



U.S. Department
of Transportation
**Federal Highway
Administration**

South Carolina

February 20, 2018

1835 Assembly Street, Suite 1270
Columbia, South Carolina 29201
803-765-5411
803-253-3989

In Reply Refer To:
HDA-SC

ELECTRONIC CORRESPONDENCE ONLY

Mr. Chad Long
Director Environmental Services Office
South Carolina Department of Transportation (SCDOT)
955 Park Street, P.O. Box 191
Columbia, South Carolina 29202

Dear Mr. Long:

The Federal Highway Administration (FHWA) has reviewed the Environmental Assessment (EA) for the Proposed I-26 Widening and Interchange Improvements (Federal Project No P029208) in Newberry, Lexington, and Richland Counties South Carolina and finds that it adequately addresses the potential impacts of the proposal. Based on the analysis provided in the EA and supporting documents we have determined that an Environmental Impact Statement (EIS) is not required. The EA is approved and acceptable for public availability and comment. The EA shall be made available for public review for a minimum of thirty (30) days before FHWA makes its final determination. The public availability shall be announced by a notice similar to a public hearing notice. Also, please provide Notice of Availability of the EA to the affected units of government, and to the State intergovernmental review contacts as specified in 23 CFR 771.119(d).

All project commitments documented in the EA are binding and the SCDOT will need to ensure that they are ultimately carried out. The public hearing may be scheduled fifteen (15) days after the document is made available for public review. Enclosed is a copy of the signed document. Please address any questions you may have concerning this project to Mr. J. Shane Belcher at 803-253-3187 or jeffrey.belcher@dot.gov.

Sincerely,

(for) Emily O. Lawton
Division Administrator

Enclosure

ec: Mr. Ed Frierson, SCDOT RPG 3 NEPA Coordinator
Mr. Michael Hood, SCDOT Design Build Program Manager

I-26 Widening and Interchange Improvements
Newberry, Lexington, and Richland Counties
Environmental Assessment



Submitted Pursuant To 42 U.S.C. 4332 (2)(c) by the
U.S. Department of Transportation, Federal Highway Administration
and

South Carolina Department of Transportation, Environmental Services Office

Feb. 20, 2018

Date of Approval

Edward W. Trivison

S.C. Department of Transportation

FEB. 20, 2018

Date of Approval

J. Shane Belcher

Federal Highway Administration

The following individuals may be contacted for additional information concerning the project:

Shane Belcher
Environmental Coordinator
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, S.C. 29201
(803) 253-3187

Michael L. Hood, PE, DBIA
Assistant Program Manager,
Design Build Group
S.C. Department of Transportation
955 Park Street
Columbia, SC 29202
(803) 737-3485

Project No. P029208

Date: 02/19/2018

SCDOT
NEPA ENVIRONMENTAL COMMITMENTS FORM



Project ID : P029208 County : Richland District : District 1 Doc Type: EA Total # of Commitments: 18

Project Name: I-26 Widening (MM85 to MM101)

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: Michael Hood, PE, DBIA

PHONE #: (803) 737-3485

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment

NEPA Doc Ref: Page: 46 Paragraph: 2

Responsibility: CONTRACTOR

Conservation Easement

Three parcels located within the PSA (TMS 01700-10-04, 01700-10-22, and 01700-10-26) are held in a Richland County conservation easement . Impacts to the tracts should be minimized to the maximum extent practicable during final design. The Richland County Conservation Division has indicated that to impact the property, ROW would need to be acquired through eminent domain and possibly condemnation. Any ROW acquisition or use of the property will need to be coordinated with the property owner and Richland County.

Water Quality

NEPA Doc Ref: Page: 52 Paragraph: 2

Responsibility: CONTRACTOR


The contractor will be required to minimize possible water quality impacts through implementation of BMPs, reflecting policies contained in 23 CFR 650B and the Department's Supplemental Specification on Erosion Control Measures (latest edition) and Supplemental Technical Specifications on Seeding (latest edition). Other measures including seeding, silt fences, sediment basins, etc. as appropriate will be implemented during construction to minimize impacts to water quality.

