC 32	SR 1139 and NC 32	EB	LR	B	N/A
		SB	R	A	N/A
NC 32	NC 94 & NC 32/94	EB	L	D	397
To NC 32 and NC 94	NC 94	SB	L	C	176
NC 32 and to NC 94	NC 32	EB	L	A	N/A
		SB	R	A	N/A
SR 1303 (Jones White Road)	NC 94	WB	LR	B	N/A

3. Travel Times

Travel times were calculated for two different routes, one traveling northeast from the US 64/SR 1139 (Beasley Road) interchange to the intersection of NC 32 and NC 94, and one traveling northwest from the US 64/SR 1114 (Benson Road) interchange to the intersection of NC 32 and NC 94. Table 8 below shows the results of the travel time calculations for each alternative.

Table 8: Travel Times (minutes)

Route	Traveling Northeast	Traveling Northwest
US 64 and Alternative 1	N/A	10.1
US 64 and Alternative 2	N/A	14.3
Alternative 1	4.4	N/A
Alternative 2	8.6	N/A

As seen in Table 8, when traveling northeast or northwest, travelers will experience a noticeable travel time savings by using Alternative 1 over Alternative 2, due to the shorter distance and limited access.

D. NCDOT Recommended Alternative

No alternative is recommended at this time. Alternatives 1 and 2 will be carried forward in the public hearing. Comments received at the combined public hearing will be reviewed and the additional coordination with other federal, state, and local agencies will occur before a final decision is made.

IV. PROPOSED IMPROVEMENTS

A. Roadway Cross-Section and Alignment

The proposed typical section for both alternatives will have two 12-foot lanes with 8-foot shoulders (2-foot paved). The existing location sections of this project will be built adjacent to the current roadway facility due to a four (4) to six (6) foot change in grade (see Section III.B for further discussion).

B. Right of Way and Access Control

The proposed right of way for this project varies from 160 feet to 200 feet along the length of the project. Additional right of way is required due to the need to raise the grade of the existing roadway. There will be limited control of access on all new location sections and partial control of access on all existing location sections.

C. Design Speed & Speed Limit

The design speed for the proposed NC 32 connector will be 60 mph and the posted speed limit will be 55 mph.

D. Anticipated Design Exceptions

There are no design exceptions anticipated for this project.

E. Intersections/Interchanges

Depending on the alternative chosen, there will be either two (2) or three (3) intersections as part of the proposed project. If Alternative 1 is chosen, one new intersection will be created at the proposed NC 32 Connector and SR 1139 (Beasley Road) and the intersection of NC 32/NC 94 will be modified to include a fourth leg where the new NC 32 Connector will join it. If Alternative 2 is chosen, three (3) existing intersections, including SR 1139 (Beasley Road) and SR 1136 (Holly Neck Road), NC 32 and SR 1139 (Beasley Road), and NC 32 and NC 94, will be modified as part of the proposed project.

No interchanges are proposed.

F. Service Roads

There are no service roads proposed.

G. Railroad Crossings

There are no railroad crossings on this project.

H. Structures

One new major hydraulic structure is anticipated on the new location section of Alternative 1, a 10-foot by 7-foot RCBC near the intersection of NC 32 and NC 94 that will carry an unnamed tributary of the Albemarle Sound.

Alternative 2 is primarily on existing location and includes three existing (3) major structure crossings. One of the crossings is the proposed replacement of dual 6-foot by 4-foot pipe arches with a 9-foot by 6-foot RCBC. The other two crossings anticipate extending or replacing existing box culverts, depending on their condition.

Table 9: Proposed Hydraulic Structures

Hydraulic Site	Alternative	Stream	Recommended Structure
1	1	UT to Albemarle Sound	10’ x 7’ RCBC
2	2	UT to Chapel Swamp	9’ x 6’ RCBC
3	2	UT to Albemarle Sound	6’ x 6’ RCBC
4	2	UT to Albemarle Sound	Dual 6’ x 6’ RCBC

I. Bicycle and Pedestrian Facilities

No additional sidewalks or bicycle accommodations are proposed.

J. Utilities

Major utilities on this project include a power transmission feeder line that would cross all alternatives and would need to be relocated.

K. Noise Barriers

No noise barriers are proposed as part of this project.

L. Work Zone, Traffic Control and Construction Phasing

For the new location sections of the project, maintenance of existing traffic will not be required. However, during the improvements to the existing location sections, traffic will be maintained along the existing route. Since significant grade changes would require traffic to be detoured, a parallel facility will be constructed adjacent to the existing facility and traffic will continue to be maintained on the existing facility for the duration of construction. Once construction is completed, the old roadway will be removed.

V. ENVIRONMENTAL EFFECTS OF PROPOSED ACTION

A. Natural Resources

The project study corridor is located in the Chesapeake-Pamlico Lowlands and Tidal Marshes ecoregion of the Coastal Plain physiographic province of North Carolina. Topography in the project study area is generally characterized as nearly level to flat. Elevations within the project study area range from a topographic low of 0 ft above mean sea level (MSL) to a topographic high of approximately 15 ft above MSL.

The project study corridor is dominated by forested and agriculture lands with scattered residential land uses. The project vicinity is rural in nature.

1. Biotic Resources

a. Terrestrial Communities

Seven terrestrial communities were identified within the project study area: Pine Woodland, Mesic Mixed Hardwood Forest, Pine/Mixed Hardwood Forest, Cypress-Gum Swamp, Successional Land, Maintained/Disturbed Land, and Agricultural Land.

1. Pine Woodland

Areas designated as pine woodlands are characterized by a predominance (greater than 80 percent cover) of pines in the canopy. Within the project study corridor, pine woodlands represent a combination of natural communities, silvicultural stands, and successional forests occurring under various hydrologic conditions from hydric to mesic, and may be ditched or unditched. This community designation includes the Mesic Pine Flatwoods and Wet Pine Flatwoods natural communities, silvicultural pine stands, and young successional pine forest stands. Under natural conditions, some of the silvicultural pine stand locations may have supported the Mesic Mixed Hardwood community. The distinctions between the various potential pine stand designations are blurred by current and past land management practices, such that for the purposes of this vegetative community evaluation, pine stands are treated together as a single community type.

Stands of loblolly pine (*Pinus taeda*) are prevalent in interstream areas. Many pine stands are silvicultural plantings managed for timber or pulpwood production while others represent natural pine woodland communities or represent seral stages resulting from old-field succession or from timber management. Pine woodlands are common throughout the project study corridor and vicinity.

Species composition within pine woodland communities varies with the age, abiotic features, and landscape position of the stand. In young stands (five (5) to ten (10) years of age), the canopy is mostly closed and excludes most other species. Hardwood saplings may become established as the stand ages. Common species within the project study corridor include sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and water oak (*Quercus nigra*). Shrub and herbaceous species composition more directly reflects the hydrologic conditions with species such as flowering dogwood (*Cornus florida*), horse sugar (*Symplocos tinctoria*), wax myrtle (*Myrica cerifera*), and bracken fern (*Pteridium aquilinum*) common in upland areas. Red bay (*Persea borbonia*), sweet bay (*Magnolia virginiana*), titi (*Cyrilla racemiflora*), sweet pepperbush (*Clethra alnifolia*), and giant cane (*Arundinaria gigantea*) are more common in areas with a longer hydroperiod. Vines such as Japanese honeysuckle (*Lonicera japonica*), greenbriers (*Smilax laurifolia* and *S. rotundifolia*), and blackberry (*Rubus* spp.) are sometimes common in disturbed stands.

2. Mesic Mixed Hardwood Forest

Mesic mixed hardwood forest is found within the project study corridor along stream channels and mesic slopes bordering intermittent tributaries. These areas are usually associated with gentle to moderate slopes adjacent to stream floodplains or in floodplain areas of deeply cut intermittent streams. The community is dominated by two species of oaks (*Quercus alba* and *Quercus rubra*), tulip poplar (*Liriodendron tulipifera*), red maple, sweetgum, and an occasional American beech (*Fagus grandifolia*). Pines may be present, but represent less than 20 percent of the canopy coverage. The understory varies in density and includes saplings of the canopy species, dogwood, sassafras (*Sassafras albidum*), and wax myrtle. Groundcover consists of vines such as honeysuckle, greenbrier, poison ivy (*Toxicodendron radicans*), and yellow jessamine (*Gelsemium sempervirens*). On some slopes along natural drainage areas, these communities may include seepage areas which support ironwood (*Carpinus caroliniana*), various sedges (*Carex* spp. and *Cyperus* spp.), cinnamon fern (*Osmunda cinnamomea*), and netted chain-fern (*Woodwardia areolata*).

3. Pine/Mixed Hardwood Forest

This community is characterized by the co-dominance of pines and hardwoods in the canopy. Pines, especially loblolly pines, contribute between 20 to 80 percent of canopy dominance, with the remainder of the canopy typically dominated by a mix of hardwood species such as water oak, sweetgum, red maple, mockernut hickory (*Carya tomentosa*), southern red oak (*Quercus falcata*), and tulip poplar. Depending on landscape position, this community may represent a successional stage of various other natural communities including the Wet or Mesic Pine Flatwoods, Mesic Mixed Hardwood Forest, and Non-riverine Wet Hardwood Forest. Pine to hardwood ratios vary considerably from site to site depending in part on age of the community and previous land management practices. Understory/shrub composition for much of this community resembles that of pine woodlands with a mixture of horse sugar, American holly (*Ilex opaca*), wax myrtle, dogwood, and saplings of canopy species present. Giant cane, greenbriers, ferns, honeysuckle, poison ivy, Virginia creeper (*Parthenocissus quinquefolia*), and other herbs

occur sporadically throughout herbaceous layers, dependent in part upon the degree of disturbance and hydrologic conditions.

4. Cypress-Gum Swamp

Cypress-Gum Swamp is found within the floodplains of the larger creeks. Cypress-gum communities generally experience more prolonged flooding than bottomland hardwood communities. The semi-permanent flooding results in dominance by bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*), although bald cypress may be lacking due to past forestry operations. Other species such as green ash (*Fraxinus pennsylvanica*), willow oak (*Quercus phellos*), water oak, and red maple may be present as sub-dominants. Understory species include sweet bay, slippery elm (*Ulmus rubra*), possum-haw (*Viburnum nudum*), Chinese privet (*Ligustrum sinense*), and sweet pepperbush. Vines include greenbriers. Herbaceous cover is sparse, usually concentrated on hummocks, and includes royal fern (*Osmunda regalis*), cinnamon fern, Virginia chain-fern (*Woodwardia virginica*), netted chain-fern, and lizard's tail (*Saururus cernuus*). Peatmoss (*Sphagnum* spp.) is prevalent throughout the shallowly flooded portions of this community.

