

I-73 South
Dillon, Marion, and Horry Counties, South 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 South. 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

Heather M. Robbins
South Carolina Department of Transportation

5/10/2017
Date of Approval

[Signature]
Federal Highway Administration

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Date: 05/03/2017



Project ID: 36358 County: Multiple District: District 5 Doc Type: RE-Eval Total # of Commitments: 21

Project Name: I-73 South

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

Displacements

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT

The SCDOT will acquire all new right-of-way and process any relocations in compliance with the Uniform Relocation Assistance and Real Property Acquisition policies Act of 1970, as amended (42 U.S. C. 4601 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 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

Responsibility: SCDOT

Displacements

According to 49 CFR Part 24.205(A)(F), relocation planning and service will be provided to businesses. These relocation services include the following:

- Site requirements, current lease terms, and other contractual obligations;
- Providing outside specialists to assist in planning and move, assistance for the actual move, and the reinstallation of machinery and other personal property;
- Identification and resolution of personalty/realty issues;
- An estimate of time required for the business to vacate the site;
- An estimate of the anticipated difficulty in locating replacement property; and,
- An identification of any advance relocation payments required for the move.

Cultural Resources

NEPA Doc Ref: Reevaluation/FEIS/ROD

Responsibility: CONTRACTOR

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.

Project ID: 36358

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

USTs/Hazardous Materials

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT

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.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: CONTRACTOR

USTs/Hazardous Materials

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.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT

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.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT

Threatened and Endangered Species

SCDOT has agreed to implement a seasonal moratorium for all in-water work between February 1 and April 30. During this period, construction-related equipment or materials will not block more than 50 percent of the river channel. The use of turbidity controls during construction is part of SCDOT's Best Management Practices which will prevent adverse water quality effects to anadromous fishes and other species. The seasonal moratorium and construction conditions would prevent impacts to the Atlantic sturgeon in the same manner as the shortnose sturgeon.

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 the construction area in order to minimize undue traffic backups and delays.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Bike and Pedestrian Construction

Non-interstate bridges constructed to elevate roadways over the interstate would have 10-foot shoulders, which could accommodate pedestrian and bicyclists safely.

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Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Human Environmental Impact

The Preferred Alternative was shifted to travel along the edge of the Zion community to avoid impacting the Zion Grocery, which serves as an important community store and meeting place. An interchange at S.C. Route 41A would be located west of the community center, and the right-of-way limits for the interchange would have potentially impacted the Zion Grocery. However, design considerations will be incorporated into the final interchange design to ensure this important local landmark is not impacted.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: SCDOT

Borrow Pits

Sufficient upland areas that could be utilized for borrow activities are present in close proximity to the Preferred Alternative alignment. Therefore, it appears that impacts to wetlands due to the borrowing activities could be avoided. Wetland delineations would be performed at the borrow pit sites and potential impacts to federally listed species and cultural resources will be evaluated prior to beginning excavation, in accordance with the SCDOT Engineering Directive (EDM -Borrow Pit Location and monitoring).

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: SCDOT

Hydraulic Studies

The use of pipes or culverts and the final bridge lengths will be determined after performing detailed hydraulic studies during the final design phase and would be dependent on several factors, such as watershed size, and the presence of FEMA regulated floodplains and floodways.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: SCDOT

Pipe and Culvert Construction

Pipe and culvert bottoms will 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

Pipe and Culvert Construction

Properly sized pipes and culverts, as determined by the final hydraulic study, will be installed under the roadway to maintain the historic hydrologic connections of wetlands and prevent the drainage or excessive flooding of jurisdictional areas.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Side Slope 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.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Revegetation

Upon completion of the bridges, the temporary means of access will be removed and the area reseeded with native species to deter colonization by invasive species.

Non-Standard Commitment

NEPA Doc Ref: ROD

Responsibility: CONTRACTOR

Permit

A Section 404 permit from the USACE and a Section 401 Water Quality Certification from SCDHEC will be obtained for unavoidable impacts to wetlands and waters of the United States and mitigation will be completed for these impacts.

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.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

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.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: CONTRACTOR

FEMA

The selected contractor will send a set of final plans and request for floodplain management compliance to the local County Floodplain Administrator.

Date: 05/04/2017



Project ID: 36358 County: Multiple District: District 5 Doc Type: RE-Eval Total # of Commitments: 6

Project Name: I-73 South

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: Reevaluation

Responsibility: CONTRACTOR

Threatened and Endangered Species

Construction work over the Little Pee Dee River will be done inside specially built cofferdams, enabling the bridge support structures ("bents") to be built on dry land within the river. The cofferdams will be installed at the locations where the bridge support structures will later be built, then pumped dry to enable work inside. Workers then (will) install steel structural rebar and pour concrete for the bent construction. The completed bents will later support the bridge spans across the river.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT

Threatened and Endangered Species

To protect potentially spawning Atlantic and shortnose sturgeon that may be moving upriver or downriver past the site during construction, SCDOT will implement an in-water work moratorium from February 1 to April 30. Construction of cofferdams may take place before or after the moratorium, but not during the moratorium. However, once a cofferdam is built, work inside it may continue year-round.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: CONTRACTOR

Threatened and Endangered Species

Bridge construction will never obstruct more than half of the river at any one time, to prevent potential hindrance of anadromous fish passage.

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SCDOT
NEPA ENVIRONMENTAL COMMITMENTS
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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT/Contractor

Threatened and Endangered Species

The use of turbidity controls (such as Type C silt fences) during construction is part of the best management practices routinely implemented by SCDOT during construction in wetlands to prevent adverse water quality effects to anadromous fishes and other species

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: CONTRACTOR

Anadromous Fishes

SCDOT will pursue construction methods that avoid and minimize impacts to the river. The use of top down construction, temporary trestles, work barges and other low impact methods will be used to the greatest extent practicable. The contractor will be limited to methods as specified in the Section 404 permit conditions. Should construction methods dictate a deviation from what is shown in the permit, SCDOT will submit a permit modification request and any impacts that may result in hydraulic modification will be reviewed at that time.

If blasting is required in the Little Pee Dee River, a blasting plan should be developed and submitted to the NMFS for review.

Non-Standard Commitment

NEPA Doc Ref: Reevaluation

Responsibility: SCDOT

Anadromous Fishes

The SCDOT should install, inspect, and maintain appropriate erosion and sedimentation control Best Management Practices in accordance with local and state storm water guidelines to avoid sediment input into adjacent waters.

I-73 South 2017 Re-evaluation

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Appendix A – I-73 South Alternative Development Technical Memorandum

Appendix B – I-73 South 2010 NEPA Re-evaluation

Appendix C – I-73 Economic Modeling White Paper

Appendix D – Hazardous Materials Report for I-73 South (August 2016)

Appendix E – I-73 South Noise Report

Appendix F – ICE Tool Worksheets

Appendix G – I-73 South Approved Jurisdictional Determinations

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Appendix I – Final Mitigation Plan for Gunter’s Island

Appendix J – Threatened and Endangered Species Lists and Agency Coordination

Appendix K – I-73 Plan Sheets

Appendix L – USGS Topographic Figures

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

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.

benefits of improved hurricane evacuation, improved capacity for vehicular and freight 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 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

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, NC 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 conducted for the I-73 South project, between I-95 and S.C. 22. A separate re-evaluation is being completed for the I-73 North 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 the current prioritization process.

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

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 period. As a result, the following purpose and need statement was developed:

The purpose of the I-73 South project is to provide an interstate link between I-95 and the Myrtle Beach region 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 December 4, 2004, 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 South 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, 63 preliminary segments were combined to develop 141 preliminary alternatives that would connect I-95 to S.C. 22. Based on input from the public, stakeholders, and the Agency Coordination Team, many of the segments composing the 141 preliminary alternatives included upgrading segments of S.C. 38, U.S. 501, U.S. 301, U.S. 76, and S.C. 319 to interstate standards. In addition, complete upgrades of existing roadways to interstate standards were also evaluated, such as S.C. 9 and S.C. 38/U.S. 501. These details can be found in the Alternative Development

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.

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 eight reasonable alternatives for evaluation in the Draft Environmental Impact Statement (DEIS), with Alternative 3 being designated as the Preferred Alternative. Once the DEIS was issued on May 30, 2006, 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 November 29, 2007, 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 February 8, 2008. The I-73 Draft EIS, Final EIS, ROD, and supporting technical memoranda are hereby incorporated by reference.

The Selected Alternative, approximately 43.5 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 (refer to **Appendix A** for typical sections and discussion of lane, shoulder, and median widths). The Selected Alternative will have interchanges with I-95, U.S. 501, S.C. 41A, U.S. 76, S-26-308, and S.C. 22 (refer to **Figure 1-2**). The portion of S.C. 22 from the intersection of I-73 all the way to its eastern terminus of U.S. 17 is a fully controlled access roadway that would otherwise meet interstate design standards except that the paved portions of the road shoulders are too narrow. This section of S.C. 22 will be upgraded and incorporated into the I-73 facility, thus providing the direct connection to the Myrtle Beach region as well as minimize environmental impacts and reduce construction costs. Even though S.C. 22 would need minor upgrades, the footprint of the roadway would not change, thus no additional direct impacts are anticipated. The upgrades required are listed in the roadway design criteria in **Appendix A**. A separate NEPA document will be completed for the upgrade of S.C. 22, as it was not included as part of the original FEIS/ROD, nor is it part of this re-evaluation.

In the South FEIS/ROD (Section 2.8.3, page 2-82), the estimated construction cost was determined in 2006 dollars, and then factored up by six percent per year to the Years 2011 and 2016. This is listed below in **Table 1.1**.

Table 1.1 I-73 South FEIS/ROD Construction Cost Estimates	
Year	Cost
2006	\$0.964 Billion
2011	\$1.29 Billion
2016	\$1.726 Billion

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

Table 1.2 2017 I-73 South Re-evaluation Construction Cost Estimate	
Year	Cost
2017	\$1.313 Billion
2020	\$1.564 Billion
2025	\$2.093 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 the I-73 South Selected Alternative since the ROD

1.3.1 Right-of-way Acquisition

With the signing of the ROD, FHWA approved the use of available federal funding for the acquisition of right-of-way (ROW). To date, SCDOT has acquired approximately 753 acres of ROW (refer to **Figure 1-3**). This includes all properties required in Dillon County and some tracts in Marion and Horry Counties that involved a relocation or where total property takes were identified. Further information can be found in Section 3.3.

1.3.2 Value Engineering Study and 2010 Re-evaluation

I-73 South was re-evaluated in 2010 due to proposed changes in the design of the Selected Alternative after the Value Engineering Study was completed. The re-evaluation was approved on May 7, 2010, and addressed the following design changes:

- I-95/I-73 Interchange Ramp Widening;
- S.C. Route 22/I-73 Interchange Ramp Re-design;
- Barnhill Road (S-26-309) Overpass Re-alignment;
- Elimination of Rest Areas;
- Watermill Road (S-84) Overpass Embankment Re-alignment at Effingham Church Road;
- Good Luck Road (S-26-569) Re-alignment; and
- J.H. Martin Road at Joiner Swamp Road (S-26-45) Frontage Road Re-alignment.

The changes to the Selected Alternative were found to result in no new significant environmental impacts beyond those that were described in the 2007 FEIS and 2008 ROD; as a result, a supplemental EIS was not required for the project. A copy of the 2010 Re-evaluation can be found in **Appendix B**.

1.3.3 TIGER Grant

SCDOT was awarded \$10 million from the “Grants for Transportation Investment Generating Economic Recovery” (TIGER Grant) discretionary grant program in 2010. This funding was used to construct the following operationally independent segments of the I-73 South project in Dillon County (refer to **Figure 1-4**):

- The bridge over Catfish Church Road (S-63) was replaced and lengthened to accommodate the new interchange;
- The frontage road associated with Catfish Church Road was realigned; and,
- Improvements were made to the U.S. 301 interchange with U.S. 501.

Because none of the improvements required a permit for wetland impacts, construction was possible prior to receipt of a Section 404 permit from the U.S. Army Corps of Engineers (USACE) and Section 401 Water Quality Certification from the South Carolina Department of Health and Environmental Control (SCDHEC). Construction on these improvements was completed in 2013.

1.3.4 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 USACE’s concerns to SCDOT and FHWA. These concerns are being addressed as part of this re-evaluation.

1.4 Current (2017) I-73 South Re-evaluation

The I-73 South 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 federal 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 last re-evaluation and FEIS/ROD, determine what changes to 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 is required.

There have been no changes to the final project alignment since the 2010 Re-evaluation (refer to **Appendix B**). 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, 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. This re-evaluation also incorporates the 2010 Re-evaluation to provide an overall summary of changes since the ROD was issued in 2008. 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.

¹¹ 23 CFR §771.129

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

Chapter 2: Purpose and Need of I-73 South

The purpose of the I-73 South project is to provide an interstate link between I-95 and the Myrtle Beach region 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 I-95 and the Myrtle Beach region.
- Economic Development – Enhance economic opportunities and tourism in South Carolina.

The secondary needs for the project are the following:

- Hurricane Evacuation – facilitate a more effective evacuation of the Myrtle Beach region during emergencies.
- Relieve Local Traffic Congestion – Reduce existing traffic congestion on roads accessing the Myrtle Beach region.
- Multimodal Planning – Allow for future provision of a multimodal facility within the Interstate Corridor.

2.1 System Linkage

I-73 South will improve national and regional connectivity by serving as a direct link between I-95 and the Myrtle Beach region. In 2015, the population of Horry County was 309,199¹³ as compared to 196,629 in 2000¹⁴ (a 35 percent increase). Horry County is the 4th most populated county in South Carolina, and is the most populated county in the state not currently served by an interstate. System linkage is particularly important due to the heavy traffic that occurs in the Myrtle Beach region during the tourist season, which stretches from April to September. The American Automobile Association (AAA) ranked Myrtle Beach third in the nation in 2015 as a summer travel destination with visitors, outranked only by Orlando, Florida and Miami, Florida.¹⁵ More than 16.1 million people visited the Myrtle Beach Region in 2013 – its highest number to date.¹⁶ The current roads between Myrtle Beach and I-95, such as U.S. Route 501, U.S. Route 378, and S.C. Route 9, are heavily used during the tourist season. No new roadways have been constructed or are currently planned between I-95 and the Myrtle Beach region that would provide for the same level of national and regional connectivity. Thus, the primary need of system linkage is still valid.

¹³ American FactFinder, 2016. Accessed at https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2015_PEPANNRES&prodType=table

¹⁴ *Interstate 73 Final EIS: I-95 to the Myrtle Beach Region*, November, 2007.

¹⁵ American Automobile Association, “AAA Travel Lists Top Summer Vacation Destinations,” <http://newsroom.aaa.com/2015/06/aaa-travel-lists-top-summer-vacation-destinations-2/>, June 8, 2015, (Accessed September 13, 2016).

¹⁶ Myrtle Beach Area Chamber of Commerce, *Statistical Abstract for the Myrtle Beach Area of South Carolina*, 24th edition, February 2015, <http://www.myrtlebeachareachamber.com/research/docs/24theditionstatisticalabstract.pdf> (Accessed September 13, 2016).

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.

Table 2.1					
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	Amenities				
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 EIS

The process to estimate economic impacts for the I-73 South study area varies from the original study conducted for the FEIS. 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.

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 FEIS/ROD, the benefits were input directly into REMI, and reflect the advantages of directly corresponding modeling inputs with outputs. The current reevaluation of the economic impact was completed by using a replica of the previous process for consistency and comparability. The estimation process for the re-evaluation 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 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 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 South Economic Modeling Results

Based on the updated TDM, construction of the I-73 South Selected Alternative would result in an average daily, network-wide increase in VMT by 174,600 and 204,900 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 VHT by 2,700 and 13,800 for 2010 and 2040, respectively (refer to **Table 2.2**). TDM characteristics for 2025 are interpolated from the base and forecast years, and projected as an 189,400 increase in daily VMT and a 7,200 decrease in VHT.

