

I-73 North
Dillon and Marlboro Counties, South Carolina
and
Richmond and Scotland Counties, North Carolina
RE-EVALUATION

U.S. Department of Transportation
Federal Highway Administration
and the
South Carolina Department of Transportation

Pursuant to 23 CFR §771.129 a Re-evaluation has been completed for I-73 North. No new significant impacts were identified and no new information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts were found. Thus, a supplemental EIS is not required for this project and SCDOT and FHWA approve this Re-evaluation.

5/9/2017
Date of Approval


South Carolina Department of Transportation

5/10/2017
Date of Approval


Federal Highway Administration

The following persons may be contacted for additional information concerning this document:

Michelle Herrell
Environmental Protection Specialist
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
(803) 765-5460

Chad Long
NEPA Division Manager
SC Department of Transportation
P.O. Box 191
Columbia, SC 29202-0191
(803)737-1396

Date: 05/01/2017



Project ID: 36358 County: Multiple District: Doc Type: RE-Eval Total # of Commitments: 29

Project Name: I-73 North (Commitments List Part 1 of 2)

The Environmental Commitment **Contractor Responsible** measures listed below **are to be included in the contract and must be implemented**. It is the responsibility of the Program Manager to make sure the Environmental Commitment **SCDOT Responsible** measures are adhered to. If there are questions regarding the commitments listed please contact:

CONTACT NAME: Leah Quattlebaum

PHONE #: (803) 737-1751

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: FEIS/ROD, Re-eval p. 23

Responsibility: SCDOT

Right of Way Acquisition

As stated in the FEIS and ROD, the SCDOT will acquire all of new right-of-way and process relocations in compliance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (42 U.S. C. 460 et seq.). The purpose of these regulations is to ensure that owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owner, to be minimize litigation and relieve congestion in the courts, and to promote public confidence in Federal and federally-assisted land acquisition programs.

Non-Standard Commitment

NEPA Doc Ref: FEIS/ROD, Re-eval p.24

Responsibility: CONTRACTOR

Cultural Resources

Consistent with the commitment in the FEIS and ROD, the contractor and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations during the construction phase of the project, if any such remains are encountered, the Resident Construction Engineer (RCE) will be immediately notified and all work in the vicinity of the discovered materials and site work shall cease until the SCDOT Archaeologist directs otherwise.

Non-Standard Commitment

NEPA Doc Ref: FEIS/ROD, Re-eval p. 26

Responsibility: CONTRACTOR

Hazardous Materials

If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed. Hazardous materials will be tested and removed and/or treated in accordance with the United States Environmental Protection Agency and the SCDHEC requirements, if necessary. In addition, consistent with the commitments in the FEIS and ROD, a Spill Prevention, Control, and Countermeasures Plan will be developed to address potential impacts from spills or releases due to construction activities.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Construction

In the event that a geodetic control monument would be impacted, notification would be provided to the National Oceanic and Atmospheric Administration no less than 90 days in advance of such activities in order to plan for their relocation.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated July 17, 2008

A "popular" publication, such as a brochure or poster, focusing on the history of the Beauty Spot Motor Court Office and providing a brief context of motor court and early automobile related tourism history in Marlboro County will be produced. The term "popular" is used because the publication may cover areas and resources beyond Marlboro County if those are pertinent to the history and context. Two Thousand (2,000) copies of this publication will be produced and copies will be distributed to the Marlboro County Historical Society, the Marlboro County Public Library, and the Pee Dee Council of Governments. The remaining copies will be submitted to the SHPO. Additionally, an electronic copy in PDF format will be submitted to the South Carolina SHPO for posting on the South Carolina SHPO's website.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

The final design of the project will attempt to avoid and/or minimize adverse effects to historic properties where possible.

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Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

Upon right-of-way acquisition or signed right-of-entry permission, the SCDOT's archaeological consultant, or staff, will perform test excavations at sites 38ML291, 38ML296, 38ML309, 38ML340, 38DN165, 38ML297, and 38ML342 that are within the APE to make a final determination of National Register eligibility. The results of test excavations and the SCDOT's recommendation of National Register eligibility will be summarized in a technical report and submitted to the South Carolina SHPO for review. Sites determined not eligible in consultation with the SHPO will no longer be historic properties.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

If there are adverse effects to historic properties that cannot be avoided (i. e. "preserved in place"), the affected historic properties will undergo data recovery in consultation with the SHPO and Catawba Indian Nation Tribal Historic Preservation Officer (THPO).

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

SCDOT's archaeological consultant, or staff, will develop a treatment plan for data recovery investigations. The treatment plan will include a description of the project's research design and sampling strategy. The treatment plan will be submitted to the South Carolina SHPO and THPO for review and approval prior to any fieldwork. The South Carolina SHPO and THPO will be afforded thirty (30) days to review the treatment plan(s) and provide comments.



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Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

All plans and reports developed for the treatment of sites subjected to data recovery shall incorporate guidance from the Secretary of the Interior's "Standards and Guidelines for Archaeological Documentation" (48 FR 44734-37) and the President's Advisory Council on Historic Preservation publication, Treatment of Archaeological Properties (ACHP 1980). In addition, these materials will be consistent with South Carolina Standards and Guidelines for Archaeological Investigations (2013).

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

At least one on-site meeting between the SCDOT, the South Carolina SHPO, and the THPO will take place during field investigations in order to discuss any necessary revisions to the original scope of work. Any revisions made to the original scope of work will be attached to the approved treatment plan and this agreement.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

A minimum of two copies of the draft technical report of data recovery investigations will be submitted to the South Carolina SHPO and THPO for review and approval within twelve (12) months from the last day of fieldwork. The draft technical report will be consistent with the standards outlined in South Carolina Standards and Guidelines for Archaeological Investigations (2013). The South Carolina SHPO and THPO reserve the right to submit the draft technical report to qualified professional archaeologists for the purpose of peer review.

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Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

Within three (3) months of draft report approval, SCDOT shall provide one bound copy and one compact disk containing a Portable Document Format (PDF) of the final technical report for the SHPO and THPO, and two bound copies, one unbound copy, and one PDF copy of the final technical report for the South Carolina Institute of Archaeology and Anthropology, all submitted to SHPO. The PDF file will be developed according the specifications and requirements of the SHPO. A separate digital abstract from the report (in Word or html format) will also be provided to the SHPO and THPO. The abstract file can be provided on the same CD as the PDF file.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

The SCDOT will ensure that all artifacts recovered during archaeological investigations are stabilized and processed for curation at the South Carolina Institute of Archaeology and Anthropology. Copies of all records, including but not limited to field notes, maps, catalogue sheets, and representative photographs and negatives will be submitted for curation with the artifacts.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation, App. C

Responsibility: SCDOT

Section 106 MOA dated 1-13-17

If, after additional archaeological testing and National Register evaluation, it is determined there are adverse effects to historic properties that cannot be avoided, SCDOT, the South Carolina SHPO, and THPO will consult to determine the appropriate format for a public education component. A public education plan will be submitted with the draft technical report and all public education materials will be developed within two (2) years from the last day of fieldwork.

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Non-Standard Commitment

NEPA Doc Ref: ROD, Re-eval p. 5

Responsibility: SCDOT

Tolling

In the event I-73 is tolled, additional National Environmental Policy Act analysis would be performed.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: SCDOT

Design Speed

A minimum design speed of 45 miles per hour, where appropriate, is necessary to be maintained in construction areas in order to minimize undue traffic backups and delays.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Bike and Pedestrian

Bridges constructed to elevate roadways over the interstate would have 10-foot shoulders, which would accommodate pedestrians and bicyclists safely.

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Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Cultural Resources

In the event that previously unknown cultural resources are discovered during construction, the resources will be handled according to 36 CFR §800.11 in coordination with the State Historic Preservation Office and appropriate Tribal Historic Preservation Offices.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: SCDOT

Cultural Resources

Detailed archaeological investigations will be completed on the Selected Alternative in North Carolina prior to purchase of right-of-way.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: SCDOT

Cultural Resources

Phase II archaeological testing will be performed on seven sites in South Carolina determined to be potentially eligible for listing on the NRHP. If any of these sites are found to be eligible for listing, then avoidance will be evaluated and/or mitigation will be performed.

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Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Hazardous Waste

Should previously unknown hazardous material contamination be discovered as the project moves forward, the contamination would be removed and properly disposed of prior to the initiation of construction activities at that site.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Air Quality

The contractor will comply with applicable federal, state, county, and other local air pollution regulations during the construction of the project.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Design

The Selected Alternative will cross the five major riparian wetland systems (Little Reedy Creek, unnamed tributary to Little Reedy Creek, Hagins Prong, Cottingham Creek, and Beverly Creek) primarily on structure. Hydraulic studies during final design will determine whether the minor crossings of ten unnamed tributaries of Crooked Creek will be piped or culverted.

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NEPA Doc Ref: ROD

Responsibility: SCDOT

Borrow Pits

A more detailed screening was performed within a one-mile wide corridor along the Selected Alternative and it was determined that sufficient upland areas that could be utilized for borrow activities appear to be present in close proximity to the Selected Alternative alignment. Wetland areas should not be used for borrow areas. Borrow activities will be done in accordance with the SCDOT Engineering Directive (EDM- Borrow Pit Location and Monitoring).

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Pipe and Culvert Construction

Where appropriate, pipe and culvert bottoms would be recessed below the bottom of perennial stream channels to allow movement of aquatic species through the structure.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Construction

If temporary roads in wetlands are used for bridge construction, the fill material would be removed and the areas reseeded with native riparian species seed mixes.

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Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Construction

Best Management Practices in accordance with local, state, and federal guidelines will be incorporated during the design and construction of the project to minimize impacts to water quality and wetlands.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Revegetation

Preventive measures will be taken to minimize the spread of invasive plant species.

NEPA Doc Ref:

Responsibility:

Date: 05/01/2017



Project ID: 36358

County: Multiple

District:

Doc Type: RE-Eval

Total # of Commitments: 6

Project Name: I-73 North (Commitments List Part 2 of 2)

The Environmental Commitment **Contractor Responsible** measures listed below **are to be included in the contract and must be implemented**. It is the responsibility of the Program Manager to make sure the Environmental Commitment **SCDOT Responsible** measures are adhered to. If there are questions regarding the commitments listed please contact:

CONTACT NAME: Leah Quattlebaum

PHONE #: (803) 737-1751

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Noise NEPA Doc Ref: ROD Responsibility: SCDOT

SCDOT will inform local planning officials of future, generalized noise levels expected to occur in the project vicinity after FHWA has made a final decision on the Environmental document.

Non-Standard Commitment NEPA Doc Ref: ROD Responsibility: CONTRACTOR

Construction

Where practicable, 2:1 side slopes were used that reduced the roadway footprint through wetlands and other sensitive areas and thus reduced the impacts.

Non-Standard Commitment NEPA Doc Ref: ROD Responsibility: SCDOT

Permits

A Section 404 permit from the U.S. Army Corps of Engineers and a Section 401 Water Quality Certification from S.C. Department of Health and Environmental Control will be obtained for unavoidable impacts to wetlands and waters of the United States and mitigation will be completed for these impacts.

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Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Construction

Modifications, such as the installation of coffer dams in stream channels in order to construct footings for bridge pilings, may be required. However, if these modifications were needed they would be temporary and removed upon completion of construction and the natural grade of the wetland restored and reseeded.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Construction

Construction activities will be confined within the permitted limits to prevent the unnecessary disturbance of adjacent wetland areas.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Construction

During construction, potential temporary impacts to wetlands will be minimized by implementing sediment and erosion control measures to include seeding of side slopes, silt fences, and sediment basins, as appropriate. Other best management practices would be required of the contractor to ensure compliance with the policies of 23 CFR 650B.

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Chapter 1: Introduction

1.1 Introduction and History of Interstate 73 (I-73)

Interstate 73 (I-73) is a national highway project that will provide a cross-country transportation corridor beginning at Sault Ste. Marie, Michigan, and traversing portions of Ohio, West Virginia, Virginia, and North Carolina before terminating near Myrtle Beach, South Carolina (refer to **Figure 1-1**).

The I-73 Corridor was identified as a High Priority Corridor by the U.S. Congress in the *Intermodal Surface Transportation Efficiency Act of 1991* (ISTEA). Congress designated high priority corridors as those that would provide the most efficient way of integrating regions, linking major population centers of the country, providing opportunities for increased economic growth, and serving the travel and commerce needs of the nation.¹ The corridors that Congress designated were to be included in the National Highway System (NHS). Congress wanted the FHWA and states to develop long-range plans and feasibility studies for these corridors, and focus federal funds towards these areas for road construction. The I-73 project is a portion of the South Carolina segment of the I-73/I-74 High Priority Corridor, and is currently listed as number five on the NHS High Priority Corridors list.² In ISTEA, Congress initially defined the I-73/74 Corridor in South Carolina to traverse from Charleston, SC north to the North Carolina state border to connect through Winston-Salem, NC before going points north and west and ending in the Detroit, MI area.

In 1994, the South Carolina Department of Transportation (SCDOT) initiated a corridor feasibility study based on ISTEA that evaluated upgrading existing roads starting at the North Carolina state line at U.S. Route 1 in Marlboro County, going through Dillon, Marion, Horry, Georgetown, or possibly Williamsburg and Berkeley Counties, and ending on the U.S. Route 17 Corridor near the city of Charleston, SC, in Charleston County.³ As the study was being completed, Congress passed the *National Highway System Designation Act of 1995* which included language that I-73 was eligible for inclusion on the Interstate System provided it was constructed to Interstate standards and connected to an existing Interstate route.⁴ The feasibility study preliminarily looked at the potential for new corridors, but not in detail.

The *Transportation Equity Act* (TEA-21), enacted by Congress in 1998, built on what ISTEA had established but shortened the I-73/I-74 High Priority Corridor by changing its terminus from Charleston, SC, to the general vicinity of Myrtle Beach, Conway, and Georgetown, SC. A second feasibility study was completed by the SCDOT for I-73 in South Carolina in June of 2003. The study was completed in response to the change of the I-73 terminus from Charleston, SC, to the Myrtle Beach, SC, area in TEA-21. The study cited the needs of fulfilling congressional intent and providing an interstate link to the Grand Strand area along with the benefits of improved hurricane evacuation, improved capacity for vehicular and freight

¹ FHWA, "High Priority Corridors," December 18, 2015
http://www.fhwa.dot.gov/planning/national_highway_system/high_priority_corridors/, (Accessed September 15, 2016).

² 23 U.S.C. §1105(c) (P.L. 102-240), (1991, as amended through P.L. 114-94).

³ SCDOT, *I-73 Feasibility Study* (April 1997).

⁴ P.L. 104-59 §332, 1995.

movement in the area, and support of population and economic growth as reasons for building I-73. The feasibility study recognized that there had been some improvements to roads in the project study area; however, the improved roads were predicted to have capacity problems along some segments in 2025, based on traffic modeling. Future traffic projections indicated that I-73 would divert traffic from existing roadways, thereby improving capacity and reducing traffic congestion.⁵

The *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) was passed by Congress and on August 10, 2005. SAFETEA-LU acknowledges the prior purpose for, and designation of, I-73 as a High Priority Corridor along with designating it as a project of “national and regional significance.”⁶

At the State level, Concurrent Resolution H. 3320 by the S.C. General Assembly states “that the members of the General Assembly express their collective belief and desire that the Department of Transportation should consider its next interstate project as one that provides the Pee Dee Region with access to the interstate system.”⁷ The SCDOT Commission adopted this resolution, and since both Congress and the S.C. General Assembly appropriated money to study the potential corridor for the proposed I-73, SCDOT was directed to study the corridor and it was programmed into the South Carolina Statewide Transportation Improvement Program (STIP).⁸ On February 11, 2005, an agreement was reached to jointly perform the environmental studies for I-73 in the vicinity of Rockingham, North Carolina to Myrtle Beach and to extend S.C. Route 31 (Carolina Bays Parkway) from S.C. Route 9 to connect with I-74 in North Carolina.

After the completion of the 2003 I-73 Feasibility Study, the SCDOT, in association with the Federal Highway Administration (FHWA), issued a Notice of Intent on August 9, 2004, to prepare an Environmental Impact Statement (EIS) for the I-73 project in South Carolina. Regionally, the I-73 alignment would begin at the interchange of I-73/I-74 in Rockingham, North Carolina, and traverse through Marlboro and Dillon Counties in South Carolina, connecting to I-95, and then proceed through Dillon, Marion, and Horry Counties, and ending in the Conway/Myrtle Beach/Georgetown area in South Carolina. Due to its distance of approximately 80 miles, logical termini were developed that divided the project into the North and South sections, with I-73 North being located from I-73/I-74 in Rockingham, N.C. to I-95 in Dillon County, and I-73 South being located between I-95 and the Conway, Myrtle Beach, and Georgetown area (refer to **Figure 1-1**). This re-evaluation is being done for the I-73 North project, between I-73/74 and I-95. A separate re-evaluation is being done for the I-73 South project.

⁵ SCDOT, *I-73 Feasibility Study* (June 2003).

⁶ 23 U.S.C. §101(2005).

⁷ South Carolina Legislature Website, Legislation Webpage,

http://www.scstatehouse.gov/query.php?search=DOC&searchtext=H%203320&category=LEGISLATION&session=115&conid=8385078&result_pos=0&keyval=1153320&numrows=10 (December 29, 2016).

⁸ Note: I-73 was included on the STIP and SCDOT was directed to study the I-73 corridor prior to passage of Act 114 in 2007, which developed a new process by which transportation projects were prioritized in the state. No additional funding has been added to the I-73 project since the passage of Act 114, thus, the I-73 project has not went through this prioritization process.

1.2 Development of Purpose and Need and Alternatives during the NEPA Process

The SCDOT and FHWA pursued this project as an interstate facility, based on Congressional intent from the aforementioned Acts⁹ and input from agencies, stakeholders, and the public during scoping and developed the following purpose need statement:

The purpose of the I-73 North project is to provide an interstate link between the southernmost proposed segment of I-73 (between I-95 and the Myrtle Beach Region) and the I-73/I-74 Corridor to serve residents, businesses, and tourists while fulfilling congressional intent in an environmentally responsible and community sensitive manner.

This purpose and need statement was finalized on January 19, 2006, with a consensus vote by the Agency Coordination Team¹⁰ and was carried forward into the alternative development process. The roadway design criteria were developed in late 2004 based on the purpose and need statement for an interstate facility, and were derived primarily from the SCDOT *Highway Design Manual* (2003); the American Association of State Highway and Transportation Officials (AASHTO) *Policy on Geometric Design of Highways and Streets* (known as the “Green Book”, 2001), and the AASHTO *Policy on Design Standards – Interstate System* (1991). These criteria were used to develop the initial and final corridor widths and typical sections for the alternatives, and were included as **Appendix A** of the *I-73 North Alternative Development Technical Memorandum*. (Note: for ease of reference, the Alternative Development Technical Memorandum including the roadway design criteria is appended to this re-evaluation in **Appendix A**.) In addition, to determine the amount of space needed in the right-of-way to accommodate rail, the American Railway Engineering and Maintenance-of-Way Association (AREMA)’s *Manual for Railway Engineering* (2001), and the grade criteria currently used (as of 2004) by the two major regional carriers: Norfolk Southern and CSX. The right-of-way widths were 400 feet in areas that required frontage roads to maintain connections of local roads, and 300 feet in areas that did not need frontage roads. SCDOT evaluated the project design criteria used to develop the roadway footprint with the latest version of SCDOT’s Highway Design Manual and AASHTO’s Green Book. With the exception of minor modifications to cross slope and super elevation requirements, no major changes would occur to the roadway typical section.