5. Successional Land

Successional areas within this community designation include fallow fields and cut-over forest land that have one (1) to ten (10) year-old natural and planted vegetation. This community type is differentiated from other forest communities by the dominance of herbaceous or shrub strata rather than tree stratum. Most of the successional areas described within the project study corridor occur as the result of timber operations, but succession from abandoned farm operations is also evident. These systems are variable in species dominance.

Species composition varies depending on soil type, available moisture, and other factors. Early successional areas in upland or ditched areas are characterized by a number of opportunistic herbs such as broomsedge (*Andropogon virginicus*), goldenrods (*Solidago* spp.), dogfennel (*Eupatorium capillifolium*), honeysuckle, blackberry, and various grass species. Early successional areas subject to prolonged surface saturation or periodic inundation may be dominated by various hydrophytic species including black willow (*Salix nigra*), wax myrtle, groundsel tree (*Baccharis halimifolia*), titi, soft rush (*Juncus effusus*), cattails (*Typha* spp.), and sedges. Later successional stages in a range of hydrologic conditions exhibit an increase in loblolly pine, red maple, and sweetgum saplings. Cut-over forests typically show similar early successional herbaceous vegetation species, but exhibit rapid regrowth from stumps of hardwood species.

6. Agricultural Land

Agricultural land is used for the cultivation of row crops and field crops as well as for grazing pasture. Farming is one of the main occupations of Washington County and a large

portion of the project study area is in agricultural land. The primary crops noted within the project study area are corn (*Zea mays*), cotton (*Gossypium* sp.), and soybean (*Glycine max*). Pastures are dominated by grass and herb mixes.

7. Maintained/Disturbed Land

Maintained/disturbed areas occupy a large percentage of land within the corridors, especially along the existing US 64 highway and secondary roads. This category includes areas with disturbed vegetation and/or soils with man-made structures including buildings, roadways, parking lots, maintained yards, and areas where other human activities dominate. Wide maintained roadside rights-of-way, power line corridors, maintained road frontages, private home sites, residential communities, and commercial complexes are included in this category. Ornamental trees, shrubs, and grasses intermix with native pines, hardwoods, and occasionally invasive weeds in an anthropogenic landscape setting.

Table 10 summarizes acreages of terrestrial communities located within the project study corridor. The terrestrial communities within the project study corridor were delimited on an aerial photograph base and verified in the field. Impervious road surfaces are not included in the terrestrial communities within the project study corridor.

Table 10: Terrestrial Communities Present within Project Corridor

Plant Community	Alt 1[a]		Alt 2[b]	
	Area (acres)	% of PSA	Area (acres)	% of PSA
Pine Woodland	221.4	41.4	41.5	9.8
Mesic Mixed Hardwood Forest	0.1	<0.1	15.5	3.7
Pine/Mixed Hardwood Forest	1.6	0.3	15.0	3.6
Cypress-Gum Swamp	6.0	1.1	20.4	4.8
Successional Land	63.6	11.9	58.1	13.7
Agricultural Land	184.2	34.5	134.4	31.8
Maintained/Disturbed Land	48.4	9.1	115.9	27.4
Total:	**525.3**	**98.3**	**400.8**	**94.8**

[a] Alt 1 is approximately 534.4 acres in areal extent and includes impervious road surfaces (9.1 acres) (1.7 percent) that are not included in this terrestrial community assessment.

[b] Alt 2 is approximately 422.6 acres in areal extent and includes impervious road surfaces (21.8 acres) (5.2 percent) that are not included in this terrestrial community assessment.

[*] Acreages and percentages do not total 100% due to errors in rounding to the 1/10 acre.

b. Terrestrial Fauna

The majority of the project study region is rural; however, much of the landscape has been altered or disturbed through fire suppression, conversion to pine plantations, agriculture, and

limited residential development. The project study corridor is primarily forested, though there are agricultural fields and small areas of residential development. The clearing and conversion of tracts of land for residential uses and roads has eliminated cover and protection for many species of wildlife while increasing habitat for other species able to utilize these anthropogenic habitats. Developed or maintained areas not only provide food for wildlife, but also create edge habitat favored by many species.

Most of the mammals expected to occur within the project study corridor are the conspicuous larger and medium-sized species that have wide habitat tolerances. Mammal species documented within the project study area included gray squirrel (*Sciurus carolinensis*), Virginia opossum (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), groundhog (*Marmota monax*), hispid cotton rat (*Sigmodon hispidus*), coyote (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), and black bear (*Ursus americanus*).

No quantitative surveys were conducted to document the small mammal populations within the project study area. The forested communities within the project study area are expected to provide habitat for small animals, including insectivores such as southeastern shrew (*Sorex longirostris*) and southern short-tailed shrew (*Blarina carolinensis*), and rodents such as white-footed mouse (*Peromyscus leucopus*) and golden mouse (*Ochrotomys nuttalli*).

Birds commonly observed in residential yards and other maintained/disturbed areas included turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), chipping sparrow (*Spizella passerina*), and American crow (*Corvus brachyrhynchos*). Successional areas included these species, as well as northern bobwhite (*Colinus virginianus*), yellow-breasted chat (*Icteria virens*), common yellowthroat (*Geothlypis trichas*), indigo bunting (*Passerina cyanea*), and brown-headed cowbird (*Molothrus ater*). Birds observed in forested areas included many of these species, as well as wild turkey (*Meleagris gallopavo*), pileated woodpecker (*Dryocopus pileatus*), red-bellied woodpecker (*Melanerpes carolinus*), northern flicker (*Colaptes auratus*), Carolina wren (*Thryothorus ludovicianus*), gray catbird (*Dumetella carolinensis*), and orchard oriole (*Icterus spurius*). Species found in or near aquatic habitats included snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), and prothonotary warbler (*Protonotaria citrea*).

Terrestrial reptiles and amphibians observed within the project study corridor include eastern box turtle (*Terrapene carolina*), Carolina anole *(Anolis carolinensis*), black racer (*Coluber constrictor*), southern toad (*Bufo terrestris*), and squirrel treefrog (*Hyla squirella*). Common reptiles expected to occur within the project study area include timber rattlesnake (*Crotalus horridus*), five-lined skink (*Eumeces fasciatus*), eastern fence lizard (*Sceloporus undulatus*), corn snake (*Elaphe guttata*), and eastern garter snake (*Thamnophis sirtalis*). Common terrestrial or arboreal amphibians expected to occur within the project study corridor include red salamander (*Plethodon glutinusus*), marbled salamander (*Ambystoma opacum*), and spring peeper (*Pseudacris crucifer*).

c. Aquatic Communities

Aquatic Habitats

Aquatic habitats within the project study area include ephemeral, intermittent, and perennial waters present in streams, depressional wetlands, and riverine habitats. These aquatic habitats are defined by having a hydroperiod long enough to support various stages or the entire life cycle of aquatic dependent species.

Aquatic Fauna

None of the streams within the project study area are considered Significant Aquatic Endangered Species Habitat. Significant Aquatic Endangered Species Habitat identifies the extent of endangered or threatened species populations and the tributaries and headwaters of their habitats.

There are no designated Anadromous Fish Spawning Areas within the project study area. However, the lower reaches of Chapel Swamp and Deep Creek, more than a 1.0 mile downstream of the project study corridor, are considered to be Anadromous Fish Spawning Areas. According to North Carolina Division of Marine Fisheries (NCDMF), Deep Creek is considered to be an Anadromous Fish Spawning Area for blueback herring (*Alosa aestivalis*) and alewife (*A. pseudoharengus*).

Fish sampling was not conducted within the project study area. In addition, the waterbodies within the project study corridor have not been sampled by the DWQ Biological Assessment Unit. Species expected to occur within the project study area include, but are not limited to, American eel (*Anguilla rostrata*), bowfin (*Amia calva*), eastern mosquitofish (*Gambusia holbrooki*), golden shiner (*Notemigonus crysoleucas*), yellow bullhead (*Ameiurus natalis*), eastern mud minnow (*Umbra pygmaea*), pirate perch (*Aphredoderus sayanus*), creek chubsucker (*Erimyzon oblongus*), bluegill (*Lepomis macrochirus*), bluespotted sunfish (*Enneacanthus gloriosus*), yellow perch (*Perca flavescens*), warmouth (*Lepomis gulosus*), and sawcheek darter (*Etheostoma serrifer*). Eastern mosquitofish were noted in waters of intermittent streams and agricultural ditches during the course of field work.

The larger streams within the project study area would be expected to support populations of game fish such as chain and redfin pickerel (*Esox niger* and *E. americanus*), largemouth bass (*Micropterus salmoides*), and several sunfish species including red breast sunfish (*Lepomis auritus*) and pumpkinseed (*Lepomis gibbosus*), as well as bluegill.

Streams within the project study area provide riparian and benthic habitat for amphibians and aquatic reptiles. Aquatic reptiles observed within the project study area include snapping

turtle (*Chelydra serpentina*), cottonmouth (*Agkistrodon piscivorus*), red-bellied water snake *(Nerodia erythrogaster*), and banded water snake (*Nerodia fasciata*). Aquatic amphibians observed within the project study area include bullfrog (*Rana catesbeiana*) and southern leopard frog (*Rana sphenocephala*).

d. Summary of Anticipated Effects

Alternative 1 is expected to have more impact on terrestrial communities and wildlife populations compared to Alternative 2 due to increased fragmentation of the existing wildlife corridor between US 64 and old US 64.

Overall, any of the alternatives for the project will likely cause temporary impacts to the aquatic communities in and around the project study corridor. Potential impacts to downstream aquatic habitat may be avoided by maintaining regular flow and jurisdictional connectivity for stream and swamp systems within the project study area. Impacts to Deep Creek may have the potential to result in impacts to anadromous fish runs or to fish spawning habitat. Support structures should be designed to avoid wetland or open water habitats whenever possible. Bridge Demolition and Removal (BDR) should follow current NCDOT Guidelines. Best Management Practices (BMPs) for the protection of surface waters should be strictly enforced to reduce impacts during all construction phases.