	2010	2025	2040
TDM (Daily)			
no build VMT	299,308,819	341,695,058	390,083,770
build VMT	299,483,398	341,884,435	390,288,637
Δ VMT	174,579	189,377	204,866
no build VHT	7,196,023	8,837,011	10,852,213
build VHT	7,193,358	8,829,774	10,838,459
Δ VHT	-2,665	-7,237	-13,755
Monetized Annual Benefits			
Travel Time	N/A	\$54.4	\$106.1
Vehicle Operating	N/A	-\$10.5	-\$11.5
Accidents	N/A	-\$17.5	-\$18.8
Emissions	N/A	-\$16.2	-\$17.3
Total	N/A	\$10.2	\$58.5
REMI Policy Variables			
Production Cost Savings	N/A	\$7.5	\$24.3
Consumer Re-spending	N/A	-\$13.5	-\$14.4
Amenities	N/A	\$16.2	\$48.7
Total	N/A	\$10.2	\$58.5
Economic Impacts			
GRP	N/A	\$10.8	\$43.6
Employment	N/A	106	365
Income	N/A	\$7.4	\$32.5
Note: All monetized data are in millions of 2016 dollars			

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 South amount to \$10.2 million in 2025, escalating to \$58.5 million in 2040 (refer to **Appendix C**). 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 benefits are categorized by policy variables for deriving economic impact measures via applying simple ratios of annual GRP/production cost savings from work done for the South Carolina Multimodal Transportation Plan (SC MTP). Such policy variables, specifically the production cost savings, translate via the ratio application into GRP impacts from \$10.8 million in 2025 to \$43.6 million in 2040. Given SC MTP effective ratios of average GRP-and income-per-employee, the GRP impacts translate into 106 jobs earning \$7.4 million in 2025, to 365 jobs earning \$32.5 million in 2040.

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

The stand-alone analysis for the I-73 South 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 effect.¹⁷ The results show that the economic effects of the projects together are more than twice the simple aggregation of the individual North and South segments' impacts. This overview likely reflects the true regional impact of these two independent projects.

2.3 Severe Weather Evacuation

Safe and expeditious severe weather evacuation is a concern for the Myrtle Beach Region due to coastal proximity and population increase. In 2015, the population of Horry County was 309,199¹⁸ as compared to 196,629 in 2000¹⁹ (a 35 percent increase). In addition, the Myrtle Beach Region sees 16.1 million visitors a year (as of 2013), with the highest tourist occupancy rates occurring from April to September (53 percent to 83 percent).²⁰ This coincides with the Atlantic Hurricane season, which runs from June 1 to November 30.²¹ In the event of a man-made threat or natural disaster, there are five designated hurricane evacuation routes that connect U.S. 17 to I-95: S.C. 9; U.S. 501; S.C. 22 (which connects to U.S. 501 in Aynor); S.C. 544 (which connects to U.S. 501 in Conway) and U.S. 521 from Georgetown. In addition, U.S. 378, a designated hurricane evacuation route, connects U.S. 501 in Conway to I-95 in Turbeville.²²

In support of the FEIS/ROD, a study was completed to evaluate the effect I-73 would have on the efficiency of evacuating residences and tourists from the Myrtle Beach Region. The *I-73 Environmental Impact Statement Hurricane Evacuation Analysis*²³ focused on evacuation times for U.S. 501, as it is the primary evacuation route for the region and has the largest number of bottlenecks, and S.C. 9. The EIS study compared evacuation times for the year 2005 and the year 2030 assuming high tourist occupancy with and without I-73, and if lanes were reversed on I-73, including S.C. 22.²⁴ The evacuation times for 2005 ranged from 16 to 24 hours on U.S. 501 (with partial lane reversal), and from 9.8 to 13.4 hours on S.C. 9. Without lane reversal, the evacuation clearance times for the no-build condition (without I-73) in 2030 ranged from 24 to 37.4 hours on U.S. 501, based on storm category, and between 11.2 and 15.5 hours on S.C. 9.²⁵ The study concluded that the construction of I-73 and, due to it being a fully controlled access facility,

¹⁷ 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.

¹⁸ American FactFinder, 2016. Accessed at

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2015_PEPANNRES&prodType=table

¹⁹ *Interstate 73 Final EIS: I-95 to the Myrtle Beach Region*, November, 2007.

²⁰ *Myrtle Beach Area Chamber of Commerce Statistical Abstract 2015*;

<http://www.myrtlebeachareachamber.com/research/docs/24theditionstatisticalabstract.pdf>; accessed 10/20/16.

²¹ NOAA, National Hurricane Center, "Tropical Cyclone Climatology", <http://www.nhc.noaa.gov/climo/> (1/5/2017).

²² *SCDOT Hurricane Evacuation Map*, http://www.scdot.org/getting/pdfs/Evac_Maps/evacMap_MyrtleBeach.pdf, accessed 10/20/16

²³ *SCDOT, I-73 Environmental Impact Statement Hurricane Evacuation Analysis*. (December 2005).

²⁴ *Interstate 73 Final EIS: I-95 to the Myrtle Beach Region*, November, 2007.

²⁵ Refer to Table 1.9, page 1-23 of *Interstate 73 Final EIS: I-95 to the Myrtle Beach Region*, November, 2007.

through the use of full lane reversal on I-73, could reduce the evacuation clearance times on U.S. 501 by 10 to 15 hours, depending on storm category, and by 3.3 to 4.3 hours on S.C. 9.

The USACE completed a study in 2012²⁶ updating the evacuation clearance times for areas along the coastline based on newer 2010 U.S. Census and other data with and without a partial U.S. 501 lane reversal and S.C. 544 enhancement plan.²⁷ In addition, the study looked at different response rates the public would have to start evacuating, as well as the tourist occupancy rates. The evacuation clearance time for Horry County with U.S. 501 reversal and S.C. 544 enhancement plan ranged from 7 to 31 hours.²⁸ Without the partial lane reversals on U.S. 501 and S.C. 544 enhancement plan, evacuation clearance times ranged from 11 to 46 hours.²⁹ The South Carolina Emergency Management Department (SCEMD) also published updated clearance times in its 2016 SC Hurricane Plan, which varied by response rate, tourist occupancy and hurricane category.³⁰ Evacuation times for the Northern Conglomerate (which includes Horry and Georgetown counties) ranged from 12 to 43 hours without U.S. 501 lane reversal and S.C. 544 enhancement, and 8 to 29 hours with U.S. 501 lane reversal and S.C. 544 enhancement.³¹

Given that the USACE and SCEMD have predicted hurricane evacuation clearance times that are greater than the 2005 study, it is expected the I-73 would still have a similar effect on reducing the clearance times as it was shown in the 2005 study. Therefore, no changes in the project's role in relation to severe weather evacuation are anticipated.

2.4 Local Traffic Congestion Relief

Traffic analyses conducted for the FEIS/ROD used portions of the Grand Strand Area Transportation Study (GSATS) TDM, the Florence Area Transportation Study (FLATS), and the 2003 statewide traffic model to forecast traffic needs from the base year of 2005 to the year 2030. Due to numerous changes over the years, it was determined that an I-73 TDM would need to be developed for the proposed project. The I-73 South TDM incorporates 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. Additionally, the statewide model highway networks and origin-destination trips were stitched together, providing for a base year of 2010 and forecast year of 2040. The GSATS urban area was removed from the analysis because the I-73 South TDM used for this study is not validated for urban areas; this removal is being noted because GSATS was included in the original EIS study. While the GSATS urban area is not included in the analysis, the updated TDM roadway network does include more local, low-speed streets than the previous study.

²⁶ USACE, *South Carolina Hurricane Evacuation Study – Northern Conglomerate Transportation Analysis*, February 2012.

²⁷ *Ibid.*

²⁸ *Ibid.*, Page 61.

²⁹ *Ibid.*

³⁰ SCEMD, *SC Hurricane Plan, Annex C Evacuation Zones and Clearance Timing*, May 26, 2016.

³¹ *Ibid.* at p. 1-C-15.

Modifications to the model inputs, as well as the overall functionality of the updated model, resulted in changes in the traffic outputs as compared to those reflected in the FEIS/ROD. The enhanced features of the new I-73 South 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 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.

Upon completion of the I-73 South TDM, the following scenarios were run to assess traffic on the roadway network. These scenarios provide the information planners used to assess the operational efficiency of the Selected Alternative for I-73 South when compared to the No-Build scenario. These scenarios include:

- 2010 No-Build – Existing traffic conditions for year 2010;
- 2010 I-73 South – Existing traffic conditions for year 2010 plus the Southern portion of I-73 between I-95 and S.C. 22 (Conway Bypass);
- 2040 No-Build – Existing plus committed³² traffic conditions for year 2040; and,
- 2040 I-73 South – Existing plus committed³³ traffic conditions for year 2040 plus the Southern portion of I-73 between I-95 and S.C. 22 (Conway Bypass).

This re-evaluation summarizes the updated traffic impacts for the Selected Alternative, including changes in VMT, 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 volumes. These results cannot be compared directly to the FEIS traffic analysis because of the changes in the base and forecast year data and the fundamental changes to the updated model.

Table 2.3		
Minimum Trip Time Between I-95 and S.C. 22 in Year 2040		
	No-Build Alternative	Selected Alternative
Minimum Travel Time (Minutes)	62.0	35.0
Average Annual Daily Traffic Volume (vehicles per day)	N/A	25,377

As shown in **Table 2.3**, the minimum trip times show that the construction of I-73 will allow traffic to travel between I-95 and S.C. 22 faster, thereby increasing the distance that traffic will

³² “Existing plus committed” indicates the existing roadway network in the base year as well as projects that are committed through planning, funding, and programming.

³³ “Existing plus committed” indicates the existing roadway network in the base year as well as projects that are committed through planning, funding, and programming.

be able to travel when compared to the No-Build condition. In the No-Build condition, traffic will be able to reach S.C. 22 in approximately 62 minutes. For the Selected Alternative, the amount of time necessary for traffic to reach S.C. 22 is approximately 35 minutes. This represents a significant time savings realized by the traveling public.

The updated traffic analysis shows that the Selected Alternative would carry a large number of vehicles throughout the study area and would permit traffic to travel more efficiently to and from I-95, thereby reducing travel times when compared to the projected 2040 No-Build traffic conditions. Typically, for a congested network, the VHT should decrease with the addition of a new roadway facility. Since this area is relatively congested, the addition of I-73 would help to alleviate some of this congestion as vehicles 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 **Table 2.4**. **Tables 2.4** and **2.5** show that the average speed per trip on the network within the study area increased with the project.

Alternative	VMT	VHT	Difference from No-Build		VMT/VHT
			VMT	VHT	
No-Build	4,757,795	120,074	NA	NA	39.6
Selected Alternative	5,187,476	116,304	429,681	-3,769	44.6

Alternative	VMT	VHT	Difference from No-Build		VMT/VHT
			VMT	VHT	
No-Build	4,757,795	120,074	NA	NA	39.6
Local Network	4,129,175	101,678	-628,620	-18,395	40.6

The analyses also indicate that the Selected Alternative would decrease VMT and VHT and increase travel speed along the rest of the existing local roadway network by diverting longer distance trips, especially those related to recreational and vacation travel, onto I-73. This will help to preserve the capacity of the existing roadway network for local trips made within the study area.

2.5 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 Region 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

The resources in the human and natural environment may have changed due to the passage of time since the ROD was issued in 2008. In addition, new laws and regulations have been enacted, as well as new policies regarding the analysis of impacts. 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 since 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** on the next page.

Table 3.1
Resource Categories Evaluated for Changes

Resource	Changes since 2008
Land Use	No direct or indirect impacts; ^a update to cumulative effects discussion
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 SCDOT has acquired some right-of-way for project
Section 4(f) and 6(f)	No change ^b
Historic Resources	Yes – construction of Catfish Church Road
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	Design changes to Selected Alternative in 2010
Uplands	No change ^d
Jurisdictional Waters of the United States	Design changes to Selected Alternative in 2010 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 Detailed hydraulic study
Wild and Scenic Rivers	No change ^e
Coastal Zone Resources	No change
Indirect and Cumulative Impacts	Yes – New development project in the area since 2008; new roadway projects in study area since 2008; addressed in each affected resource category
Sources:	
^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.nrcs.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 Land Use

Land use has remained mostly unchanged within the project study area since the 2008 ROD was issued. The Selected Alternative would have the same direct and indirect impacts as discussed in the FEIS/ROD (refer to pages 3-17 to 3-18 of FEIS), as there were no additional impacts based on the design changes evaluated in the 2010 Re-evaluation.

The South Carolina Ports Authority announced plans to develop a second inland port in Dillon, South Carolina at the I-95 Mega Site industrial park, located off Harbor Freight Road at the S.C. 34 interchange with I-95.³⁴ The 173-acre facility is expected to be open by 2018, and will initially process 35,000 containers coming via an existing CSX rail line from the Charleston Port.³⁵ Eventually, the container throughput will increase to approximately 90,000 to 130,000 containers annually in 2038, with most of the expansion infrastructure being located within the industrial park.³⁶ The Mega Site industrial park is already zoned as an industrial use, so no change to zoning will occur. The new inland port could spur additional development, similar to what has occurred in the vicinity of the existing inland port in Greer, SC.³⁷ If new companies locate near the Mega Site industrial park, additional land in the vicinity of the industrial park could be converted from existing land uses to industrial uses for additional development. If this occurs, the developers would be responsible for obtaining the necessary permits and approvals to construct additional developments.

3.2 Socioeconomic and Communities

3.2.1 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.

³⁴ South Carolina Ports Authority, “SC Ports Authority Finalizes Plans to Construct Second Inland Port,” September 12, 2016, <http://www.scspsa.com/news/sc-ports-authority-finalizes-plans-to-construct-second-inland-port/> (Last accessed January 11, 2017).

³⁵ USACE, Joint Public Notice #SAC 2016-01715 (Revised), January 17, 2017, http://www.sac.usace.army.mil/Portals/43/docs/regulatory/publicnotices/Jan2017_PN/SAC-2016-01715_Revised_Dillon_County_South_Carolina_Inland_Port_Dillon.pdf?ver=2017-01-17-100408-067 February 21, 2017).

³⁶ *Ibid.*

³⁷ SCSPA, “Dillon Inland Port 2016 Tiger VIII Grant Application,” April 29, 2016, pp. 15-16, <http://www.scspsa.com/wp-content/uploads/dillon-inland-port-project-narrative-tiger.pdf> (January 11, 2017).

This section highlights changes to socioeconomic data for communities within the study area is outlined in the tables below. **Table 3.2** demonstrates how the population within the project study area has changed. As reflected in the table, population growth varies significantly between the counties within the project study area. As expected with coastal counties, Horry County has experienced significantly more growth (27 percent) than the other counties in the study area. Dillon County experienced a modest four percent change between 2000 and 2010. Marion County, by contrast, had a population decline of seven percent.

	2000	2010	Percent Change (2000 -2010)
Dillon County	30,720	32,060	4%
Horry County	196,630	269,290	27%
Marion County	35,460	33,060	-7%
South Carolina	4,012,012	4,625,364	13%

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

Table 3.3 shows how demographics within the counties and communities of the project study area have changed since the 2000 Census. The demographic composition of counties and communities within the project study area generally remained consistent between the 2000 and 2010 Census. Latta and Marion saw small decreases in their population, while Mullins lost nearly ten percent of its population. Mullins also had a six percent increase in minority populations. Each county saw a small increase of one to three percent in their senior citizen populations, and the percentage of households with school-age children also increased in each county.

	Population 2000	Population 2010	% Minority 2000	% Minority 2010	% Over age 65 2000	% Over age 65 2010	% Households w/ school-age children 2000	% Households w/ school-age children 2010
Dillon County	30,722	32,062	49%	52%	12%	13%	35%	36.5%
Dillon	6,316	6,788	46%	43%	16%	16%	43%	34.6%
Latta	1,410	1,379	42%	41%	18%	17%	24%	29.3%
Horry County	196,629	269,291	19%	20%	15%	17%	26%	27%
Aynor*	587	560	14%	18%	15%	19%	35%	33%
Marion County	35,466	33,062	58%	59%	12%	15%	32%	33.4%
Marion	7,042	6,939	68%	72%	15%	15%	30%	35.1%
Mullins	5,029	4,663	63%	69%	17%	18%	36%	32.1%

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

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

* Aynor falls within one of the Block Groups that changed from 2000 to 2010. Two Block Groups were combined to make one larger Block Group and is limited in the ability to compare 2000 census data to 2010 census data.