The Corridor Analysis Tool (CAT) tool was a computer program developed to identify potential roadway corridors using GIS data. Endpoints and waypoints were set in the CAT program, and the CAT would find the path of least impact based on the GIS data. Through the initial CAT analysis, 122 preliminary segments were combined to develop 1896 preliminary alternatives that would connect I-74 to I-95. Because there were a large number of preliminary alternatives, all alternatives with wetland acreage impacts over 300 acres were eliminated to reduce the number of preliminary alternatives to 474. Based on input from the public, stakeholders, and the Agency Coordination Team, many of the segments composing the preliminary alternatives included

⁹ It should be noted that Congress referred to this project as an interstate in ISTEA, NHS Act, TEA-21, and SAFETEA-LU.

¹⁰ The Agency Coordination Team (ACT) was composed of state and federal regulatory and resource agencies, and met over 25 times on the I-73 South Project during the NEPA process to provide input on the purpose and need, alternative development and evaluation, Preferred Alternative, and mitigation. For further information see Chapter 4 of the I-73 South FEIS.

upgrading segments of existing roadways to interstate standards. In addition, complete upgrades of existing roadways to interstate standards were also evaluated, such as S.C. 38. These details can be found in the Alternative Development Technical Memorandum (refer to **Appendix A**). The preliminary alternatives incorporating existing roadways were found to have more impacts to both the natural and human environment than preliminary alternatives using new alignment segments.

Alternatives were screened and through Agency Coordination Team involvement (consensus voting), public input, and field studies, were narrowed to three reasonable alternatives for evaluation in the Draft Environmental Impact Statement (DEIS), with Alternative 2 being designated as the Preferred Alternative. Once the DEIS was issued on July 19, 2007, additional public and agency input was sought, and the Preferred Alternative was modified to further reduce impacts where possible. The FHWA and SCDOT completed a Final Environmental Impact Statement (FEIS) on August 6, 2008, detailing the comments received and changes made to the Preferred Alternative due to public and agency input, and signed the Record of Decision (ROD) for I-73 South on October 22, 2008. The I-73 Draft EIS, Final EIS, ROD, and supporting technical memoranda are hereby incorporated by reference.

The Selected Alternative, approximately 36.6 miles in length, will be a four-lane interstate facility that can be developed to accommodate a six-lane facility with corridors for future rail lines and allowances for frontage roads where needed. The Selected Alternative would have interchanges with I-95, S.C. 34, S.C. 381, U.S. 15/401, S.C. 79, N.C. 1803, and I-74 (refer to **Figure 1-2**).

In the North FEIS/ROD (Section 2.7.3, page 2-59), the estimated construction cost was determined in 2008 dollars, and then factored up by six percent per year to the Years 2013 and 2018 (refer to **Table 1.1**).

Year	Cost
2008	\$0.841 Billion
2013	\$1.125 Billion
2018	\$1.505 Billion

These construction cost estimates for the Selected Alternative were updated in January 2017. The estimated construction cost was determined in 2017 dollars, and then factored up by six percent per year to the Years 2020 and 2025 (Refer to **Table 1.2**).

Year	Cost
2017	\$1.070 Billion
2020	\$1.275 Billion
2025	\$1.706 Billion

Approximately \$38.1 million remains in federal funding from money “earmarked” in prior Highway Transportation Acts, such as ISTEA (1991), TEA-21 (1998), and SAFETEA-LU (2005). A state or local funding match would be required to fully utilize these federal funds. Funding sources to cover the remainder of this project have not been identified at this time.

An Intermediate Traffic and Revenue Study was completed for SCDOT in February 2016 that evaluated the feasibility of tolling I-73 North, I-73 South, S.C. 22, and the Southern Evacuation Lifeline. Note, this study was for feasibility only, and if tolling were pursued, an investment grade study would need to be completed. This feasibility study evaluated different eight different tolling scenarios, as well as different toll rates. The feasibility study is located on the I-73 project website at www.i73insc.com. The feasibility study also assumed that an all-electronic toll system would be used, with overhead gantries placed at certain locations on the mainline of the roadways. The disturbance footprint associated with this type of tolling system would be minimal.

However, there is currently no plan by SCDOT to toll I-73 (May 2017). If tolls were to be implemented in the future, NEPA documentation would be completed to address the direct, indirect, and cumulative impacts that would result from installation of the tolling system and operations.

1.3 Updates to I-73 North since the ROD

1.3.1 Section 404 Permit Application and Mitigation Plan

SCDOT submitted a Section 404 permit application to the USACE in January 2011 that included the I-73 North and South Selected Alternatives from the North Carolina/South Carolina border to the southern terminus at S.C. 22. Due to a change in the proposed wetland mitigation, the permit application was subsequently withdrawn and SCDOT resubmitted the revised permit application and conceptual mitigation plan in June 2016. The USACE placed the revised permit application on public notice on July 8, 2016, for public comment. The comment period closed on August 8, 2016, but was extended to September 6, 2016, for those who requested additional time to provide comments. The USACE provided copies of all letters received during the public comment period and provided these letters, as well as the Corps’ concerns to SCDOT and FHWA. These concerns are being addressed as part of this re-evaluation.

1.4 Current I-73 North Re-evaluation

The I-73 North Project is being re-evaluated due to the passage of time since the last major FHWA approval or grant was issued for the project. As directed by 23 CFR §771.129, a written re-evaluation must occur before proceeding with the proposed project if it has been more than three years without any major action since the most recent FHWA approval or grant.¹¹ In accordance with FHWA regulations,¹² the purpose of this re-evaluation is to determine how the existing environment has changed since the signing of the ROD, determine what changes to

¹¹ 23 CFR §771.129

¹² 23 CFR §771.129, and FHWA Technical Advisory 6640.8A.

impacts may occur as a result of the proposed project based on the current environment and Selected Alternative, and to determine whether a supplement to the FEIS/ROD is required.

There have been no changes to the alignment of the Selected Alternative. Thus, the focus of this re-evaluation is to determine if there is any new information or circumstances relevant to environmental concerns with regards to the Selected Alternative and its impacts that would result in significant environmental impacts not evaluated in the FEIS/ROD, per 23 CFR §771.130. This re-evaluation will update the data supporting the needs for the project, and evaluate whether any changes have occurred with regards to resources impacted by the Selected Alternative. In addition, it will update any studies and analyses with regards to new laws and policies that have been enacted since the 2008 ROD. The environmental commitments made as part of the ROD will be incorporated into this re-evaluation, as well as any new environmental commitments that are made. These environmental commitments will be memorialized on the SCDOT Environmental Commitment Form at the front of this document.

Chapter 2: Purpose and Need of I-73 North

The purpose of the I-73 North project is to provide an interstate link between the southernmost portion of the I-73 project (from I-95 to the Myrtle Beach region) and the I-73/I-74 corridor in North Carolina, to serve residents, businesses, and tourists while fulfilling congressional intent in an environmentally responsible and community sensitive manner.

The primary needs for the project are the following:

- **System Linkage** – Improve national and regional connectivity by providing a direct link between the future I-73 segment from I-95 and the Myrtle Beach region and the I-73/I-74 corridor in North Carolina.
- **Economic Development** – Enhance economic opportunities in counties with high unemployment and low income in northeastern South Carolina and southeastern North Carolina.

The secondary needs for the project are the following:

- **Improved Access for Tourism** – This project would allow improved access to and from tourist destinations in the eastern part of South Carolina as well as the Hamlet area in North Carolina.
- **Increased Safety on Existing Roads** – This project would increase the safety of the current roads through the project area by moving a significant volume of local, out-of-state, and commercial traffic to an interstate designed for higher volume of traffic.
- **Multimodal Planning** – This project would accommodate the future provision of a multimodal facility within the interstate corridor.

2.1 System Linkage

I-73 North would improve the national and regional connectivity of northeastern South Carolina by providing a direct link between I-73 and I-95 in Dillon County and the I-73/I-74 Corridor in North Carolina while also serving as a means to facilitate the movement of people and goods more efficiently between the Southeast and Midwest regions of the United States. No new roadways have been constructed or are currently planned between I-95 and I-73/74 in Hamlet that would provide for the same level national and regional connectivity. Thus, the primary need of system linkage is still valid.

2.2 Economic Development Opportunities

2.2.1 Methodology

The process of determining economic impacts from a travel efficiency-related perspective for a new location roadway facility entails three overarching steps: 1) travel demand modeling; 2) monetizing travel efficiency benefits from the travel demand data; and, 3) translating monetized benefits into standard economic impact metrics.

Data collected from the Travel Demand Model (TDM) included average daily vehicle-miles traveled (VMT), vehicle-hours traveled (VHT), and speeds (in miles-per-hour, MPH) for two major vehicle types and five trip categories:

- passenger vehicles
 - home-based work (HBW, or commuting)
 - home-based other (HBO, or personal)
 - non-home based (NHB, or business-related)
- commercial vehicles
 - local truck (Truck 1, or light trucking and delivery)
 - long-distance truck (Truck 2, or tractor trailer trucking)

Differences in VMT and VHT between the Selected Alternative and No-Build scenarios are the basis for travel efficiencies that can be monetized into benefits to the traveling public. Benefits include four typical categories:

- vehicle-operating cost savings, from Δ VMT and speeds
- accident cost savings, from Δ VMT
- travel times savings, from Δ VHT
- emissions cost savings, from Δ VMT and speeds

The TDM gives results in average daily metrics; the incremental changes in VMT and VHT are then annualized by assumptions regarding operating days per year for each trip purpose. The annualized changes in TDM characteristics are then applied monetization assumptions regarding the per-mile or per-hour costs of travel for the four benefit categories. **Table 2.1** demonstrates the travel efficiency benefits by trip purpose into economic policy variables.

	HBW	HBO	NHB	Truck 1	Truck 2
Vehicle Operating	Consumer Re-spending		Production Cost (dis)Savings		
Accidents					
Travel Time					
Emissions					

Travel time, vehicle-operating, and accident cost savings for non-home based (NHB, or business) and truck trips are direct *Production Cost Savings* for industries, reflecting tangible changes to business operations. Vehicle operating and accident cost savings for commuting (HBW) and personal (HBO) trips reflect changes in *Consumer Spending* patterns, shifting between transportation-related consumption (e.g., gas/tires/oil, insurance, repairs, etc.) to other discretionary consumption activities (e.g., entertainment, restaurant services, etc.). Travel time savings for commuting and personal trips and all emissions savings do not reflect actual monetary transactions within an economy, but are implicitly recognized as *Amenities* to a region, or rather, a factor contributing to the relative attractiveness of the area. Such variables are typically input into an economic model across time (with details by industry, commodity, etc.) to derive standard economic impact metrics, which include:

- *Gross Regional Product (GRP)* – net dollar-value economic activity (i.e., total output less gross intermediate inputs), synonymous with value-added; includes income, profits, taxes, etc., required to produce final goods and services
- *Jobs/Employment* – full-time-equivalent (FTE) annual jobs
- *Income* – wage/salary earnings paid to the associated jobs

As the impacts are derived from a two-state network, the impact estimates are for the entire region; however, the majority of the estimated impacts are expected to be concentrated within the counties along the alignment and the major metropolitan areas abutting those counties.

2.2.2 Changes from 2008 FEIS/ROD

The process to estimate economic impacts for the I-73 study area varies from the original study conducted in the original EIS. Various factors account for the differences, which include, but are not limited to: travel demand modeling, benefits monetization, and economic modeling, assumptions, and analyses procedures. These changes are discussed below and also in **Appendix B**.

2.2.2.1 Travel Demand Model (TDM)

Updating the TDM included stitching together the South Carolina Statewide Model developed in 2015 and the North Carolina Statewide Model developed in 2016, which provided a different scale and level of detail than the previous model. The changes include:

- More refined roadway network and zone system, including a highway network with minor arterials and collector facilities and a zone system conforming to the 2010 Census geographies;
- More detailed trip purposes, including auto trips for home-based work, home-based other, and non-home based and truck trips for local and long distance;
- More detailed volume delay curve parameters that vary by roadway type, allowing for a more accurate modeling of congestion; and,
- More recent validation to year 2010 traffic conditions and 2040 forecast conditions.

Improved and refined industry analyses standards, such as model improvements, facilitate a more accurate and realistic estimation of travel characteristics at the network level.

2.2.2.2 Benefits Monetization

Generally, the benefits monetization process was conducted similarly to previous studies, translating TDM changes in VHT and VMT into the standard benefit categories of travel time, vehicle operating, accident, and emissions cost savings. However, calculations and the various applied factors for monetization have been refined to correspond with improved industry standards and processes, especially FHWA-recommended standardized assumptions, per TIGER/FASTLANE guidance.

2.2.2.3 Economic Impacts Tools/Models

The previous study used an available REMI model (a complex, dynamic forecasting and policy analysis tool), which automates the calculation process for estimating economic impacts from travel-efficiency benefits. In the 2008 FEIS/ROD, the benefits were input directly into REMI, and reflect the advantages of directly corresponding modeling inputs with outputs. The current re-evaluation of the economic impact was completed by using a replica of the previous process for consistency and comparability. Due to the high costs to use REMI, the estimation process relies on calculations from a conceptually- and geographically-similar analysis, but with an order-of-magnitude difference.

2.2.2.4 Other Factors

Additionally, the differences between previous and current impact estimates result from fundamental differences in the economy since 2005. Since the 2008 FEIS/ROD analysis, the economy experienced the “Great Recession” followed by tempered growth and fundamental structural changes. Consequently, even the basic relativity between economic relationships (including modeling inputs/outputs) has altered towards the more conservative compared with history.

In all, the modeling processes, data, and assumptions have improved with ten years of advancement in industry analyses, and therefore, the results of the economic analysis cannot be compared directly to the analysis in the 2008 FEIS/ROD. Despite the difficulty in direct comparability, the current estimates are more conservative, but reflect more realistic and accurate conditions under the existing circumstances.

2.2.3 I-73 North Economic Modeling Results

Based on the updated TDM, construction of the Selected Alternative for I-73 North would result in an average daily, network-wide increase in vehicle-miles travelled (VMT) from 121,800 to 111,500 for the base year of 2010 and the forecast year of 2040, respectively. Such VMT increases at higher average network speeds correspond with a reduction in vehicle-hours travelled (VHT) by 5,200 and 10,400 for 2010 and 2040, respectively (refer to **Table 2.2**). TDM characteristics for 2025 are interpolated from these years, and forecasted as a 118,300 increase in daily VMT and a 7,400 decrease in VHT.

After annualizing the incremental changes in daily TDM characteristics and applying respective monetization factors (refer to **Table 2.2**), the monetized benefits from I-73 North amount to \$30.5 million in 2025, escalating to \$53.2 million in 2040. Travel time savings are the dominant category, stemming from VHT reductions, which are partially offset by dis-savings in vehicle-operating, accident, and emissions cost increases stemming from VMT increases.

Monetized annual travel-efficiency-related benefits are categorized by policy for the purposes of deriving economic impact measures via applying ratios of annual GRP/production cost savings from work done for the SC MTP. Such policy variables, specifically the production cost savings, translate via the ratio application into gross regional product impacts from \$36.5 million in 2025 to \$51.5 million in 2040. Given SC MTP

effective ratios of average GRP-and income-per-employee, the GRP impacts translate into 358 jobs earning \$25.0 million in 2025, to 432 jobs earning \$38.4 million in 2040.

	2010	2025	2040
TDM (Daily)			
no build VMT	299,308,819	341,695,058	390,083,770
build VMT	299,430,593	341,813,395	390,195,256
Δ VMT	121,775	118,337	111,485
no build VHT	7,196,023	8,837,011	10,852,213
build VHT	7,190,805	8,829,566	10,841,795
Δ VHT	-5,218	-7,446	-10,418
Monetized Annual Benefits			
Travel Time	N/A	\$59.4	\$78.7
Vehicle Operating	N/A	-\$5.5	-\$5.7
Accidents	N/A	-\$11.0	-\$10.0
Emissions	N/A	-\$12.5	-\$9.8
Total	N/A	\$30.5	\$53.2
REMI Policy Variables			
Production Cost Savings	N/A	\$25.5	\$28.7
Consumer Re-spending	N/A	-\$10.1	-\$7.4
Amenities	N/A	\$15.1	\$31.9
Total	N/A	\$30.5	\$53.2
Economic Impacts			
GRP	N/A	\$36.5	\$51.5
Employment	N/A	358	432
Income	N/A	\$25.0	\$38.4
All monetized data are shown in millions of 2016 dollars			

2.2.4 I-73 South and I-73 North Combined Results

The stand-alone analysis for the I-73 North Project reflects the relatively constrained effects on a narrow geographic area rather than the true regional, bi-state network-wide effects resulting from both proposed segments of I-73 (North and South combined). Combining the proposed I-73 as one singular route to correspond with the regional implications of the projects showing how the larger network effect from constructing both segments is likely to be greater than the simple summation of the effects from either segment individually.

A TDM run was conducted for a combined I-73 North and South in the year 2040 to determine that larger, network-wide effect¹³. Resulting impacts are more than twice the simple aggregation of the individual North and South segments' impacts derived in the

¹³ Only 2040 was run as a test outside the contracted SOW to gauge the relativity of the network effects; 2010 was not included due to level of efforts in coding the combined network; however, a 2010 anchor run could be conducted later to be used for intervening year interpolations.

previous sections. This overview likely reflects the true regional impact of these two independent projects.

2.3 Local Traffic Congestion Relief

Traffic analyses conducted for the 2008 FEIS/ROD used portions of the Grand Stand Area Transportation Study (GSATS) Traffic Demand Model (TDM), the Florence Area Transportation Study (FLATS) and the 2003 statewide traffic model were used to forecast traffic needs from the base year of 2005 to the year 2030.

To incorporate the latest travel demand model data that spans the I-73 South study area and the region, the South Carolina Statewide Model developed in 2015 and the North Carolina Statewide Model developed in 2016 were stitched together to form the I-73 TDM. The statewide model highway networks and origin-destination trips were stitched together for a base year 2010 and forecast year 2040.

Modifications to both the model inputs, as well as the overall functionality of the updated model, resulted in changes in the traffic outputs as compared to the model used for the FEIS/ROD. The enhanced features of the new I-73 TDM compared to the previous model include:

- More refined roadway network and zone system including a highway network with minor arterials and collector facilities and a zone system conforming to the 2010 Census geographies.
- More detailed trip purposes including auto trips for home-based work, home-based other, and non-home based and truck trips for local and long distance.
- More accurate congestion by enabling more detailed volume delay curve parameters that vary by roadway type.
- More recent validation to year 2010 traffic conditions and 2040 forecast conditions.

The following scenarios were run to assess traffic on the roadway network using the I-73 TDM.

- 2010 No Build – Existing traffic conditions for year 2010
- 2010 I-73 North – Existing traffic conditions for year 2010 plus the Northern portion of I-73 between I-95 and I-74 in North Carolina.
- 2040 No Build – Existing plus committed¹⁴ traffic conditions for year 2040
- 2040 I-73 North – Existing plus committed¹⁵ traffic conditions for year 2040 plus the Northern portion of I-73 between I-95 and I-74 in North Carolina.

This re-evaluation summarizes the updated traffic impacts for the Selected Alternative including changes in vehicle miles of travel (VMT), vehicle hours of travel (VHT) and travel speed (VMT/VHT) on a regional basis and within the study area, as compared to the No-build scenario. **Tables 2.3 to 2.5** summarize the results of these comparisons based on the projected 2040 traffic

¹⁴ “Existing plus committed” indicates the existing roadway network in the base year as well as projects that are committed through planning, funding, and programming.