Stormwater

NEPA Doc Ref: Page: 52 Paragraph: 3

Responsibility: CONTRACTOR


Stormwater control measures, both during construction and post-construction, are required for SCDOT projects with land disturbance and/or constructed in the vicinity of 303(d), TMDL, ORW, tidal, and other sensitive waters in accordance with the SCDOT's MS4 Permit. The selected contractor would be required to minimize potential stormwater impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and SCDOT's Supplemental Specifications on Seed and Erosion Control Measures (latest edition).

Project ID : <input type="text" value="P029208"/>	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	
ENVIRONMENTAL COMMITMENTS FOR THE PROJECT		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 59 Paragraph: 2"/>	Responsibility: <input type="text" value="SCDOT/CONTRACTOR"/>
<input type="text" value="Individual Permit"/>		
<p>Impacts to jurisdictional waters will be permitted under a Department of the Army Section 404 permit from the U.S. Army Corps of Engineers. Based on preliminary design, it is anticipated that the proposed project would be permitted under an Individual Army Corps of Engineers Permit (IP). SCDOT will provide the Army Corps with information regarding any proposed demolition activities during the Section 404 permitting process. The required mitigation for this project will be determined through consultation with the USACE and other resource agencies. The Contractor is responsible for obtaining the Section 404 permit and required mitigation, in consultation with SCDOT.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page:59,60 Paragraph:5,3"/>	Responsibility: <input type="text" value="Contractor"/>
<input type="text" value="Invasive Species Management"/>		
<p>SCDOT will comply with the intent of EO 13112 regarding Invasive Species by actively stabilizing all temporarily disturbed areas with measures and/or seed mixtures that would not include invasive species. Best Management Practices contained in the SCDOT Standard Specifications for Highway Construction would be used to reduce the introduction or spread of invasive species. Cleared areas would be seeded with both temporary and permanent seed mixtures. Vegetative matting and/ or other techniques may also be used to stabilize areas that are cleared of vegetation, preventing the growth or spread of invasive species.</p>		


Floodplains	NEPA Doc Ref: <input type="text" value="Page: 62 Paragraph: 2"/>	Responsibility: <input type="text" value="SCDOT"/>
<p>The selected contractor will send a set of final plans and request for floodplain management compliance to the local County Floodplain Administrator.</p>		

Project ID : <input type="text" value="P029208"/>	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	
ENVIRONMENTAL COMMITMENTS FOR THE PROJECT		

Migratory Bird Treaty Act	NEPA Doc Ref: <input type="text" value="Page: 64 Paragraph: 2"/>	Responsibility: <input type="text" value="SCDOT"/>
<p>The federal Migratory Bird Treaty Act, 16 USC § 703-711, states that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. The South Carolina Department of Transportation (SCDOT) will comply with the Migratory Bird Treaty Act of 1918 in regard to the avoidance of taking of individual migratory birds and the destruction of their active nests.</p> <p>The contractor shall notify the Resident Construction Engineer (RCE) at least four (4) weeks prior to construction/demolition/maintenance of bridges and box culverts. The RCE will coordinate with SCDOT Environmental Services Office (ESO), Compliance Division, to determine if there are any active birds using the structure. After this coordination, it will be determined when construction/demolition/maintenance can begin. If a nest is observed that was not discovered after construction/demolition/maintenance has begun, the contractor will cease work and immediately notify the RCE, who will notify the ESO Compliance Division. The ESO Compliance Division will determine the next course of action.</p> <p>The use of any deterrents by the contractor designed to prevent birds from nesting, shall be approved by the RCE with coordination from the ESO Compliance Division. The cost for any contractor provided deterrents will be provided at no additional cost to SCDOT.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 77 Paragraph: 2-5"/>	Responsibility: <input type="text" value="CONTRACTOR"/>
<p>Air Quality</p> <p>State and local regulations regarding dust control and other air quality emission reduction controls will be followed. In order to minimize the amount of construction dust generated, current state best management practices, will be followed during the construction of the project. These include covering earth-moving trucks to keep dust levels down, watering haul roads, and refraining from open burning, except as may be permitted by local regulations. The construction equipment would also produce slight amounts of exhaust emissions. The EPA has listed a number of approved diesel retrofit technologies which may be deployed as emissions mitigation measures for equipment used in construction at the discretion of the Contractor, in consultation with SCDOT.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 85 Paragraph: 2"/>	Responsibility: <input type="text" value="SCDOT/CONTRACTOR"/>
<p>Noise - Barrier Walls</p> <p>Based on the studies thus far accomplished, SCDOT intends to install highway traffic noise abatement measures in the form of a barrier at NAA 5 and 6 (Westcott Ridge and Arbor Springs). These preliminary indications of likely abatement measures are based upon preliminary design for a barrier cost of \$35.00 per square foot that will reduce the noise level by at least 5 dB(A) for residences. If it subsequently develops during final design that these conditions have substantially changed, the abatement measures might not be provided. A final decision of the installation of the abatement measure(s) will be made upon completion of the project's design and the ongoing public involvement processes.</p>		