When evaluating economic characteristics of the counties and communities within the project study area, **Table 3.4** notes that each county has experienced growth in an economic capacity. While Dillon County saw a relatively small increase in its median household income between 2000 and 2010, Horry County saw median household incomes grow by more than eighteen percent and Marion County saw growth of more than fifteen percent. However, the percentage of the population living below the poverty level also increased in each county between 2000 and 2010.

	Median Household Income 2000	Median Household Income 2010	% below Poverty level 2000	% below Poverty level 2010	Households w/ no vehicle 2000	Households w/ no vehicle 2010	Median value of owner occupied homes 2000	*Median value of homes 2010
Dillon County	\$26,630	\$26,818	24%	30%	15%	14%	\$60,700	\$61,400
Dillon	\$25,267	\$26,477	26%	28%	24%	21%	\$68,300	\$121,600
Latta	\$25,833	\$30,048	21%	28%	19%	16%	\$59,000	\$74,600
Horry County	\$36,470	\$43,142	12%	15%	7%	5%	\$119,700	\$170,100
Aynor**	\$29,583	\$42,500	20%	16%	7%	20%	\$92,100	\$185,600
Marion County	\$26,526	\$30,629	23%	25%	16%	13%	\$63,500	\$82,500
Marion	\$24,265	\$23,003	27%	40%	23%	23%	\$58,500	\$97,900
Mullins	\$20,154	\$29,701	29%	32%	25%	18%	\$60,800	\$89,200

Source: U.S. Census Bureau, 2000/2010 U.S. Census.
*Median value home costs were used for 2010 data sets
Block Groups changed between the 2000 to 2010 census that includes boundaries and sizes and do not allow for straight comparison between years.
** Aynor falls within one of the Block Groups that changed from 2000 to 2010. Two Block Groups were combined to make one larger Block Group and is limited in the ability to compare 2000 census data to 2010 census data.

Each community and county, with the exception of the city of Marion, saw median household incomes increase between 2000 and 2010. All counties and communities saw an increase in median housing value. Positive economic news is also reflected in the unemployment data for the project study area, which is shown in **Table 3.5**.

	2006 Unemployment Rate	2015 Unemployment Rate	Change
Dillon	9.5%	8.7%	-0.8%
Horry	5.4%	7.0%	1.6%
Marion	12.2%	10.0%	-2.2%
Three-County Average	9.0%	8.6%	-0.5%
South Carolina	6.5%	6.0%	-0.5%
United States	4.6%	5.3%	0.7%

Source: South Carolina Employment Security Commission, "Labor Force and Employment Data, 2006"/
Community Profiles 9/19/2016, South Carolina Employment and Workforce

The counties within the project study area have generally had a decrease in unemployment rates

between 2006 and 2015, with Dillon County seeing a 0.8 percent decrease in its unemployment rate and Marion County experiencing a 2.2 percent decrease. Horry County has seen its unemployment rate increase by 1.6 percent. Horry County’s robust tourism industry was hit hard by the 2008 recession, but has since shown considerable improvement. Horry County’s unemployment rate is also similar to that of South Carolina and the United States as a whole. **Table 3.6** lists the major employers for each county within the project study area.

Table 3.6 Top Employers by County		
Employer	Number of Employees	Product
Dillon County		
<i>Perdue Farms</i>	<i>1050</i>	<i>Poultry processing</i>
Dillon Yarn	423	Synthetic yarn
<i>South of the Border</i>	<i>450</i>	<i>Tourism</i>
<i>Wix Corporation</i>	<i>374</i>	<i>Oil and air filters</i>
<i>McLeod Health</i>	<i>320</i>	<i>Medical care</i>
<i>Franco Manufacturers</i>	<i>300</i>	<i>Kitchen accessories distribution</i>
<i>Harbor Freight Tools</i>	<i>240</i>	<i>Tool distribution</i>
Horry County		
<i>Horry County Department of Education</i>	<i>4000</i>	<i>Education</i>
Burroughs & Chapin Co.	2214	Real Estate & Development
<i>Wal-Mart Associates Inc.</i>	<i>1792</i>	<i>Customer service</i>
<i>Horry County Gov.</i>	<i>1470</i>	<i>Government</i>
AVX-Conway	1380	Electronic Components
<i>Conway Hospital Inc.</i>	<i>1000</i>	<i>Health Care</i>
<i>Grand Strand Regional Medical Center</i>	<i>1000</i>	<i>Health Care</i>
Myrtle Beach National	960	Golf Course Management
Marion County		
<i>Arvin Meritor</i>	<i>734</i>	<i>Automotive components</i>
Blumenthal Mill, Inc.	770	Woven damask jacquard
<i>Beneteau USA, Inc.</i>	<i>245</i>	<i>Sailboats</i>
Sara Lee Hosiery	210	Women’s hosiery
Precision Southeast	210	Plastic parts molding
<i>SOPAKCO</i>	<i>200</i>	<i>Military rations packaging</i>
Datwyler Rubber & Plastics	143	Plastic and rubber moldings
SLI Lighting	105	Light bulbs
Source: US Census Bureau, American Fact Finder Census 2000 Demographic Profile Highlights.		
Italicized text indicates employers listed in the FEIS that are still listed as major employers in the study area.		

Fourteen of the twenty-three major employers within the three counties in the study area are still listed top employers or still in operations when compared to the analysis in the FEIS/ROD. Since completion of the FEIS/ROD, the following companies have been noted as major

employers in the Community Profiles of Dillon, Marion and Horry Counties from the South Carolina Department of Employment and Workforce:

Dillon County³⁸

Signode Industrial Group, LLC
West Rock Services, LLC
Wal-mart
LUIHN Four, Inc.

Horry County³⁹

Lowes Home Center
Hilton Worldwide, Inc.
Coastal Carolina University
Southeast Restaurant Corps

Marion County⁴⁰

Anderson Brothers Bank
McLeod Physician Assoc.
Pitbull Enterprises
CCBCC, Inc.

3.2.2 Changes to socioeconomic impacts since the FEIS/ROD

Communities detailed in the FEIS/ROD 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 in order to assess any changes. The communities studied in the FEIS/ROD are listed below:

- Latta;
- Temperance Hill;
- Zion;
- Mullins;
- Aynor;
- Cool Springs;
- Methodist Rehobeth;
- Joiner;
- Ketchuptown;
- Poplar Hill; and,
- Bakers Chapel.

The 2010 Re-evaluation analyzed potential community impacts to the communities where design changes were occurring, including Bakers Chapel, Joiner, Mallory, Methodist Rehobeth, and Mullins. It was determined no additional impacts would occur to these communities as a result of the minor design changes (refer to **Appendix B**). When aerial photography from 2015 was compared to photography from 2006, no significant changes in land use or increases in development were observed in the communities in the project study area. Thus no changes are anticipated to the impacts discussed in the FEIS/ROD or 2010 Re-evaluation for community cohesion, visual impacts, access and travel patterns, or projected development. For changes to relocations and noise impacts, please refer to **Section 3.4** of this re-evaluation.

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

³⁸ *Community Profile, Dillon County, by the SC Department of Employment and Workforce, 9/19/2016*

³⁹ *Community Profile, Horry County, by the SC Department of Employment and Workforce, 9/19/2016*

⁴⁰ *Community Profile, Marion County, by the SC Department of Employment and Workforce, 9/19/2016*

would have a positive socioeconomic benefit to the Dillon area. Thus, cumulative effects to the socioeconomics of the project study area would be the same as those discussed in the FEIS/ROD, except for the Dillon area, which is expected to see an additional positive socioeconomic effect due to the inland port.

3.3 Environmental Justice

Since the finalization of the FEIS/ROD and 2010 Re-evaluation, 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 FEIS/ROD.

In order to determine what changes occurred amongst environmental justice populations, data from the 2000 and 2010 Census were compared. **Table 3.7** presents minority and poverty data from both the 2000 and 2010 Census for the state of South Carolina and the three counties that comprise the project study area.

Table 3.7 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%
Dillon County	30,722	32,062	15,780	16,663	49%	52 %	3%
Horry County	196,629	26,9291	42,323	54,220	19%	20%	2%
Marion County	35,466	33,062	21,313	19,628	58%	59%	1%

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

As demonstrated in **Table 3.7**, minority population percentages were generally stable between 2000 and 2010. All counties within the project study area maintained a percentage of minority populations within 2% of the previous data. Both Dillon and Marion Counties have higher minority population percentages than the state of South Carolina, while Horry County has a lower minority population.

Each county within the project study area experienced an increase in the percentage of its population living below the poverty level from 2000 to 2010. **Table 3.8** shows the percentage below poverty for each county and how the percentages have changed. Dillon County saw the largest change, with an additional six percent of its population falling below the poverty line in 2010, while Horry County and Marion County reflected three percent and two percent increases, respectively. South Carolina observed a two percent increase in the percentage of its population living below the poverty level.

	Total Population		Total Below Poverty		Percent Below Poverty		Difference (2010-2010)
	2000	2010	2000	2010	2000	2010	
South Carolina	4,012,012	4,625,364	547,869	716,537	14 %	16 %	2%
Dillon County	30,722	32,062	7,311	9,490	24 %	30 %	6%
Horry County	196,629	269,291	23,356	41069	12%	15%	3%
Marion County	35,466	33,062	8,117	8,271	23%	25%	2%

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

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 FEIS/ROD.

It was determined in the FEIS/ROD and 2010 Re-evaluation 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.

3.4 Relocations

Table 3.9 summarizes the number of relocations within the project right-of-way of the Selective Alternative and notes the changes that have occurred to the number of relocations since the 2008 ROD.

Table 3.9				
Summary of Relocations within the Project Study Corridor				
	2008 ROD	2010 Re-evaluation	2017 Re-Evaluation	Change from 2008 ROD
Dillon County*				
Residential	8	8	0	-8
Non-residential	2	2	0	-2
Marion County				
Residential	48	48	26	-22
Non-residential	1	1	3	+2
Horry County				
Residential	18	18	12	-6
Non-residential	1	1	1	-
TOTAL	78	78**	42	-36
*All right-of-way has been acquired in Dillon County, thus no relocations are left to be acquired.				
**Note: a house was constructed after the 2008 ROD that was identified during the VE Study. To avoid relocating this house, a frontage road was realigned, which resulted in avoiding this residence.				

In 2008, the total number of relocations was 78, including 74 residential relocations, and 4 non-residential relocations (3 businesses and 1 waste transfer facility). As shown above, the number of relocations was reduced overall since the 2008 ROD and 2010 Re-evaluation. The following changes have occurred to the number of relocations since 2008:

- In Dillon County, all the right-of-way has been acquired for the project; thus, no relocations are left to acquire in Dillon County.
- In Marion County and Horry County, the finalization of the right-of-way plans resulted in an overall reduction of relocations. In addition, some properties were acquired since the signing of the ROD, further reducing the number of remaining relocations that need to be acquired.
- In Marion County, two non-residential properties (a business and place of worship) were constructed within the future right-of-way of I-73, bringing the total number of non-residential relocations in Marion County to three.

No additional ROW impacts are anticipated in Dillon County, as all of the right-of-way for I-73 is now owned by SCDOT. However, if a property owner in Marion County or Horry County whose property has not yet been acquired decides to construct a residence, business, etc., within the finalized right-of-way limits, then additional relocations could occur.

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.

3.5 Historic Resources

Based on the results of the cultural resources surveys in the FEIS/ROD and 2010 Re-evaluation, the Selected Alternative would not impact any NRHP-eligible or listed sites. Two buildings and a cemetery, which were identified as potentially eligible for the NRHP in the FEIS/ROD and 2010 Re-evaluation, were located in the vicinity of the Catfish Church Road improvements that were completed as part of the TIGER-funded construction. These improvements were completed in 2013, and construction did not impact these potentially eligible properties, and thus no mitigation was required for these sites. As part of the current Re-evaluation, architectural resources were evaluated to see if any have become potentially eligible for the NRHP due to the passage of time. No new architectural resources were identified as potentially eligible during this review. Archaeological resources were not evaluated as there have been no changes to the alignment since the 2010 Re-evaluation. Thus, the Selected Alternative for I-73 South is not anticipated to impact any historic and cultural resources.

Consistent with the commitment in the 2008 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.

3.6 Hazardous Materials

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 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 (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.

In 2015, the list was formerly known as CERCLIS was renamed to SEMS by the United States Environmental Protection Agency (USEPA). SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of USEPA's Superfund Program across the United States. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). 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 3.10** 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.

Table 3.10			
Listed Hazardous Materials and Waste Sites Potentially Impacted by the Selected Alternative			
Site	Site Name	Description	Status
Sites Listed in the FEIS			
23	Luther Martin Grocery	Identified in the FEIS and is listed on the EDR report. Located adjacent to the proposed alignment.	One 3,000 gallon capacity gasoline UST and two 2,000 gallon capacity gasoline USTs, all of which have been removed. A LUST was reported in June 2001, but received a status of no further action in November 2001.
8	Lanes Convenience Store	Identified in the FEIS and is listed on the EDR report.	Currently, there are four fuel ASTs present and in use.
25	Penske Truck Leasing	Identified in the FEIS and is listed on the EDR report.	The only information provided on this site is that it was on the LUST database with No Further Action required in March 1996. The report does show an abandoned 1,000-gallon waste oil tank.
Newly Identified Sites Not Listed in the FEIS			
13	R&J Kwik Stop	(New) The site is impacted by the Selected Alternative and has been identified for information purposes. Site is an active gas station.	Located on the SPILL database; no additional information was available. Currently, there is one AST on the site.
19	S&H Quick Stop	The proposed site was identified on the 2005 EDR report but did not include information on the location of the site (Orphaned Site). The 2016 report provided the location and site information. Site is currently abandoned.	Located on the UST and LUST databases having two abandoned 1,000-gallon capacity gasoline USTs, one abandoned 550-gallon capacity gasoline UST, and three 2,000-gallon gasoline showing to be "Extended out of use". A release date of 11/08/1989 was confirmed in December of the same year but no cleanup was reported.
Sites Present with No History of Violations/enforcement – For Informational Purposes			
10	Rocktenn Latta Corrugate/ Westrock CP LLC/ St. Laurent PaperBoard	(New) The site is located adjacent to the Selected Alternative and has been identified for information purposes.	Identified as having an AST between 15,000-gallon tank. No enforcement actions in the last 5-years.
11	Packaging Corp of America (Signode)	(New) The site is located adjacent to the Selected Alternative and has been identified for information purposes.	No violation found.
LUST – Leaking Underground Storage Tank UST – Underground Storage Tank AST – Aboveground Storage Tank			

As shown in **Table 3.10**, four new sites were identified in the current review of databases: R&J Kwik Stop; S&H Quick Stop; Rocktenn Latta Corrugate/Westrock CP LLC/St. Laurent PaperBoard; and, Packaging Corp of America (Signode). Despite the identification of four new sites, no additional impacts to hazardous materials sites are anticipated; two of the sites have no history of violations or enforcement and the others are not anticipated to pose a concern. The three sites identified in the FEIS/ROD, Luther Martin Grocery, Lanes Convenience Store, and Penske Truck Leasing, will be impacted by the Selected Alternative. Based on reviews of the updated data, the impacts of the Selected Alternative remain consistent with the impacts analysis presented in the 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 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.

3.7 Noise

A traffic noise analysis was conducted as part of the FEIS/ROD and 2010 Re-evaluation, and found that a total of thirteen receptors would be impacted by noise, all of which were residential uses.^{41, 42} Since 2010, 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**.

3.7.1 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-nine 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**.

⁴¹ *Interstate 73 Final EIS: I-95 to the Myrtle Beach Region*, November, 2007, p. 3-114.

⁴² *Interstate 73 South: Dillon, Marion, and Horry Counties, South Carolina, Final Environmental Impact Statement Re-Evaluation*, May 7, 2010, p. 4.