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2. Waters of the United States

Section 404 of the Clean Water Act (CWA) requires regulation of discharges into "Waters of the United States." Although the principal administrative agency of the CWA is the U.S. Environmental Protection Agency (EPA), the USACE has major responsibility for implementation, permitting, and enforcement of provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

Water bodies such as rivers, lakes, and streams are subject to jurisdictional consideration under the Section 404 program. However, by regulation, wetlands are also considered "Waters of the United States." Wetlands have been described as:

> Those areas that are inundated or saturated by groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

The USACE requires the presence of three parameters (hydrophytic vegetation, hydric soils, and evidence of jurisdictional hydrology) in support of a jurisdictional determination.

Jurisdictional areas within the project study corridor have been reviewed by the USACE. A formal Jurisdictional Determination will be forwarded to NCDOT once it has been received from the USACE.

A traditional delineation was applied to the widening portion of the project study area. However, at the recommendation of the USACE, a two-step approach to the wetlands delineation was applied within Alternatives 1 and 6 due to the drought conditions, complexity, and disturbance of the flatwood systems. This was also recommended due to the large expanses of hydric soils within these two alternatives. The two-step approach included 1) in the areas where the wetland/upland break was well defined, a traditional delineation was applied and 2) in ditched flatwood areas where the wetland/upland break was not well defined, a zone of influence off each ditch was used to approximate the jurisdictional line.

a. Streams, Rivers, Impoundments

As part of the Natural Resource Investigation, all surface waters were classified using the Cowardin Classification. The streams within the project study area are considered to be riverine systems. Riverine systems may be perennial or intermittent and are identified as those areas contained within a channel that are not dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and contain less than 0.5 parts per thousand (ppt) ocean-derived salts. Stream lengths, flow characteristics (perennial or intermittent), and other characteristics are provided in Table 11.

Table 11: Characteristics of Water Resources in the Project Corridor

Stream Type	Alternative 1 Length (feet)	Alternative 2 Length (feet)
Important Lower Perennial	1,353	2,375
Unimportant Intermittent	352	1,199
Important Intermittent	0	385
Total:	**1,705**	**3,959**

Cowardin Classifications

Riverine, Lower Perennial (R2) –S2, S3, S5, S7, S8, S9, S10, and S11 are considered to be lower perennial riverine systems. These systems are characterized by low gradient, slow to moderately moving water with no tidal influence.

Riverine, Intermittent (R4) –S1, S4, S6, and S12 are considered to be intermittent riverine systems. These systems are characterized by having flowing water for only part of the year. Water may remain in pools or be absent during the summer and dry seasons.

Stream Importance

To aid in alternative analyses and to help determine stream mitigation requirements, the USACE designates streams as either important or unimportant. Streams that have perennial flow, associated wetlands, significant aquatic fauna, or associated Threatened and Endangered species are generally considered to be important and impacts to these streams would require mitigation. Intermittent streams may be considered important if the associated wetlands, significant aquatic fauna, or Threatened and Endangered species criteria are met. Streams designated as unimportant do not support important aquatic function based on USACE's determination and typically do not require mitigation. S2, S3, S5, S6b, S7, S8, S9, S10, and S11 are considered important stream channels by the USACE and impacts to these streams will likely require mitigation. S4 and S6a are considered to be intermittent/unimportant stream channels and should not require mitigation by the USACE. Final decisions on importance and mitigation requirements rest with the USACE.

S1 and S12 were claimed as jurisdictional ditches by the USACE, but were claimed as jurisdictional stream channels by DWQ. These features were considered to be Waters of the U.S., but were not considered to be isolated. S4 was claimed as a jurisdictional intermittent/unimportant stream channel by the USACE, but was not claimed as a jurisdictional stream channel by DWQ. S5 was claimed by USACE and DCM, but was not claimed as a jurisdictional stream channel by DWQ.

b. Wetlands

The wetland areas present within the project study corridor are primarily identified as palustrine in nature as identified on the National Wetlands Inventory (NWI) mapping. Table 12 presents the breakdown of wetland types within each alternative. Palustrine systems include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%. Some wetland systems are defined as palustrine, but are hydrologically influenced by adjacent streams through periodic overbank flooding and are considered riverine wetlands. Non-riverine wetlands are not typically influenced by overbank flooding. Due to the widely overlapping nature of the alternates, a breakdown of wetlands within each alternative is provided in the full text of the Natural Resources Technical Report (NRTR).

Wetlands within the project study corridor vary in vegetative composition, depending in part on hydrologic regime and site-specific disturbances. The wetlands within the project study area were identified as palustrine, forested (PFO). The class Forested Wetland is characterized by having woody vegetation that is 20 feet tall or taller.

Wetland systems vary in vegetative composition, depending in part on hydrological regime and site specific disturbances. All wetlands within the boundaries of this project have been disturbed and altered to some extent, so special modifiers denoting particular disturbance factors have not been utilized in this classification scheme, except where necessary to differentiate communities. Four (4) wetland types were identified: palustrine forested, palustrine scrub-shrub, palustrine emergent, and palustrine unconsolidated bottom. Each of these community types is discussed below.

Palustrine Forested (PFO)
These areas are identified as forested jurisdictional wetlands which are palustrine in nature. Vegetation within this wetland type varies throughout the project study corridor. Four general wetland forest types are present including: 1) needle-leaved evergreen communities (NWI designation PFO4), located primarily in interstream flat systems; 2) mixed needle-leaved evergreen/broad-leaved deciduous communities (NWI designation PFO4/1), primarily located in interstream flat systems; 3) deciduous hardwood communities (NWI designation PFO1), primarily located in interstream flat systems and floodplain areas of smaller streams; and 4) deciduous communities (NWI designation PFO6) primarily located within the floodplain of the larger tributaries within the project study area.

Palustrine Scrub-shrub (PSS)
These areas are identified as scrub-shrub jurisdictional wetlands that are palustrine in nature. Woody vegetation is less than 20 ft in height within these communities. The majority of these communities are recently timbered areas. Hydrologic regimes exhibited in these areas range from seasonally flooded to semipermanently flooded. Pines, red maple, sweetgum, greenbrier, blackberry, and other opportunistic species are common components of this wetland type.

Palustrine Emergent (PEM)
These areas are identified as palustrine emergent wetland systems. Within the project study area, these systems typically have persistent vegetation and are found in low landscape depressions or partially excavated areas where woody shrubs and trees cannot establish or are kept from establishing by routine maintenance or disturbance. Hydrologic regimes exhibited in these systems range from seasonally flooded to semipermanently flooded. Soft rush, cattails, and woolgrass (*Scirpus cyperinus*) are common components of this wetland type.

Palustrine Unconsolidated bottom (PUB)
Areas identified as palustrine, unconsolidated bottom wetlands within the project study area are typically small ponds or ditches with permanent or semipermanent flooding with an ordinary high water mark that have been claimed as jurisdictional features by the USACE.

c. Summary of Anticipated Effects

Jurisdictional areas are present in the project study corridor within each of the alternatives. Table 11 provides a summary of the wetland and stream impacts within each alternative. Approximate locations of wetlands and surface waters are presented in Figure 3. Wetland and stream impacts are calculated from slope stake to slope stake, plus an additional 25 feet outside of each limit as determined from the current preliminary design plans for each alternative. The totals are rounded to the nearest 0.1 acre.

Impacts to individual wetland sites and streams for Alternatives 1 and 2 are included in Tables 12 and 13, respectively.

Table 12: Wetland and Stream Impacts – Alternative 1

Wetland/Stream Identification	Wetland Type	Wetland Area Impacted (Acres)	Length of Stream Impacted (ft)	NC DWQ Rating	Riverine/Non-Riverine (wetlands) / Perennial / Intermittent (streams)	Wetland Quality
D2		0*				
D22		0*				
D23		0*				
D28		0*				
D33		0*				
D34		0*				
D36		0*				
D38a		0*				
D39a		0.1				
D4		0*				
D5		0*				
D6		0*				
S8b			191		P	
W23	PFO4/1	0.7		16	NR	Medium
W24a	PFO4	0*		17	NR	Medium
W24b	PFO4	0*		17	NR	Medium
W29	PEM	0*		15	NR	Medium
W31a/c	PFO4/1	3.7		49/23	R	Medium
W33a	PSS	0.3		21	NR	Medium
W33b	PFO4	0*		21	NR	Medium
W35	PFO4/1	6.5		24	NR	Medium
W36	PFO4	0.2		14	NR	Medium
W37a	PSS	1.9		21	NR	Medium
W37c	PFO4/1	0.4		24	NR	Medium
W3a	PSS	1.5		20	NR	Medium
W3b	PSS	2.4		20	NR	Medium
W4	PSS	1.5		20	NR	Medium
W41	PFO4/1	0.1		10	NR	Medium

TOTALS:		19.3	191			

* -- Indicates that the wetland impact is less than 0.1 acre, but greater than 0

Table 13: Wetland and Stream Impacts – Alternative 2

Wetland/Stream Identification	Wetland Type	Wetland Area Impacted (Acres)	Length of Stream Impacted (ft)	NC DWQ Rating	Riverine / Non-Riverine (wetlands) Perennial / Intermittent (streams)	Wetland Quality
D10		0*				
D14		0*				
D18		0.1				
D2		0*				
D20		0*				
D21		0*				
D22		0*				
D23		0*				
D28		0*				
D3		0*				
D4		0*				
D5		0*				
D6		0*				
D9		0*				
S3a			174		P	
S5a			44		P	
S5b			167		P	
S6a			85		I	
S7a			55		P	
S7b					P	
W11b	PFO6	0.6		80	R	High
W13a	PEM	0.1		20	NR	Medium
W13b	PSS	0.1		20	NR	Medium
W15	PSS	0.8		15	NR	Medium
W17	PFO4/1	0.3		15	NR	Medium
W19	PFO1	0.1		15	NR	Medium
W20a	PFO6	0*		80	R	High
W20b	PFO6	0.1		80	R	High
W20c	PFO6	0.5		80	R	High

W22a	PFO4	0.1		11	NR	Medium
W24a	PFO4	0*		17	NR	Medium
W33a	PSS	0.3		21	NR	Medium
W33b	PFO4	0*		21	NR	Medium
W3a	PSS	1.5		20	NR	Medium
W3b	PSS	2.4		20	NR	Medium
W4	PSS	1.5		20	NR	Medium
W6	PFO1	0*		15	NR	Medium
W8	PFO1	0.1		15	NR	Medium
W9	PFO4	0*		6	NR	Medium
TOTALS:		**8.5**	**525**			

* -- Indicates that the wetland impact is less than 0.1 acre, but greater than 0

d. Avoidance, Minimization, and Mitigation

Mitigation has been defined in National Environmental Policy Act (NEPA) regulations to include efforts which: avoid, minimize, rectify, reduce or eliminate, or compensate for adverse impacts to the environment. Mitigation of wetland impacts is recommended in accordance with Section 404(b)(1) Guidelines of the CWA, Federal Highway Administration (FHWA) step-down procedures, mitigation policy mandates articulated in the USACE/EPA Memorandum of Agreement (MOA), Executive Order 11990, and USFWS mitigation policy directives.