Project ID : <input type="text" value="P029208"/>	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	
ENVIRONMENTAL COMMITMENTS FOR THE PROJECT		

Noise	NEPA Doc Ref: <input type="text" value="Page: 96 Paragraph: 4"/>	Responsibility: <input type="text" value="SCDOT"/>
<p>SCDOT will inform local planning officials of future, generalized noise levels expected to occur in the project vicinity after FHWA has made a final decision on the Environmental document.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 96 Paragraph: 2"/>	Responsibility: <input type="text" value="CONTRACTOR"/>		
<table><tr><td>Noise - Traffic</td></tr><tr><td><p>It will be necessary that some work be required during non-peak traffic hours in nights and/or weekends. These activities may impact adjacent residential areas and thus a specific work plan will be necessary regarding work during these time periods and will be submitted for approval by the SCDOT Resident Construction Engineer prior to its undertaking.</p></td></tr></table>			Noise - Traffic	<p>It will be necessary that some work be required during non-peak traffic hours in nights and/or weekends. These activities may impact adjacent residential areas and thus a specific work plan will be necessary regarding work during these time periods and will be submitted for approval by the SCDOT Resident Construction Engineer prior to its undertaking.</p>
Noise - Traffic				
<p>It will be necessary that some work be required during non-peak traffic hours in nights and/or weekends. These activities may impact adjacent residential areas and thus a specific work plan will be necessary regarding work during these time periods and will be submitted for approval by the SCDOT Resident Construction Engineer prior to its undertaking.</p>				


USTs/Hazardous Materials	NEPA Doc Ref: <input type="text" value="Page: 100 Paragraph: 2"/>	Responsibility: <input type="text" value="SCDOT"/>
<p>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.</p>		

Project ID : <input type="text" value="P029208"/>	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	
ENVIRONMENTAL COMMITMENTS FOR THE PROJECT		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 103 Paragraph: 1"/>	Responsibility: <input type="text" value="SCDOT"/>
<input type="text" value="Lead-based paint"/>		
<p>The existing structures shall be removed and disposed of by the Contractor in accordance with Subsection 202.4.2 of the Standard Specifications. The Contractor's attention is called to the fact that this project may require removal and disposal of structural components containing lead-based paints. Removal and disposal of structural components containing lead-based paints shall comply with all applicable Federal, State, and Local requirements for lead as waste, lead in air, lead in water, lead in soil, and worker health and safety.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 103 Paragraph: 1"/>	Responsibility: <input type="text" value="CONTRACTOR"/>
<input type="text" value="Lead-based paint"/>		
<p>Lead-based paint surveys must be taken on 6 of the 10 bridges included within the project area. The results should be submitted to SCDOT RCE for review prior to demolition or reconstruction. Excluded from additional surveys are S-167 (Parr Road), S-39 (Holy Trinity Church Road), SC 202, and S-48 (Columbia Ave) which have already tested positive for the presence of lead-based paint.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 102 Paragraph: 2"/>	Responsibility: <input type="text" value="CONTRACTOR"/>
<input type="text" value="Asbestos"/>		
<p>SCDOT has surveyed the existing bridges for Asbestos Containing Material (ACM). The 10 bridges in the project corridor contain ACM. Potential removal of ACM would be coordinated with the SCDHEC Bureau of Air Quality, Asbestos Section prior to demolition or disturbances to the existing bridges.</p>		

Project ID : <input type="text" value="P029208"/>	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	
---	---	--