3.7.2 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 Average Annual Daily Traffic (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, 73-85 percent of the DHV was automobiles, pickup trucks and SUVs. The percent of medium duty trucks of the DHV was assumed to be 6-10 and the percent of heavy duty trucks was assumed to range from 9-17. **Appendix E** identifies the fleet mix for each specific link. A speed limit of 70 miles per hour (mph) was used for I-73 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 317 receptors were included in the noise model.

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 Noise Abatement Criteria (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 3.11 on the following page contains the various NAC categories and a description for each.

3.7.3 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 71 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.

Table 3.11
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.

SOURCE: FHWA, 23 CFR Part 772, Table 1.

\1\ Either Leq(h) or L10(h) (but not both) may be used on a project.

\2\ The Leq(h) and L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

\3\ Includes undeveloped lands permitted for this activity category.

3.7.3.1 Noise Modeling Results

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 0.1 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 11.4 dBA, while an increase of 11.3 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 97 receivers, all of which are residential land uses.

3.7.3.2 Changes since FEIS/ROD and 2010 Re-evaluation

The FEIS/ROD and 2010 Re-evaluation reported a total of thirteen receptors impacted by noise, all of which were residential uses.^{43,44} The analysis performed in support of this evaluation determined that 71 receptors of residential use would be impacted by noise resulting from the Proposed Project (refer to **Appendix E**), an increase of 84 impacted receptors. There are three reasons why the analysis performed for this re-evaluation produced different results from the 2007 FEIS and 2010 Re-evaluation analyses:

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.

The analysis performed for this re-evaluation is substantially more detailed than the analysis performed in the FEIS/ROD and 2010 Re-evaluation. The analyses for both the FEIS/ROD and 2010 Re-evaluation 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 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

⁴³ *Interstate 73 Final EIS: I-95 to the Myrtle Beach Region*, November, 2007, p. 3-114.

⁴⁴ *Interstate 73 South: Dillon, Marion, and Horry Counties, South Carolina, Final Environmental Impact Statement Re-Evaluation*, May 7, 2010, p. 4.

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 2007 analysis and the 2017 analysis.

Table 3.12			
Fleet Mix Comparison for Noise Analyses (in percent)			
	Automobile	Medium Truck	Heavy Truck
2007 Analysis	91%	3%	6%
2017 Analysis	72-75%	5-6%	20-22%

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 Reasonable Alternatives to determine baseline existing sound levels (for potential substantial increase impacts). The updated analysis had 18 field measurements for only the Selected Alternative.

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

3.7.4 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, primarily because the final design was modified to minimize impacts to the greatest extent to the natural and human environment. The acquisition of additional right-of-way to alter the alignment or create a buffer zone would result in an increase in impacts.

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.

3.7.4.1 Factors Considered when evaluating Noise Barriers as a Mitigation Measure

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 states 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**).

3.7.4.2 Results of Noise Barrier Analysis

Forty-seven 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.

3.7.5 Construction Noise

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 of **Appendix E**. 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 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.

3.7.6 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 highways long after these highways were proposed and/or constructed. 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.

3.8 Air Quality

The three counties within the project study area were found to be in attainment of the NAAQS standards in 2008 and 2010. The NAAQS standards were revised since 2008, and all three counties within the project study area remain in attainment.

3.8.1 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 Sources⁴⁵ 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

⁴⁵ Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007

National Air Toxics Assessment (NATA).⁴⁶ 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.

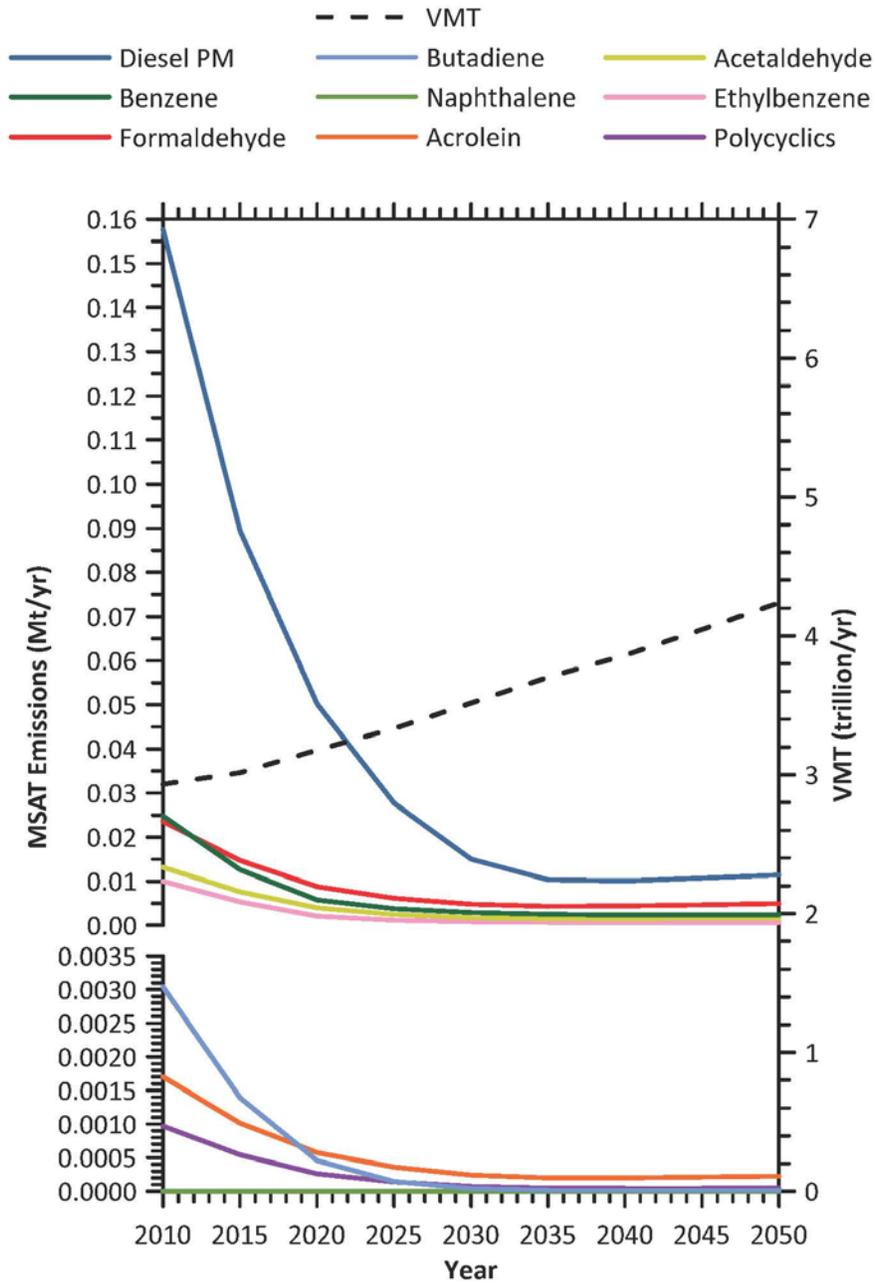
Motor Vehicle Emissions Simulator (MOVES) Model

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 2017-2025.⁴⁷ 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.⁴⁸ 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.

⁴⁶ USEPA, "National Air Toxics Assessment," <https://www.USEPA.gov/national-air-toxics-assessment>, (December 8, 2016).

⁴⁷ 79 FR 60344

⁴⁸ 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.*⁴⁹ 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 NEPA 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 concentrations⁵⁰ 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

⁴⁹ 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).

⁵⁰ 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.⁵¹ 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.”⁵²

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.⁵³

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

⁵¹ *Ibid.*

⁵² 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).

⁵³ 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, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the regional transportation network (refer to **Table 2.4**). This increase in VMT would lead to higher MSAT emissions for the Selected Alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the existing routes, such as U.S. 501. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to USEPA's MOVES2014 model, emissions of all of the priority MSAT decrease as speed increases. Also, 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 2050.⁵⁴ 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 project 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; 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.

3.8.2 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.⁵⁵ According to the USEPA, the

⁵⁴ 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).

⁵⁵ USEPA, "GHG Overview," <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>. (Last accessed 11/28/16).

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, and some industrial processes are the main emission generators of greenhouse gases.⁵⁶ In 2014, the transportation sector was responsible for almost 27% of the CO₂ emissions in the U.S.⁵⁷ 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.⁵⁸

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, 2017.⁵⁹ Even though this guidance has been rescinded, the GHG analysis was completed prior to that date, and has been left in this re-evaluation.

GHG Analysis

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 3.14**.

Table 3.14 Project CO₂e Emissions and Fuel Cycle Emissions	
	Selected Alternative in 2040
VMT (millions of miles, per year)	5,187,476
CO ₂ e operations emissions and fuel cycle emissions (metric tons per year)	816,533
Note: CO ₂ e Emissions Factor provided by FHWA HQ Moves Lookup Tables.	

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

⁵⁶ Ibid.

⁵⁷ USEPA, “Greenhouse Gas Inventory Data Explorer,” <https://www3.epa.gov/climatechange/ghgemissions/inventoryexplorer/#allsectors/allgas/econsect/current>. (Last accessed 11/28/16).

⁵⁸ USEPA, “Climate Change Basic Information,” <https://www.epa.gov/climatechange/climate-change-basic-information>. (Last accessed 11/28/16).

⁵⁹ <https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economi-1>

this tool is not appropriate to inform engineering analysis and pavement selection.⁶⁰ The assumptions used for the ICE Tool and worksheets are included in **Appendix F**. The results below in **Table 3.15** and **Table 3.16** include both annualized energy use and annual GHG emissions, per year over the 25-year analysis cycle, and include both unmitigated and mitigated scenarios.

	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	41,953	11,513	53,466	6,491	-	59,957	41,953	8,682	50,635	6,491	-	57,126
Direct Energy												
Construction Equipment	13,254	1,336	14,590	23,123	-	37,713	13,254	1,005	14,259	-	-	14,259
Routine Maintenance						3,170						3,170
Total	55,207	12,849	68,056	29,614	-	100,840	55,207	9,687	64,894	6,491	-	74,555

	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	2,582	661	3,243	643	-	3,886	2,582	519	3,101	643	-	3,744
Direct Emissions												
Construction Equipment	966	97	1,063	174	-	1,237	966	76	1,042	174	-	1,216
Routine Maintenance						231						231
Total	3,548	758	4,306	817	-	5,354	3,548	595	4,143	817	-	5,191

⁶⁰ 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.)

3.9 Farmlands

The Selected Alternative would result in the direct conversion of 1,915 acres of prime and statewide important farmland soils based on the quantifications in the FEIS (refer to **Table 3.17**). The 2010 Re-evaluation concluded that the proposed design changes to the Selected Alternative would increase the previous total acreage of prime farmland or farmland of statewide importance within the Selected Alternative corridor by 9 acres.

	FEIS/ROD	2010 Re-evaluation	2017 Re-Evaluation
Dillon County	656	663	663
Prime Soils	373	378	378
Statewide Important Soils	283	285	285
Marion County	498	502	502
Prime Soils	362	363	363
Statewide Important Soils	136	139	139
Horry County	761	759	759
Prime Soils	451	446	446
Statewide Important Soils	310	313	313
Total	1,915	1,924	1,924

Note: Values are approximate and rounded to the nearest whole number.

Impacts to prime and statewide important farmland soils have not changed since the impact analysis conducted for the design changes to the Selected Alternative as part of the 2010 Re-evaluation. In addition, digital mapping, online databases, and coordination with the Natural Resources Conservation Service was completed to determine if any additional protected farmland easements were located in the Selected Alternative corridor. No additional easements were identified. No changes to indirect and cumulative farmland impacts are anticipated to occur directly from the new Inland Port, as it is located within in an industrial park. However, if additional businesses locate in proximity to the Inland Port, this would have the potential to convert prime farmlands or statewide important soils to industrial land uses. If these businesses need to obtain federal permits, they would have to assess their effects in compliance with the Farmland Protection Policy Act.

3.10 Waters of the United States

Two wetland delineations were conducted for I-73 South. The USACE approved the original Jurisdictional Determination (JD) on March 18, 2008 (refer to **Appendix G**). The second delineation was conducted during the 2010 Re-Evaluation. Because Rapanos Guidance was issued by USACE and USEPA in 2008, the entire delineation was re-submitted based on the new guidelines, which resulted in changes to the previous JD, especially stream determinations. The USACE approved the revised JD on September 24, 2014 (refer to **Appendix G**).

3.10.1 Identification of additional wetlands and streams since the 2014 JD

The Selected Alternative was reviewed for changes in waters of United States using the 2014 approved wetland delineation overlain onto 2015 aerial photography. Based on this review, five potential resources were identified that were not included in the 2010 Re-Evaluation:

- A pond located northeast of intersection of Highway 308 and South Nichols Highway in Horry County;
- A canal located east of Ketchuptown (south of Lake Swamp Road) in Horry County;
- A pond located west of Pecan Pointe Community in Marion County;
- A pond located southwest of intersection of Highway 917 and Branchwood Drive in Marion County; and,
- A pond located just north of I-95, northwest of the Catfish Church Road overpass in Dillon County.

These resources were investigated during a field visit in September 2016 to determine if they would be considered jurisdictional waters of the United States. All resources were determined to be excavated wholly in uplands (based on wetland limits in the current approved JD). Therefore, none of the five additional features identified within the project corridor since the 2010 Re-evaluation would likely to be considered jurisdictional by USACE and would not increase impacts.

3.10.2 Changes to impacts to wetlands and other waters have occurred since the FEIS/ROD and 2010 Re-Evaluation

Current and previous calculations of potential impacts associated with construction of the Selected Alternative were performed by overlaying the construction limits onto wetland mapping. The wetland mapping identified in the 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. Upon completion of the FEIS/ROD, 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. During field reviews of the delineations, changes were made to refine the boundaries and limits of jurisdictional waters and streams. Changes to the previously estimated aquatic resources were identified and impacts were updated. Updates to the wetland impacts resulted from several changes in the project, including:

- The USACE issued a JD in accordance with the 1987 Wetland Delineation Manual on March 18, 2008.
- Impacts were re-calculated for the 2010 Re-Evaluation utilizing construction limits developed for the right-of-way plans with the aid of survey data; these impacts are more accurate than the impacts reported in the FEIS.

- Design changes extended outside the corridor that was delineated for the FEIS, therefore an additional field delineation was required to calculate impacts for the 2010 Re-Evaluation.

SCDOT submitted a Section 404 permit application to USACE on January 11, 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. As a result of the 2010 JD based on the Rapanos Guidance (approved in 2014), stream impacts increased from 3,860 linear feet, as reported in the FEIS and the 2010 Re-evaluation, to 4,571 linear feet in the Section 404 permit application. Wetland impacts decreased from 296 acres, as reported in the 2010 Re-evaluation, to 293.1 acres due to changes in the design as noted above. **Table 3.18** below details the changes in impacts from the FEIS/ROD through the current re-evaluation.

Resource	FEIS/ROD	2010 Re-Evaluation	2017 Re-Evaluation	Change from FEIS/ROD
Wetlands (acres)	313.0	296*	293.1	-19.9
Streams (linear feet)	3,860	3,860	4,571	+711
<p>* Note: The design changes in the 2010 Re-evaluation resulted in a decrease of 0.26 acre of wetland impacts overall. The change in wetland impacts from the FEIS/ROD and 2010 Re-evaluation was due to the overall wetlands being calculated using the construction limits for the right-of-way plans in the 2010 Re-evaluation rather than conceptual design that was used in the FEIS/ROD. Source: Michael Baker International (2016).</p>				

3.10.3 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 in June 2016. 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.

3.10.4 Changes to Indirect Impacts

The estimated indirect impacts to wetlands and streams that could occur as the result of development of currently vacant lands along the Selected Alternative were shown in Table 3.47 of the FEIS (refer to page 3-159). Based on a review of 2015 aerial photography versus aerial photography used during the analysis for the FEIS, the indirect impacts from FEIS are not anticipated to change.