¹⁵ “Existing plus committed” indicates the existing roadway network in the base year as well as projects that are committed through planning, funding, and programming.

volumes. These results cannot be compared directly to the FEIS/ROD traffic analysis because of the changes in the base and forecast year data and the fundamental changes to the updated travel demand model.

Table 2.3 Minimum Trip Time Between I-95 and I-74 in Year 2040		
	No-Build Alternative	Selected Alternative
Minimum Travel Time (Minutes)	55.0	31.0
Average Annual Daily Traffic Volume (vehicles per day)	N/A	29,520

As shown in **Table 2.3**, the minimum trip times show that the construction of I-73 will allow traffic to reach I-95 faster, and therefore increase the distance that traffic will be able to travel when compared to the No-Build condition. In the No-Build condition, traffic will be able to reach I-95 from the junction of NC 38 and I-74 in approximately 55 minutes. For the Selected Alternative, the amount of time necessary for traffic to reach I-95 is approximately 31 minutes. This is a significant time savings accruing to the public.

Table 2.4 VMT and VHT in Local Network including the I-73 Selected Alternative Average Annual Daily Traffic Volumes (Year 2040)					
Alternative	VMT	VHT	Difference from No-Build		VMT/VHT
			VMT	VHT	
No-Build	2,973,118	58,253	NA	NA	51.0
Selected Alternative	4,181,208	74,653	1,208,090	16,400	56.0

The updated traffic analysis shows that the Selected Alternative would carry a large number of vehicle-miles of travel throughout the study area, and would permit traffic to travel more quickly to and from I-95 than conditions would permit under the projected 2040 No-build traffic conditions. Typically, for a congested network, the VHT should decrease with the addition of a new roadway facility. The VHT for this project increased – this is consistent with the previous I-73 traffic analysis. This increase is because this study area is not very congested and because I-73 would induce more trips into the project study area, thus more vehicle hours of travel. These are vehicles that would alter travel routes to take advantage of the improved efficiency (shorter travel times) of I-73. The improved efficiency is demonstrated by the ratio of VMT to VHT, shown in **Tables 2.4 and 2.5**. This shows that the average speed of each trip in the network within the study area increased with the project.

Table 2.5 VMT and VHT in Network Only (without I-73 Selected Alternative) Average Annual Daily Traffic Volumes with I-73 Traffic Removed (Year 2040)					
Alternative	VMT	VHT	Difference from No-Build		VMT/VHT
			VMT	VHT	
No-Build	2,973,118	58,253	N/A	N/A	51.0
Local Network	3,051,633	59,128	78,515	876	51.6

The analyses also indicate that the Selected Alternative would slightly increase vehicle-miles and vehicle-hours of travel as well as travel speed of the rest of the existing No-Build network suggesting that more vehicles are drawn to the study area and use arterial streets that provide access to I-73 and that traffic is traveling faster. The faster travel speeds are recognized mainly by longer distance trips, especially those related to recreational and vacation travel, onto I-73.

2.4 Multimodal Planning

One of the secondary needs of the project is to provide a transportation corridor for a future multimodal facility. This future facility could allow visitors to the Myrtle Beach area to be served by high-speed rail rather than by car or airplane, thereby reducing traffic congestion in the region. Although a specific multimodal component has not yet been designated or identified in the planning process, right-of-way within the I-73 corridor was intended for this use in the future. No changes have been made with regards to the right-of-way or corridor footprint; thus, the corridor of the project would still accommodate for future installation of a multimodal facility along with the interstate.

Chapter 3: Environmental Update

This section discusses any new information regarding changes to the natural and human environment, as well as re-evaluates the impacts to the human and natural environment from the Selected Alternative using any new laws, regulations, or policies instituted since 2008. Changes from the 2008 ROD are described in the text and tables below. Comparison and narratives will not be provided regarding resources for which no change in impacts is identified in **Table 3.1**.

Table 3.1 Resource Categories	
Resource	Change since 2008
Land Use	No change ^a
Socioeconomics/Communities	New 2010 Census Data
Environmental Justice	New 2010 Census Data New USDOT and FHWA Orders on EJ Updated FHWA EJ Reference guide
Relocations	New development within the right-of-way
Section 4(f) and 6(f)	No change ^b
Historic Resources	Updated MOA
Hazardous Materials/Waste Sites	Updated SEMS data
Noise	Updates to 23 CFR Part 772 Updates to SCDOT noise policy New traffic data
Air Quality	New MSATs guidance Updated NAAQS standards New Climate Change guidance ^c
Farmlands	No change ^d
Uplands	No change ^e
Wetlands	Delineation approvals; Section 404 permit application
Invasive Species	No change
Wildlife	No change
Protected Species	Updated USFWS Species List
Water Resources/ Water Quality	Updated 303(d) list Section 404 permit application
Floodplains	FEMA map revisions
Wild and Scenic Rivers	No change ^f
Coastal Zone Resources	No change
Indirect and Cumulative Impacts	Yes – New development projects in the area since 2008.
Source:	
^a United States Department of Agriculture (USDA) Natural Resource Conservation Services (NRCS) – National Geospatial Center of Excellence, “National Land Cover Dataset,” 2011.	
^b National Park Service, <i>State Land and Water Conservation Fund</i> , “Grant Listing,” http://waso-lwcf.nrc.nps.gov/public/index.cfm , (Accessed October 10, 2016).	
South Carolina Department of Natural Resources, “DLG Parks 1:24,000 Scale Shapefile,” http://www.dnr.sc.gov/GIS/gisdnrdata.html , (Accessed October 10, 2016).	
^c Note: This guidance has been rescinded as of March 28, 2017 through the <i>Presidential Executive Order on Promoting Energy Independence and Economic Growth</i> . However, the GHG analysis has been left in these re-evaluations.	
^d United States Department of Agriculture (USDA) Natural Resource Conservation Services (NRCS) – National Geospatial Center of Excellence, “National Land Cover Dataset,” 2011.	
^e National Park Service, National Wild and Scenic Rivers System, https://www.rivers.gov/south-carolina.php , (Accessed on October 21, 2016)	

3.1 Socioeconomic and Community Characteristics

3.1.1 Existing Conditions Update

The 2010 Census was completed by the U.S. Census Bureau, requiring updates to demographic and economic data for the project study area. Two challenges exist when comparing the 2000 Census data to the 2010 data:

- Census Block Group boundaries have been reconfigured and no longer align with the block groups in the 2000 Census data (refer to **Figure 3-1**); and,
- The detailed demographic, economic and housing data that was once supplied by the Decennial Census Long Form no longer exists and now is estimated by the American Community Survey.

Therefore, it is important to note that not all categories of census data from 2000 to 2010 are directly comparable, including those using Census Block Group boundaries. In addition to census data updates, aerial photography surveys were used to determine if any new housing developments, residential or non-residential buildings have been constructed or removed within the study area in the time lapse between the FEIS/ROD and this re-evaluation. Due to the small portion of the project corridor that exists within the limits of Scotland County, socioeconomic information for Scotland County is not included on all tables.

Although no major changes to socioeconomic impacts have occurred, demographics within the project study area have been updated to reflect the most recent available data. **Table 3.2** demonstrates how the population within the project study area has changed.

As reflected in **Table 3.2**, limited population change occurred within the project study area between 2000 and 2010. Marlboro, Richmond, and Scotland Counties posted negligible growth of less than one percent, while Dillon County’s population grew by four percent. By contrast, South Carolina and North Carolina’s populations grew by thirteen percent and sixteen percent, respectively. **Table 3.3** shows how demographics within the counties and communities of the project study area have changed since the 2000 Census.

Table 3.2			
Project Study Area Population Change			
	2000	2010	Percent Change (2000 -2010)
Dillon County, SC	30,722	32,062	4%
Marlboro County, SC	28,818	28,933	<1%
South Carolina	4,012,012	4,625,364	13%
Richmond County, NC	46,564	46,639	<1%
Scotland County, NC	35,998	36,157	<1%
North Carolina	8,049,313	9,535,483	16%
Source: U.S. Census Bureau, 2000/2010			

Table 3.3								
Demographic Characteristics of Communities in Project Study Area								
	Population 2000	Population 2010	% Minority 2000	% Minority 2010	% over 65 2000	% over 65 2010	% Households w/ school- age children 2000	% Households w/ school- age children 2010
Dillon County Communities (SC)								
*Dillon	6,316	6,788	46%	43%	16%	16%	43%	35%
Marlboro County Communities (SC)								
Bennettsville	9,425	9,069	65%	67%	15%	15%	28%	32%
Blenheim	137	154	57%	44%	20%	15%	16%	33%
Clio	774	726	64%	73%	14%	18%	25%	29%
McColl	2,498	2,174	34%	43%	11%	13%	31%	35%
Tatum	69	75	25%	27%	23%	12%	25%	28%
Richmond County Communities (NC)								
Hamlet	6,018	6,495	38%	45%	17%	16%	28%	36%
Source: U.S. Census Bureau, 2000/2010 U.S. Census.								
*Dillon is not impacted by the Selected Alternative but was used to represent changes to communities within the county.								

Some communities within the project study area showed large shifts in the demographic characteristics of their populations between 2000 and 2010. Blenheim saw a decrease in minority population of thirteen percent, while the minority populations of Clio, McColl, and Hamlet increased by nine, nine, and seven percent, respectively. While the populations of Dillon and Hamlet increased, Bennettsville, Clio, and McColl saw their populations decline and Blenheim and Tatum grew negligibly. Elderly populations generally remained stable, although Tatum saw its senior citizen population decrease by eleven percent between 2000 and 2010. The percentage of households with school-age children grew in each community.

When evaluating economic characteristics of the counties and communities within the project study area, **Table 3.4** notes that each community has experienced growth in an economic capacity. While Dillon saw a relatively small increase in its median household income between 2000 and 2010, Tatum saw its median household income grow by 147 percent. The percentage of the population below the poverty level grew in the majority of communities, although it declined in McColl, Tatum, and Hamlet by a small percentage.

	Median HH Income 2000	Median HH Income 2010	% below Poverty level 2000	% below Poverty level 2010	HH w/ no vehicle 2000	HH w/ no vehicle 2010	Median value of homes 2000	Median value of homes 2010
Dillon County Communities (SC)								
*Dillon	\$25,267	\$26,477	26%	28%	24%	21%	\$68,300	\$121,600
Marlboro County Communities (SC)								
Bennettsville	\$22,389	\$24,386	27%	27%	26%	21%	\$57,700	\$82,600
Blenheim	\$26,667	\$31,667	16%	25%	27%	0%	\$36,900	\$80,900
Clio	\$25,313	\$28,068	29%	56%	30%	15%	\$50,200	\$50,500
McColl	\$22,015	\$30,033	32%	31%	20%	9%	\$47,100	\$50,300
Tatum	\$21,750	\$53,750	8%	7%	21%	0%	\$45,000	\$100,000
Richmond County Communities (NC)								
Hamlet	\$29,013	\$30,699	22%	21%	17%	13%	\$54,500	\$81,900
Source: U.S. Census Bureau, 2000/2010 U.S. Census.								
*Dillon is not impacted by the Selected Alternative but was used to represent changes to communities within the county.								

Each community showed an increase in the median value of homes between 2000 and 2010, with the value of homes more than doubling in Blenheim and Tatum and increasing by significant margins in Dillon, Bennettsville, and Hamlet. Positive economic news is also reflected in the unemployment data for the project study area, which is reflected in **Table 3.5**. Dillon and Marlboro Counties both saw a small decrease in their unemployment rates, while Richmond County's unemployment rate rose slightly between 2006 and 2015. Overall, unemployment within the project study area decreased by approximately half a percentage point. **Table 3.6** lists the major employers for each county within the project study area.

	2006 Unemployment Rate	2015 Unemployment Rate	Change
*Dillon County, SC	9.5%	8.7%	-0.8%
*Marlboro County, SC	11.2%	10.1%	-1.1%
**Richmond County, NC	7.5%	7.9%	0.4%
Three-County Average	9.4%	8.9%	-0.5%
*SC State Average	6.5%	8.7%	2.2%
**NC State Average	5.2%	4.8%	-1.0%
*National Average	4.6%	5.3%	0.7%
* Source: <u>Community Profiles 9/19/2016, South Carolina Employment and Workforce</u>			
**Source: <u>http://www.homefacts.com/unemployment/North-Carolina/Richmond-County.html</u> ;			

Table 3.6 Top Twenty Employers in Dillon and Marlboro Counties*	
Dillon County (Employer – Business type)	Marlboro County (Employer – Business type)
<i>Perdue Farms Inc. – Poultry processing</i>	<i>Marlboro County Board of Education – Education</i>
<i>Lake View School District #1 – Education</i>	<i>Mohawk Industries – Carpet yarn manufacturing</i>
<i>Wix Filtration Corporation – Oil/air filters</i>	<i>Domtar Paper Company LLC – Paper and pulp</i>
<i>Unifi Manufacturing Inc – Synthetic yarn</i>	<i>Musashi South Carolina – ATV parts</i>
<i>McLeod Medical Center Dillon – Healthcare</i>	<i>Marley Engineered Products LLC – Electric resistance heater manufacturing</i>
<i>Franco Manufacturing Company Inc. – Comforter manufacturing</i>	<i>U.S. Department of Justice – Federal prison corrections</i>
<i>Flying J Inc. – Fuel service</i>	<i>S.C. Department of Corrections – State prison corrections</i>
<i>County of Dillon – Government services</i>	<i>Unaka Company Inc – Packaged food</i>
<i>Anvil Knitwear – Knitwear manufacturing</i>	<i>Chesterfield/Marlboro LP – Healthcare</i>
<i>Stone Container Corporation – Corrugated packaging</i>	<i>Marlboro County Council – Government services</i>
<i>Mohawk – Carpet yarn manufacturing</i>	<i>JL Anderson Company – Brick manufacturing</i>
<i>The Schafer Company Inc. – Tourism</i>	<i>City of Bennettsville – Government services</i>
<i>Wal-mart Associates Inc. – Retail services</i>	<i>Dundee Manor LLC – Healthcare</i>
<i>Cooke Associates of Fork Inc. – Healthcare</i>	<i>Ox Bodies Inc. – Heavy-duty truck bodies</i>
<i>City of Dillon – Government services</i>	<i>Rockwell Automation Dodge – Vehicle parts</i>
<i>Herald Office Supply Company – Business forms</i>	<i>Priority One Home Healthcare – Healthcare</i>
<i>Pee Dee Home Healthcare Inc. – Healthcare</i>	<i>Camp Bennettsville Inc. – Recreational services</i>
<i>SCDOT – Government services</i>	<i>C & M Foods Inc. – Frozen foods</i>
<i>Dillon Healthcare Inc. – Healthcare</i>	<i>Pacific MDF Products Inc. of SC – MDF board manufacturing</i>
<i>South of the Border Restaurants Inc. – Tourism</i>	<i>International Cup Corporation – Vending cups</i>
Source: South Carolina Employment Security Commission, Community Profiles 9/19/2016, South Carolina Employment and Workforce	
*Italicized text indicates employers listed in the FEIS/ROD that are still listed as major employers in the study area.	

Of the 40 top employers in Dillon and Marlboro Counties, South Carolina, in 2016, 24 were also listed as top employers for these counties in the 2008 FEIS/ROD. In addition, the following companies were recently noted as major employers in the Community Profiles of Dillon and Marlboro Counties from the South Carolina Department of Employment and Workforce:

Dillon County¹⁶

Signode Industrial Group LLC
WestRock Services Inc.
Wal-Mart
LUIHN Four Inc.

Marlboro County¹⁷

Wal -Mart Associates Inc.
Industrial Performance Partners Inc.

¹⁶ Community Profile, Dillon County, by the SC Department of Employment and Workforce, 9/19/2016

¹⁷ Community Profile, Marlboro County, by the SC Department of Employment and Workforce, 9/19/2016

Table 3.7 shows the top twenty employers for both Richmond and Scotland Counties, North Carolina.

Table 3.7	
Top Twenty Employers in Richmond and Scotland Counties*	
Richmond County (Employer – Business type)	Scotland County (Employer – Business type)
<i>Richmond County Schools – Education</i>	<i>Scotland County Schools – Education</i>
<i>Perdue Products Inc. – Poultry processing</i>	West Point Home, Inc. – Towel manufacturing
<i>First Health of the Carolinas Inc. – Healthcare</i>	<i>Scotland Memorial Hospital Corporation – Healthcare</i>
<i>State of North Carolina – Government services</i>	<i>The Mega Force Staffing Group, Inc. – Professional staffing services</i>
<i>Burlington Industries V, LLC – Textile manufacturing</i>	<i>Saint Andrews Presbyterian College – Education</i>
<i>County of Richmond – Government services</i>	<i>State of North Carolina – Government services</i>
<i>Wal-mart Associates Inc. – Retail services</i>	<i>Wal-mart Associates, Inc. – Retail services</i>
Hanesbrands Inc. – Hosiery manufacturing	<i>County of Scotland – Government services</i>
Sandhills Regional Medical Center – Healthcare	<i>Pilkington North America – Glass product manufacturing</i>
<i>Richmond Technical College – Education</i>	Butler Manufacturing Co. – Steel building manufacturing
UCO Fabrics, Inc. – Fabric manufacturing	Crestline Homes Inc. – Modular home manufacturing
Owens-Illinois Closure Inc. – Recycled glass and bottle manufacturing	<i>Olsten Staffing Services Corp. – Professional staffing services</i>
<i>Hood Packaging Corp. – Paper/plastic packaging</i>	Employment Control Inc. – Professional staffing services
<i>Richmond Yarns – Yarn</i>	<i>Hanesbrands Inc. – Hosiery manufacturing</i>
Laurel Hill Paper Company Corp. – Recycled paper products	<i>Meritor Transmission Corp. – Automotive parts</i>
City of Rockingham – Government services	Manis Custom Builder Inc. – Modular home manufacturing
The Mentor Network – Education	Eaton Corporation – Machinery part manufacturing
<i>Food Lion LLC – Grocery shipment/services</i>	<i>FCC of North Carolina LLC – Vehicle part manufacturing</i>
<i>Lowes Home Centers Inc. – Retail services</i>	McCarter Electrical Company – Electric/security/telecommunications wiring
Britthaven Inc. – Healthcare	<i>City of Laurinburg – Government services</i>
Source: Employment Security Commission of North Carolina, as of September 2006./ NC data is produced by LEAD (Labor & Economic Analysis Division) of the North Carolina Department of Commerce under contract with the Bureau of Labor Statistics (BLS), http://d4.nccommerce.com/default.aspx (Accessed October 12,2016)	
*Italicized text indicates employers listed in the FEIS/ROD that are still listed as major employers in the study area.	

Of the 40 top employers in Richmond and Scotland Counties, North Carolina, in 2016, 25 were also listed as top employers for these counties in the 2008 FEIS/ROD. In addition, the following companies were recently noted as major employers in these counties:

Richmond County

Superior Cranes Inc.
Trinity Manufacturing
Wade Manufacturing Company

Scotland County

Maverick Transportation, LLC
Rostra Precision Controls Inc.
Kordsa, Inc.

3.1.2 Changes to socioeconomic impacts since the 2008 FEIS/ROD

Communities detailed in the 2008 FEIS Community Impact Assessment were reviewed for changes, including growth, additional development, changes in accessibility, and changes in the socioeconomic makeup of the community. Aerial photography from 2015 was compared to the aerial photography from 2006 that was examined in the 2008 FEIS/ROD in order to assess any changes. The communities studied in the 2008 FEIS/ROD are listed below:

- Hamlet;
- Brightsville;
- Newtonville;
- Adamsville;
- Hebron;
- Clio; and,
- Dunbar.