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 108 Paragraph: 3"/>	Responsibility: <input type="text" value="SCDOT/CONTRACTOR"/>
<input type="text" value="Cultural Resources - Cemeteries"/>		
<p>The Department will ensure that the existing known limits of the Comalander and Summer-Counts Cemeteries are identified and delineated in the field. Prior to construction activities near these cemeteries, a construction barrier fence or other appropriate barrier will be erected a minimum of 10 feet beyond the known cemetery limits. This will ensure that these cemeteries and any potential unmarked graves associated with them will be protected. As currently designed, these cemeteries are not proposed to be impacted by the project. However, if construction would need to impede into a delineated area, the Department will provide an archaeologist on site to monitor all ground disturbing activities near the affected area(s).</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 109 Paragraph: 1"/>	Responsibility: <input type="text" value="CONTRACTOR"/>
<input type="text" value="Cultural Resources"/>		
<p>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 material shall cease until the SCDOT Archaeologist directs otherwise.</p>		

Non-Standard Commitment	NEPA Doc Ref: <input type="text" value="Page: 110 Paragraph: 5"/>	Responsibility: <input type="text" value="SCDOT/CONTRACTOR"/>
<input type="text" value="Displacements"/>		
<p>The SCDOT, and/ or contractor 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.</p>		

Table of Contents

1	Introduction	1
1.1	Project Location.....	3
1.2	Where does the project start and stop?	3
1.3	What are the existing characteristics of the roadway?	4
1.4	How would the project be funded?	5
2	Purpose and need for Action	5
2.1	What is the purpose of this project?	6
2.2	Why is the project needed?	6
2.2.1	What are the traffic conditions?	6
2.2.2	What are the roadway design deficiencies?	9
2.2.3	Why is safety an issue and why is it a secondary need?	13
3	Alternatives.....	14
3.1	How were the alternatives developed and evaluated?	14
3.2	Alternatives considered and eliminated	15
3.2.1	Exit 85	15
3.2.2	Exit 91	17
3.2.3	Exit 97	18
3.3	No-Build Alternative	18
3.4	What is the I-26 mainline build Reasonable Alternative?	19
3.4.1	I-26 Mainline Build Alternative.....	19
3.4.2	I-26 Congestion Management Strategies and the Build Alternative.....	24
3.5	What are the interchange build Reasonable Alternatives?	28
3.5.1	Exit 85 Little Mountain Interchange.....	28
3.5.2	Exit 91 Columbia Avenue Interchange	31
3.5.3	Exit 97 Broad River Road	34
3.6	What is the project Preferred Alternative?.....	38
4	Existing conditions and Environmental consequences	44
4.1	Land Use	45
4.1.1	What is the existing land use in the study area?.....	45
4.1.2	What local planning documents contribute to land use planning within the study area?	47

4.1.3	How would the alternatives impact land use in the project study area?	48
4.2	Farmlands	49
4.2.1	How is farmland protected?.....	49
4.2.2	What are the types and the amounts of protected farmland soils?	49
4.3	Water Quality	50
4.3.1	What drainage basin is the study area located in?	51
4.3.2	What is the existing water quality of the surface waters in the study area?.....	51
4.3.3	How would the project affect water resources and water quality?	51
4.3.4	Are there wild and scenic rivers in the study area?	52
4.4	Waters of the US	53
4.4.1	What are wetlands and streams?.....	53
4.4.2	How were wetlands and streams identified within the study area?	54
4.4.3	What wetlands and streams are located within the study area?	54
4.4.4	What kind of impacts would occur to wetlands and streams as a result of the proposed project?.....	55
4.4.5	How would the impacts be mitigated?	57
4.5	Permits and Certifications	58
4.5.1	What environmental permits would be required for the proposed project?.....	58
4.6	Invasive Species Management	59
4.7	Floodplains	60
4.7.1	What is a floodplain?.....	60
4.7.2	Is the study area within the floodplain?.....	61
4.7.3	How will the proposed project affect floodplains and flood elevations?	61
4.8	Other Plant and Wildlife Resources	62
4.8.1	What other plant and wildlife resources are being assessed?.....	62
4.8.2	How would the project impact other plant and wildlife resources?.....	64
4.9	Threatened, Endangered, and Protected Species	64
4.9.1	What federal and state protected species may occur within the study area?	65
4.9.2	Would any species be impacted by the project?	67
4.11	Noise.....	78
4.11.1	What is noise and how is it measured?.....	78
4.11.2	How were noise conditions studied in this area?	79
4.11.3	How would the project affect noise levels?	79