3.10.5 Changes to Cumulative Effects

As indicated in the FEIS/ROD and 2010 Re-evaluation, the I-73 South project study area contains a wide variety of wetland types. Based on a review of the 2015 aerial photography and a site visit in September 2016, wetland types identified within the project study area have not changed since approval of the FEIS or 2010 Re-Evaluation.

Previously constructed projects have contributed to cumulative stream and wetland impacts in the project study area. Several additional transportation and development projects have been identified since the approval of the FEIS/ROD and 2010 Re-evaluation. **Table 3.19** provides a summary of the known potential cumulative impacts associated with proposed and constructed projects within the project study area.

As stated in the FEIS/ROD and 2010 Re-evaluation, 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.

**Table 3.19
Potential Cumulative Wetland Acres and Stream Impacts**

Project	Location	Project Type	Timeframe	Wetland Impact (acres)	Stream Impact (linear feet)
Carolina Bays Parkway (after-the-fact impacts)	Horry	Transportation	Completed	17.87	892.9
S.C. Route 707 Widening/Interchange	Horry	Transportation	Completed	1.21	637
CSX Bridge Replacement	Marion	Transportation	Completed	1.67	0
Wahee Road Farm	Marion	Water Resources	Completed	81.74	0
Dillon Inland Port	Dillon	Development	Ongoing	5.88	0.05
International Drive	Horry	Transportation	Ongoing	24.88	0
Greentree Reservoir	Marion	Water Resources	Future	91.99	0

Source:
SCDOT Active Project Lists, Horry, Marion, and Dillon County, <http://dbw.scdot.org/activeprojects/>
USACE Charleston District – Regulatory Public Notice and Final Permit Actions.

3.11 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**).⁶¹ The USFWS species list is summarized in **Table 3.20**.

**Table 3.20
Threatened and Endangered Species Known to Occur or Possibly Occur in
Dillon, Horry, and Marion Counties, South Carolina**

Scientific Name	Common Name	Federal Status	County
Plants			
<i>Amaranthus pumilus</i>	Sea-beach amaranth [†]	Threatened	Horry
<i>Lindera melissifolia</i>	Pondberry	Endangered	Horry (possible)
<i>Oxypolis canbyi</i>	Canby's dropwort	Endangered	Horry (possible), Marion
<i>Schwalbea americana</i>	American chaffseed	Endangered	Horry (possible)
Animals			
<i>Trichechus manatus</i>	West Indian manatee*	Endangered	Horry
<i>Haliaeetus leucocephalus</i>	Bald eagle	Protected Under BGEPA	Dillon, Horry, Marion
<i>Picoides borealis</i>	Red-cockaded woodpecker	Endangered	Dillon, Horry, Marion

⁶¹ USFWS, “Endangered, Candidate, and At- Risk Species County Listings,” https://www.fws.gov/charleston/EndangeredSpecies_County.html, April 27, 2016 (Accessed October 10, 2016).

Scientific Name	Common Name	Federal Status	County
<i>Mycteria americana</i>	Wood stork	Endangered	Horry, Marion (possible)
<i>Dendroica kirtlandii</i>	Kirtland's warbler	Endangered	Horry (possible)
<i>Charadrius melodus</i>	Piping plover [†]	Threatened	Horry
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle*	Endangered	Horry
<i>Dermochelys coriacea</i>	Leatherback sea turtle*	Endangered	Horry
<i>Caretta caretta</i>	Loggerhead sea turtle*	Threatened	Horry
<i>Chelonia mydas</i>	Green sea turtle*	Threatened	Horry
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered	Dillon (possible), Horry, Marion
<i>Acipenser oxyrinchus</i>	Atlantic sturgeon	Endangered	Dillon (possible), Horry, Marion
Source: USFWS IPaC report (October 6, 2016) and County Occurrence Lists (October 10, 2016).			
† requires beachfront dune habitat			
*requires marine or estuarine aquatic habitat			

Since the completion of the 2010 I-73 Re-Evaluation, the Atlantic sturgeon was listed as endangered by USFWS for Horry, Marion, and Dillon Counties. No other species have been listed.

3.11.1 Potential impacts to Threatened and Endangered 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 South study corridor and submitted to the USFWS for review. The BA concluded that the proposed activity may affect, but is not likely to adversely affect the Kirtland's warbler, and would have no effect upon the Pondberry, Canby's dropwort, American chaffseed, Red-cockaded woodpecker, or the Wood stork. USFWS concurred with the conclusions of the BA in a letter dated October 16, 2007 (refer to **Appendix J**).

Field surveys were conducted from April through July 2009 to determine the presence or absence of federally protected species for design changes identified in the 2010 Re-Evaluation. As part of the 2010 Re-Evaluation, a supplemental BA was prepared and submitted to USFWS for review. In a letter dated October 1, 2009 (refer to **Appendix J**), USFWS concurred with the determination that "the proposed action is not likely to affect resources under the jurisdiction of the USFWS that are currently protected by the Act."

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

concluded 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.

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 the project study area. 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.⁶² The BA included certain conditions on construction and demolition activities that could potentially disturb migrating sturgeon at the Little Pee Dee River crossing. This BA was submitted to the Southeast Regional Office of the National Marine Fisheries Service (NMFS) by the USACE on February 8, 2013 and included the following construction commitments pertaining to the Little Pee Dee River bridge construction:

- Construction work over the river will be done inside specially built cofferdams, enabling the bridge support structures (“bents”) to be built on dry land within the river. The cofferdams will be installed at the locations where the bridge support structures will later be built, then pumped dry to enable work inside. Workers then (will) install steel structural rebar and pour concrete for the bent construction. The completed bents will later support the bridge spans across the river.
- To protect potentially spawning Atlantic and shortnose sturgeon that may be moving upriver or downriver past the site during construction, SCDOT will implement an in-water work moratorium from February 1 to April 30. Construction of cofferdams may take place before or after the moratorium, but not during the moratorium. However, once a cofferdam is built, work inside it may continue year-round.
- Bridge construction will never obstruct more than half of the river at any one time, to prevent potential hindrance of anadromous fish passage.
- The use of turbidity controls (such as Type C silt fences) during construction is part of the best management practices routinely implemented by SCDOT during construction in wetlands to prevent adverse water quality effects to anadromous fishes and other species.

NMFS’ Southeast Regional Office responded to the USACE in a letter dated April 29, 2013, which concurred with the determination and construction commitments in the BA 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**).

In response to the USACE public notice, NMFS’ Habitat Conservation Division provided comments on the project and proposed mitigation in a letter dated July 29, 2016. In addition, NMFS made the following recommendations to avoid and minimize impacts to anadromous fishes upstream or downstream of the Little Pee Dee River crossing that will be incorporated into the project commitments:

⁶² 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.

- SCDOT should restrict in-water work in the Little Pee Dee River from May 1 to February 14 of each year, with no in-water work conducted between February 15 to April 30, and avoid blocking or constructing the river throughout the year to avoid impacts.
- SCDOT should pursue construction methods that avoid and minimize impacts to the river, including the use of top-down construction, temporary work trestles, work barges, or other methods that reduce or eliminate impacts to the river.
- If blasting is required in the Little Pee Dee River, a blasting plan should be developed and submitted to the NMFS for review.
- The SCDOT should install, inspect, and maintain appropriate erosion and sedimentation control Best Management Practices in accordance with local and state storm water guidelines to avoid sediment input into adjacent waters.

A review of aerial photography and a limited site reconnaissance of the Selected Alternative were conducted in September 2016 to evaluate potential impacts to federally protected species, and no change in habitats was observed. Therefore, it is anticipated that the project may affect, but is not likely to adversely affect, Kirtland's warbler, the shortnose sturgeon, and the Atlantic sturgeon. It is anticipated that the project will still have no effect on pondberry, Canby's dropwort, American chaffseed, the red-cockaded woodpecker, and the wood stork. According to the SCDNR's online eagle nest location database, one active nest is located approximately one mile southwest of the I-73/S.C. 917 overpass, west of Latta.⁶³ Therefore, it is anticipated that the bald eagle, which is protected by the Bald and Golden Eagle Protection Act, would not be affected. There would be no effect to the remaining listed species that require marine or estuarine aquatic, or beachfront dune habitat, because these habitat types do not occur within the project study area for the Selected Alternative.

3.11.2 Differences in cumulative impacts to federally protected species since the FEIS/ROD and 2010 Re-evaluation

It was determined in the 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.⁶⁴ For future development such as those activities previously mentioned, the developer would be required to obtain the necessary permits, which would trigger

⁶³ SCDNR, "South Carolina's Bald Eagles – Nest Locations", <http://www.dnr.sc.gov/wildlife/baldeagle/locations.html>, September 29, 2016

⁶⁴ 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).

Endangered Species Act review and consultation with NMFS to ensure the project would not jeopardize the existence of the sturgeon.

3.12 Water Resources/Water Quality

The FEIS/ROD addressed water quality issues in a general manner because potential impacts were based on a conceptual design and could not be quantified. Impacts to water quality for the design changes were not evaluated in the 2010 Re-Evaluation. The Section 404 permit application was based on right-of-way plans for the I-73 South Selected Alternative, therefore potential water quality impacts could be assessed and mitigation measures developed.

During the public comment period for the Section 404 permit application, the South Carolina Department of Health and Environmental Control (SCDHEC) requested additional information concerning a post-construction stormwater management plan for the Loosing Swamp, Chinners Swamp, and Little Pee Dee River crossings by the proposed I-73 project. During subsequent meetings and discussions, six additional water bodies were identified as impaired, outstanding resource waters (ORW), or that are within designated Total Maximum Daily Load (TMDL) watersheds, that will be crossed by, or are in close proximity to, the proposed I-73 alignment. The additional water bodies include Hellhole Swamp, White Oak Creek, Lake Swamp, Buck Swamp, Cedar Creek, and the Pee Dee Basin (White Oak Creek and Brown Swamp). The 2012 303(d) list was released in May 2013 and a review of the list did not add any additional water bodies that could potentially be impacted. Since the submittal of the additional information to SCDHEC regarding the above listed waters, the 2014 303(d) list⁶⁵ was released in June 2015. No new water bodies were added that could potentially be impacted, however, the status of several water bodies changed. The *2016 State of South Carolina Integrated Report Part I: Listing of Impaired Waters*⁶⁶ 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 is still pending at this time.⁶⁷

Each crossing of an impaired stream or water body located in a TMDL watershed along the I-73 alignment from I-95 to S.C. Route 22 was evaluated to determine the best stormwater treatment method, and in some instances two options were identified. The proposed treatment measures consist of the use of non-structural low impact development controls and vegetated filter strips obtained from the SCDHEC Best Management Practices Handbook.⁶⁸ Based upon the implementation of these treatment measures, I-73 will not significantly contribute to the impairment of streams and watersheds identified along the alignment.

⁶⁵ SCDHEC, 2015, State of South Carolina Integrated Report for 2014, Part I: Section 303(d) List of Impaired Waters, available online at http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_14-303d.pdf (Accessed October 3, 2016)

⁶⁶ 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).

⁶⁷ As of April 24, 2017, the 2016 303(d) List has yet to be issued.

⁶⁸ SCDHEC, Best Management Practices Handbook, <http://www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook/>, (accessed on October 12, 2016).

3.12.1 Impaired waters, TMDL watersheds, and ORWs in the project study area and proposed post-construction storm water management structures

Following is a discussion of each impaired feature, TMDL watershed, or ORW identified along the Selected Alternative and the proposed post-construction stormwater management measures. For convenience, reference is made to the pertinent I-73 permit sheet where appropriate. Red-lined I-73 plan sheets are provided in **Appendix K** and referenced in the text below to illustrate the direction of stormwater flow and proposed post-construction stormwater treatment methods. In some instances, a USGS topographic figure indicating the I-73 corridor in relation to impaired waters being discussed is provided in **Appendix L**.

3.12.1.1 Little Pee Dee River – ORW

The proposed I-73 alignment will cross the Little Pee Dee River and associated wetlands, and Black Creek, immediately adjacent to the existing SC 917 crossing. Stormwater runoff treatment was evaluated for three dual bridges associated with this crossing. These include an overflow bridge located approximately 0.3 mile northwest of the River, the bridge over the River, and the bridge over Black Creek located approximately one mile east of the River.

The proposed overflow bridges located northwest of the Little Pee Dee River will be 540 feet in length and will not require deck drains (permit Sheet 113 of 178). Stormwater runoff will flow on the bridge shoulders to the northwest end of the bridges where it will be routed into a grass-lined median ditch for pretreatment prior to discharge into adjacent wetlands (refer to Plan Sheets 16 and 17 in **Appendix K**).

The proposed bridges over the Little Pee Dee River will be 1,053 feet in length (permit Sheet 115 of 178). Due to the length of the bridges, drains will be required to remove rain water from the bridge decks. Bridge runoff will be captured in a closed drainage system and piped to the east end of the bridges where it will be routed into a grass-lined median ditch for pretreatment prior to discharge into adjacent wetlands (refer to Plan Sheets 18 and 19 in **Appendix K**).

The proposed bridges over Black Creek will be 270 feet in length and will not require deck drains (permit Sheet 119 of 178). Stormwater runoff from the bridges will flow on the bridge shoulders to each end of the bridges where it will be routed into a grass-lined median ditch for pretreatment prior to discharge into adjacent wetlands (refer to Plan Sheet 22 in **Appendix K**).

Stormwater runoff from the southbound lanes of the I-73 causeway through wetlands associated with the Little Pee Dee River will sheet flow over grassed slopes into the grassed median ditch for treatment prior to discharge into wetlands. Runoff from the northbound lanes will sheet flow over grassed slopes into a large grassed ditch between I-73 and S.C. 917 for treatment.

3.12.1.2 Loosing Swamp (RS-03513) – Dissolved Oxygen (DO) Impaired

Sample station RS-03513 is located approximately 2.9 miles downstream of the I-73 crossing of Loosing Swamp (refer to Figure 1 in **Appendix L**). Additionally, I-73 crosses an un-named tributary and Watery Bay that drain into Loosing Swamp. Loosing Swamp and the un-named tributary will be bridged while the Watery Bay crossing will consist of box culverts. Within the I-73 alignment, Loosing Swamp consists of a channel with no wetlands adjacent to it and the crossing will occur on two bridges 60 feet in length (permit Sheet 159 of 178). Wetlands are adjacent to the unnamed tributary and it will also be crossed by two 60-foot long bridges (permit Sheet 157 of 178). There is no stream present at the Watery Bay crossing (permit Sheet 161 of 178).

The proposed bridges over the unnamed tributary to Loosing Swamp will not require deck drains. Two options for stormwater treatment were identified for this crossing. The first option will be to trap the bridge runoff in a box at the approach and pipe it to a vegetative strip for treatment prior to discharge into wetlands. The second option will be to trap the runoff in a box at the approach and let it sheet flow down a grassed slope into a grassed median ditch for treatment prior to discharge into wetlands (refer to Plan Sheets 35 and 6 in **Appendix K**).

The proposed bridges over Loosing Swamp will not require deck drains. Two options for stormwater treatment were identified for this crossing. The first option will create an asphalt berm in front of the guardrail at the southern bridge approaches to divert bridge runoff down gradient where it will be collected into boxes and then discharged into the grassed median ditch to be filtered before being released (refer to Plan Sheet 9 in **Appendix K**). The second option will be to collect runoff water in boxes at the bridge approaches and release it into the grassed median ditch. The median ditch would be graded to drain back to Station 4866+00 where it will be released into a vegetative filter strip via a median pipe.

The I-73 crossing of Watery Bay wetlands will include an 8-foot by 5-foot box culvert. A portion of the I-73 stormwater runoff will be treated in the grassed median ditch. Road runoff in uplands adjacent to Watery Bay wetlands will be treated as it sheet flows down the grassed side slopes and additional treatment will be provided prior to entering wetlands by roadside grass-lined flat-bottom ditches with less than five percent longitudinal slopes (refer to Plan Sheet 11 in **Appendix K**).

3.12.1.3 Chinners Swamp (RS-07051) – Fecal Coliform (FC) TMDL

Chinners Swamp is one of three drainages within a TMDL watershed in Horry County that I-73 traverses (refer to Figure 2 in **Appendix L**). The other two crossings consist of un-named tributaries to Chinners Swamp. The TMDL parameter for this watershed is fecal coliform (FC).