When aerial photography from 2015 was compared to photography from 2006, no significant changes in land use or increases in development were noticed for Brightsville, Newtonville, Adamsville, Hebron, Clio, or Dunbar. Thus no changes are anticipated to the impacts discussed in the 2008 FEIS/ROD for community cohesion, visual impacts, access and travel patterns, or projected development. For changes to relocations and noise impacts, please refer to Sections 3.3 and 3.6, respectively.

In Hamlet, the new Richmond County Commercial Interstate Park along I-74 in the vicinity of the proposed interchange with the Selected Alternative has been completed; RSI Corporation and Big Rock Builders are current tenants of the Park. Several other businesses, including Carolina Gas and Propane, have been demolished. As previously mentioned, the new inland port in Dillon would be located outside of the City of Dillon, and would result in additional jobs, either from direct employment at the port facility, or indirectly from potential new businesses that could establish as a result of the port facility. This would have a positive socioeconomic benefit to the Dillon area. Thus, impacts to the socioeconomics of the project study area would be the same as those discussed in the 2008 FEIS/ROD, except for the Dillon and Hamlet areas, which are expected to see positive socioeconomic effects due to the inland port and industrial park.

3.2 Environmental Justice

Since the finalization of the 2008 FEIS/ROD, which used the 2000 Census data, information from the 2010 Census has been released. Therefore, all minority and poverty information for counties and communities within the project study area was updated to reflect the most recent available data. A review of aerial photography and field verifications were also used to determine if previous observations in low-income and/or minority communities had changed since the 2008 FEIS/ROD.

In order to determine what changes occurred amongst environmental justice populations, data from the 2000 and 2010 Census were compared. **Table 3.8** presents minority and poverty data from both the 2000 and 2010 Census for the state of South Carolina and the four counties that comprise the project study area.

Table 3.8
Minority Population Within the Project Study Area, 2000-2010

	Total Population		Total Minority Population		Percent Minority Population		Difference (2000 – 2010)
	2000	2010	2000	2010	2000	2010	
South Carolina	4,012,012	4,625,364	1,411,528	1,565,364	35 %	34 %	-1%
North Carolina	8,049,313	9,535,483	2,244,657	3,006,533	28 %	32 %	4%
Dillon County	30,722	32,062	15,780	16,663	51 %	52 %	1%
Marlboro County	28,818	28,933	16,203	16,946	56 %	59 %	3%
Richmond County	46,564	46,639	17,690	18,567	38 %	40 %	2%
Scotland County	35,998	36,157	17,886	19,335	50 %	54 %	4%

Source: U.S. Census Bureau, 2000/2010

Block Groups changed between the 2000 to 2010 census that includes boundaries and sizes and do not allow for straight comparison between years.

As demonstrated in **Table 3.8**, each county within the project study area saw an increase in their minority population percentages by one to four percent. Both Dillon and Marlboro Counties have higher minority population percentages than the state of South Carolina. Similarly, both Richmond and Scotland Counties have higher minority population percentages than the state of North Carolina.

Each county within the project study area also saw an increase in the percentage of its population living below the poverty level from 2000 to 2010. **Table 3.9** on the following page shows the percentage below poverty for each county and how the percentages have changed. Scotland County saw the largest change, with an additional eight percent of its population falling below the poverty line in 2010, while Marlboro County experienced a five percent increase and Dillon and Richmond Counties each saw a six percent increase.

In addition to updated demographic and economic data updates, updated orders and new guidance was issued by the United States Department of Transportation (USDOT) and FHWA. The USDOT updated the *Final DOT Environmental Justice Order 5610.2(a)* in May 2012, and FHWA subsequently updated Order 6640.23A entitled *FHWA Actions to Address Environmental Justice and Minority Populations and Low-Income Populations* in June 2012. In 2015, the FHWA released the *FHWA Environmental Justice Reference Guide*, a resource document intended to help NEPA practitioners meet environmental justice compliance requirements. The I-73 project was reviewed in light of these updated orders and guidance to ensure the project was in compliance with Executive Order 12898, and does not result in a disproportionately high and adverse human health and environmental effects to environmental justice populations.

The community characteristics inventory (basic services, activity centers, transit accessibility) has not significantly changed for the minority or low-income communities within the study area since the completion of the 2008 FEIS/ROD.

	Total Population		Total Below Poverty		Percent Below Poverty		Difference (2000 – 2010)
	2000	2010	2000	2010	2000	2010	
South Carolina	4,012,012	4,625,364	547,869	716,537	14 %	16 %	2%
North Carolina	8,049,313	9,535,483	958,667	1,399,945	12 %	15 %	3%
Dillon County	30,722	32,062	7,311	9,490	24 %	30 %	6%
Marlboro County	28,818	28,933	5,882	7,193	20 %	25%	5%
Richmond County	46,564	46,639	8,754	11,467	19 %	25 %	6%
Scotland County	35,998	36,157	7,212	10,039	20 %	28 %	8%

Source: U.S. Census Bureau, 2000/2010

It was determined in the FEIS that all areas containing environmental justice populations would experience beneficial and adverse effects similar to those over the overall Community Impact Assessment study area population, and no environmental justice populations would bear a disproportionately high and adverse impact. Based on the updated demographic and economic data and using the most recent FHWA guidance for assessment, the Selected Alternative would not have a disproportionately high and adverse human health or environmental effects to environmental justice populations.

3.3 Relocations

Table 3.10 summarizes the number of relocations that would occur due to the Selected Alternative and notes the changes that have occurred to the number of relocations since the 2008 ROD.

	2008 ROD	2017 Re-Evaluation	Change
Dillon County			
Residential	0	0	0
Non-residential	0	1	+1
Marlboro County			
Residential	13	8	-5
Non-residential	2	2	-
Richmond County			
Residential	4	5	+1
Non-residential	2	2	-
Scotland County			
Residential	7	6	-1
Non-residential	0	0	-
TOTAL	28	24	-4

In 2008, the total number of relocations was 28, including 26 residential and 2 non-residential relocations (2 businesses). As shown below, the number of relocations within right-of-way (ROW) of the Selected Alternative decreased by four overall since 2008 due to the following changes:

- Dillon County: One non-residential building (place of worship) was constructed within the ROW since 2008.
- Marlboro County: Five residences were removed by property owners since 2008.
- Richmond County: One residence was constructed within the ROW since 2008.
- Scotland County: One residence was removed by the property owner since 2008.

These relocations are based on conceptual design, and as final design and ROW plans are completed, the number of relocations may change. In addition, if a property owner decides to construct a residence, business, etc., within the ROW limits, then additional relocations would occur.

As stated in the FEIS and ROD, the SCDOT will acquire all of new ROW and process relocations in compliance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (42 U.S. C. 460 et seq.). The purpose of these regulations is to ensure that owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owner, to be minimize litigation and relieve congestion in the courts, and to promote public confidence in Federal and federally-assisted land acquisition programs.

3.4 Historic Resources

Based on the cultural resources surveys completed for the FEIS/ROD, the Selected Alternative would result in an adverse effect to the Beauty Spot Motor Court Office Building, which was determined eligible for the National Register of Historic Places (NRHP). In an effort to reach a mutually agreeable mitigation strategy for the unavoidable impacts to the Beauty Spot Motor Court Office Building, SCDOT coordinated with SHPO to develop a mitigation plan. The mitigation plan includes preparing a publication for public distribution, such as a brochure or poster, that focuses on the history of the Beauty Spot Motor Court Office Building and provides a brief history of motor court and early automobile-related tourism in Marlboro County (refer to SHPO letter dated March 6, 2008, and the Memorandum of Agreement (MOA) between FHWA, SCDOT, and SHPO, signed July 2008 in **Appendix C**). The mitigation plan remains in place but could be altered to add additional mitigation for any additional impacts that are determined to occur pending final design. A survey was conducted in October 2016 and no new architectural resources were identified.

Archaeological sites 38ML291, 38ML296, 38ML309, 38ML340, 38DN165, 38ML297, and 38ML342 were identified during the cultural resources surveys within the right-of-way of the Selected Alternative and may be impacted pending final design. It was determined these sites would need further testing to determine whether they are eligible for the NRHP. Brockington and Associates conducted a field visit on October 13, 2016, to verify the ongoing integrity of the sites and ensure that no major changes had occurred (refer to **Appendix C**); no major changes were

noted.¹⁸ A previous MOA for these sites expired in September 2013 and a new MOA was executed by FHWA, SCDOT and SHPO in January 2017 (refer to **Appendix C**) with the same terms. Per the MOA, further testing will be conducted for these sites upon right-of-way acquisition or signed right-of-entry permission to make a final determination of NRHP eligibility. This information will be forwarded to the proper state SHPO for review.

Consistent with the commitment in the FEIS and ROD, the contractor and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations during the construction phase of the project, if any such remains are encountered, the Resident Construction Engineer will be immediately notified and all work in the vicinity of the discovered materials and site work shall cease until the SCDOT Archaeologist directs otherwise.

3.5 Hazardous Materials/Waste Sites

The original regulatory database search for hazardous materials sites within the project area was provided by Environmental Data Resources (EDR) in August 2005 for use in the 2008 FEIS/ROD. A new search and report of the project corridor was completed for the re-evaluation in August 2016 in an effort to verify the status of the previously identified sites and identify any new sites that have been added to the regulatory data bases since completion of the FEIS/ROD (refer to **Appendix D**). Impacts to hazardous waste sites and underground storage tanks were re-evaluated using the updated EDR report, aerial photography, and field visits to determine any land use changes that have occurred in the project study area since completion of the FEIS/ROD.

In support of the 2008 FEIS/ROD, an extensive search of USEPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) was performed; CERCLIS has since been renamed the Superfund Enterprise Management System (SEMS). SEMS tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of USEPA's Superfund Program across the United States. This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

After a review of the updated SEMS data and other identified databases searched by EDR, seven hazardous materials and waste sites were identified as potentially impacted by the Selected Alternative (refer to **Figure 3-2**). **Table 3.11** on the following page lists the sites identified within the project corridor or adjacent to the right-of-way; aerial photography and field reviews were conducted to verify the status of listed sites.

¹⁸ Brockington and Associates, *Interstate 73 North Cultural Resources Re-evaluation, Dillon and Marlboro Counties, South Carolina*, October 31, 2016

Table 3.11			
Listed Hazardous Materials and Waste Sites Potentially Impacted by the Selected Alternative			
Site	Site Name	Description	Status
Sites Listed in FEIS/ROD			
1	Charlie's Auction and Water System	Building abandoned.	Listed in FINDS database. No other information was found concerning potential hazardous materials. Based on review of the available data, there is nothing to indicate that contamination will be an issue at the site.
7	Central Carolina Propane	Site currently abandoned.	No tanks at the site; abandoned.
6	Community Grocery	This site was originally identified as an abandoned gas station; however, the new EDR report identifies the site as Community Grocery.	Listed as UST and LUST. One 3,000-gallon capacity abandoned gasoline UST. A LUST was reported in October 1991 and clean-up was initiated in August 1992. Status showed tank as abandoned.
New Sites Present with No History of Violations/enforcement – For Informational Purposes			
2	Laticrete International	(New) Site is located adjacent to the Selected Alternative along I-74 south of Hamlet, NC.	Located on the Toxics Release Inventory System (TRIS) and no violations have been reported in the last 3 years.
Total Potentially Impacted Sites/Sites of concern on the Selected Alternative			3/1
LUST – Leaking Underground Storage Tank UST – Underground Storage Tank AST – Aboveground Storage Tank			

The 2008 FEIS/ROD listed three sites as potential hazardous materials site impacts, including Charlie's Auction and Water System, Central Carolina Propane, and Community Grocery.¹⁹ As noted in **Table 3.11**, one new site, Laticrete International, was also identified as adjacent to the project study corridor but outside of the existing right-of-way limits. Each of these sites was investigated via aerial photography and field surveys to determine their present status. All but one site, Laticrete International, appear to be completely abandoned and/or demolished, and Laticrete International has had no violations in the last three years. The 2008 FEIS/ROD determined that no further investigation of the three listed sites were required, as no potential impacts were anticipated. Based on reviews of the updated data, the impacts of the Selected Alternative remain consistent with the impacts analysis presented in the 2008 FEIS/ROD.

If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed. Hazardous materials will be tested and removed and/or treated in accordance with USEPA and SCDHEC requirements, if necessary. In addition, consistent with the commitments in the FEIS and ROD, a Spill Prevention, Control, and Countermeasures Plan will be developed to address potential impacts from spills or releases due to construction activities.

¹⁹ Interstate-73 (I-73) Final Environmental Impact Statement From I-95 to future Interstate 74 in North Carolina, November 22, 2008, p. 3-113.

3.6 Noise

A traffic noise analysis was conducted as part of the 2008 FEIS/ROD, and a total of ten receptors were predicted to be impacted by noise, including eight residential uses, one commercial use (a produce stand), and one institutional use (a cemetery).²⁰ Since 2008, FHWA regulations found in 23 CFR Part 772, outlining the procedures for abatement of highway traffic noise and construction noise have been updated as well as the SCDOT Traffic Noise Abatement Policy. Thus, a new noise analysis was undertaken for the Selected Alternative to determine existing noise levels, and to evaluate potential future noise levels, their associated impacts, and the feasibility of noise mitigation measures associated with the Selected Alternative. The FHWA Traffic Noise Model (TNM version 2.5, released April 2004) was used in the analysis to compare existing and future noise levels. The Noise Impact Analysis is included in **Appendix E**.

3.6.1 Noise Measurements and Model Validation

Ambient noise field measurements were collected in the field in September and October 2016 to determine noise levels and used to validate the TNM. Field measurements were taken at twenty-one representative locations in the study area (refer to noise measurement data sheets in Noise Impact Analysis, **Appendix E**). The modeled noise levels at these sites, as applicable, were within the validation criteria stated in the *SCDOT Noise Abatement Policy*; therefore, the model was considered valid. For further information, please refer to **Appendix E**.

3.6.2 Modeling Assumptions and Identification of Potential Receptors and/or Land Use Types

FHWA TNM 2.5 was used to derive existing and future noise levels. The environmental traffic data used was approved by SCDOT. Applicable TNM modeling features, where applicable, were added to the analysis to provide accurate sound level reduction results.

The traffic data (and design files) for the proposed project were provided by CDM Smith on behalf of SCDOT, including the estimated AADT, Design Hourly Volume (DHV) and fleet mix percentages for the existing year and the design year 2040 (refer to **Appendix E**). Ten percent of the AADT was used to approximate the DHV. For the Build Alternative and depending on the specific I-73 link, 72-75 percent of the DHV was automobiles, pickup trucks and SUV's. The percent of medium duty trucks of the DHV was assumed to be 5-6 and the percent of heavy duty trucks was assumed to range from 19-22. **Appendix E** identifies the fleet mix for each specific link. A speed limit of 70 miles per hour (mph) was used for I-73, I-74 and I-95. Cross-street and ramps speeds were modeled at 45 mph. In addition, an assumption of a 50/50 directional split was used for all scenarios, and 12-foot wide travel lane widths were used, plus inside and outside shoulders. Potential receptors within 500 feet of the corridor were first identified using Google Maps, and then field verified to determine the type of receptor. A total of 92 receptors were included in the noise model.

²⁰ *Interstate-73 (I-73) Final Environmental Impact Statement From I-95 to future Interstate 74 in North Carolina*, November 22, 2008, p. 3-120.

In order to determine if highway noise levels were compatible with various land use activities, the FHWA-developed Noise Abatement Criteria (NAC) and procedures to be used in the planning and design of highways. As explained in 23 CFR Part 772, traffic noise impacts occur when either:

- 1) The predicted traffic noise levels approach or exceed the FHWA NAC for the applicable activity category shown below; or,
- 2) The predicted traffic noise levels substantially exceed the existing noise levels by more than 15 dBA.

Table 3.12 contains the various NAC categories and a description for each.

Table 3.12				
23 CFR 772 (Table 1) Noise Abatement Criteria (NAC)				
Activity Category	L_{eq} (h)^{1,2\}	L₁₀ (h)^{1,2\}	Evaluation Location	Description of Activity Category
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ^{3\}	67	70	Exterior	Residential.
C ^{3\}	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E ^{3\}	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.
<p>SOURCE: SCDOT Traffic Noise Abatement Policy, August 25, 2015</p> <p>\1\ Either Leq(h) or L10(h) (but not both) may be used on a project.</p> <p>\2\ The Leq(h) and L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.</p> <p>\3\ Includes undeveloped lands permitted for this activity category.</p>				

3.6.3 Existing and Modeled Future Noise Levels

The modeled and/or measured results and figures for the existing condition, and the 2040 design year No-build and Build Alternatives can be found in **Appendix E**. A total of 26 receivers would have an NAC impact and/or substantial increase impact for the 2040 Build Alternative. Table 4 in **Appendix E** shows the predicted sound levels/impacts and Figure 3 in **Appendix E** identifies the receiver locations.

Many of the receivers in the project corridor are located in areas where there is little or zero traffic. In order to establish an existing baseline for determining potential substantial increase criteria, the greater of the sound levels either measured or modeled (if there were any available traffic volumes) was used as the existing condition sound level.

The existing, No-Build, and Build alternatives were analyzed for noise impacts to receptors. Under the existing conditions, a total of zero receptors have noise levels that approach or exceed the NAC criteria for their respective land use. Under the future No-Build scenario, sound levels are anticipated to increase by 0.3 dBA on average over the existing condition as a result of predicted traffic growth in the project area. No receivers would have noise levels that approach or exceed the NAC criteria for their respective land use under this scenario.

When compared to the existing condition, noise levels for the 2040 Build Alternative are predicted to increase by an average of 10.2 dBA, while an increase of 9.9 dBA over the No-build Alternative is anticipated. Noise levels are predicted to approach or exceed the NAC criteria and/or meet or exceed the substantial increase criteria for 26 receivers, all of which are residential land uses.

3.6.4 Changes to Noise since the 2008 FEIS/ROD

The 2008 FEIS/ROD reported a total of ten receptors impacted by noise, including eight residential uses, one commercial use (a produce stand), and one institutional use (a cemetery).²¹ The analysis performed in support of this evaluation determined that 26 receptors of residential use would be impacted by noise resulting from the Proposed Project (refer to **Appendix E**), an increase of 16 receptors. There are three reasons why the analysis performed for this re-evaluation produced different results from the 2008 analysis:

1. Increased detail in the analysis;
2. Addition of ten more years of traffic data; and
3. Change in the assumptions of heavy truck percentages.

The analysis performed for this re-evaluation is substantially more detailed than the analysis performed in the 2008 FEIS/ROD. The analysis used noise contours with distances generated by the TNM model. These contours were overlain on GIS data layers that contained detailed land use data and structural information for the project study area to calculate the number and

²¹ *Interstate-73 (I-73) Final Environmental Impact Statement From I-95 to future Interstate 74 in North Carolina*, November 22, 2008, p. 3-120.

types of structures that fell within the contours associated with each NAC category for the Selected Alternative.

Furthermore, according to the latest 23 CFR Part 772 (Final Rule 7/13/2010, Effective date 7/13/2011), noise contours are no longer allowed to be used to predict noise impacts unless the results are to be used for planning purposes and/or to estimate a study area that encompasses all potential predicted noise impacts; thus, a detailed noise model was developed in TNM that included each receptor within 500 feet of the alignment. Travel lanes, roadway shoulders, overpasses, interchange ramps and cross-streets were included in the noise model for the current analysis, as well as terrain data and land use cover, where appropriate.