4.11.4	How can noise impacts be mitigated?.....	82
4.11.5	What noise impacts occur from construction?	96
4.11.6	How with noise information be shared with local officials?	96
4.12	Hazardous Waste and Underground Storage Tanks (HAZMAT)	97
4.12.1	What are hazardous waste sites?.....	97
4.12.2	Are there any potentially contaminated sites located within the study area?	97
4.12.3	Would the Preferred Alternative impact potentially contaminated sites?	100
4.13	Lead-Based Paint and Asbestos.....	101
4.13.1	What regulations exist for lead-based paint and asbestos?	101
4.13.2	What structures may contain lead or asbestos?	101
4.13.3	How would the project impact lead/asbestos structures?	102
4.14	Cultural Resources.....	103
4.14.1	What are cultural resources and historic properties?.....	103
4.14.2	Why are cultural resources being considered for this project?	104
4.14.3	What cultural resources and historic properties exist in the study area and how would they be affected by the proposed project?.....	105
4.14.4	What would be the potential impacts to cultural resources?.....	108
4.15	Sections 4(f) and 6(f)	109
4.15.1	What are Sections 4(f) and 6(f)?.....	109
4.15.2	What are the existing Section 4(f) and 6(f) resources located in the study area?	110
4.15.3	Would any Section 4(f) and 6(f) resources be impacted by the proposed project?	110
4.16	Communities	110
4.16.1	What impacts could occur to communities?.....	110
4.16.2	Would the project disproportionately impact Environmental Justice communities?.....	115
4.17	What economic impacts could the project have?	116
4.17.1	Existing Conditions	116
4.17.2	Potential Economic Impacts	118
4.18	Indirect and Cumulative Effects	120
4.18.1	What are Indirect and Cumulative Effects and why is an analysis needed?	120
4.18.2	What study area is used for analysis (Study Area Boundaries)?	121
4.18.3	How were community trends and goals analyzed (Study Area Communities, Trends, and Goals/Methodology)	122
4.18.4	What are notable environmental features?.....	123

4.18.5	What is the context of the affected resources?	124
4.18.6	What are the impact-causing activities of the proposed project?	124
4.18.7	What are the potential indirect impacts?	124
4.18.8	How were the results analyzed?	125
4.18.9	What are the cumulative impacts and reasonable foreseeable actions?	126
4.18.10	How would these impacts be mitigated?	126
5	Agency Coordination and Public Involvement	127
5.1	How have the regulatory and resource agencies been involved in the project?	127
5.2	What information was shared during the Public Information Meeting?	128
5.3	Public Hearing	129
6	References	130

List of Figures

Figure 1: Project Location	2
Figure 2: I-26 near Exit 97	5
Figure 3: Level of Service (LOS)	7
Figure 4: Exit 85 Existing Interchange Deficiencies	10
Figure 5: Exit 91 Existing Interchange Deficiencies	11
Figure 6: Exit 97 Existing Interchange Deficiencies	12
Figure 7: Exit 85 Alternative 1 (Eliminated)	16
Figure 8: Exit 85 Alternative 2 (Eliminated)	17
Figure 9: Exit 91 Dual Roundabout Interchange Alternative 1 (Eliminated)	18
Figure 10: I-26 Typical Sections	20
Figure 11: Koon Road Detour	22
Figure 12: Exit 85 Reasonable Alternatives	29
Figure 13: Exit 91 Alternative 2	32
Figure 14: Exit 91 Alternative 3	34
Figure 15: Exit 97 Reasonable Alternatives	35
Figure 16: Exit 85 Alternative 1A, Preferred Alternative	41
Figure 17: Exit 91 Alternative 3, Preferred Alternative	42