The first unnamed tributary to Chinners Swamp in the I-73 alignment consists of a perennial stream within the Mose Swamp wetland system (permit Sheet 163 of 178). An 8-foot by 5-foot box culvert is proposed at this crossing. Side slopes at this location will provide a large vegetative filter strip, which will treat the runoff before draining to the

adjacent wetland (refer to Plan Sheet 13 in **Appendix K**). On the southbound lanes, the side slopes provide a filter strip that works in conjunction with a grass-lined flat-bottom ditch to filter the water before being released into the wetland.

The second unnamed tributary to Chinners Swamp consists of an intermittent stream (permit Sheet 166 of 178). A 30-inch reinforced concrete pipe (RCP) is proposed at this crossing. The southbound lane grassed side slopes of 4:1, combined with a grass-lined flat-bottom roadside ditch, will provide filtration before entering the tributary (refer to Plan Sheet 18 in **Appendix K**). The northbound lanes sheet flow into the median ditch, which has 6:1 grassed side slopes and a wide flat bottom. The grassed side slopes combined with the ditches provides filtration before the runoff reaches the tributary. All ditches have a less than five percent longitudinal slope.

At the proposed I-73 crossing, Chinners Swamp consists of a channel with no adjacent wetlands (permit Sheet 166 of 178). A 66-inch RCP is proposed at this crossing. The grassed side slopes will be 4:1 and combined with a grass-lined flat-bottom ditch, will provide filtration of stormwater runoff prior to entering Chinners Swamp (refer to Plan Sheet 19 in **Appendix K**). A portion of the northbound lanes will sheet flow into the grassed median ditch, which has 6:1 side slopes and a wide flat bottom. The side slopes, combined with the ditches, provide filtration before the runoff reaches Chinners Swamp. All ditches will have a less than five percent longitudinal slope.

3.12.1.4 Hellhole Swamp (RS-05561) – DO Impaired

The I-73 alignment is located approximately 4.6 miles west of Hellhole Swamp. While approximately three miles of the I-73 alignment is located in the same eight digit HUC as Hellhole Swamp (03040206), there is no direct hydrologic connection between them (refer to Figure 3 in **Appendix L**); therefore I-73 will not contribute to the impairment.

3.12.1.5 Lake Swamp – ORW

The proposed I-73 alignment will cross Lake Swamp immediately adjacent to the existing Nichols Highway (S-26-23) crossing (permit Sheets 136 and 138 of 178). Stormwater runoff treatment was evaluated for two dual bridges as well as the causeway. The proposed bridges will be 150 feet in length and will not require deck drains. Runoff from the bridges will flow on the shoulders to the ends of the bridges where it will collect in boxes and discharge into the grassed median ditch for treatment prior to discharge into Lake Swamp (refer to Plan Sheets 16, 17, and 18 in **Appendix K**). Runoff from the south- and northbound lanes of I-73 causeway through Lake Swamp will sheet flow over grassed slopes into the grassed median ditch for treatment prior to discharge into wetlands.

3.12.1.6 Buck Swamp (PD-349) – DO Impaired

Approximately 5.4 miles of Buck Swamp are designated as impaired, from S.C. Route 41 to its confluence with the Little Pee Dee River (refer to Figure 4 in **Appendix K**). The proposed I-73 alignment does not cross Buck Swamp but will cross seven channels and wetland systems that drain into the impaired reach of Buck Swamp, including two named systems, Maidendown Swamp and The Gulley.

The first wetland crossing that drains into the impaired reach of Buck Swamp is The Gulley. The Gulley bridges will be 84 feet in length (permit Sheet 83 of 178). Runoff from the bridges will flow on the shoulders to the ends of the bridges where it will discharge into the grassed median ditch for treatment prior to discharge into wetlands (refer to Plan Sheet 16 in **Appendix K**). A portion of the runoff from the north- and southbound lanes will sheet flow through grassed 6:1 side slopes into the grassed median ditch, for treatment prior to discharge into wetlands. And a portion of the runoff from the north- and southbound lanes will sheet flow through grassed 4:1 side slopes prior to entering wetlands.

The second crossing consists of a non-regulated agricultural ditch that will be piped to maintain the hydrologic connection (permit Sheet 85 of 178). A frontage road is proposed at this location. Stormwater runoff will sheet flow down grassed side slopes into grassed roadside ditches with less than five percent slope and the median ditch for treatment prior to discharging into the agricultural ditch (refer to Plan Sheets 21 and 22 in **Appendix K**).

The third crossing is a regulated agricultural ditch that provides a significant nexus between remnant wetlands associated with Piney Bay to Buck Swamp (permit Sheet 87 of 178). Stormwater runoff from the south bound lanes will sheet flow through grassed side slopes into the grassed median ditch, which will have a wide flat bottom for treatment prior to discharge into the agricultural ditch (refer to Plan Sheet 26 in **Appendix K**). Runoff from the northbound lanes will sheet flow through grassed side slopes into grassed roadside ditches for treatment prior to entering the agricultural ditch.

The fourth drainage is an intermittent stream and associated wetlands that will be impacted by modifications to Harry Martin Road, which will cross over I-73 (permit Sheet 89 of 178). This stream is an unnamed tributary to Maidendown Swamp. Runoff will sheet flow down the 4:1 grassed side slopes on the south side of Harry Martin Road prior to entering the stream and wetlands (refer to Plan Sheet 40 in **Appendix K**). Leading up to the crossing, runoff will sheet flow down grassed side slopes and into grassed roadside ditches for treatment prior to entering the wetlands and stream. Harry Martin Road is an existing road and the proposed modification will not increase traffic volumes since it will cross over I-73, therefore there will be no additional pollutants entering the wetland and stream.

The fifth crossing by I-73 is an unnamed perennial reach of the intermittent stream described above, and its associated wetlands (permit Sheet 91 of 178). Stormwater runoff from the northbound lanes will sheet flow down grassed side slopes into a grassed flat-bottom median ditch for treatment prior to discharging into the stream and wetlands (refer to Plan Sheets 30 and 31 in **Appendix K**). Runoff from the southbound lanes will sheet flow down a 4:1 grassed side slope prior to entering the stream and wetland.

The sixth drainage impact will occur to the stream and wetlands described at the fifth crossing above as the result of constructing Watermill Road over I-73 (permit Sheet 93 of 178). Runoff will sheet flow down the grassed side slopes on the north side of Watermill Road prior to entering the stream and wetlands (refer to Plan Sheet 24 in **Appendix K**). Leading up to the crossing, stormwater runoff will sheet flow down grassed side slopes

and into adjacent uplands prior to entering the wetlands and stream. Water Mill Road is an existing road and the proposed modification will not increase traffic volumes since it will cross over I-73, therefore there will be no additional pollutants entering the wetland and stream.

The seventh I-73 crossing of a drainage feature that flows into the impaired reach of Buck Swamp is Maidendown Swamp. Dual bridges are proposed at Maidendown Swamp. The south bound bridge will be 320 feet long and the northbound bridge will be 120 feet long (permit Sheet 95 of 178). Runoff from the bridges will flow on the shoulders to the ends of the bridges where it will discharge into the grassed median ditch for treatment prior to discharge into wetlands (refer to Plan Sheets 8 and 9 in **Appendix K**). Runoff from the southbound lanes will sheet flow into the grassed median ditch, which has a wide flat bottom, for treatment prior to discharge. The runoff from the northbound lanes will sheet flow through grassed side slopes prior to entering wetlands. Leading up to the crossing, stormwater from the northbound lanes will sheet flow down grassed side slopes into a grassed roadside ditch with less than five percent slope for treatment prior to discharge into wetlands.

3.12.1.7 Cedar Creek (PD-351) – DO Impaired

Cedar Creek is designated as impaired from the Little Pee Dee Heritage Preserve to approximately 10.7 miles upstream, and to the east. The proposed I-73 alignment is located approximately 2.8 miles southwest of, and downstream of, Cedar Creek (refer to Figure 5 in **Appendix L**). Stormwater runoff from I-73 will not enter Cedar Creek; therefore I-73 will not contribute to the impairment.

3.12.1.8 White Oak Creek and Brown Swamp (PD-037 and RS-08229) – FC TMDL

An approximately 0.75-mile section of I-73 crosses through a corner of this TMDL watershed south of Mullins (refer to Figure 6 in **Appendix L**). Other features of the project that will be constructed in the watershed include the S.C. Route 41 and Old Stage Road over passes. No wetlands or streams will be impacted by this section of the project. Stormwater runoff from the inside north- and southbound lanes will flow into the grassed median ditch for treatment prior to discharging into adjacent uplands. Runoff from the outside lanes will sheet flow down grassed side slopes into adjacent uplands.

As previously stated, based upon the information provided here regarding the implementation of the proposed post-construction stormwater treatment measures, I-73 will not significantly contribute to the impairment of streams and watersheds identified along the alignment. The post-construction stormwater treatment measures described above will be incorporated into the project commitments.

3.12.2 Changes to indirect and cumulative impacts

3.12.2.1 Indirect Impacts

No changes to indirect impacts resulting from implementation of the Selected Alternative are anticipated. As outlined in the FEIS/ROD and 2010 Re-evaluation, the Selected Alternative would indirectly impact streams in five different watershed units and it is expected that 24 freshwaters, including five with specific standards, would be impacted. Stormwater runoff from impervious surfaces may also indirectly impact water quality in

the project study area. Impacts to watershed units begin to occur when ten percent or more of the watershed unit is comprised of impervious surfaces.⁶⁹ The amount of impervious surfaces from future residential, commercial, and industrial uses are estimated to be approximately 771 acres of new impervious surfaces from the Selected Alternative. 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 Alternatives as a result of the increase in impervious surfaces.⁷⁰

3.12.2.2 Cumulative Impacts

I-73 North, a 36.8-mile new interstate, is proposed for construction between I-95 in Dillon County and I-73/74 in Richmond County, North Carolina, with new right-of-way varying from 300 to 400 feet in width. The Selected Alternative for I-73 North would not cross any impaired streams or waters with special protections. In addition to I-73 North, a bridge replacement project on S.C. Route 917 at the Little Pee Dee River and upgrades to I-74 in North Carolina, which is partially in the Pee Dee Sub-basin, is also proposed. It is uncertain exactly when these projects would begin or what additional effects they may have on the water quality in the sub-basin.

Since the completion of the FEIS/ROD and 2010 Re-evaluation, several new projects have also been proposed. According to SCDOT's Project Viewer website,⁷¹ the following projects have been constructed, or are in construction or upcoming in the project study area:

- Horry County:
 - Carolina Bays Parkway;
 - US 707 Widening/Interchange;
 - International Drive;
 - S-106 Bridge Replacement over Grier Swamp
 - S-106 Bridge Replacement over Crab Tree Swamp
 - U.S. 501 Business over Waccamaw River and SCL Railroad Bridge Rehabilitation
- Marion County:
 - SC 41 over US 501 Bridge Rehabilitation
 - S-41 over Smith River Bridge Replacement
 - SC 41 over Maiden Down Swamp Bridge Replacement
- Dillon County:
 - US 301 over Little Pee Dee River Bridge Replacement
 - I-95 Rehabilitation and Resurfacing

Although cumulative impacts to water quality could occur, the Section 401 water quality certification process would afford protection of the streams/ditches and watershed units identified within the project study area. In addition to roadway projects, the Inland Port is being proposed in Dillon County, near the city of Dillon at the I-95 Industrial Park.

⁶⁹ Schueler, T. The Center for Watershed Protection. "Watershed Protection Techniques." (Vol. 1, No. 3, Fall 1994).

⁷⁰ SCDOT, *Interstate 73 Final Environmental Impact Statement: From I-95 to the Myrtle Beach Region*, February 8, 2008, p. 3-226.

⁷¹ SCDOT Programmed Project Viewer, <http://www.dot.state.sc.us/inside/projectViewer.aspx> (February 28, 2017).

This project is going through the Section 404 permitting process, and must obtain a Section 401 water quality certification. The Inland Port may spur additional development in the vicinity. However, prior to any construction, the proper permits for stormwater control and runoff would need to be obtained for these projects to be constructed. These projects would require that standards be met for 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.

3.13 Floodplains

The Selected Alternative has three confirmed floodplain crossings, with a total of 14,220 feet of linear impacts and 92.8 acres of floodplain encroachment from the FEIS. These crossings are located where the Selected Alternative intersects with the Little Pee Dee River, Little Reedy Creek, and Maidendown Swamp (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 that significant changes in the floodplain classifications of the project area have occurred since the 2008 ROD and the 2010 Re-evaluation. **Table 3.21** shows the classifications of stream crossing areas in the FEIS/ROD, 2010 Re-evaluation, and 2017 re-evaluation for comparison.

Location	FEIS/ROD	2010 Re-evaluation	2017 Re-evaluation
Little Pee Dee River	Zone A	Zone A	Zone AE
Maidendown Swamp	Zone A	Zone A	Zone A
Joiner Swamp	Zone A	Zone A	No information available
Little Reedy Creek	Zone A	Zone A	Zone A
Lake Swamp	Zone A	Zone A	No special flood hazard area

The Little Pee Dee River floodplain has been reclassified from Zone A to Zone AE,⁷² meaning that base flood elevations are now provided for this floodplain. The classifications for Maidendown Swamp⁷³ and Little Reedy Creek⁷⁴ remain Zone A. Lake Swamp, which was previously classified as a Zone A floodplain, is no longer classified as a special flood hazard area; the FIRM for this area was updated on October 18, 2011.⁷⁵

During the final design phase of the project, a detailed hydrological study was completed. Bridge and culvert designs conform to the requirements in 23 CFR 650, Subpart A, *Location and Hydraulic Design of Encroachment on Floodplains*. This analysis included 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 has reviewed the engineering analysis for the final design to verify that there is no change in water surface

⁷² FEMA, Flood Insurance Rate Map, Panel 45067C0190E, October 18, 2011.

⁷³ FEMA, Flood Insurance Rate Map, Panel 45067C0158E, October 18, 2011.

⁷⁴ FEMA, Flood Insurance Rate Map, Panel 45069C0100C, May 24, 2011.

⁷⁵ FEMA, Flood Insurance Rate Map, Panel 45067C0300E, October 18, 2011.

elevations or expansion/ increase of the flood hazard areas on adjacent properties. Ongoing design efforts and coordination with resource and regulatory agencies have minimized floodplain impacts during the final design process.

Despite the changes in floodplain classifications, no additional certification for floodplain impacts is required for issuance of a permit at this time. Should the classification of the floodplains change and trigger additional certification (such as a No-rise Certification or a Conditional Letter of Map Revision [CLOMR]/Letter of Map Revision [LOMR]), SCDOT will pursue the appropriate certification.

As indicated in **Table 3.22**, the reclassification of the Little Pee Dee River and Lake Swamp resulted in a change in impacts. Impacts to the Little Pee Dee River floodplain increased from 12,500 linear feet and 82.6 acres of impact to 16,755 linear feet and 106.8 acres, while no impacts would occur at the Lake Swamp crossing. This results in an overall increase of 1,540 linear feet or 7.9 acres of floodplain impact by the Selected Alternative.

Location	FEIS/ROD Impact (linear feet/acres)	2010 Re-evaluation Impact (linear feet/acres)	2017 Re-evaluation Impact (linear feet/acres)
Little Pee Dee River	12,500/82.6	12,500/82.6	16,755/106.8
Maidendown Swamp	810/5.1	810/5.1	810/5.1
Joiner Swamp	470/5.1	470/5.1	470/5.1
Little Reedy Creek	1,110/5.1	1,110/5.1	1,110/5.1
Lake Swamp	2,725/16.3	2,725/16.3	0/0
Total Impacts	17,605/114.2	17,605/114.2	19,145/122.1

Chapter 4: Summary of Findings

Table 4.1 compares the impacts anticipated to result from the Selected Alternative as detailed in the FEIS/ROD, the 2010 Re-evaluation and this re-evaluation. No changes to the project alignment have occurred since those proposed in the 2010 Re-evaluation; however, the project limits have been further refined and new development has occurred. In addition, new regulations, policies, and analysis methods are required, such as the new SCDOT noise policy and the Rapanos rule, 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.