Section 404(b)(1) Guidelines, the USACE/EPA MOA, and Executive Order 11990 stress avoidance and minimization as primary considerations for protection of wetlands. Practicable alternatives analyses must be fully evaluated before compensatory mitigation can be discussed.

The FHWA policy stresses that all practicable measures should be taken to avoid or minimize harm to wetlands which will be affected by federally funded highway construction. A sequencing (step-down) procedure is recommended in the event that avoidance is not practicable. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

1. Avoidance

Due to the location of wetlands, streams, and surface waters within the project study corridor, avoidance of all jurisdictional impacts is not possible. Avoidance of some wetlands and streams within the project study area has been accomplished during the design.

2. Minimization

The approved jurisdictional delineation within this project study corridor will be utilized to further minimize wetland and surface impacts when choosing an alternative. Reduction of fill slopes at stream and wetland crossings will reduce unnecessary impacts. Impacts to the stream can be minimized by designing support structures to avoid wetland or open water habitats whenever

possible. The jurisdictional delineation within the project study corridor will be utilized to further minimize wetland and stream impacts when designing the proposed alignment within the chosen Alternate. Utilization of BMPs is recommended in an effort to minimize impacts, including avoiding placing staging areas within wetlands.

Due to the presence of wetlands and streams throughout the project corridor, complete avoidance of these resources is not possible. Several efforts were made to reduce the effect of the project upon wetlands and streams, including developing alignments that avoided or minimized impact to these resources to the maximum extent practicable. Alternative 6 was proposed as a possible means of reducing the wetland impacts incurred by the new location alternative, Alternative 1. However, due to the significant number of wetlands in the corridor, Alternative 6 actually had higher impacts than Alternative 1. Another minimization effort included using culverts at two stream crossings as opposed to bridges, which minimized the impact to both wetlands and streams. Because of the grade change required to build bridges, the footprint of the bridge and the slope stakes was actually less for culverts at the two sites in question.

3. Compensatory Mitigation

Compensatory mitigation will likely be required for all unavoidable losses after all practical avoidance and minimization options are utilized. A specific mitigation plan cannot be developed until final design is completed and actual impacts determined. NCDOT will evaluate the potential for on-site mitigation once the Least Environmentally Damaging Practicable Alternative (LEDPA) has been selected. NCDOT will use the Ecosystem Enhancement Program (EEP) to meet mitigation requirements provided there is no suitable on-site mitigation available. In accordance with the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers (USACE), Wilmington District" (MOA), July 22, 2003, the North Carolina Department of Environment and Natural Resources EEP will be requested to provide off-site mitigation to satisfy the federal CWA compensatory mitigation requirements for this project.

e. Anticipated Permit Requirements

Due to the amount of potential wetland and stream impacts, it is anticipated that an individual Section 404 permit will be needed for this project with the USACE. Moreover, in accordance with the Clean Water Act, a Section 401 Water Quality General Certification must be obtained from NC Division of Water Quality (NCDWQ) prior to issuance of the individual permit.

3. Rare and Protected Species

a. Federally Protected Species

Species with the federal classification of Endangered (E), Threatened (T), or officially Proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973 as amended. Table 14 presents the federally protected species listed for Washington County.

Descriptions of these federally protected species along with habitat requirements and biological conclusions for this project are presented following the table.

Table 14: Federally Listed Species for Washington County

Common Name	Scientific Name	Federal Status[a]	Habitat Present	Biological Conclusion[b]
American alligator	*Alligator mississippiensis*	T(S/A)	Yes	N/A
Red wolf	*Canis rufus*	E (XN)*	Yes	MA/NLAA

[a] T(S/A)- Threatened due to similarity of appearance, E – Endangered (XN) Experimental Nonessential populations are treated as threatened species on public land, for consultation purposes, and as a species proposed for listing on private land.

[b] MA/NLAA – May Affect/Not Likely to Adversely Affect

* This species is treated as "Proposed" species for Section 7 of the Endangered Species Act. Proposed species are taxa proposed for official listing as endangered or threatened.

Red wolf (*Canis rufus*)

The red wolf is a medium sized, wild canid that resembles the coyote, but is larger and more robust. Adults measure 4.5 to 5.5 ft in length, and weigh from 35 to 90 pounds. This species is slightly smaller than the gray wolf (*C. lupus*) with a more slender and elongated head, and longer legs. Its pelage is shorter and coarser than in any race of *C. lupus* and individuals vary in color from reddish to gray to black. The red wolf prefers habitat that provides large amounts of cover, including both upland and swamp forests, coastal marshes, and prairies. Small to medium sized mammals are normal prey items, but the red wolf is also heavily dependent on white-tailed deer. The red wolf was once found throughout the southeastern United States, but was extirpated from most of its range by 1920. Captive-bred animals were released at Alligator River National Wildlife Refuge in the fall of 1987, and successful reproduction resulted in 26-30 adults by August 1993.

Biological Conclusion: May Affect/Not Likely to Adversely Affect

North Carolina Natural Heritage Program (NCNHP) records indicate no documented occurrences of the red wolf within 1.0 mile of the project study corridor. No individuals were observed during the field investigation. According to USFWS, there are no red wolves in the area at this time. However, there have been documented occurrences of red wolves in the past and there are recent occurrences in the surrounding areas. Due to the E(XN) status for this species, it is only considered to have federal protection on public lands. No public lands are contained within the project study corridor. This species is treated as a "Proposed" species for Section 7 of the Endangered Species Act. According to the U.S. Fish and Wildlife Service (USFWS), the outcome of an informal or formal "conference" for a proposed species is not legally binding unless the species becomes fully listed.

American alligator (*Alligator mississippiensis*)

The American alligator is a large reptile that generally reaches adult lengths of six (6) to eleven (11) feet in North Carolina. No other crocodilians occur naturally in North Carolina and adults are readily identifiable in the wild. In North Carolina, mating reportedly takes place in May to early June, with eggs deposited in nest mounds in July and hatching occurring in September. The young, who are black with conspicuous yellow crossbands, are easily identifiable by their appearance as well.

American alligator reaches its northernmost distribution near the Albemarle Sound in the Coastal Plain of North Carolina, although it is less common north of the Pamlico Sound. American alligator may be found in brackish water and tidal estuarine habitats as well as freshwater habitats. American alligator inhabits swamps, marshes, ponds, lakes, and large streams.

Biological Conclusion: Not Applicable

NCNHP records indicate no documented occurrences of American alligator within 1.0 mile of the project study area. Potential habitat is present within the larger swamp systems and tributaries that flow into the Albemarle Sound. American alligator is listed as threatened based on the similarity in appearance [T(S/A)] to other federally-listed crocodilians; however, there are no other crocodilians within North Carolina. A Biological Conclusion is not required for this species.

b. Bald Eagle Protection

Effective August 8, 2007, the bald eagle (*Halieaeetus leucocephalus*) was delisted from the Endangered Species Act. A biological conclusion is no longer necessary for this species. The bald eagle is still protected under the Bald and Golden Eagle Protection Act. The National Bald Eagle Management Guidelines restrict disturbance activities within a primary zone extending 330 to 660 ft outward from a nest tree, which is considered critical for maintaining acceptable conditions for bald eagles. Accordingly, bald eagle occurrences and nesting habitat were surveyed. Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within one mile of open water. Suitable nesting or foraging habitat for the bald eagle is a significant distance from open water. During the most recent survey in July 2007, no individuals or nesting sites were observed within 660 ft of the project limits. This project will therefore have no adverse effects on the bald eagle.

c. Federal Species of Concern and State Protected Species

The USFWS also maintains a category of species designated as “Federal Species of Concern” (FSC). The FSC designation provides no federal protection under the ESA for the species listed. However, these are listed since they may attain federally protected status in the

future. The presence of potential habitat within the project study area has been evaluated in Table 15 for the FSC species listed for Washington County.

Table 15: Federal Species of Concern (FSC) for Washington County

Common Name	Scientific Name	State Designation[a]	Habitat Present[b]
American eel	*Anguilla rostrata*	N/A	Yes
Black-throated green warbler	*Dendroica virens waynei*	SR	Yes
Lake Phelps killifish	*Fundulus* cf. *diaphanus*	SR	No
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	T	Yes

[a] N/A – Not applicable – no state designation, E – Endangered, SR – Significantly Rare, T – Threatened.

[b] Potential habitat based extensively on Franklin (2006) and LeGrand et al. (2006), and other literature previously cited.

A review of the NCNHP records indicates that no FSC have been documented within 1.0 mile of the project study corridor.

4. Soils

The general soils associations within the project study area include the Augusta-Altavista-Wahee and Cape Fear-Portsmouth-Roanoke associations.

The Augusta-Altivista-Wahee association is characterized by nearly level, somewhat poorly drained and moderately well drained soils that have a loamy surface layer and a loamy or clayey subsoil. This soil association is on low ridges near small streams that flow into the Roanoke River and Albemarle Sound.

The Cape Fear-Portsmouth-Roanoke association is characterized by nearly level, very poorly drained and poorly drained soils that have a loamy surface layer and a loamy or clayey subsoil. This soil association is mainly in the Blacklands. The Blacklands are areas of soil in the southern portion of Washington County that have surface layers that are muck.

Each general soil association contains one or more mapping units occupying a unique natural landscape position. Soil mapping units are named for the major soil or soils within the unit, but may contain minor inclusions of other soils.

There are six hydric soil mapping units, two non-hydric soil mapping units that may contain hydric inclusions, and four other non-hydric soil mapping units mapped within the project study corridor. Soils descriptions are listed below.

- **Argent silt loam** (*Typic Ochraqualfs*), **(Ar)**, is mapped in the eastern portion of the project study area. These nearly level, poorly drained soils occur on broad flats near small streams that flow into the Albemarle Sound. This soil mapping unit is hydric.

- **Cape Fear loam** (*Typic Umbraquults*), **(Cf)**, is mapped in large areas in the eastern and western portions of the project study area. These nearly level, very poorly drained soils occur on broad flats and in slight depressions near small streams that flow into the Albemarle Sound. This soil mapping unit is hydric.