Next, the previous analysis used peak hour 2030 design year volumes. The updated analysis used 2040 design year volumes, a growth of 10 years of traffic, including the predicted increase from the proposed inland port at Dillon, a significant generator of vehicles, particularly trucks. The addition of the inland port at Dillon to the traffic model influenced the fleet mix for the current analysis, with more heavy trucks expected on I-73. **Table 3.12** shows the differences in the fleet mix comparison for the 2008 analysis and the 2017 analysis.

Table 3.12			
Fleet Mix Comparison for Noise Analyses (in percent)			
	Automobile	Medium Truck	Heavy Truck
2008 Analysis	91%	3%	6%
2017 Analysis	72-75%	5-6%	19-22%
Source: CDM Smith and Michael Baker International (December 2016)			

Please also note that the absolute number of medium and heavy trucks did not just double, triple or quadruple based on percentage alone. These percentage increases were applied to 10 more years of traffic growth as well.

Additionally, the previous analysis had a total of 12 field measurements for three Build Alternatives to determine baseline existing sound levels (for potential substantial increase impacts). The updated analysis had 18 field measurements for only one Build alternative.

And finally, there were some new homes constructed since the original analysis.

3.6.5 Noise Abatement

Because there are receptors that would be impacted by noise from the Design Year Build Alternative, noise abatement measures were considered for the Proposed Project as part of the noise analysis (refer to **Appendix E**). When considering noise abatement measures, primary consideration shall be given to exterior areas where frequent human use occurs. Since South Carolina is not part of the FHWA-approved Quiet Pavement Pilot Program, the use of quieter pavements was not considered as an abatement measure for the proposed project. In addition, the planting of vegetation or landscaping was also not considered as a

potential abatement measure, since it is not an acceptable Federal-aid noise abatement measure due to the fact that only dense stands of evergreen vegetation planted 100 feet deep will reduce noise levels. In accordance with 23 CFR §772.13(c), the following measures were considered and evaluated as a means to reduce or eliminate the traffic noise impacts:

- Acquisition of rights-of-way;
- Traffic management;
- Alteration of horizontal and vertical alignments;
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development;
- Noise insulation of public use or nonprofit institutional structures; and,
- Noise barriers.

Table 3.13 outlines the different types of noise abatement measures considered and whether they were eliminated from consideration or carried forward. Of the possible noise abatement measures considered for the proposed project, only noise barriers were carried forward for consideration due to the constraints listed in **Table 3.13** for the other options.

Table 3.13 Mitigation Types Considered for Noise Impacts	
Mitigation Type	Status
Acquisition of rights-of-way	Eliminated. The acquisition of rights-of-way to mitigate the noise levels at the affected site would result in disruptive relocations.
Traffic management	Eliminated. Measures such as exclusive lane designations and signing for prohibition of certain vehicle type would prevent the project from serving its intended purpose, such as moving people, goods and services.
Alteration of horizontal and vertical alignments	Eliminated. Alignment modifications as a means of noise abatement may result in disruptive relocations for this project and may affect other natural resources.
Acquisition of real property or interests therein (predominantly unimproved property)	Eliminated. The taking of adequate property to create an effective buffer zone would most likely involve taking the impacted receivers and would require purchasing additional right-of-way. Additionally, receivers that are farther from the road are likely not impacted.
Noise insulation of public use or nonprofit institutional structures	Eliminated. No public use or nonprofit institutional structures would be impacted by the proposed project.
Noise Barriers	Carried forward for further consideration.

3.6.5.1 South Carolina Noise Barrier Analysis

Among the most common noise barriers are earthen berms and freestanding walls. The optimum situation for the use of free-standing noise barriers is when a dense concentration of impacted receivers lies directly adjacent to and parallel with the highway right-of-way. In these instances, one barrier can protect many people at a relatively low cost per impacted site. For this study, an earthen berm was ruled out since there may not be enough room for proper sloping. Drainage and safety line-of-sight may also be an issue.

Based on the need for a barrier to be continuous and to protect a dense concentration of receivers, it is typically not considered reasonable to provide abatement for single impacted or small number of impacted receivers.

When considering abatement, the SCDOT Noise Policy Guidelines state that noise abatement measures must be both feasible and reasonable. The feasibility of a noise barrier is determined by the following factors:

- **Acoustic feasibility:** It is SCDOT's policy that a noise reduction of at least five dBA must be achieved for at least 75 percent of impacted receivers for the noise abatement measure to be acoustically feasible.
- **Engineering feasibility:** Feasibility also includes engineering considerations. The ability to achieve noise reduction may be limited by engineering considerations such as the topographical features of the area, safety, drainage, utilities, maintenance and access. In addition, due to constructability constraints, the height of the noise abatement measure cannot exceed 25 feet.

In addition to determining if a noise abatement measure is feasible, the measure must also be considered reasonable. There are three mandatory reasonable factors that must be met for a noise abatement measure to be considered reasonable:

- **Viewpoints of the Property Owners and Residents of the Benefited Receivers:** SCDOT shall solicit the viewpoints of all of the benefited receivers and document a decision on either desiring or not desiring the noise abatement measure. The viewpoints will be solicited as part of the public involvement process through a voting procedure if a barrier is proposed. The method of obtaining the votes shall be determined on a project-by-project basis, but may include flyers, door-to-door surveys, a public meeting, or a mailing. The voting ballot will explain that the noise abatement shall be constructed unless a majority (greater than 50% of the benefited receivers) of votes not desiring noise abatement is received. For non-owner occupied benefited receivers, both the property owner and the renter may vote on whether the noise abatement is desired. One owner ballot and one resident ballot shall be solicited for each benefited receiver. Home owner associations or local governments cannot be given authority over the desirability for abatement. The viewpoints of the abatement must be solicited from the property owners and tenants.
- **Cost Effectiveness:** The allowable cost of the abatement will be based on 35 dollars per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost will be divided by the number of benefited receivers. If the cost per benefited receiver is less than \$30,000, then the barrier is determined to be cost effective. This allowable cost will be reanalyzed every five years. During the detailed noise abatement evaluation, a more project-specific construction cost should be applied at a cost per square foot basis. The estimation will take into consideration the cost of the actual noise barrier, required hydrology, additional right-of-way, and other aspects associated with the noise barrier construction.

- Noise Reduction Design Goal:** It is SCDOT’s policy that a noise reduction of at least eight dBA must be achieved for 80 percent of those receivers determined to be in the first two building rows and considered benefited. Please note that the first two building rows will only be applicable if they are within 500 feet from the edge of pavement noise source.

The three mandatory reasonable factors must collectively be achieved in order for a noise abatement measure to be deemed reasonable. Failure to achieve any one of the reasonable factors will result in the noise abatement measure being deemed not reasonable. Completion of a “Feasibility and Reasonableness Worksheet” is required for inclusion in the noise analysis report (refer to **Appendix E**).

Seventeen barriers were analyzed as potential noise abatement measures for the Proposed Project (refer to **Appendix E**). Overall, as a result of the mitigation analysis, there were no feasible and reasonable solutions to mitigate for the noise according to the SCDOT noise policy. Therefore, there are no analyzed noise barriers that are proposed to be carried forward to the construction phase. The primary reason for the lack of mitigation to be forwarded to the construction phase is the sparsity of development throughout the entire rural project corridor. Essentially, there were not enough potentially benefited homes to meet the SCDOT noise reduction design goal and/or the SCDOT criteria for cost reasonableness.

3.6.5.2 North Carolina Noise Barrier Analysis

Approximately five miles of the proposed I-73 is located in North Carolina at its northern terminus with I-74. As a result, the NCDOT impact criteria as well as the feasibility and reasonableness criteria were applied to predicted impacted receivers.

NCDOT applies the same absolute NAC approach criteria as SCDOT. The NCDOT Substantial Increase Noise Impact Criteria is different than SCDOT’s 15 dBA (or greater) criteria over existing conditions, however. NCDOT uses a graduated increase impact scale based on the existing sound levels as shown below. These criteria were applied in **Table 3.14** for NC receivers 1 through 33.

Table 3.14 NCDOT Substantial Increase Noise Impact Criteria	
Hourly Equivalent A-Weighted Sound Level (decibels (dB(A)))	
Existing Noise Level ¹ ($L_{eq(h)}$)	Predicted Design Year Noise Level Increase ² ($L_{eq(h)}$)
50 or less	15 or more
51	14 or more
52	13 or more
53	12 or more
54	11 or more
55 or more	10 or more
¹ Loudest hourly equivalent noise level from the combination of natural and mechanical sources and human activity usually present in a particular area. ² Predicted hourly equivalent Design Year traffic noise level minus existing noise level.	

When traffic noise impacts are identified and noise abatement is warranted, noise abatement measures shall be considered and evaluated for feasibility and reasonableness. All of the following conditions must be met in order for noise abatement to be justified and incorporated into project design, as applicable. Failure to achieve any single element of feasibility or reasonableness will result in the noise abatement measure being deemed not feasible or not reasonable, whichever applies.

When considering abatement, the NCDOT Noise Abatement Criteria Guidelines state that noise abatement measures must be both feasible and reasonable. The feasibility of a noise barrier is determined by the following factors:

- Any receiver that receives a minimum noise level reduction of five dB(A) due to noise abatement measures shall be considered a benefited receiver. Noise reduction of five dB(A) must be achieved for at least one impacted receiver.
- Engineering feasibility of the noise abatement measure(s) shall consider adverse impacts created by or upon property access, drainage, topography, utilities, safety, and maintenance requirements.

In addition to determining if a noise abatement measure is feasible, the measure must also be considered reasonable. There are three mandatory reasonable factors that must be met for a noise abatement measure to be considered reasonable:

- **Viewpoints of the property owners and residents of all benefited receivers shall be solicited:** One owner ballot and one resident ballot shall be solicited for each benefited receiver. Points per ballot shall be distributed in the following weighted manner:
 - 3 points/ballot for benefited front row property owners
 - 1 point/ballot for all other benefited property owners
 - 1 point/ballot vote for all residents
- **Size and Cost:** The maximum allowable base quantity of noise walls and/or earthen berms per benefited receiver shall not exceed 2,500 ft² and 7,000 yd³, respectively. Additionally, an incremental increase of 35 ft² for noise walls and 100 yd³ for earthen berms shall be added to the base quantity per the average increase in dB(A) between existing and predicted exterior noise levels of all impacted receivers within each noise sensitive area, which is defined as a group of receivers that are exposed to similar noise sources. A base dollar value of \$37,500 plus an incremental increase of \$525 (as defined above) shall be used to determine reasonableness of buffer zones and noise insulation.
- **Noise Reduction:** A noise reduction design goal of at least 7 dB(A) must be evaluated for all front row receivers. At least one benefited front row receiver must achieve the noise reduction design goal of 7 dB(A) to indicate the noise abatement measure effectively reduces traffic noise.

In addition to the previous criteria for determining whether a noise abatement measure is reasonable and feasible, NCDOT also requires that the following be identified prior to CE approval or issuance of a FONSI or ROD:

- Noise abatement measures that are feasible and reasonable;
- Noise impacts for which no abatement appears to be feasible and reasonable;

- Locations where noise impacts will occur, where noise abatement is feasible and reasonable, and the locations that have no feasible and reasonable abatement; and,
- Whether it is "likely" or "unlikely" that noise abatement measures will be installed for each noise sensitive area identified. "Likely" does not mean a firm commitment. The final decision on the installation of the abatement measures shall be made upon completion of the project design, the public involvement process, concurrence with the NCDOT Policy, and FHWA approval.

Five barriers were analyzed as potential noise abatement measures for the Proposed Project in North Carolina (refer to **Appendix E**). Overall, as a result of the mitigation analysis, there were no feasible and reasonable solutions to mitigate for the noise according to the NCDOT noise policy. Therefore, there are no analyzed noise barriers that are proposed to be carried forward to the construction phase. The primary reason for the lack of mitigation to be forwarded to the construction phase is the sparsity of development throughout the entire rural project corridor. Essentially, there were not enough potentially benefited homes to meet the NCDOT noise reduction design goal and/or the NCDOT criteria for reasonableness.

3.6.6 Construction Noise

If the Build Alternative is chosen, temporary increases in noise levels would occur during the time period that construction takes place. Noise levels due to construction, although temporary, can impact areas adjacent to the project. The major noise sources from construction would be the heavy equipment operated at the site. However, other construction site noise sources would include hand tools and trucks supplying and removing materials.

Typical noise levels generated by different types of construction equipment are presented in Table 5. Construction operations are typically broken down into several phases including clearing and grubbing, earthwork, erection, paving and finishing. Although these phases can overlap, each has their own noise characteristics and objective.

SCDOT's "2007 Standard Specifications for Highway Construction" includes various references to construction noise, including Sections 107.6-paragraph 3, 606.3.1.6.3-paragraph 1, 607.3.1.6.3-paragraph 1, 607.3.2.6.3-paragraph 1, and 702.4.15-paragraph 3. The SCDOT specifications cited above are generalized for nuisance noise avoidance. Detailed specifications suggested for consideration for inclusion in the proposed project's construction documents may consist of the following:

- Construction equipment powered by an internal combustion engine shall be equipped with a properly maintained muffler.
- Air compressors shall meet current USEPA noise emission exhaust standards.
- Air powered equipment shall be fitted with pneumatic exhaust silencers.
- Stationary equipment powered by an internal combustion engine shall not be operated within 150 feet of noise sensitive areas without portable noise barriers placed between the equipment and noise sensitive sites. Noise sensitive sites include residential buildings, motels, hotels, schools, churches, hospitals, nursing homes, libraries and public recreation areas.

- Portable noise barriers shall be constructed of plywood or tongue and groove boards with a noise absorbent treatment on the interior surface (facing the equipment).
- Powered construction equipment shall not be operated during the traditional evening and/or sleeping hours within 150 feet of a noise sensitive site, to be decided either by local ordinances and/or agreement with the SCDOT.

3.6.7 Coordination with Local Officials

SCDOT has no authority over local land use planning and development. SCDOT can only encourage local officials and developers to consider highway traffic noise in the planning, zoning and development of property near existing and proposed highway corridors. The lack of consideration of highway traffic noise in land use planning at the local level has added to the highway traffic noise problem which will continue to grow as development continues adjacent to major highway long after these highways were proposed and/or constructed.

As indicated in the July 2011 NCDOT Traffic Noise Abatement Policy, local jurisdictions with zoning control should use the information contained in this report to develop policies and/or ordinances to limit the growth of noise-sensitive land uses located adjacent to roadways. Furthermore, NCDOT encourages the dissemination of this information to all people who may be affected by, or who might influence others affected by, traffic noise.

In order to help local officials and developers consider highway traffic noise in the vicinity of proposed Type I project, SCDOT will inform them of the predicted future noise levels and the required distance from such projects needed to ensure that noise levels remain below the NAC for each type of land use.

The contour distances to the 66 and 71 dBA sound levels are shown in **Appendix E**. Please note that the values in the table do not represent predicted levels at every location at a particular distance back from the roadway. Sound levels will vary with changes in terrain and will be affected by the shielding of objects such as buildings and tree zones.

3.7 Air Quality

The four counties within the project study area were found to be in attainment of the NAAQS standards in 2008. The NAAQS standards were revised in 2015, and all four counties within the project study area remain in attainment. Impacts to air quality are not anticipated to change.

3.7.1 Mobile Source Air Toxics

Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that USEPA regulate 188 air toxics, also known as hazardous air pollutants. USEPA assessed this expansive list in its

rule on the Control of Hazardous Air Pollutants from Mobile Sources²² and identified a group of 93 compounds emitted from mobile sources that are part of USEPA's Integrated Risk Information System (IRIS). In addition, USEPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA).²³ These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future USEPA rules.

Motor Vehicle Emissions Simulator (MOVES) Model

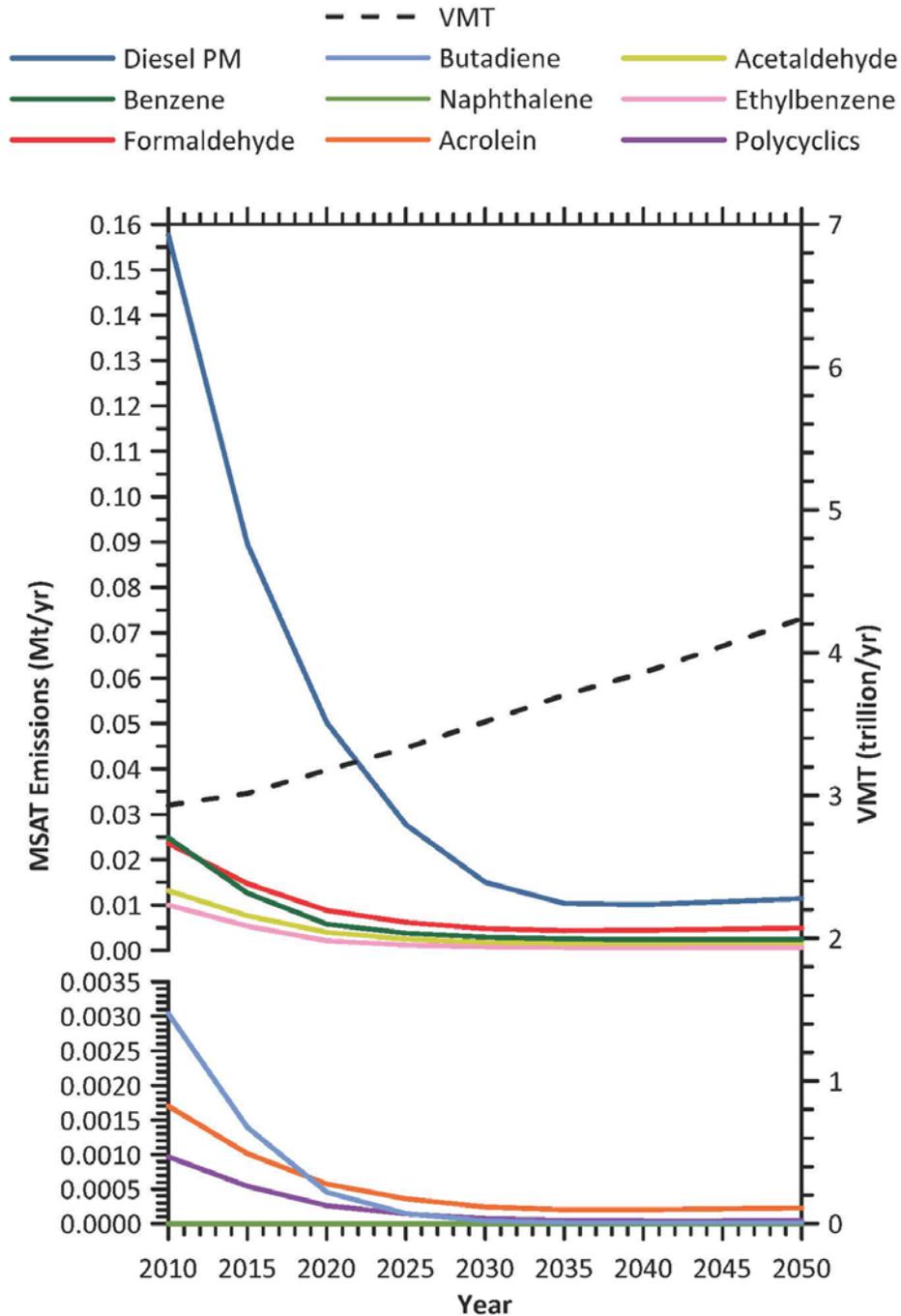
According to USEPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and VMT data. MOVES2014 incorporates the effects of three new Federal emissions standard rules not included in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017, heavy-duty greenhouse gas regulations that phase in during model years 2014-2018, and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025.²⁴ Since the release of MOVES2014, USEPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide, USEPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions.²⁵ The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014. Using USEPA's MOVES2014a model, as shown in the graphic on the next page, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

²² Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007

²³ USEPA, "National Air Toxics Assessment," <https://www.USEPA.gov/national-air-toxics-assessment>, (December 8, 2016).