Resource	Unit of Measure	FEIS /ROD	2010 Re-evaluation	2017 Re-evaluation
Relocations	Number	78	78	42
Hazardous Materials	Number	3	3	3
Noise	Number of Receptors	13	13	71
Farmlands	Acres	1,915	1,924	1,924
Wetlands	Acres	313.0	296.0	293.1
Streams	Linear Feet	3,860	3,860	4,571
Water Quality	Number of ORW*, Impaired and/or TMDL	3 ORW; 2 Impaired; 4 TMDL	2 ORW; 3 Impaired; 2 TMDL	2 ORW; 3 Impaired; 2 TMDL
Floodplains	Acres	114.2	114.2	122.1
	Linear Feet	17,605	17,605	19,145
T&E Species	Number of Species	14 total Determination of No Effect or MABNLAA**	14 total Determination of No Effect or MABNLAA**	15 total Determination of No Effect or MABNLAA**
* ORW: Outstanding Resource Water, TMDL: Total Maximum Daily Load				
** MABNLAA: May Affect, But Would Not Likely to Adversely Affect				

4.1 Relocations

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

- In Dillon County, all the right-of-way has been acquired for the project; thus, no relocations are left to acquire in Dillon County.
- In Marion County and Horry County, the finalization of the right-of-way plans resulted in an overall reduction of relocations. In addition, some properties were acquired since the ROD was issued, further reducing the number of remaining relocations that need to be acquired.
- In Marion County, two non-residential properties (a business and place of worship) were constructed within the future right-of-way of I-73, bringing the total number of non-residential relocations in Marion County to three.

Relocations are further discussed in **Section 3.4** 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 and Waste Sites

The amount of impacts to hazardous materials sites has remained unchanged since the 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 13 residential receptors to 71 residential receptors. This is due to the fact that the 2007 FEIS and 2010 Re-evaluation analyses were 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 3.7.3.2** 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 Noise Policy. Thus no abatement is proposed for the Selected Alternative.

4.4 Prime and Statewide Important Soils

The amount of protected farmland soils impacts increased by 9 acres due to design changes that were previously evaluated in the 2010 Re-evaluation (refer to **Appendix B**).

4.5 Waters of the United States

The wetland and stream impacts changed due to the Rapanos guidance, resulting in changes to the earlier JD done in support of the FEIS/ROD, especially stream determinations. For further details, please refer to **Section 3.10** of this re-evaluation. Thus, the amount of stream impacts increased due to this change by 766 linear feet. The amount of wetland impacts decreased by almost 20 acres because detailed right-of-way and final design plans were used to calculate wetland impacts in 2010 and 2017, while conceptual design was used to calculate the amount of wetlands impacted in 2008. As previously discussed, wetland and stream impacts for this and the I-73 North project would be compensated by using the Gunter's Island Site. Please refer to **Section 3.10.3** for further information about the Gunter's Island Mitigation Site.

4.6 Water Quality

SCDHEC's listing of waters and classifications changed from 2008 to 2017. The number of streams crossed that are classified as outstanding resource waters decreased by one. The number of waters listed as impaired increased by one, and the number of streams in a TMDL watershed decreased by two. For further information on the proposed post-construction stormwater management measures, please refer to **Section 3.12.1** of this re-evaluation.

4.7 Floodplains

The amount of floodplain impacts changed due to the reclassification of the Little Pee Dee River floodplain (reclassified from Zone A to Zone AE), and Lake Swamp floodplain (classified as a Zone A floodplain, is no longer classified as a special flood hazard area). For further information, refer to **Section 3.13** of this re-evaluation. Despite the overall increase in impacts due to the reclassification of these floodplains, all bridge and culvert designs conform to the requirements in 23 CFR 650, Subpart A, *Location and Hydraulic Design of Encroachment on Floodplains*. This analysis included 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, the USACE has reviewed 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.

4.8 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, the 2010 Re-evaluation, 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.”

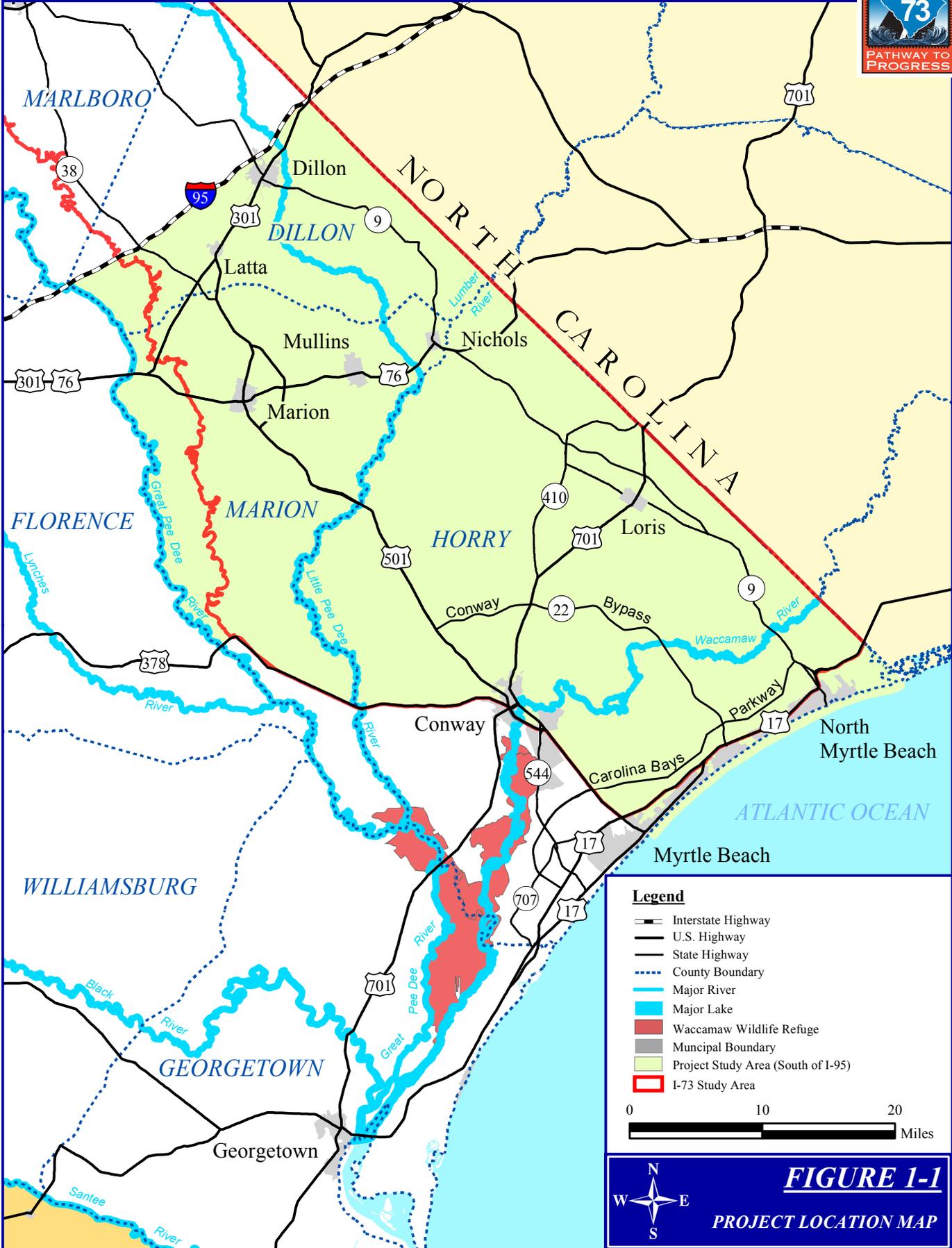
Similarly, FHWA, in its own NEPA implementing regulations [23 CFR §771.130(a)] states that a supplemental EIS would be needed “whenever the FHWA determines that:

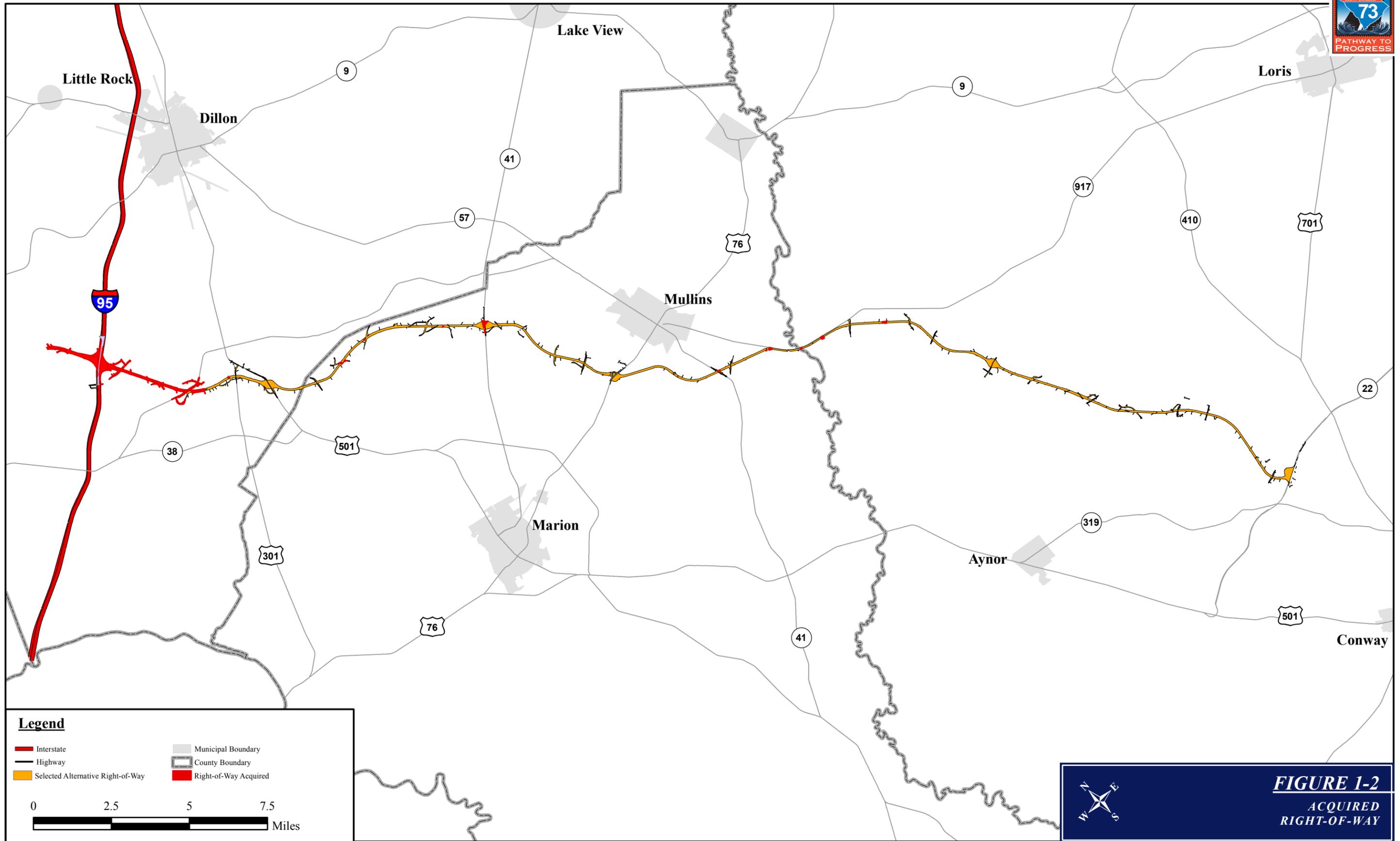
- (i) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or,
- (ii) New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts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

No design changes have occurred to the Selected Alternative since those evaluated in the FEIS/ROD and 2010 Re-evaluation (refer to **Appendix B**). Overall, the affected environment has remained largely unchanged since the FEIS/ROD. **Table 4.1** notes the changes to impacts from the FEIS/ROD, the 2010 Re-evaluation 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 and 2010 Re-evaluation. Neither condition requiring a Supplemental EIS under the CEQ or FHWA regulations are applicable to this project.

I-73 South

Figures





Legend

Interstate	Municipal Boundary
Highway	County Boundary
Selected Alternative Right-of-Way	Right-of-Way Acquired