- **Dorovan mucky silt loam overwash** (*Typic Medisaprists*), **(Dr)**, is mapped within drainages throughout the project study area. These nearly level, very poorly drained soils occur on the flood plains of the Albemarle Sound and of major streams and their tributaries. This soil mapping unit is hydric.

- **Muckalee loam (***Typic Fluvaquents*), **(Me)**, is mapped in the northwest portion of the project study area. These nearly level, poorly drained soils occur on flood plains of small streams that flow into the Albemarle Sound. This soil mapping unit is hydric.

- **Roanoke loam** (*Typic Ochraquults*), **(Ro)**, is mapped throughout the project study area. These nearly level, poorly drained soils occur on broad flats and in small drainageways that flow into the Albemarle Sound. This soil mapping unit is hydric.

- **Tomotley fine sandy loam** (*Typic Ochraquults*), **(To)**, is mapped in the northwest portion of the project study area. These nearly level, poorly drained soils occur on slightly elevated areas on broad flats and in depressions near small streams that flow into Albemarle Sound. This soil mapping unit is hydric.

- **Augusta fine sandy loam** (*Aeric Ochraquults*), **(At)**, is mapped in the north central portions of the project study area. These nearly level, somewhat poorly drained soils occur on broad flats adjacent to small streams and waterways that flow into Albemarle Sound. This soil mapping unit is non-hydric but may contain hydric inclusions of poorly drained soils in depressions and drainageways.

- **Wahee fine sandy loam** (*Aeric Ochraquults*), **(Wa)**, is mapped throughout the project study area. These nearly level, somewhat poorly drained soils occur on low ridges near the small streams that flow into Albemarle Sound. This soil mapping unit is non-hydric but may contain hydric inclusions of Roanoke loam in depressions and drainageways.

- **Altavista fine sandy loam** (0 to 2 percent slope) (*Aquic Hapludults*), **(AaA)**, is mapped in the northern central and northwest portions of the project study area. These moderately

drained soils occur on low ridges near small streams that flow into Albemarle Sound. This soil mapping unit is non-hydric.

- **Bojac loamy fine sand** (0 to 3 percent slopes) (*Typic Hapludults*), **(BoA)**, is mapped within the north central portion of the project study area. These well drained soils occur on low ridges near small streams that flow into Albemarle Sound. This soil mapping unit is non-hydric.

- **Dogue fine sandy loam** (0 to 3 percent slopes) (*Aquic Hapludults*), **(DgA)**, is mapped in the western and northwest portions of the project study area. These moderately well drained soils occur on low ridges near small streams that flow into Albemarle Sound. This soil mapping unit is non-hydric.

- **Wickham loamy sand** (0 to 4 percent slopes) (*Typic Hapludults*), **(WkB)**, is mapped in the northern central and northwest portions of the project study area. These well drained soils occur on low ridges near streams that flow into Albemarle Sound. This soil mapping unit is non-hydric.

5. Coastal Zone Issues

a. Coastal Area Management Act (CAMA)

The Coastal Area Management Act (CAMA) provides for jurisdictional review of impacts affecting Areas of Environmental Concern (AEC) in 20 designated coastal counties, including Washington County. Chapel Swamp Creek, located in the project area, is designated as inland fishing and as a Public Trust Water. Therefore, Chapel Swamp Creek may be considered an AEC. Encroachment on an AEC resource may require a Major Development Permit per CAMA regulations. The Federal Coastal Zone Management Act requires that federal actions (*i.e.*, 404 permit issuance) comply with requirements of state administered coastal zone management programs; therefore non-AEC impacts in Washington County will require a CAMA consistency determination as part of the permit process. According to the Division of Coastal Management (DCM), Alternative 1 will not have any impacts to AECs. Alternative 2 may have potential impacts to three AECs, including Chapel Swamp (S2) and two UTs to the Albemarle Sound (S5 and S7, see Figure 3).

b. Essential Fish Habitat Assessment

Essential Fish Habitat (EFH) is defined by the National Marine Fisheries Service (NMFS) as "those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity". For the purpose of interpreting the definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a

species' full life cycle. An EFH Assessment is an analysis of the effects of a proposed action on EFH and mandatory contents include: a description of the proposed action, an analysis of the effects of that action on EFH, the federal action agency's views on those effects and proposed mitigation, if applicable. An adverse effect includes any impact which reduces the quality and/or quantity of EFH. Adverse effects may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey, or reduction in a species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. EFH is only designated for federally managed species that have a management plan under a Fisheries Management Council. The South Atlantic Fisheries Council manages such species as, but not limited to, red drum (*Sciaenops ocellatus*), bluefish (*Pomatomus saltatrix*), summer flounder (*Paralichthys dentatus*), and several species of shrimp (*Penaeus* spp.).

During agency review of the Environmental Assessment (EA) for the proposed project, the USACE makes the initial determination of whether or not a proposed project "may adversely affect" EFH. This determination by the USACE is submitted to the NMFS for their review and comment. NMFS will then determine if additional consultation is necessary regarding the proposed project or if they concur with USACE's decision. According to the NMFS, no impacts are expected to Essential Fish Habitat.

B. Cultural Resources

1. Compliance

This project is subject to compliance with the National Environmental Policy Act (NEPA) of 1969 and the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 of the NHPA, as amended, 36 CFR Part 800, requires Federal agencies to take into account the effect of their undertakings on properties included in or eligible for inclusion in the National Register of Historic Places (NR) and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

2. Historic Architectural Resources

There are four (4) historic properties on this project that are either eligible for or listed on the National Register of Historic Places.

Table 16: Effects to Historic Architectural Resources

Historic Property	Status	Alternative	Effects
Albemarle Grill (Skinnersville Civic Center)	DE	1 & 2	For Alternative 1, there will be no effect. For Alternative 2, there will be no adverse effect – parking will be temporarily impacted by construction easements.
Hopkins House	DE	2	No effect
Farm on NC 32	DE	2	For Alternative 2, there could be a possible adverse effect if drainage work impacts trees within existing right of way.
Rehoboth Methodist Church	NR	2	No adverse effect if tree protection measures are employed, historic marker is reinstalled after construction, and temporary fence is erected along existing right of way during construction.

DE – Determined eligible for the National Register of Historic Places

NR – Listed on the National Register of Historic Places

According to the Concurrence Form for Assessment of Effects dated November 14, 2008, the NCHPO stated that there would be no adverse effects on any of these properties except the farm on NC 32. Under Alternative 2, the construction of drainage ditches could negatively impact the trees on this site that are a contributing factor to the setting and historic character of this particular property.

3. Archaeological Resources

In a letter dated May 6, 2002, the North Carolina Department of Cultural Resources (NCDCR) stated that there were no known archaeological sites within the project corridor. Based on their knowledge of the area, it is unlikely that any archaeological resources that may be eligible for inclusion in the National Register of Historic Places would be affected by this project. They recommended that no archaeological investigation be conducted in connection with this project.

After Alternative 6 was developed, a second letter was received from NCDCR dated September 22, 2006 stating that since Alternative 6 was adjacent to and very similar in scope with Alternative 1, no archaeological investigation needed to be conducted.

C. Section 4(f)/6(f) Resources

Section 4(f) of the US Department of Transportation (USDOT) Act of 1966 protects the use of publicly owned parks, recreation areas, wildlife/waterfowl refuges, and historic properties.

If Alternative 2 is chosen as the preferred alignment, there will be an adverse effect to a farm on NC 32 that has been determined eligible for inclusion on the National Register of Historic Places and is considered a Section 4(f) protected property.

Under Alternative 2, the Albemarle Grill, also known as the Skinnersville Civic Center, will experience a temporary impact due to a construction easement. This site is eligible for listing on the National Register of Historic Places, and as such, falls under the province of Section 4(f). During a meeting with the North Carolina State Historic Preservation Office (NCSHPO) held on November 14, 2008, it was determined that there would be no adverse effect to this property.

Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended existing Section 4(f) legislation to simplify the processing and approval of projects that have only *de minimis* impacts on lands protected by Section 4(f). This revision provides that if a transportation use of Section 4(f) property results in a *de minimis* impact on the property, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete.

Section 6(f) of the Land and Water Conservation Act applies to the conversion of certain recreation lands to non-recreational purposes. The act applies to recreation lands that have received Land and Water Conservation Fund (LWCF) money. Any land conversions on property that has received LWCF money must be approved by the US Department of the Interior–National Park Service. Section 6(f) also requires that any applicable land converted to non-recreational uses must be replaced with land of equal or greater value, location, and usefulness. No Section 6(f) protected properties will be impacted by this project.

D. Farmland

North Carolina Executive Order Number 96, *Preservation of Prime Agricultural and Forest Lands*, requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the US Natural Resources Conservation Service (NRCS). These soils are determined by the Soil Conservation Service and based on criteria such as crop yield and level of input of economic resources. The Farmland Protection Policy Act (FPPA) requires that applicable environmental documents evaluate farmland impacts and comply with FPPA guidelines to minimize impacts.

A soil survey of the proposed project area by Washington Soil and Water Conservation showed areas of *Altavista* and *Wickham* soils, which are designated as prime farmland soils. *Cape Fear* soil is also in the area and designated as farmland soil of statewide importance. NCDOT is currently performing a Farmland Impact Assessment for this project and will include the assessment in determining a recommended alternative.

E. Social Effects

1. Demographics

The Demographic Study Area is comprised of Census Tract 9501, Block Groups 1 and 3. The Demographic Study Area is generally the smallest statistical area, as determined by common US Census boundaries that fully contains the Direct Community Impact Area. The data for the Demographic Study Area provides a demographic overview of residents in the area. The information obtained by the Census may not reflect the exact aspects surrounding the project but should provide accurate information on the area trends.

Washington County had a decline in population of almost two percent (2%) between 1990 and 2000, as seen in Table 17. As of July 2005, the county's population of 13,418 ranks as the 10th smallest in North Carolina. However, in contrast to the overall slight decline in population in the county between 1990 and 2000, the Demographic Study Area had a population increase of 14.2% (202 residents), primarily the result of a 34.7% increase of 215 residents in Census Tract 9501, Block Group 3. According to the North Carolina State Demographics Office, the Town of Plymouth's population in 2005 was estimated at 3,985, the Town of Roper's was 629, and the Town of Creswell's was 261. Only the Town of Roper experienced a population increase at that time.