²⁴ 79 FR 60344

²⁵ USEPA, *USEPA Releases MOVES2014a Mobile Source Emissions Model: Questions and Answers*, <https://nepis.USEPA.gov/Exe/ZyPDF.cgi?Dockey=P100NNR0.txt>, (December 8, 2016).



FHWA Projected National MSAT Emissions Trends 2010-2050 for Vehicles Operating on Roadways Using USEPA’s MOVES2014 Model

FHWA has provided updated interim guidance on addressing MSATs in the USEPA analysis through *Memorandum HEPN-10: Updated Interim Guidance on Mobile Source Air Toxic*

*Analysis in USEPA Documents.*²⁶ This re-evaluation includes a basic analysis of the likely MSAT emission impacts of the proposed project. A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. However, available technical tools do not enable FHWA to predict the project-specific health impacts of the emission changes associated with the alternatives in this re-evaluation. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR §1502.22(b)) regarding incomplete or unavailable information.

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

USEPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the *Clean Air Act* and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects. Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in USEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations²⁷ or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete

²⁶ FHWA, "Updated Interim Guidance on Mobile Source Air Toxic Analysis in USEPA Documents," HEPN-10, October 18, 2016, http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/ (January 12, 2017).

²⁷ Health Effects Institute, Special Report 16: Mobile Source Air Toxics – A Critical Review of the Literature on Exposure and Health Effects, <https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects>, November 2007, (December 8, 2016).

differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI.²⁸ As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. USEPA states that with respect to diesel engine exhaust, “[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk.”²⁹

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by USEPA as provided by the CAAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires USEPA to determine an “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld USEPA’s approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.³⁰

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than

²⁸ *Ibid.*

²⁹ USEPA, IRIS Database, “Diesel Engine Exhaust, Section II.C.”
https://cfpub.USEPA.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal, (December 8, 2016).

³⁰ United States Court of Appeals, *Case No. 07-1053: Natural Resources Defense Council and Louisiana Environmental Action Network vs. Environmental Protection Agency*,
[https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/\\$file/07-1053-1120274.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf), (December 8, 2016)

the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

For the Selected Alternative, the amount of MSATs emitted would be proportional to the VMT. The VMT estimated for the Selected Alternative is slightly higher than that for the No-Build Alternative as previously shown in **Tables 2.4 and 2.5**, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the Selected Alternative along I-73, along with a corresponding decrease in MSAT emissions along the parallel routes, such as SC 38, SC 381, and SC 9. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds of I-73; according to USEPA's MOVES2014 model, emissions of all of the priority MSAT decrease as speed increases. It is expected there would be no appreciable difference in overall MSAT emissions between the No-build and Selected Alternative. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent between 2010 and 2050.³¹ Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The new travel lanes contemplated as part of the Selected Alternative will have the effect of moving some traffic closer to nearby homes, schools, and businesses in a few communities such as Hamlet and Bennettsville; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the Selected Alternative than the No-build Alternative. However, the magnitude and the duration of these potential increases compared to the No-build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, the localized level of MSAT emissions for the Selected Alternative could be higher relative to the No-Build Alternative, but this would be offset due to increases in speeds and reductions in congestion on the local road network (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

³¹ FHWA, Updated Interim Guidance on Mobile Source Air Toxic Analysis in USEPA Documents, http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm, October 12, 2016, (December 8, 2016).

3.7.2 Greenhouse Gases and Climate Change

Greenhouse gases (GHGs) are those that trap heat in the atmosphere of the Earth, and include carbon dioxide, methane, nitrous oxide, and fluorinated gases.³² According to the U.S. Environmental Protection Agency (USEPA), the most common of the GHGs is carbon dioxide (CO₂), which accounted for almost 81% of all U.S. GHG emissions due to human activities in 2014. The combustion of fossil fuels, land use changes, as well as some industrial processes are the main emission generators of greenhouse gases.³³ In 2014, the transportation sector was responsible for almost 27% of the CO₂ emissions in the US.³⁴ Because GHGs trap heat in the atmosphere, the outcome has been a warming of the Earth's temperature, which has led to a change in the climate of the Earth, resulting in more extreme weather events, melting of glaciers, and sea level rise.³⁵

On August 2, 2016, the Council on Environmental Quality (CEQ) issued *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. While this guidance does not legally require agencies to mitigate for impacts to the climate due to GHG emissions, it does direct agencies to disclose the potential amounts of GHG being released due to the agency's action, as well as the agency's influence on climate change. However, this CEQ guidance was recently rescinded through the *Presidential Executive Order on Promoting Energy Independence and Economic Growth*, dated March 28, 2017.³⁶ Even though this guidance has been rescinded, the GHG analysis was completed prior to that date, and has been left in this re-evaluation.

For this project, the operations, fuel cycle, and construction/maintenance emissions were estimated. A GHG Analysis was completed for the Selected Alternative, and included the emissions from constructions, operations, and fuel cycle. Operations and fuel cycle emissions were determined using lookup tables from the Motor Vehicle Emission Simulator (MOVES2014a) provided by the FHWA. The results of the analysis are shown below in **Table 3.15**.

Table 3.15	
Project CO₂e Emissions and Fuel Cycle Emissions	
	Selected Alternative in 2040
VMT (millions of miles, per year)	4,181,208
CO ₂ e operations emissions and fuel cycle emissions (metric tons)	664,903
Note: CO ₂ e Emissions Factor provided by FHWA HQ Moves Lookup Tables.	

³² USEPA, "GHG Overview," <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>. (Last accessed 11/28/16).

³³ Ibid.

³⁴ USEPA, "Greenhouse Gas Inventory Data Explorer," <https://www3.epa.gov/climatechange/ghgemissions/inventoryexplorer/#allsectors/allgas/econsect/current>. (Last accessed 11/28/16).

³⁵ USEPA, "Climate Change Basic Information," <https://www.epa.gov/climatechange/climate-change-basic-information>. (Last accessed 11/28/16).

³⁶ <https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economi-1>

To determine the construction and maintenance emissions over the lifespan of the project, the FHWA’s Infrastructure Carbon Estimator (ICE) Tool was used. The ICE Tool can be used to create ball park estimates of energy usage and GHG emissions for a life-cycle of a project, including construction/rehabilitation and routine maintenance. However, it should be noted that this tool is not appropriate to inform engineering analysis and pavement selection.³⁷ The assumptions used for the ICE Tool and worksheets are included in **Appendix F**. The results below in the **Tables 3.16 and 3.17** include both annualized energy use and annual GHG emissions, per year over the 25-year analysis cycle, and include both unmitigated and mitigated scenarios.

Table 3.16												
Annualized energy use (mmBTUs), per year over 25 years												
	Unmitigated						Mitigated					
	Roadway - new construction	Roadway- rehabilitation	Roadway - total	Bridges	Rail, bus, bicycle, ped.	Total	Roadway - new construction	Roadway- rehabilitation	Roadway - total	Bridges	Rail, bus, bicycle, ped.	Total
Upstream Energy												
Materials	39,327	10,796	50,123	3,354	-	53,477	39,327	8,142	47,469	3,354	-	50,823
Direct Energy												
Construction Equipment	12,424	1,253	13,677	12,557	-	26,234	12,424	943	13,367	-	-	13,367
Routine Maintenance						2,971						2,971
Total	51,751	12,049	63,800	15,911	-	82,682	51,751	9,085	60,836	3,354	-	67,161

³⁷ FHWA, “Infrastructure Carbon Estimator Final Report and User’s Guide,” September 2014, https://www.fhwa.dot.gov/environment/climate_change/mitigation/tools/carbon_estimator/users_guide/page00.cfm. (Last accessed 11/28/16.)

Table 3.17
Annual GHG emissions (MT CO₂e), per year over 25 years

	Unmitigated					Mitigated						
	Roadway - new construction	Roadway-rehabilitation	Roadway - total	Bridges	Rail, bus, bicycle, ped.	Total	Roadway - new construction	Roadway-rehabilitation	Roadway - total	Bridges	Rail, bus, bicycle, ped.	Total
Upstream Emissions												
Materials	2,420	619	3,039	335	-	3,374	2,420	485	2,905	335	-	3,240
Direct Emissions												
Construction Equipment	906	91	997	94	-	1,091	906	71	977	94	-	1,071
Routine Maintenance						217						217
Total	3,326	710	4,036	429	-	4,682	3,326	556	3,882	429	-	4,528

3.8 Waters of the United States

One wetland delineation was performed for I-73 North in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and the Rapanos guidance issued by USACE and USEPA in 2008. Jurisdictional Determinations (JD) were issued by the USACE Charleston District for the South Carolina portion on December 14, 2009, and by the USACE Wilmington District for the North Carolina Portion on November 30, 2010 (refer to **Appendix G**).

3.8.1 Changes to wetland mapping since the 2008 FEIS/ROD

The wetland mapping identified in the 2008 FEIS/ROD was estimated by utilizing GIS data layers which included NWI maps, soil data layers, USGS topographic maps, 1999 false color infrared photography, 2003 true color aerial photography, 2005 true color aerial photography, and 2006 false color infrared aerial photography, along with field visits and ground truthing. The conceptual design was then overlain onto the wetland mapping and impacts were estimated based on this wetland mapping.

Upon completion of the 2008 FEIS/ROD, the wetland mapping was used as the basis for the jurisdictional wetland determination. The wetland determination was completed in the field, in accordance with the 1987 Wetland Delineation Manual, and submitted to the Corps of Engineers for approval. The Corps approved the wetland delineation and finalized the JD on December 14, 2009 and November 30, 2010. The Selected Alternative corridor was reviewed for changes in waters of United States.

3.8.2 Changes to impacts to wetlands and other waters since the 2008 FEIS/ROD

Potential impacts associated with construction of the Selected Alternative were calculated by overlaying the construction limits onto wetland mapping produced from the 2008 wetland mapping (described above). To calculate impacts for the 2008 FEIS/ROD, the conceptual design was overlain onto the wetland mapping that was completed prior to approval of the JDs, which were issued after the approval of the FEIS.

During field reviews of the delineations, changes were made to refine the boundaries and limits of jurisdictional wetlands and streams. Changes to the previously estimated aquatic resources were identified and impacts were updated. These updated impacts from the 2008 FEIS/ROD through the current re-evaluation are detailed in **Table 3.18** below.

Table 3.18			
2008 and 2017 Wetland and Stream Impacts for I-73 North			
(North and South Carolina)			
Resource	2008 FEIS/ROD	2017 Re-Evaluation	Change
Wetlands (acres)	57.2	75.8	+18.6
Streams (linear feet)	14,994	3,322.9	-11,671.1

Source: Michael Baker International (2017).

Table 3.19 lists the wetland and stream impacts divided by state.

Table 3.19		
2008 and 2017 Wetland and Stream Impacts for I-73 North		
Divided by State		
	Wetlands (acres)	Streams (linear feet)
I-73 North (SC only from permit)	55.7	90.0
I-73 North (NC only from approved delineation)	20.1	3,232.9

Source: Michael Baker International (2017).

3.8.3 Mitigation

The 2011 Section 404 permit application included a Conceptual Mitigation Plan that identified three separate mitigation sites. Sandy Island Mitigation bank and the Joiner Bay Site were identified to provide compensatory wetland mitigation, while the Britton’s Neck Site was chosen to provide stream mitigation. Joiner Bay was a site located in Horry County and Britton’s Neck was located in Marion County. However, concerns were raised over the sustainability of the Britton’s Neck Site during agency review of the Conceptual Mitigation Plan. To address agency concerns, SCDOT replaced the Britton’s Neck Site with the Long Branch Site, which was located in Dillon County. A Final Mitigation Plan was developed that detailed the proposed restoration and enhancement of wetlands at Joiner Bay, and stream restoration and enhancement at the Long Branch Site. During this time, the available wetland mitigation credits from Sandy Island Mitigation Bank were depleted for another transportation project and were no longer available.

During the USACE public notice comment period, concerns were raised by resource and regulatory agencies resulted in concerns regarding the ability of the proposed mitigation sites to provide compensatory mitigation for the entire I-73 corridor in South Carolina. The USACE provided all comments and concerns to SCDOT and FHWA on August 29, 2014. In response, SCDOT investigated the use of a permittee responsible, landscape scale mitigation site, Gunter's Island, abutting the Little Pee Dee River in Horry County, to mitigate all impacts for the project. Gunter's Island is a 6,258-acre tract, which contains 89,836 linear feet of streams and 4,618.5 acres of wetlands. A conceptual mitigation plan for Gunter's Island was submitted to the Corps, along with a revised Department of the Army permit application. Due to the time that has lapsed from the original public notice and the change in the proposed mitigation plan, it was necessary to place the proposed project and compensatory mitigation plan on public notice again to allow for public and agency comment. A revised Department of the Army permit application was submitted in June 2016 with an updated Mitigation Plan that included the new landscape scale site and responses to comments that were received during the first public notice period in 2011. The comments and responses to the 2016 public notice and comment period can be found in **Appendix H**.

The compensatory mitigation plan presently consists of a single, permittee responsible, landscape scale mitigation site, Gunter's Island, which will provide all wetland and stream mitigation for the Selected Alternative in South Carolina. The selection of the Gunter's Island tract is a large-scale mitigation opportunity with regional importance based on a watershed approach to protect water quality and aquatic resources. The final Mitigation Plan, located in **Appendix I**, provides detailed information about this 6,258-acre site and how it meets the 2008 Mitigation Rule. Gunter's Island will become a South Carolina Department of Natural Resources (SCDNR) Heritage Preserve. SCDNR would serve as the property owner and long-term steward, providing the public access and recreational opportunities. The ecological attributes of Gunter's Island include:

- Protection of approximately a 13:1 preservation ratio of wetland (acres) protected versus those impacted, and approximately a 19:1 preservation ratio of stream (feet) protected versus impacted.
- Gunter's Island provides connectivity with other protected lands. Gunter's Island is located in proximity to a majority of the Little Pee Dee River HP. It is directly adjacent to the Little Pee Dee HP Johnson Tract (approximately 200 acres) to the south. Gunter's Island is also located just upstream along the Little Pee Dee River from Woodbury Wildlife Management Area (WMA).
- Preservation of Gunter's Island protects 11 miles of river frontage along the Little Pee Dee River, 11 miles of bottomland hardwood along the river corridor, and will protect 89,836 linear feet of stream and 4618.5 acres of wetland. Gunter's Island contains 12 identified ox-bow lakes along with numerous other ancient ox-bow channels, and several different categories of wetland type which all provide diversity in aquatic habitats and ecosystems.
- Preservation of Gunter's Island addresses identified watershed needs for protection against threats such as habitat fragmentation, development, silviculture, mining, and hydrological modification by preserving a large contiguous property with intact resources under threat of development.

- Gunter’s Island is identified as a high priority tract within the Little Pee Dee-Lumber Focus Area of South Carolina by the South Carolina Department of Natural Resources and other conservation groups.
- In addition to riparian areas and forested wetlands, Gunter’s Island has approximately 8 miles of ecologically unique ecotone sand bluffs, occurring between the black water bottomlands and the uplands.
- Preservation of Gunter’s Island safeguards a USEPA classified Aquatic Resource of National Importance and South Carolina Department of Health and Environmental Control outstanding water resource, the Little Pee Dee River.

The SCDOT, USACE, and FHWA distributed a copy of the draft NEPA re-evaluations, Final Mitigation Plan as well as response to comments received during the USACE’s public notice period to the regulatory and resources agencies on March 2, 2017 for a 30-day review. The USEPA and SCDNR provided comments on the Final Mitigation Plan, which can be found in **Appendix H**. The USEPA, in its letter dated March 31, 2017, stated that the agency’s concerns regarding mitigation were addressed and the agency had no further comments. The SCDNR’s letter, dated April 3, 2017, stated that the mitigation plan aligns with a high standard for projects that result in a significant amount of unavoidable impacts to Waters of the United States.

For the portion of I-73 North in North Carolina (refer to **Table 3.18**), the North Carolina Department of Transportation (NCDOT) will coordinate with the USACE Wilmington District, to obtain necessary permits and provide mitigation for the North Carolina portion of the project. SCDOT is currently coordinating with NCDOT regarding the Section 404 permitting for North Carolina.

3.8.4 Indirect and Cumulative Impacts update

The project study area for I-73 North contains a wide variety of wetland types. Based on a review of the 2015 aerial photography and a site visit conducted in September 2016, wetland types identified have not changed since approval of the 2008 FEIS/ROD.

Previously constructed projects have contributed to cumulative stream and wetland impacts and additional transportation and development projects have been identified since the approval of the 2008 FEIS/ROD. **Table 3.20** on the next page provides a summary of the known potential cumulative impacts associated with proposed and constructed projects within the project study area.

In addition to the projects outlined in the 2008 FEIS/ROD, several projects have been added to the *Statewide Transportation Improvement Program 2014 to 2019* (STIP), including the U.S. 301 bridge over the little Pee Dee River and I-95 improvements are proposed in Dillon County.³⁸ In Marlboro County, the STIP identifies corridor improvements to S-35 as a safety project.

³⁸ SCDOT, *Statewide Transportation Improvement Program 2014 to 2019*, Revision 33, September 15, 2016, <http://www.scdot.org/inside/pdfs/stip/stip.pdf> (accessed October 13, 2016).

Project	Location	Project Type	Timeframe	Wetland Impact (acres)	Stream Impact (linear feet)
I-74 in North Carolina	Richmond, NC	Transportation	Future	16	2,895
Vulcan Materials Quarry (planned)	Richmond, NC	Mining	Future	0.8	2,557
<p>Source: Michael Baker International 2016. SAC Numbers: 2010-00600, and 2014-00460-4E, SCDOT Active Project Lists Dillon and Marlboro County, http://dbw.scdot.org/activeprojects/</p>					

The North Carolina Department of Transportation (NCDOT) *2016 to 2025 State Transportation Improvement Program* lists two proposed projects for Richmond County,³⁹ including the I-74 Rockingham-Hamlet bypass and the U.S. 220/I-73/I-74 project. Eleven projects are identified for Scotland County, including the I-74 Rockingham-Hamlet bypass, U.S. 401 widening, U.S. 15/U.S. 501 bridge replacement over Jumper Creek, U.S. 74 bridge over Gum Swamp Creek, U.S. 401 bridge over the Lumber River, U.S. 501 bridge over Leith’s Creek, SR 1128 bridge over Joes Creek, SR 1421 bridge over Big Shoe Heel Creek, SR 1425 bridge over Juniper Creek, SR 1615 bridge over Bridge Creek, and SR 1645 over Leith’s Creek.

As stated in the 2008 FEIS/ROD, state and federal approvals through the *Clean Water Act* were required for the completed projects and would be required prior to construction for the proposed projects. Permit applicants would be required to demonstrate avoidance and minimization efforts as part of the Section 404 permitting process.

3.9 Federally Protected Species

An updated threatened and endangered species list was obtained in October of 2016 using USFWS’ online Information for Planning and Conservation (IPaC) application and evaluates only the Selected Alternative alignment (refer to **Appendix J**). The IPaC report was supplemented with county lists downloaded from the USFWS South Carolina Field Office website on October 10, 2016 (refer to **Appendix J**) and the North Carolina Raleigh Field Office websites on October 10, 2016 (refer to **Appendix J**).^{40,41} The USFWS species list is summarized on the following page in **Table 3.21**.

³⁹ NCDOT, *2016 to 2025 State Transportation Improvement Program*, October 2016, https://connect.ncdot.gov/projects/planning/STIPDocuments1/LIVE_STIP.pdf, (accessed October 13, 2016).