0 2.5 5 7.5
Miles

FIGURE 1-2
ACQUIRED
RIGHT-OF-WAY

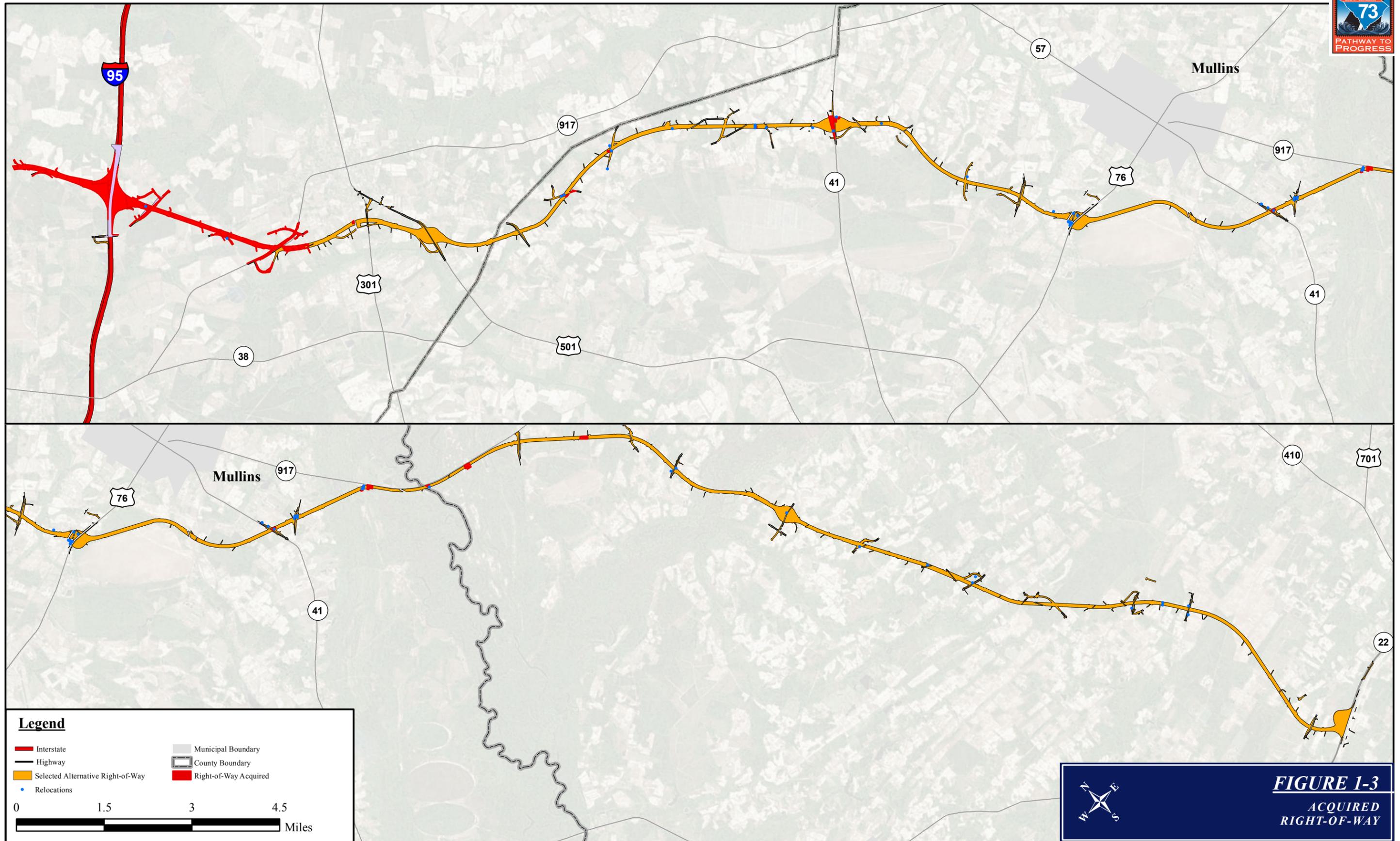
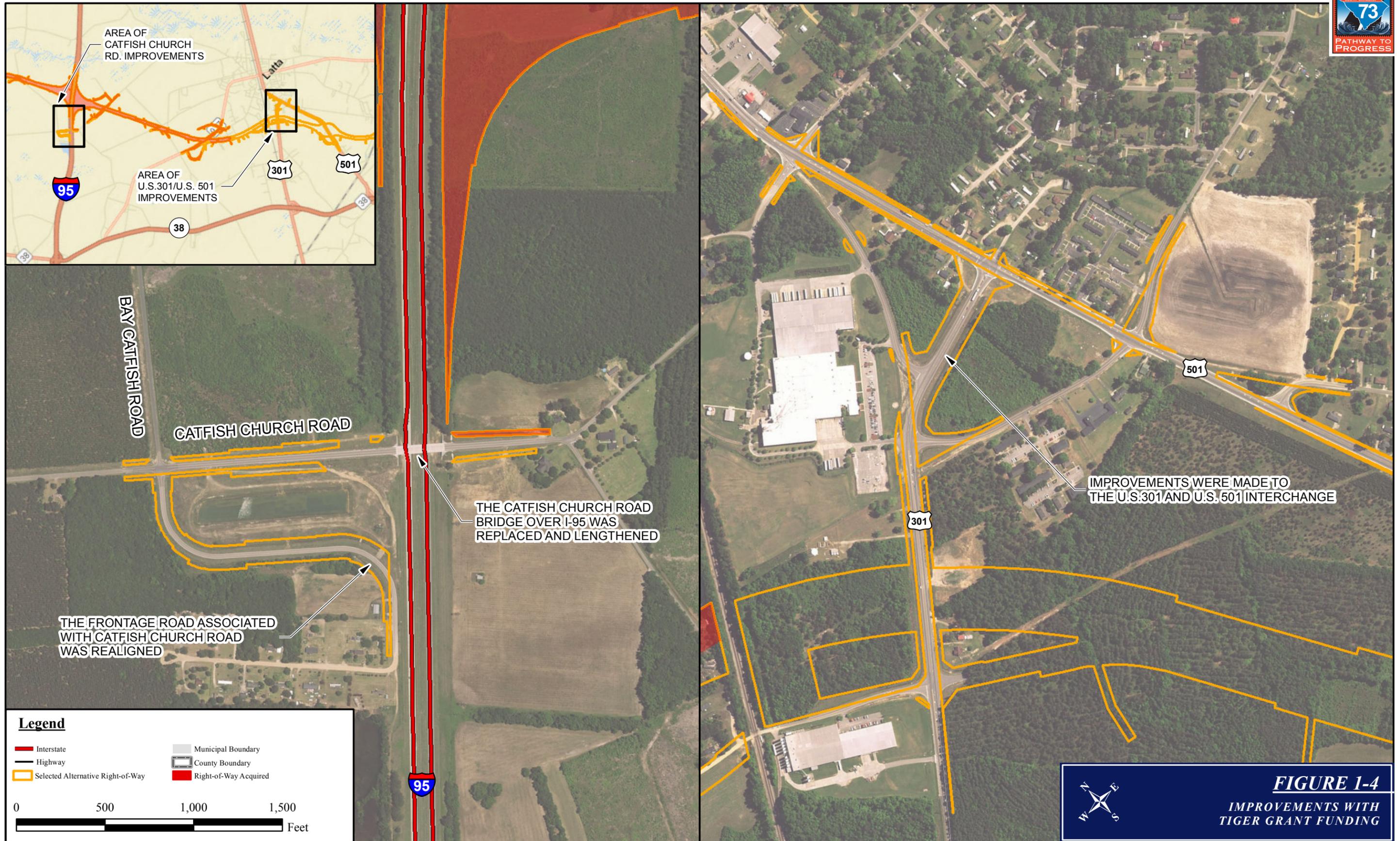


FIGURE 1-3
ACQUIRED
RIGHT-OF-WAY



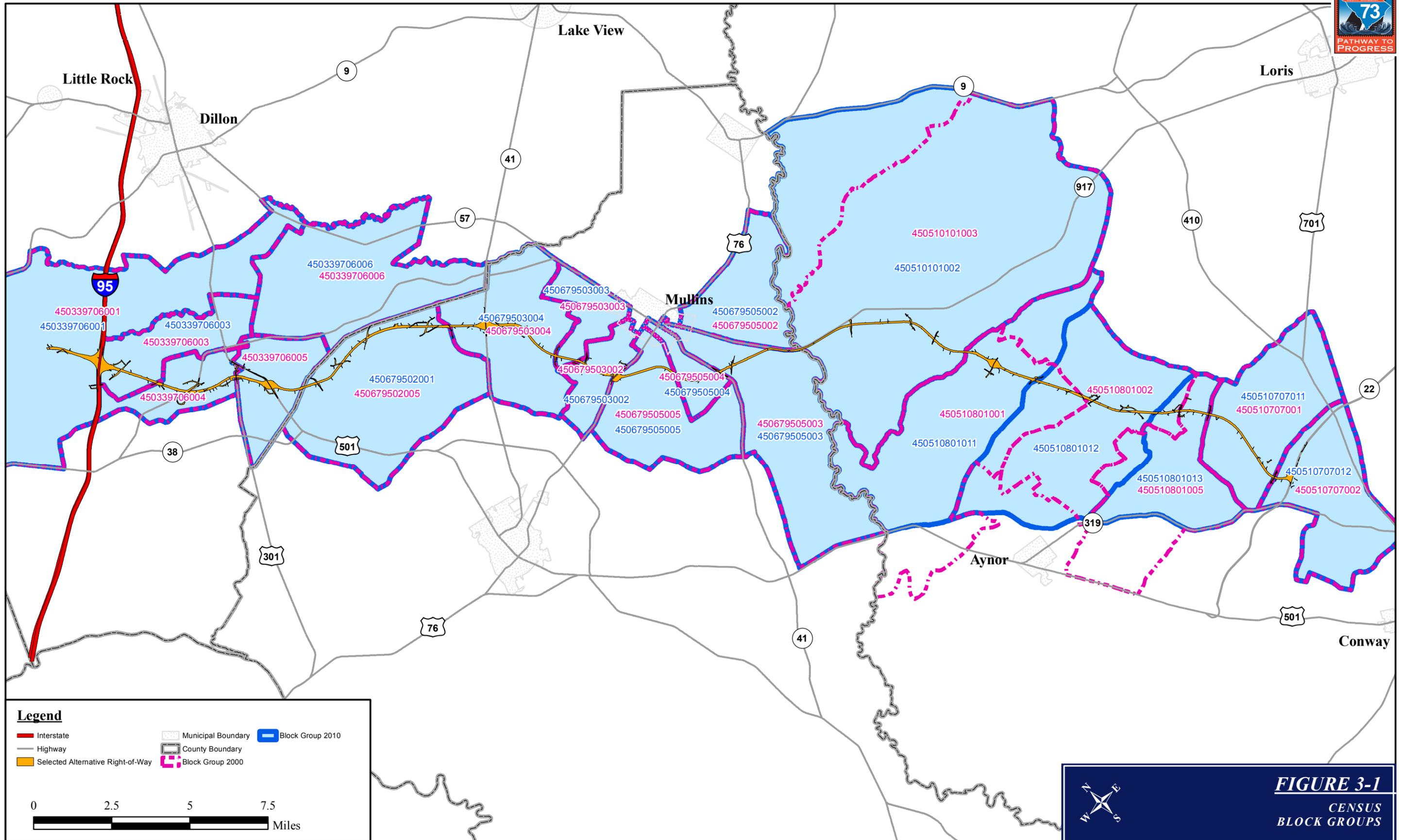
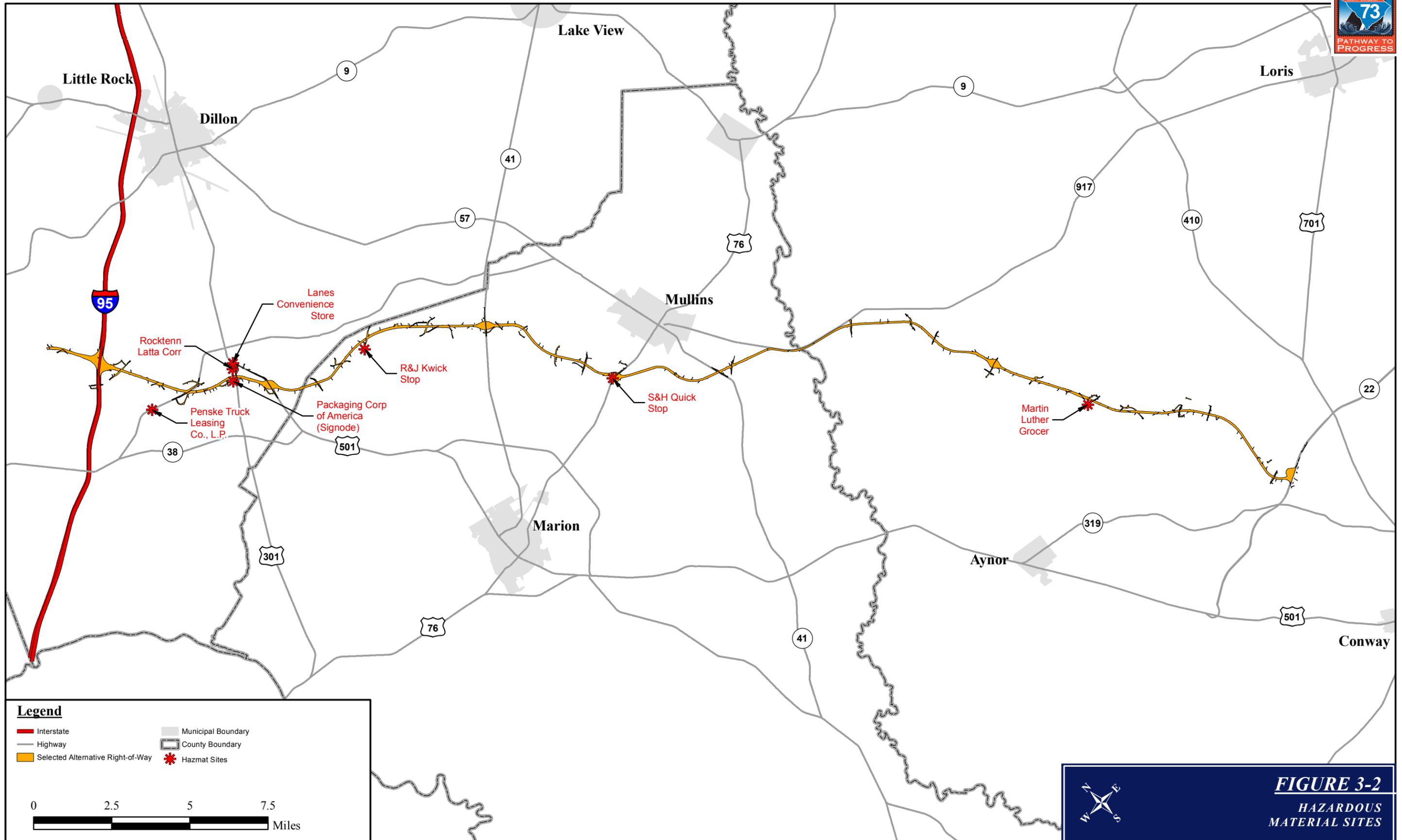


FIGURE 3-1
CENSUS
BLOCK GROUPS

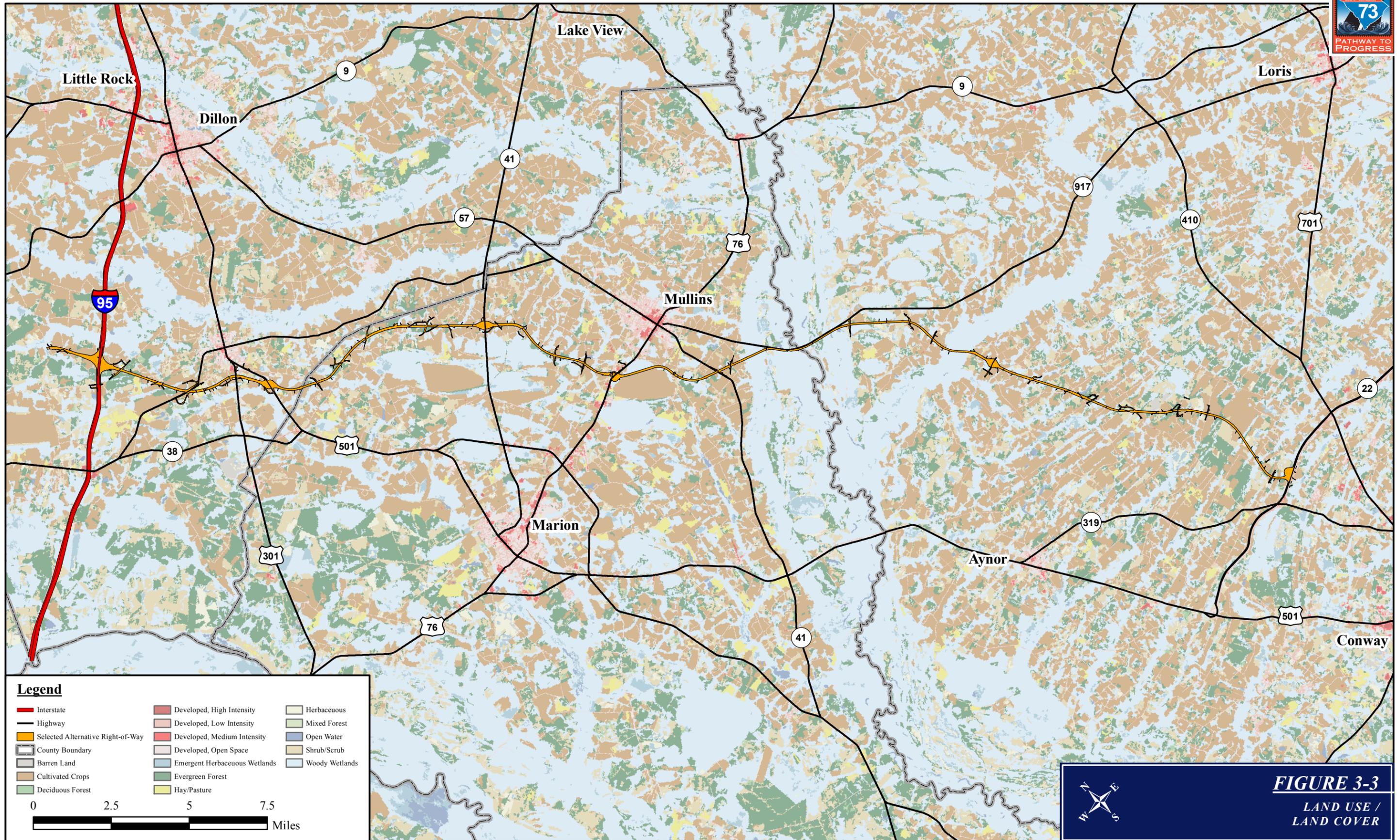


Legend

- Interstate
- Highway
- Selected Alternative Right-of-Way
- Municipal Boundary
- County Boundary
- ✱ Hazmat Sites

0 2.5 5 7.5
 Miles

FIGURE 3-2
 HAZARDOUS
 MATERIAL SITES



Legend

- | | | |
|-----------------------------------|------------------------------|----------------|
| Interstate | Developed, High Intensity | Herbaceous |
| Highway | Developed, Low Intensity | Mixed Forest |
| Selected Alternative Right-of-Way | Developed, Medium Intensity | Open Water |
| County Boundary | Developed, Open Space | Shrub/Scrub |
| Barren Land | Emergent Herbaceous Wetlands | Woody Wetlands |
| Cultivated Crops | Evergreen Forest | |
| Deciduous Forest | Hay/Pasture | |



FIGURE 3-3
LAND USE /
LAND COVER