Table 17: Population Growth, 1990-2000

Category	Demographic Study Area	Block Group 1	Block Group 3	Washington County	North Carolina
1990 Population	1,427	807	620	13,997	6,628,637
2000 Population	1,629	794	835	13,723	8,049,313
Increase	202	-13	215	-274	1,420,676
Percent Change (%)	14.2	-1.6	34.7	-2.0	21.4

The race and ethnicity of the Demographic Study Area is predominately white as seen in Table 18, with 59.2% of the population being of Caucasian descent. The percentage of African Americans located within the study area is 40%, which is lower than the county rate of 49.8%. There are no notable minority populations in the Demographic Study Area.

Table 18: Population by Race/Ethnicity, 2000

Category	Demographic Study Area	Block Group 1	Block Group 3	Washington County	North Carolina
White	963 (59.2%)	531 (66.9%)	431 (51.6%)	6,562 (47.8%)	5,648,953 (70.2%)
Black or African American	653 (40%)	263 (33.1%)	390 (46.7)	6,832 (49.8%)	1,720,197 (21.4%)
American Indian and Alaska Native	0	0	0	0	97,289 (1.2%)
Asian	0	0	0	73 (0.5%)	110,167 (1.4%)
Native Hawaiian and other Pacific Islander	7 (0.4%)	0	7	7 (0.1%)	3,081 (0.1%)
Some other race**	0	0	0	90 (0.6%)	96,662 (1.1%)
Hispanic or Latino (of any race)	7 (0.4%)	0	7	159 (1.2%)	372,964 (4.6%)
Total Population	**1,630 (100%)**	**794 (100%)**	**835 (100%)**	**13,723 (100%)**	**8,049,313 (100%)**

In the Demographic Study Area, 8.9% of the residents were unemployed in 2000, compared to 7.1% overall in Washington County in that same year. The December 2005 unemployment rate in Washington County was 6.7%.

Table 19 displays the median household income distribution throughout the study area. The $31,989 median household income of the residents in the Demographic Study Area is slightly higher than the County's $28,865 median. The Demographic Study Area and Washington County both have over 11% of the population achieving a Bachelors degree or higher. There are 11.8% of residents in the Demographic Study Area with income below the poverty level, compared to 21.5% in Washington County. The unemployment and poverty rates are reflective of the fishing, farming and forestry economies in the county, and a low education level.

Table 19: Median Household Income, 2000

	Demographic Study Area	Block Group 1	Block Group 3	Washington County	North Carolina
Median Household Income	$31,989	$32,647	$31,202	$28,865	$39,184

Over 47% of the vacant homes in the Demographic Study Area are used for seasonal, recreational or occasional use, as compared to the countywide rate of 27 percent. The median home value of $77,950 in the Demographic Study Area is higher than the county's value of $69,400. The higher cost of housing in Census Tract 9501 Block Group 3 ($94,500) may be

directly related to the waterfront houses along the Albemarle Sound that are dissimilar in size and age to neighboring single family and modular homes.

2. Neighborhoods/Communities

A rural population reduces the potential for and magnitude of displacement-related community impacts for this project that ranges from 3.7 to 5.7 miles in length. Both alternatives will temporarily impact the Skinnersville Civic Center's parking and also the Pea Ridge Convenience Center as part of the widening of the NC 32/NC 94 intersection. Alternative 2 will impact the Holly Neck Church of Christ cemetery on SR 1139 (Beasley Road) and the historic farm on NC 32.

This project will not create a barrier effect, split, disrupt or isolate the community. It is expected that neighborhood cohesion will remain intact and the project will not interrupt social interaction among residents.

3. Relocations of Residences and Businesses

For Alternative 1, it is anticipated that there will be one (1) business relocation. Alternative 2 is expected to have one (1) business and 17 residential relocations.

4. Environmental Justice

Executive Order 12898 requires that Environmental Justice principles be incorporated into all transportation studies, programs, policies, and activities. The three environmental principles are: 1) to ensure the full and fair participation of all potentially affected communities in the transportation decision making process, 2) to avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority or low income populations, and 3) to fully evaluate the benefits and burdens of transportation programs, policies, and activities upon low-income and minority populations.

No disproportionate and adverse impacts to minority, low income, or tribal populations are expected for this project.

5. Bicycle and Pedestrian Facilities

Residents, tourists and recreational bike riders have access to NC Bike Route 3 on NC 32 (former US 64). Washington County officials stated that NC 32 and NC 94 have increased pedestrian and bicycle traffic as a result of the realignment of US 64 and the shifting of heavy traffic and through-travel to that road. Because Alternative 2 uses NC 32 on existing location, there would be an increased effect on bicycle traffic. Alternative 1 would have little effect on bicycle traffic.

6. Recreational Facilities

There are no recreational facilities that will be impacted as a result of this project.

F. Economic Effects

The Pea Ridge Convenience Store is a long-standing social gathering spot at the intersection of NC 32 and NC 94, located across the street from the Skinnersville Civic Center. Construction and intersection widening would impact parking and access for this popular locally owned store. At this same intersection, property occupied by a vacant store building was recently sold. Located on a 64-acre parcel, future plans for this commercial site are unknown.

Agricultural products, including potatoes, wheat, corn, soybeans and cotton, comprise an important part of Washington County's economy. In 2002, Washington County had 193 farms with an average of 593 acres. The agriculture and forestry industries employ 8% of the workforce, generating $59,407,000 cash receipts in 2004. Both proposed alternatives bisect active farm operations and may impact prime soils and farmlands.

G. Land Use

1. Existing and Future Land Use

The Direct Community Impact Area is zoned County Rural Agricultural. It is possible that a conversion to a more intensive use for some properties could occur as a result of this project, as a new and better connection would be expected to increase traffic counts. Current employment centers will not be directly affected. Any impacts to property taxes because of this project are not known at this time.

Residential development is underway in both Washington and Chowan Counties, with emphasis on the areas near the Albemarle Sound. These include:

- **Albemarle Acres** – 76-unit residential development southeast of the NC 32 and NC 94 intersection.

- **Waterside at the Pointe** – 175-unit residential development north of the NC 32 and NC 94 intersection, south of the Albemarle Sound Bridge.

- **Sandy Point** – 1600-unit residential development just north of the Albemarle Sound Bridge in Chowan County.

- **Sandridge Phase I** – 24-unit residential development located approximately ½ miles northeast of the NC 32 and NC 94 intersection.

- **Sandridge Phase II** – 67-unit residential development located approximately ½ miles northeast of the NC 32 and NC 94 intersection.

- **Cedar Shores Phase II** – 47-unit residential development located approximately ½ miles northeast of the NC 32 and NC 94 intersection.

2. Project Compatibility with Local Plans

As noted in the Community Impact Assessment, the Edenton-Chowan Planning Department feels that the project is a "much needed connector from (Highway) 64 to NC 32 to the north side of the Albemarle Sound and could tremendously benefit all communities on the north side with regard to tourism and economic development." Washington County Manager David Peoples has also fervently expressed the county's desire for a new connector from US 64 to the Albemarle Sound Bridge during the most recent Merger meeting.

H. Indirect and Cumulative Effects

An Indirect and Cumulative Effects Screening is currently being performed by NCDOT staff and will be incorporated into the FONSI.

I. Flood Hazard Evaluation

Washington County is currently participating in the National Flood Insurance Regular Program. Though there is one stream crossing on Alternative 1 and three (3) on Alternative 2, this project will not affect any designated flood hazard zones, and the proposed improvements will not have any adverse effect on the existing floodplain areas. A more detailed impact analysis will be performed during the project drainage design. NCDOT's Hydraulics Unit will coordinate with FEMA and local authorities to ensure compliance with applicable floodplain ordinances.

J. Traffic Noise Analysis

In accordance with Title 23 Code of Federal Regulations Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (Title 23 CFR 772), each Type I highway project must be analyzed for predicted traffic noise impacts. Type I projects are proposed Federal or Federal-Aid highway projects for construction of a highway on new location or improvements of an existing highway which significantly changes the horizontal or vertical alignment or increases the vehicle capacity. Traffic noise impacts are determined from the current procedures for the abatement of highway traffic noise and construction noise found in Title 23 CFR 772, which also includes provisions for traffic noise abatement measures. When traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures must be considered for reducing or eliminating these impacts. A copy of the unabridged version of the full technical report entitled *Traffic Noise Analysis – Proposed NC 32 Connector* can be viewed in the Transportation Building, 1 South Wilmington Street, Room 443, Raleigh.

1. Ambient Noise Levels

Ambient noise measurements were taken in the vicinity of the project to determine ambient (existing) noise levels for the identified land uses. The purpose of this noise level information was

to quantify the existing acoustic environment and to provide a base for assessing the impact of noise level increases. The existing equivalent sound level (Leq) noise levels in the project corridor were measured fifty feet from the edge of pavement and ranged from 61 decibels (dBA) to 64-dBA. A background noise level of 50-dBA was determined for the project, to be used in areas where traffic noise was not the predominant source. The ambient measurement locations are described in Table 19.

The existing roadway and traffic conditions were used with the most current traffic noise prediction model to calculate existing noise levels for comparison with noise levels actually measured. The calculated existing noise levels averaged less than 1-dBA difference from the measured noise levels for the location where noise measurements were obtained. Hence, the computer model is a reliable tool in the prediction of noise levels. Differences in dBA levels can be attributed to "bunching" of vehicles, low traffic volumes, and actual vehicle speeds versus the computer's "evenly-spaced" vehicles and single vehicular speed.

Table 20: Ambient Noise Levels (Leq)[1]

Site	Location	Description	Noise Level (dBA)
1	NC 32 at Oak Grove Baptist Church	Grassy	61
2	NC 32/ NC 94 at Skinnersville Civic Center	Gravel	64
3	NC 94 at Tyrell Prison Work Farm	Grassy	63

[1] Ambient noise level sites were measured at fifty feet from the edge of pavement of the nearest lane of traffic.

2. Analysis Results

A land use is considered impacted by highway traffic noise when exposed to noise levels approaching or exceeding the FHWA noise abatement criteria and/or predicted to sustain a substantial noise increase. The NCDOT Traffic Noise Abatement Policy defines a traffic noise impact occurs when the predicted traffic noise levels either:

- Approach or exceed the FHWA noise abatement criteria (with "approach" meaning within 1-dBA of the value found in Table 2 of the full Traffic Noise Analysis), or

- Substantially exceed the existing noise levels as shown in the lower portion of Table 2 (see full Traffic Noise Analysis).

Consideration for noise abatement measures must be given to receptors that fall in either category.

The number of receptors in each activity category, for each section, that are predicted to become impacted by future traffic noise are shown in Table 21. These receptors include those expected to experience traffic noise impacts by either approaching or exceeding the FHWA Noise Abatement Criteria (NAC) or by a substantial increase in exterior noise levels. Under Title 23

CFR Part 772, no residences are predicted to be impacted due to highway traffic noise in the project area.