⁴⁰ USFWS, “Endangered, Candidate, and At- Risk Species County Listings,” https://www.fws.gov/charleston/EndangeredSpecies_County.html, April 27, 2016 (Accessed October 10, 2016).
USFWS, “Endangered and Threatened Species and Species of Concern by County for North Carolina,” https://www.fws.gov/raleigh/species/cntylist/nc_counties.html, (Accessed on October 10, 2016).

⁴¹ USFWS, “Endangered, Candidate, and At- Risk Species County Listings,” https://www.fws.gov/charleston/EndangeredSpecies_County.html, April 27, 2016 (Accessed October 10, 2016).

Table 3.21			
Threatened and Endangered Species Known to Occur or Possibly Occur in Dillon County and Marlboro County, South Carolina, and Richmond County and Scotland County, North Carolina			
Scientific Name	Common Name	Federal Status	County
Plants			
<i>Lysimachia asperulifolia</i>	Rough-leaved loosestrife	Endangered	Richmond, Scotland
<i>Oxypolis canbyi</i>	Canby's dropwort	Endangered	Marlboro, Scotland
<i>Rhus michauxii</i>	Michaux's sumac	Endangered	Richmond, Scotland
<i>Schwalbea americana</i>	American chaffseed	Endangered	Scotland
Animals			
<i>Picoides borealis</i>	Red-cockaded woodpecker	Endangered	Dillon, Marlboro, Richmond, and Scotland
<i>Alligator mississippiensis</i>	American alligator	T/SA*	Scotland**
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered	Dillon, Marlboro, and Richmond
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGEPA	Dillon, Marlboro, and Richmond
<i>Acipenser oxyrinchus</i>	Atlantic sturgeon	Endangered	Dillon and Marlboro
<i>Lasmigonia decorata</i>	Carolina heelsplitter	Endangered	Richmond
Source: USFWS.			
* Threatened due to similarity of appearance.			
** Historical record - species last seen in the designated county over 20 years ago.			

Since the completion of the 2008 FEIS/ROD, the Atlantic sturgeon was listed as endangered by USFWS for Marlboro and Dillon Counties. No other species have been listed.

3.9.1 Potential Impacts to Protected Species

Intensive field surveys were conducted within the 600-foot wide Selected Alternative study corridor between July 2006 and May 2007, concurrent with the wetland delineation. No federally protected species were found within or adjacent to the Selected Alternative study corridor during the field surveys. A Biological Assessment (BA) was prepared for the I-73 North study corridor and submitted to the USFWS for review. The USFWS concurred with the finding that the project would have no effect on any of the species reviewed in the I-73 North DEIS (refer to August 6, 2008 letter in **Appendix J**).

During the Public Notice period for the Section 404 Permit Modification issued on July 8, 2016, the USFWS reviewed the proposed action to ensure compliance with Section 7 of the Endangered Species Act. In a letter dated July 16, 2016 (refer to **Appendix J**), the USFWS concurred that the proposed action “may affect, but will not likely adversely affect threatened or endangered species known to occur in the Counties encompassed by the proposed project.”

A review of aerial photography and a limited site reconnaissance of the project study area for the Selected Alternative was conducted in September 2016 to evaluate potential impacts to

federally protected species, and no change in habitats was observed. According to the South Carolina Department of Natural Resources' (SCDNR) online eagle nest location database, one active nest is located approximately 1.5 miles west of the I-73 North corridor along Lilly Quick Creek, north of Lake Wallace.⁴² Thus, the USFWS' concurrence from July 16, 2016 is still valid, and the project would not affect the bald eagle, which is protected by the *Bald and Golden Eagle Protection Act*.

Due to the listing of the Atlantic sturgeon as Endangered in April 2012, another BA was prepared by SCDOT that addressed only the Atlantic and shortnose sturgeon. Suitable habitat for Atlantic and shortnose sturgeon are present within Dillon and Marlboro counties. The Pee Dee River basin is a known suitable spawning migration corridor for the Atlantic sturgeon, with the closest documented occurrence of this species located over 60 miles from the study corridor in the Great Pee Dee River at Winyah Bay.⁴³ This BA was submitted to the National Marine Fisheries Service (NMFS) by the USACE on February 8, 2013. NMFS responded to the USACE in a letter dated April 29, 2013, which concurred with the determination stating "Two species of sturgeon (shortnose and Atlantic) could be present in or near the project area and may be affected by the project. However, we believe these species are unlikely to be adversely affected." (refer to April 29, 2013 letter in **Appendix J**). This concurrence letter was from the Southeast Regional Office of NMFS, and was primarily concerned with the I-73 South Selected Alternative crossing of the Little Pee Dee River, due to its potential for spawning habitat for the Atlantic and shortnose sturgeon. The NMFS Habitat Conservation Division provided comments in a letter dated July 29, 2016 (refer to **Appendix J**) as it relates to upstream passage of anadromous fishes to spawning habitat in the Little Pee Dee River. The I-73 North Selected Alternative does not cross the Little Pee Dee River.

3.9.2 Differences in cumulative impacts to federally protected species since the 2008 FEIS/ROD

It was determined in the 2008 FEIS/ROD that cumulative impacts could occur to the shortnose sturgeon, bald eagle, Kirtland's warbler, and woodstork as a result of the Selected Alternative. This determination is not anticipated to change. Developers would be responsible for coordinating with the USFWS to ensure that their projects would not jeopardize the continued existence of these species. With the addition of the Atlantic sturgeon to the threatened and endangered species list in 2012, and given that its habitat is similar to the shortnose sturgeon, it is anticipated that cumulative impacts to this species could occur as well. Primary cumulative impacts of concern to the shortnose sturgeon and the Atlantic sturgeon include pollution, incidental take by commercial fisheries, impingement at hydroelectric and nuclear power intakes, poaching, and alteration of habitat due to damming of rivers.⁴⁴ If hydroelectric or nuclear power intake facilities were to be implemented, it

⁴² SCDNR, "South Carolina's Bald Eagles – Nest Locations", <http://www.dnr.sc.gov/wildlife/baldeagle/locations.html>, September 29, 2016

⁴³ Mark R. Collins & Theodore I. J. Smith, *Management Briefs: Distributions of Shortnose and Atlantic Sturgeons in South Carolina*, North American Journal of Fisheries Management, 17:4, 995-1000, 1997.

⁴⁴ NOAA-National Marine Fisheries Service, 1998, Recovery Plan for the Shortnose Sturgeon (*Acipenser brevirostrum*), (Silver Spring, MD: Shortnose Sturgeon Recovery Team for the National Marine Fisheries Service, 104pp., 1990).

would require an impact analysis through the Federal Energy Regulatory Commission process. For future development such as those activities previously mentioned, the developer would be required to obtain the necessary permits, which would trigger Endangered Species Act review and consultation with NMFS to ensure the project would not jeopardize the existence of the sturgeon.

3.10 Water Resources/Water Quality

The 2008 FEIS/ROD addressed water quality issues in a general manner because potential impacts were based on a conceptual design and could not be quantified. Listings for impaired waters were obtained from 2006 SCDHEC and NCDEQ 303(d) lists. In North Carolina, Marks Creek was identified as impaired in Richmond County; no impaired waters were listed in Scotland County. According to the NCDEQ 2014 303(d) list, Marks Creek is still the only impaired water in the study area.⁴⁵ The Draft NCDEQ 303(d) list for 2016 is now available for review.⁴⁶ Marks Creek is identified on the 2016 list as well. The impaired reach of the creek is located approximately two miles west and down gradient of the nearest proposed I-73 construction. Because the northern Selected Alternative design is in the conceptual phase, potential impacts to the impaired water is not known at this time.

The previously mentioned Section 404 permit application, which addressed impacts from the South Carolina State line to S.C. 22, was based on final design for the portion referred to as I-73 South (from the I-95 interchange to S.C. 22). The northern portion from the South Carolina State line to the proposed interchange with I-95 was based upon conceptual design. During the public comment period for the Section 404 permit application, SCDHEC requested additional information concerning for additional information concerning a post-construction stormwater management plan for the Upper Little Pee Dee River, Lightwood Knot Creek, and Lake Wallace. These water bodies will be crossed by or are in close proximity to the Selected Alternative for I-73 North and were identified as impaired, outstanding resource waters (ORW) or are within designated Total Maximum Daily Load (TMDL) watersheds. The 2012 303(d) list, which was released in May, 2013, later identified Hagins Prong as additional impaired water body was added in the vicinity of the Selected Alternative. Since that time, no additional water bodies have been added to the list. The *2016 State of South Carolina Integrated Report Part I: Listing of Impaired Waters*⁴⁷ was made available for public comment from Friday, April 1, 2016 - Monday, May 2, 2016. Once responses to all comments received are drafted, the document will be forwarded to USEPA, Region 4 for final approval. A hyperlink to the final document will be established on the SCDHEC website, once approved. Approval of the document is still pending as of May 2017.

⁴⁵ NC DEQ, *The State of North Carolina 303(d) List for 2014*, https://ncdenr.s3.amazonaws.com/s3fs-public/Water%20Quality/Planning/TMDL/303d/2014/2014_303dlist_countiesfinal.pdf, (Accessed on October 14, 2016).

⁴⁶ NC DEQ, *The State of North Carolina 303(d) List for 2016*, https://ncdenr.s3.amazonaws.com/s3fs-public/Water%20Quality/Planning/TMDL/303d/2016/NC_2016_Category_5_20160606.pdf, (Accessed October 14, 2016).

⁴⁷ SCDHEC, 2016, *Impaired Waters & Contaminant Limits - 303(d), TMDL; How can I find the current and past South Carolina's 303(d) List?*, <http://www.scdhec.gov/HomeAndEnvironment/Water/ImpairedWaters/Overview/#4>. (Accessed October 3, 2016).

The permit drawings for I-73 North were based on the conceptual design that was used during the 2008 FEIS/ROD; final design has not yet been completed. During the final design preparation, SCDOT proposes to apply post-construction water quality treatments to the sensitive streams and watersheds along the Selected Alternative for I-73 North as required by SCDHEC Water Quality Certification and NPDES regulations. Each crossing of an impaired stream or water body located in a TMDL watershed along the Selected Alternative from the South Carolina border to I-95 would be evaluated to determine the best stormwater treatment method or methods for each particular site. The proposed treatment measures would include, but are not limited to, the use of non-structural low impact development controls, vegetated filter strips (in medians, adjacent stormwater channels, and side slopes), overflow bridges, closed drainage systems to pipe stormwater from bridge decks, berms to direct stormwater off bridges, and collection of stormwater into boxes to be discharged to vegetated filter strips. Design for these treatment measures would be obtained from the most current SCDHEC Best Management Practices Handbook⁴⁸ at the time of design. Based upon the implementation of these treatment measures, the Selected Alternative will not significantly contribute to the impairment of streams and watersheds identified along the alignment.

Following is a discussion of each impaired feature, TMDL watershed, or ORW identified along the northern alignment and the proposed post-construction stormwater management measures. For convenience, a USGS topographic figure indicating the I-73 corridor in relation to impaired waters being discussed is provided in **Appendix K**.

3.10.1 Upper Little Pee Dee (PD-029E) – Fecal Coliform TMDL

Approximately 1.8 miles of the I-73 North alignment falls within the Upper Little Pee Dee TMDL watershed, including an interchange with S.C. 79 (refer to Figure 1 in **Appendix K**). No wetlands or streams will be impacted by this section of the project; however, agricultural ditches that drain into Beaverdam Creek will be impacted. SCDOT will evaluate this section of roadway during the final design process to determine the best stormwater runoff treatment at this location. It is anticipated that the use of non-structural low impact development controls and vegetated filter strips will be applicable in this impaired watershed.

3.10.2 Lightwood Knot Creek (PD-713) – Biological Impairment

Lightwood Knot Creek is designated as impaired from its confluence with Crooked Creek to approximately 4.5 miles upstream. The Selected Alternative for I-73 North is located east of Crooked Creek (refer to Figure 2 in **Appendix K**). Stormwater runoff from I-73 will not enter Lightwood Knot Creek; therefore, I-73 North will not contribute to the impairment.

3.10.3 Lake Wallace (RL-05398) – Chlorophyll-A, Total Phosphorous Impaired

The 2014 303(d) list shows the portion of Lake Wallace at the boat ramp and picnic area located along the southwest shore of the lake, RL-09100 (on the northeastern shoreline) and CL-086 (at the dam) as designated as impaired. The Selected Alternative for I-73 North is located approximately 1.5 miles east of the impaired portion of the lake (refer to Figure 3 in **Appendix K**). I-73 North will cross several agricultural ditches that are present in the area; however, these ditches flow in a southeasterly direction away from the lake and toward

⁴⁸ SCDHEC, Best Management Practices Handbook, <http://www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook/>, (accessed on October 12, 2016).

Cottingham Creek, which flows generally to the south away from Lake Wallace. I-73 will cross Beverly Creek, a tributary to Crooked Creek which flows into Lake Wallace, northeast of the lake. The Beverly Creek crossing is approximately 3.2 stream miles upstream of the designated impaired waters. Due to downstream beaver activity in Beverly Creek, there is no distinct channel present at the proposed I-73 crossing, however, in order to minimize wetland impacts, two 250-foot long bridges are proposed at this crossing (permit Sheet 17 of 178). It is anticipated that post-construction best management practices (BMPs), such as utilizing grassed swales in the median and no direct stormwater discharge from the proposed bridges, will be applied to the Beverly Creek crossing during the final design process.

3.10.4 Hagins Prong (PD-336) – Fecal Coliform Impaired

Hagins Prong is designated as impaired at S.C. Route 381. The Selected Alternative for I-73 North crosses Hagins Prong approximately 2.4 river-miles downstream of monitoring station PD-336 (refer to Figure 4 in **Appendix K**). The proposed alignment does not cross any streams, ditches, or wetland systems that drain into Hagins Prong north of S.C. Route 38; therefore, I-73 North will not contribute to the impairment.

Post-construction stormwater treatment measures would be applied in the North Carolina portion of the Selected Alternative utilizing guidance from the most current North Carolina Division of Environmental Quality (NCDEQ) Stormwater Design Manual at the time of design.⁴⁹ Based upon the information regarding the implementation of the proposed post-construction stormwater treatment measures, I-73 North will not significantly contribute to the impairment of streams and watersheds identified along the alignment.

3.10.5 Changes to Indirect and Cumulative Impacts

No changes to indirect impacts resulting from implementation of the Selected Alternative are anticipated. As noted in the 2008 FEIS/ROD, the Selected Alternative would indirectly impact streams in five different watershed units and it is expected that 70 streams or ditches would be impacted. Water quality may also be indirectly impacted by stormwater runoff from impervious surfaces within the project study area. As explained in the 2008 FEIS/ROD, impacts to watershed units begin to occur when ten percent or more of the watershed unit is comprised of impervious surfaces.⁵⁰ Approximately 535 acres of new impervious surfaces from future residential, commercial, and industrial uses are anticipated to result from the Selected Alternative.⁵¹ When compared to the amount of total acres per watershed unit and due to the rural nature of the project study area, no impacts are likely from the Selected Alternative as a result of the increase in impervious surfaces.⁵²

Section 3.8.4 details the additional transportation and development projects that are anticipated to occur in the vicinity of the project study area; **Table 3.19** describes their anticipated impacts to wetlands and streams. These projects may cumulatively impact water

⁴⁹ NCDEQ, Stormwater Design Manual, <https://deq.nc.gov/sw-bmp-manual>, (accessed on May 2, 2017)

⁵⁰ Schueler, T. The Center for Watershed Protection. "Watershed Protection Techniques." (Vol. 1, No. 3, Fall 1994).

⁵¹ *Interstate-73 (I-73) Final Environmental Impact Statement From I-95 to future Interstate 74 in North Carolina*, November 22, 2008, p. 3-258.

⁵² *Interstate-73 (I-73) Final Environmental Impact Statement From I-95 to future Interstate 74 in North Carolina*, November 22, 2008, p. 3-259.

quality as they increase the amount of impervious surfaces that will be located in the watersheds, contributing to stormwater runoff. Prior to any construction, the proper permits for stormwater control and runoff would need to be obtained for these projects. These projects would require that standards be met for stormwater run-off control and treatment. The requirements are designed to minimize potential impacts to water quality and volumes during construction and subsequent operation of these facilities.

3.11 Floodplains

In the 2008 FEIS/ROD, it was determined that the Selected Alternative had five floodplain crossings, with a total of 3,890 feet of linear impacts and 15.4 acres of floodplain encroachment. These crossings are located where the Selected Alternative intersects with the Beverly Creek, Cottingham Creek, Hagins Prong, Little Reedy Creek, and Little Reedy Creek Tributary 5 (refer to **Figure 3-3**).

In order to verify the previous floodplain impacts, the most recent Flood Insurance Rate Maps for the project area were reviewed. This review found one major change that has occurred in the classification of floodplains in the project area since the 2008 FEIS/ROD was approved. **Table 3.22** shows the classifications of stream crossing areas in the 2008 FEIS/ROD and 2017 re-evaluation for comparison.

Location	2008 FEIS/ROD	2017 Re-evaluation
Beverly Creek	Zone A	Zone A
Cottingham Creek	Zone A	Zone AE with floodway
Hagins Prong	Zone A	Zone A
Little Reedy Creek	Zone A	Zone A
Little Reedy Creek	Zone A	Zone A
Little Reedy Creek	Zone A	Zone A

While the classification for five of the six floodplain crossings remained the same between 2008 and 2017, the classification for the Cottingham Creek crossing changed from Zone A to Zone AE with floodway. As mentioned, floodplains classified in Zone AE have base flood elevations. Floodplains classified as Zone AE with floodway, as the Cottingham Creek crossing is, classified, require a No-Rise Certification or a Conditional Letter of Map Revision (CLOMR)/Letter of Map Revision (LOMR) before impacts are permissible. Per FEMA guidance, “any project in a floodway must be reviewed to determine if the project will increase flood heights. An engineering analysis must be conducted before a permit can be issued. The community's permit file must have a record of the results of this analysis, which can be in the form of a No-rise Certification.”⁵³ A CLOMR/LOMR is “FEMA's comment on a proposed project that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the

⁵³ FEMA, “No-Rise Certification,” <https://www.fema.gov/no-rise-certification-floodways>, (Accessed October 9, 2016).

existing regulatory floodway, the effective Base Flood Elevations, or the Special Flood Hazard Area.”⁵⁴

Table 3.23 summarizes the change in impacts as a result of the re-classification of Cottingham Creek.

Table 3.23		
Floodplain Crossing Locations and Impact Areas of the Selected Alternative		
Location	2008 FEIS/ROD Impact (linear feet/acres)	2017 Re-evaluation Impact (linear feet/acres)
Beverly Creek	300/0.5	300/0.5
Cottingham Creek	1,160/4.5	1,362/9.1
Hagins Prong	740/3.3	740/3.3
Little Reedy Creek	360/0.4	360/0.4
Little Reedy Creek	1,080/5.4	1,080/5.4
Little Reedy Creek	250/1.3	250/1.3
Total Impacts	3,890/15.4	4,092/20.0

As indicated in **Table 3.23**, the reclassification of Cottingham Creek resulted in a change in impacts. Impacts to the Cottingham Creek floodplain increased from 1,160 linear feet and 4.5 acres of impact, to 1,362 linear feet and 9.1 acres. This results in an overall increase of 202 linear feet or 4.6 acres of floodplain impact by the Selected Alternative.