Table 21: Approximate Number of Impacted Receptors

Description	Activity Category				
	A	B	C	D	E
ALTERNATIVE 1					
SR 1139 (Beasley Road) from US 64 to Start of New Location – No receptors within this section	0	0	0	0	0
New Location from SR 1139 (Beasley Road) to the Intersection of NC 32/NC 94 – No receptors within this section	0	0	0	0	0
NC 32/ NC 94 from the Intersection of NC 32 and NC 94 to the end of project	0	0	0	0	0
ALTERNATIVE 2					
SR 1139 (Beasley Road) from US 64 to SR 1136 (Holly Neck Road)	0	0	0	0	0
SR 1136 (Holly Neck Road) from SR 1139 (Beasley Road) to start of New Location	0	0	0	0	0
New Location from SR 1136 (Holly Neck Road) to NC 32	0	0	0	0	0
NC 32 from end of New Location to the Intersection of NC 32 and NC 94	0	0	0	0	0
NC 32/NC 94 from the Intersection of NC 32/NC 94 to the end of project	0	0	0	0	0

Table 22 exhibits the exterior traffic noise level increases for the identified receptors by roadway section. There are no substantial noise level impacts anticipated due to this project. The predicted noise level increases for this project range up to +13 dBA. The amount of substantial noise level impacts for each roadway section can be found in Table 22. When real-life noises are heard, it is barely possible to detect noise level changes of 2-3 dBA. A 5-dBA change is more readily noticeable.

Table 22: Predicted Substantial Noise Level Impacts

Description	Exterior Noise Level Increase			Substantial Noise Level Increase [1]	Impacts Due to Both Criteria
	≤ 9 dBA	10-14 dBA	≥ 15 dBA		
ALTERNATIVE 1					
SR 1139 (Beasley Road) from US 64 to start of New Location *No receptors within this section*	0	2	0	0	0
New Location from SR 1139 (Beasley Road) to the Intersection of NC 32/NC 94 *No receptors within this section*	1	0	0	0	0
NC 32 from the Intersection of NC 32/NC 94 to the end of project	12	0	0	0	0
ALTERNATIVE 2					
SR 1139 (Beasley Road) from US 64 to SR 1136 (Holly Neck Road)	4	0	0	0	0
SR 1136 (Holly Neck Road) from SR 1139 (Beasley Road) to start of New Location	1	0	0	0	0
New Location from SR 1136 (Holly Neck Road) to NC 32	3	0	0	0	0
NC 32 From New Location to the Intersection of NC 32 and NC 94	22	0	0	0	0
NC 32/NC 94 from the Intersection of NC 32 and NC 94 to end of project	12	0	0	0	0

[1] As defined by only a substantial increase (See bottom of Table 2 in the full Traffic Noise Analysis)

In accordance with the NCDOT 2004 Traffic Noise Abatement Policy, federal and state governments are not responsible for providing noise abatement measures for new development where building permits are issued within the noise impact area of a proposed highway after the "Date of Public Knowledge." The Date of Public Knowledge of the location of a proposed highway project will be the approval date of Categorical Exclusions (CEs), Findings of No Significant Impact (FONSIs) or Records of Decision (RODs). For development occurring after this public knowledge date, local governing bodies are responsible for ensuring that noise compatible designs are utilized along the proposed facility.

Table 23: Predicted Leq Noise Levels and Noise Contours

Description	Maximum Predicted Leq Noise Levels (dBA)[1]			Maximum Contour Distances[2]	
	50 ft	100 ft	200 ft	72-dBA	67-dBA
ALTERNATIVE 1					
SR 1139 (Beasley Road) from US 64 to start of New Location	66	60	54	<37	55
New Location from SR 1139 (Beasley Road) to the Intersection of NC 32 and NC 94	65	59	53	<37	47
NC 32/NC 94 from the Intersection of NC 32 and NC 94 to the end of project	68	62	56	<37	69
ALTERNATIVE 2					
SR 1139 (Beasley Road) from US 64 to SR 1136 (Holly Neck Road)	57	51	46	<37	<37
SR 1136 (Holly Neck Road) from SR 1139 (Beasley Road) to start of New Location	57	51	46	<37	<37
New Location from SR 1136 (Holly Neck Road) to NC 32	57	51	46	<37	<37
NC 32 From end of New Location to the Intersection of NC 32 and NC 94	65	59	54	<37	47
NC 32/NC 94 from the Intersection of NC 32 and NC 94 to the end of project	68	62	56	<37	69

[1] 50-ft, 100-ft, and 200-ft distances are measured from the edge of nearest travel lane

[2] 72-dBA and 67-dBA contour distances are measured from the center of proposed roadway

3. Noise Abatement Alternatives

If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered. Consideration for noise abatement measures must be given to all impacted receptors. Based on this analysis, there are no predicted impacted receptors due to highway traffic noise in the project area with any of the proposed alignments. The following discussion addresses the applicability of these measures to the proposed project.

a. Highway Alignment Selection

Highway alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts and costs. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment

selection is primarily a matter of siting the roadway at a sufficient distance from noise sensitive areas. Changing the highway alignment is not a viable alternative for noise abatement.

b. Traffic System Management Measures

Traffic system management measures, which limit vehicle type, speed, volume and time of operations, are often effective noise abatement measures. For this project, traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service of the proposed facility.

Past project experience has shown that a reduction in the speed limit of 10 mph would result in a noise level reduction of approximately 1 to 2-dBA. Because most people cannot detect a noise reduction of up to 3-dBA, and because reducing the speed limit would reduce roadway capacity, it is not considered a viable noise abatement measure. This and other traffic system management measures, including the prohibition of truck operations, are not considered to be consistent with the project's objective of providing a high-speed, limited-access facility.

c. Noise Barriers

Physical measures to abate anticipated traffic noise levels are often applied with a measurable degree of success on fully controlled facilities by the application of solid mass, attenuable measures strategically placed between the traffic sound source and the receptors to effectively diffract, absorb, and reflect highway traffic noise emissions. Solid mass, attenuable measures may include earth berms or artificial abatement walls.

The project will maintain partial or limited control of access, meaning most commercial establishments and residents will have direct access connections to the proposed roadway, and all intersections will adjoin the project at grade. For a noise barrier to provide sufficient noise reduction, it must be high enough and long enough to shield the receptor from significant sections of the highway. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It then becomes economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be eight times the distance from the barrier to the receptor. For example, a receptor located fifty feet from the barrier would normally require a barrier four hundred feet long. An access opening of forty feet (10 percent of the barrier length) would limit its noise reduction to approximately 4-dBA. Consequently, this type of control of access effectively eliminates the consideration of berms or noise walls as noise mitigation measures.

Additionally, businesses, churches, and other related establishments located along a particular highway normally require accessibility and high visibility. Solid mass, attenuable measures for traffic noise abatement would tend to disallow these two qualities, and thus, would not be acceptable abatement measures in this case.

d. Other Mitigation Measures Considered

The acquisition of property in order to provide buffer zones to minimize noise impacts is not considered a feasible noise mitigation measure for this project. The cost to acquire impacted receptors for buffer zones would exceed the allowed abatement cost per benefited receptor. The use of buffer zones to minimize impacts to future sensitive areas is not recommended because this could be accomplished through land use control.

The use of vegetation for noise mitigation is not considered reasonable for this project, due to the substantial amount of right-of-way necessary to make vegetative barriers effective. FHWA research has shown that a vegetative barrier must be approximately one hundred feet wide to provide a 3-dBA reduction in noise levels. In order to provide a 5-dBA reduction, substantial amounts of additional right-of-way are required.

The cost of the additional right-of-way and to plant sufficient vegetation is estimated to exceed the abatement cost allowed per benefited receptor. Noise insulation was also considered; however, no public or non-profit institutions were identified that would be impacted by this project.

4. Construction Noise

The major construction elements of this project are expected to be earth removal, hauling, grading, and paving. General construction noise impacts, such as temporary speech interference for passers-by and those individuals living or working near the project, can be expected particularly from paving operations and from the earth moving equipment during grading operations. However, considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours, these impacts are not expected to be substantial. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

5. Summary

The traffic noise analysis determined there is no predicted substantial impacts to any noise receptors within the study area for this proposed highway project. Based on this preliminary study, traffic noise abatement is not recommended and no noise abatement measures are proposed. This evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772. No additional noise analysis will be performed for this project unless warranted by a significant change in the project scope, vehicle capacity or alignment.

In accordance with NCDOT Traffic Noise Abatement Policy, the Federal/State governments are not responsible for providing noise abatement measures for new development for which building permits are issued after the Date of Public Knowledge. The Date of Public Knowledge of the proposed highway project will be the approval date of the Finding of No Significant Impact (FONSI). For development occurring after this date, local governing bodies are responsible to insure that noise compatible designs are utilized along the proposed facility.

K. Air Quality Analysis

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO), hydrocarbons (HC), particulate matter, sulfur dioxide (SO_2), and lead (Pb) (listed in order of decreasing emission rate). Automobiles are considered the major source of CO in the project area. For this reason, most of the analysis presented herein is concerned with determining expected carbon monoxide levels in the vicinity of the project due to traffic flow.

1. Background CO Concentrations

Automobiles are considered the major source of carbon monoxide (CO) in the project area. In order to determine the ambient CO concentration at a receptor near a highway, two concentration components must be used: local and background. The local concentration is defined as the CO emissions from cars operating on highways in the near vicinity (i.e., distances within 400 feet) of the receptor location. The background concentration is defined by the North Carolina Department of Environment, Health and Natural Resources as "the concentration of a pollutant at a point that is the result of emissions outside the local vicinity; that is, the concentration at the upwind edge of the local sources." This project is located in a CO attainment area, therefore no CO microscale analysis was performed.

2. Air Quality Analysis Results

The project is located in Washington County, which complies with the National Ambient Air Quality Standards (NAAQS). This project will not add substantial new capacity or create a facility that is likely to meaningfully increase emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this attainment area.

3. Construction Air Quality Effects

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents.

4. Mobile Source Air Toxics (MSATs)

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources in 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could adjust the full 21 and the primary six (6) MSATs.

5. Summary

Vehicles are a major contributor to decreased air quality because they emit a variety of pollutants into the air. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. New highways or the widening of exiting highways increase localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. Significant progress has been made in reducing criteria pollutant emissions from motor vehicles and improving air quality, even as vehicle traffic has increased rapidly.