During the final design phase of the project, a detailed hydrological study will be completed. Bridge and culvert designs will conform to the requirements in 23 CFR 650, Subpart A, *Location and Hydraulic Design of Encroachment on Floodplains*. This analysis will include establishing base flood elevations and adjusting bridge and culvert designs to minimize the risk of flooding upstream to less than one foot of rise, as required by FEMA. In addition to FEMA requirements, the USACE also evaluates floodplain hazards and floodplain impacts. The USACE will review the engineering analysis for the final design to verify that there is no change in water surface elevations or expansion/ increase of the flood hazard areas on adjacent properties. No resiliency measures are being evaluated at this time, but may be incorporated into final design, as appropriate.⁵⁵

⁵⁴ FEMA, “Conditional Letter of Map Revision,” <https://www.fema.gov/conditional-letter-map-revision>, (Accessed October 9, 2016).

⁵⁵ CEQ, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. Section V.

Chapter 4: Summary of Findings

Table 4.1 compares the impacts anticipated to result from the Selected Alternative as detailed in the 2008 FEIS/ROD and this re-evaluation. No changes to the project alignment have occurred since the 2008 FEIS/ROD; changes to impacts are a result of changes to the existing conditions or changes in guidance from federal agencies. New regulations, policies, and analysis methods are required, such as the new SCDOT and NCDOT noise policies, which change how resources are evaluated. These are detailed in Chapter 3, and have thus resulted in a change in the amount of impacts since 2008.

Table 4.1			
Comparison of Selected Alternative Impacts from 2008 FEIS/ROD through 2017 Re-evaluation			
Resource	Unit of Measure	2008 FEIS/ROD	2017 Re-evaluation
Relocations	Number	28	24
Hazardous Materials	Number	3	3
Noise	Number of Receptors	10	26
Wetlands	Acres	57.2	75.8
Streams	Linear Feet	14,994	3,322.9
Water Quality	Number	0 ORW*; 3 Impaired; 0 TMDL	0 ORW*; 3 Impaired; 1 TMDL
Floodplains	Acres	15.4	20.0
	Linear Feet	3,890	4,092
T&E Species	Number of Species	9 total Determination of No Effect or MABNLAA*	10 total Determination of No Effect or MABNLAA*
* ORW: Outstanding Resource Water, TMDL: Total Maximum Daily Load			
** MABNLAA: May Affect, But Not Likely to Adversely Affect			

4.1 Relocations

There was an overall decrease in the number of relocations due to the following:

- Dillon County: One non-residential building (place of worship) was constructed within the ROW since 2008.
- Marlboro County: Five residences were removed by property owners since 2008.
- Richmond County: One residence was constructed within the ROW since 2008.
- Scotland County: One residence was removed by the property owner since 2008.

Relocations are further discussed in **Section 3.3** of this Re-evaluation. All remaining right-of-way acquisition will occur in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended (42 U.S.C. 460 et seq.).

4.2 Hazardous Materials

The amount of impacts to hazardous materials sites has remained unchanged since the 2008 FEIS/ROD. If avoidance of hazardous materials is not a viable alternative and soils that appear to

be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed. Hazardous materials will be tested and removed and/or treated in accordance with the USEPA and SCDHEC requirements, if necessary. In addition, consistent with the commitments in the FEIS and ROD, a Spill Prevention, Control, and Countermeasures Plan will be developed to address potential impacts from spills or releases due to construction activities.

4.3 Noise

The number of noise receptors impacted has increased from 10 residential receptors to 26 residential receptors. This is due to the fact that the 2008 FEIS/ROD analysis was done using noise contours while the noise analysis for the current re-evaluation modeled each receptor within 500 feet of the Selected Alternative. In addition, there were other factors, including the following:

1. Increased detail in the analysis;
2. Change in the design year from 2030 to 2040; and,
3. Change in the assumptions of heavy truck percentages.

These factors are further explained in **Section 3.6.4** of this re-evaluation. Noise abatement, in the form of barriers were analyzed for the impacted receptors; however, it was determined that abatement measures were not reasonable or feasible based on the SCDOT and NCDOT Noise Policy. Thus no abatement is proposed for the Selected Alternative.

4.4 Waters of the United States

To calculate impacts for the 2008 FEIS/ROD, the conceptual design was overlain onto the wetland mapping that was completed prior to approval of the jurisdictional determinations, which were issued after the approval of the FEIS. During field reviews of the delineations, changes were made to refine the boundaries and limits of jurisdictional wetlands and streams. Changes to the previously estimated aquatic resources were identified and impacts were updated. For further details, please refer to **Section 3.8** of this re-evaluation. The amount of stream impacts decreased by 11,671 linear feet, while the amount of wetland impacts decreased by 18.6 acres. As previously discussed, wetland and stream impacts for the I-73 North project (within the state of South Carolina) and I-73 South would be compensated by using the Gunter's Island Site. Please refer to **Section 3.8.3** for further information about the Gunter's Island Mitigation Site.

4.5 Water Quality

Stream classifications have remained relatively the same since the 2008 FEIS/ROD, thus no additional impaired streams or outstanding resource waters would be crossed by the Selected Alternative. A TMDL was developed for one watershed since the 2008 FEIS/ROD, and the Selected Alternative would have a stream crossing over a water managed in the TMDL. As discussed in **Section 3.8** of this re-evaluation. During the final design preparation, SCDOT and NCDOT will coordinate with SCDHEC and NC-DEQ and apply post-construction water quality treatments to the sensitive streams and watersheds along the Selected Alternative for I-73 North

as required by the Section 401 Water Quality Certifications, applicable water quality manuals, and NPDES regulations.

4.6 Floodplains

Due to the reclassification of the Cottingham Creek floodplain from Zone A to Zone AE with floodway, the amount of floodplain impacts increased by 4.6 acres and 202 linear feet. For further information please refer to **Section 3.11** of this re-evaluation. During the final design phase of the project, a detailed hydrological study will be completed. Bridge and culvert designs will conform to the requirements in 23 CFR 650, Subpart A, *Location and Hydraulic Design of Encroachment on Floodplains*. This analysis will include establishing base flood elevations and adjusting bridge and culvert designs to minimize the risk of flooding upstream to less than one foot of rise, as required by FEMA. In addition to FEMA requirements, the USACE also evaluates floodplain hazards and floodplain impacts. The USACE will review the engineering analysis for the final design to verify that there is no change in water surface elevations or expansion/ increase of the flood hazard areas on adjacent properties.

4.7 Federally Protected Species

The number of listed Threatened and Endangered species in the project study area increased by two between 2008 and 2017. For further information, please refer to **Section 3.11** of this re-evaluation. However, it was found that the project would have either no effect, or may affect, but would not likely to adversely affect these species. In addition, there would be no effect to the bald eagle, which is protected under the Bald and Golden Eagle Protection Act.

Chapter 5: Conclusion

The purpose of the re-evaluation is to document the reconsideration of environmental impacts based on the passage of time between the approval of the FEIS/ROD and the present and to determine whether a supplement to the FEIS/ROD is needed.

This re-evaluation was accomplished by a thorough document review, updated traffic study and analysis, an updated noise study and analysis, site visits, and the evaluation of both public and agency comments from the Department of Army Permit Public Notice.

As stated in the Council on Environmental Quality (CEQ) regulations (40 CFR §1502.9), federal agencies are required to prepare supplements to a DEIS or FEIS if:

- (i) “The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or,
- (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.”

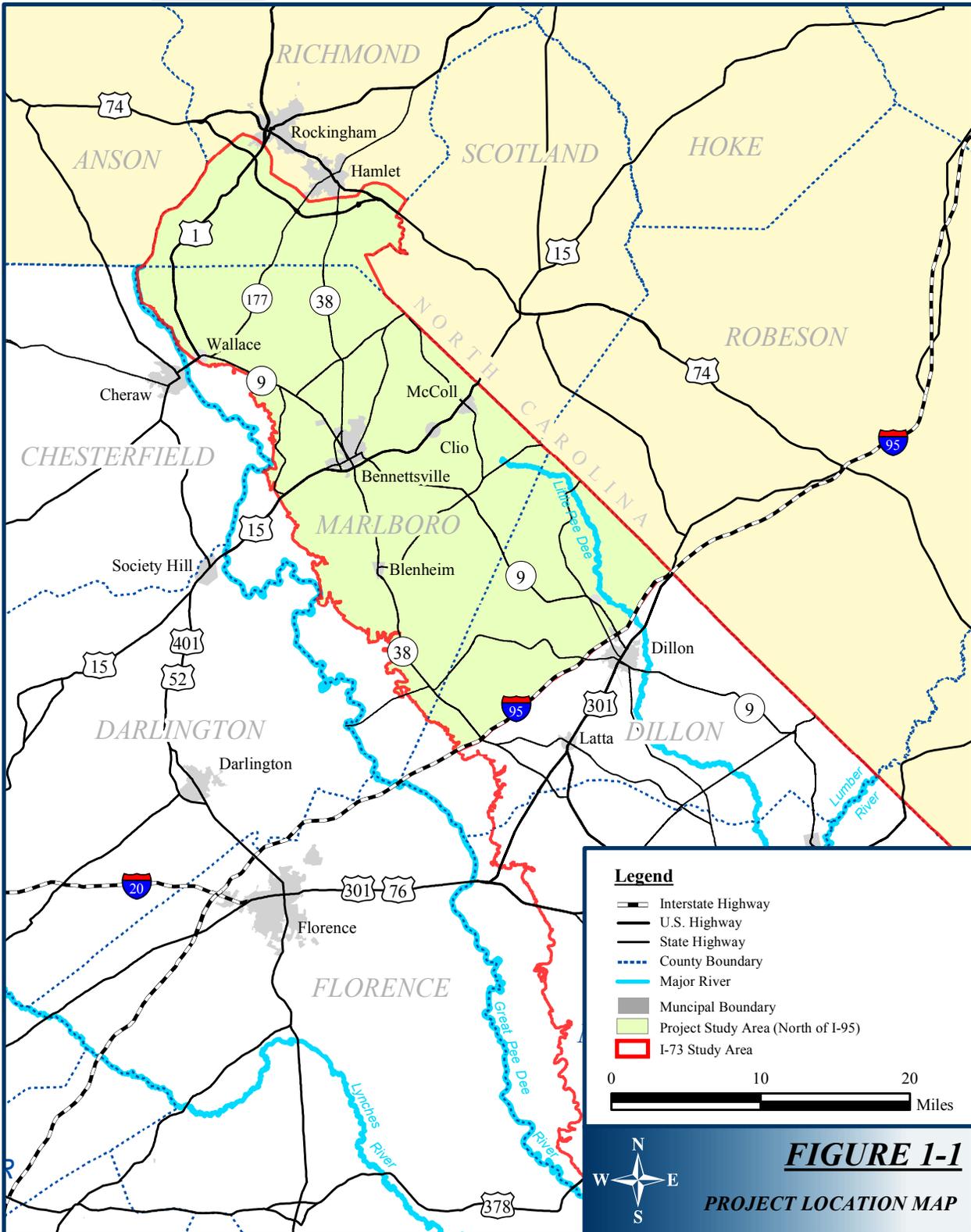
Similarly, FHWA, in its own NEPA implementing regulations [23 CFR §771.130(a)] states that a supplemental EIS would be needed “whenever the FHWA determines that:

- (i) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or,
- (ii) New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS.”

No design changes have occurred to the Selected Alternative since those evaluated in the FEIS/ROD. Overall, the affected environment has remained largely unchanged since the FEIS/ROD. **Table 4.1** notes the changes to impacts from the FEIS/ROD and the current re-evaluation. Impacts increased for several resources, primarily due to changes in laws, regulations, guidance, and policies on how these impacts are evaluated. This is fully discussed in the respective sections of this re-evaluation, and summarized in **Chapter 4**. Although impacts to a number of previously described environmental resources increased, the changes were not found to be significant and did not change the validity of the FEIS/ROD. Neither condition requiring a Supplemental EIS under the CEQ or FHWA regulations are applicable to this project.

I-73 North

Figures





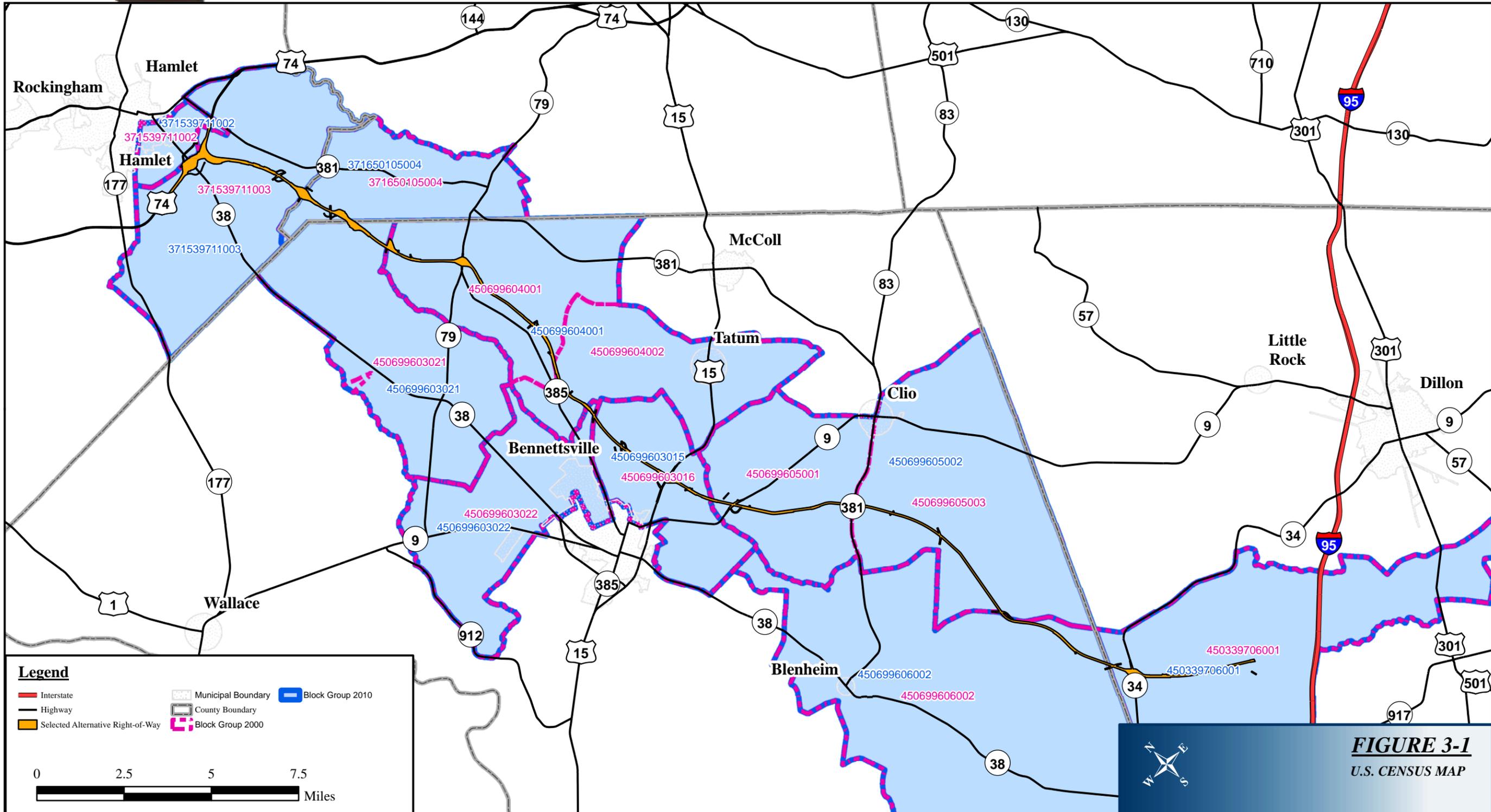


FIGURE 3-1
U.S. CENSUS MAP



FIGURE 3-2
HAZARDOUS
MATERIALS MAP

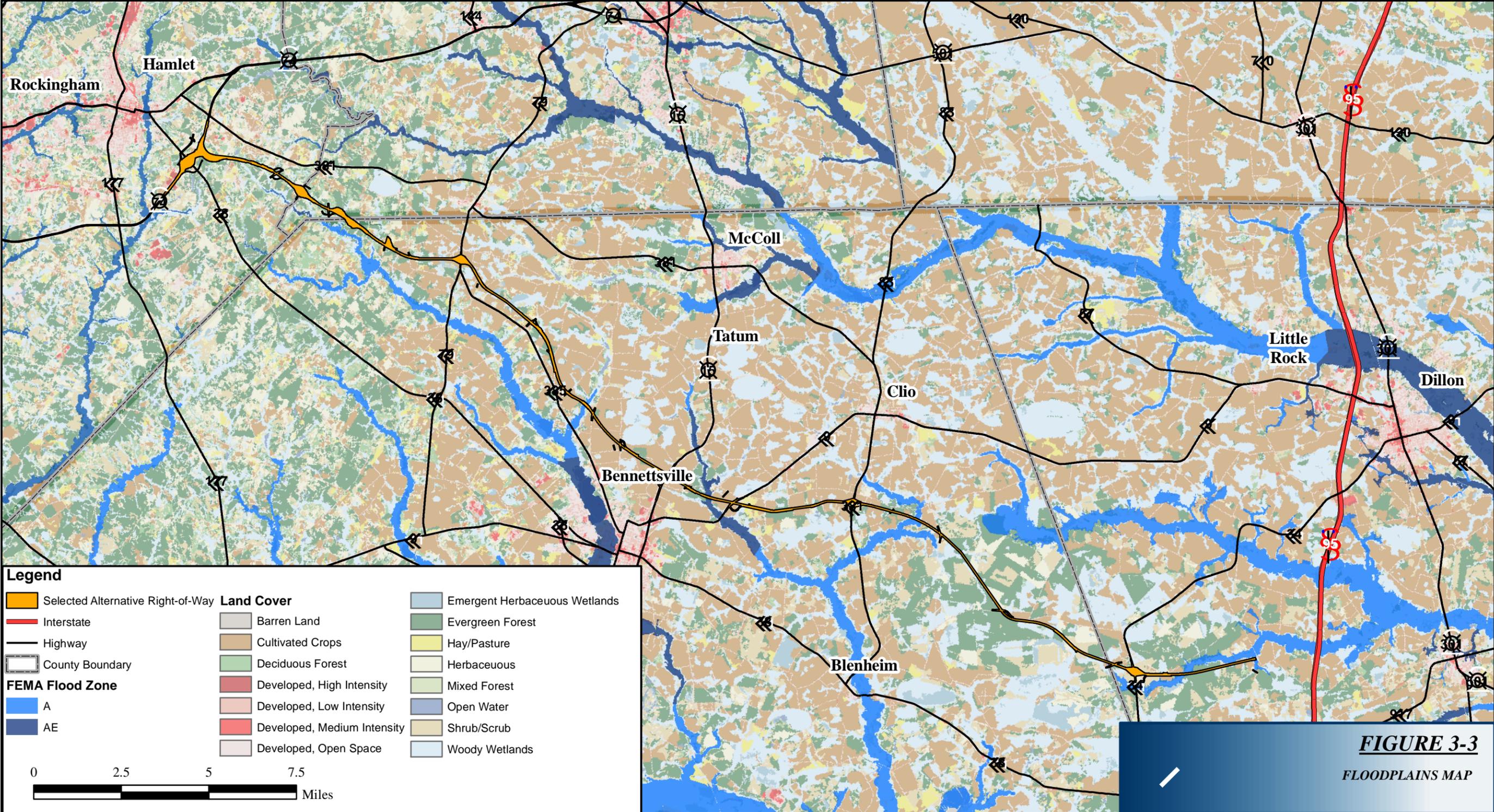


FIGURE 3-3
FLOODPLAINS MAP