L. Hazardous Material

Based on the Geographical Information Systems (GIS) technology and a field reconnaissance study conducted on February 14, 2007, the GeoEnvironmental Section determined that there are three (3) possible sites presently or formerly containing petroleum underground storage tanks (USTs) within the project limits (see Table 24). No hazardous waste sites or landfills were identified within the project limits; however, one active and one former automotive repair facility were found to be located within the project limits. Low to nonexistent monetary and scheduling impacts are anticipated from the three (3) possible UST sites and the automotive repair facility.

Table 24: Known and Potential GeoEnvironmental Impact Sites

Property Location	Property Owner	UST Owner	Facility ID #
Davenport's Service Center 14830 Highway 32 Roper, NC 27970	James & Sandra Davenport	N/A	N/A
This active car repair garage is located on the south side of NC 32 and 0.3 miles east of SR 1136 (Holly Neck Road). A waste oil aboveground storage tank (AST) is located next to the building. The business has never installed USTs and the property does not appear on the UST Section's registry. **This site will have a negligible impact to this project**.			
Property Location	**Property Owner**	**UST Owner**	**Facility ID #**
Simp's Pit Cooked BBQ 15061 Highway 32 Roper, NC 27970	Rachel Cale Simpson	E.T. Four, Inc.	0-006295
This closed restaurant and former gas station is located on the north side of NC 32 and 0.6 miles east of SR 1136 (Holly Neck Road). The building is set back 54 feet from the NC 32 median. Two (2) pump islands are located at the front of the store. Two (2) rectangular asphalt patches were noted in the front parking lot and are 35 feet from the highway. A monitoring well is present near the southwest corner of the building and is set back 40 feet from the median. The UST Section's registry indicates that two (2) USTs were removed in October 1994. There is no other evidence of USTs or UST removal. **This site will have a low impact to this project**			
Property Location	**Property Owner**	**UST Owner**	**Facility ID #**
Red Apple Market 14 16650 Highway 32 Roper, NC 27970	Artie B. Ange	E.T. Four, Inc.	0-006310

This former gas station and convenience store is located across from the intersection of NC 32 and SR 1317 (Pritchard's Loop Road). The storefront is 68 feet from the NC 32 median. At the time of this investigation, the parcel was for sale. A pump island is located at the front of the property and 49 feet from the highway. A concrete slab is in front of the pump island. The UST Section's registry indicates that four (4) USTs were removed from the property in April 1994. A groundwater incident occurred on this site and was assigned number 12830. The soil and pavement in front of the store has been removed and disturbed. Therefore, there is no remaining evidence of USTs or UST removal. **This site will have a low impact to this project.**

Property Location	Property Owner	AST Owner	Facility ID #
Pea Ridge Convenience Store 106 NC 32 N Roper, NC 27970	Pea Ridge Convenience Store	Pea Ridge Convenience Store	N/A

This active gas station and convenience store is located on the northeast corner of the NC 32 and NC 94 traffic triangle. Three ASTs are located at the south side of the store and are set back 112 feet from the NC 32 median. The store is 85 feet from the highway. The property does not appear to be on the UST Section's registry and there is no evidence of USTs or UST removal. **This site will have a negligible impact to this project.**

VI. COMMENTS AND COORDINATION

A. Citizens Informational Workshop

A Citizens Informational Workshop was held on November 17, 2004 at the Vernon G. James Research Center on US 64 in Plymouth to introduce this project to the public and obtain their comments and suggestions about improvements. Approximately 38 people attended. Eleven written comments were received during and after this workshop, most of which supported Alternative 1, although two citizens expressed interest in Alternatives 3 and 5 as their primary choice. Several citizens also requested that the existing intersection of NC 32 and NC 94 be upgraded to a safer configuration than the current Y-type intersection.

B. Public Hearing

A public hearing will be held following the circulation of this document. This public hearing will provide more detailed information to the public about the proposed improvements. The public will be invited to make additional comments or voice concerns regarding the proposed project.

C. NEPA/404 Merger Process

Merger 01 is a process to streamline the project development and permitting processes, agreed to by the USACE, NCDENR-DWQ, FHWA, and NCDOT and supported by other stakeholder agencies and local units of government. To this effect, the Merger 01 process provides a forum for appropriate agency representatives to discuss and reach consensus on ways to facilitate meeting the regulatory requirements of Section 404 of the Clean Water Act during the NEPA/SEPA decision-making phase of transportation projects.

The Merger 01 process allows agency representatives to work more efficiently by providing a common forum for them to discuss and find ways to comply with key elements of their agency's mission. It engenders quicker and more comprehensive evaluation and resolution of issues. The Merger process helps to document how competing agency mandates are balanced during a shared decision-making process, which results in agency representatives reaching a "compromised-based decision" to the regulatory and individual agency mandates.

Concurrence Point 1: On May 8, 2002, the initial Merger meeting was held. On July 23, 2003, the Merger team met and concurred on the Purpose and Need of the project. The purpose of the proposed project is to "improve connectivity in the study area. This does not preclude improving the existing facilities."

Concurrence Point 2: On March 16, 2006, the Merger team met and concurred on alternatives to carry forward for detailed study. Of the five design alternatives presented, three existing alternatives were carried forward (Alternatives 1, 2, and 5) and one new alternative was developed (Alternative 6) in an attempt to reduce wetland impacts.

Concurrence Point 2A: On November 13, 2008, the Merger team met to discuss bridging options for this project and to determine which alternatives should be carried forward. At this point, the Merger team concluded that Alternatives 5 and 6 should be dropped from further study.

Copies of signed concurrence point forms are provided in Appendix C.

D. Other Agency Coordination

Federal, state, and local agencies were consulted during the preparation of this Environmental Assessment. Written comments were received and considered from agencies noted with an asterisk (*) during the preparation of this assessment.

U.S. Army Corps of Engineers
* U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
* National Marine Fisheries Service
* State Clearinghouse
* N.C. Department of Cultural Resources
* N.C. Department of Environment and Natural Resources
* N.C. Wildlife Resources Commission
* N.C. Division of Coastal Management
* N.C. Division of Forest Resources
* N.C. Division of Marine Fisheries
* N.C. Division of Water Quality
Washington County
* Chowan County
* Southern Albemarle Association
* Town of Columbia

These comments and related issues, included in Appendix B, have been addressed in this document.

KOG/kg

APPENDIX A
MAPPING & FIGURES

APPENDIX B
COMMENTS FROM FEDERAL, STATE, & LOCAL AGENCIES

APPENDIX C
MERGER CONCURRENCE FORMS

APPENDIX D
RELOCATION/DISPLACMENT POLICIES

NCDOT's Relocation/Displacement Policies

NCDOT's policy regarding relocations involves providing assistance to those affected by transportation improvements per the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act. All alternatives under evaluation will result in the displacement of homes and/or businesses. Some residents in the DCI Study Area appear to be low-income. If so, and if they are displaced, the Last Resort Housing Program established by the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (PL 91-646) may be used.

The Division of Highways offers a Relocation Assistance Program to help minimize the effects of displacement on families and businesses. The occupants of the affected residences or businesses may qualify for aid under one or more of the NCDOT relocation programs.

It is the policy of the NCDOT to ensure that comparable replacement housing will be available prior to construction of state and federally assisted projects. Furthermore, the North Carolina Board of Transportation has the following three programs to minimize the inconvenience of relocation:

- Relocation Assistance
- Relocation Moving Payments
- Relocation Replacement Housing Payments or Rent Supplement

The Relocation Assistance Program provides experienced NCDOT staff to assist displacees with information such as availability and prices of homes, apartments, or businesses for sale or rent and financing or other housing programs. The Relocation Moving Payments Program provides for payment of actual moving expenses encountered in relocation. Where displacement will force an owner or tenant to purchase or rent property of higher cost or to lose a favorable financing arrangement (in cases of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program will compensate up to $22,500 to owners who are eligible and qualify and up to $5,250 to tenants who are eligible and qualify.

The relocation program for the proposed action will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), and the North Carolina Relocation Assistance Act (GS-133-5 through 133-18). The program is designed to provide assistance to displaced persons in relocating to a replacement site in which to live or do business. At least one relocation officer is assigned to each highway project for this purpose.

The relocation officer will determine the needs of displaced families, individuals, businesses, non-profit organizations, and farm operations for relocation advisory services without regard to race, color, religion, sex, or national origin. The NCDOT will schedule its work to allow ample time prior to displacement for negotiations and possession of replacement housing that meets decent, safe, and sanitary standards. The displacees are given at least a 90-day written notice after NCDOT purchases the property. Relocation of displaced persons will be offered in

areas not generally less desirable in regard to public utilities and commercial facilities. Rent and sale prices of replacement property will be within financial means of the families and individuals displaced, and will be reasonably accessible to their places of employment. The relocation officer will also assist owners of displaced businesses, non-profit organizations, and farm operations in searching for and moving to replacement property.

All tenant and owner residential occupants who may be displaced will receive an explanation regarding all available options, such as (1) purchase of replacement housing, (2) rental of replacement housing, either private or public, or (3) moving existing Owner-occupant housing to another site (if possible). The relocation officer will also supply information concerning other state or federal programs offering assistance to displaced persons and will provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

The Moving Expense Payments Program is designed to compensate the displacee for the costs of moving personal property from homes, businesses, non-profit organizations, and farm operations acquired for a highway project. Under the Replacement Program for Owners, NCDOT will participate in reasonable incidental purchase payments for replacement dwellings such as attorney's fees, surveys, appraisals, and other closing costs and, if applicable, make a payment for any increased interest expenses for replacement dwellings. Reimbursement to owner-occupants for replacement housing payments, increased interest payments, and incidental purchase expenses may not exceed $22,500 (combined total), except under the Last Resort Housing provision.

A displaced tenant may be eligible to receive a payment, not to exceed $5,250, to rent a replacement dwelling or to make a down payment, including incidental expenses, on the purchase of a replacement dwelling. The down payment is based upon what the state determines is required when the rent supplement exceeds $5,250.

It is the policy of the state that no person will be displaced by the NCDOT's state or federally assisted construction projects unless and until comparable replacement housing has been offered or provided for each displacee within a reasonable period of time before displacement. No relocation payment received will be considered as income for the purposes of the Internal Revenue Code of 1954 or for the purposes of determining eligibility or the extent of eligibility of any person for assistance under the Social Security Act or any other federal law.

Last Resort Housing is a program used when comparable replacement housing is not available, or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the federal/state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. Last Resort Housing may be used if necessary.