Figure 18: Exit 97 Alternative 1, Preferred Alternative	43
Figure 19: Project Study Area	44
Figure 20: Richland County Conservation Easement.....	45
Figure 21: Pasture within PSA.....	50
Figure 22: Wateree Creek Stream Crossing	51
Figure 23: Wateree Creek Tributary	55
Figure 24: Metz Branch Stream Crossing.....	61
Figure 25: FHWA Projected National MSAT Emissions Trends 2010-2050 for Vehicles Operating on Roadways Using EPA’s MOVES2014 Model	71
Figure 26: Noise Study Equipment.....	77
Figure 27: Noise Analysis Area 1	86
Figure 28: Noise Analysis Area 2	87
Figure 29: Noise Analysis Area 3	88
Figure 30: Noise Analysis Area 4.....	89
Figure 31: Noise Analysis 5	90
Figure 32: Noise Analysis Area 6.....	91
Figure 33: Noise Analysis 7	92
Figure 34: Noise Analysis Area 8.....	93
Figure 35: Noise Analysis Area 9	94
Figure 36: Noise Analysis Areas 10 and 11	95
Figure 37: Corner Pantry at Exit 91	98
Figure 38: House at Archeological Site 38NE1359.....	104
Figure 39: Headstone at Parr Road Cemetery	108
Figure 40: Chapin Furniture Building	119
Figure 41: Public Meeting Signage.....	128
Figure 42: Public Information Meeting.....	128

Tables

Table 1:	Segment Capacities and Level of Service (LOS) along I-26.	9
Table 2:	Exit 85 Alternatives 1 and 1A Impacts Matrix.....	16
Table 3:	Exit 85 Alternatives 2 and 2A Impacts Matrix.....	17
Table 4:	Reasonable Alternatives Impact Matrix	23
Table 5:	Congestion Management Toolbox.....	27
Table 6:	Potential Impacts from the I-26 Preferred Alternatives	40
Table 7:	Estimated Stream Impacts	56
Table 8:	Estimated Wetland Impacts.....	57
Table 9:	Floodplains and Existing Crossings in the I-26 Widening PSA	61
Table 10:	Federally Protected Species and Potential Project Impacts	68
Table 12:	Year 2040 Build/No-Build Vehicle Miles Travel (VMT)	76
Table 13:	NAC for Land Use Categories	79
Table 14:	Summary of Receivers Approaching or Exceeding NAC	81
Table 15:	Noise Analysis Areas and Preliminary Determination of Barrier Effectiveness	85
Table 16:	Edge of Pavement Distances where NAC threshold would be exceeded.	96
Table 17:	Potentially Hazardous Materials Sites	99
Table 18:	Potential for Asbestos or Lead within I-26 Bridges.	102
Table 19:	Archaeological Resources Documented in the I-26 PSA.....	105
Table 20:	Previously Identified Architectural Resources in the I-26 PSA.	105
Table 21:	Newly Identified Architectural Resources in the I-26 PSA.....	107
Table 22:	Population Growth in the I-26 PSA.	112
Table 23:	Population Makeup in Lexington, Newberry, and Richland Counties	112
Table 24:	Newberry County Population Demographics by Census Tract and Block Group (BG)	114
Table 25:	Lexington County Population Demographics by Census Tract and Block Group (BG)	114

Table 26:	Richland County Population Demographics by Census Tract and Block Group (BG)	114
Table 27:	Economic Conditions for Newberry, Lexington, and Richland Counties	117
Table 28:	Direct, Indirect, and Cumulative Effects	121

Appendices

APPENDIX A	Interstate 26 Widening Traffic Analysis Report
APPENDIX B	Exit 85 IMR
APPENDIX C	Exit 91 IMR
APPENDIX D	Exit 97 IMR
APPENDIX E	Carolina Crossroads I-20/26/126 Corridor Project Congestion Management Process Technical Memorandum
APPENDIX F	Richland County Conservation Easement Letter
APPENDIX G	Farmland Impact Conversion Rating Form
APPENDIX H	Natural Resources Technical Memorandum
APPENDIX I	Floodplain Checklist
APPENDIX J	Traffic Noise Analysis Report
APPENDIX K	Phase I Environmental Site Assessment, Lead and Asbestos Surveys
APPENDIX L	Phase I Cultural Resource Survey for Proposed Widening of Interstate 26
APPENDIX M	SHPO and THPO Coordination
APPENDIX N	Letter of Intent and Responses
APPENDIX O	Public Information Meeting Summaries

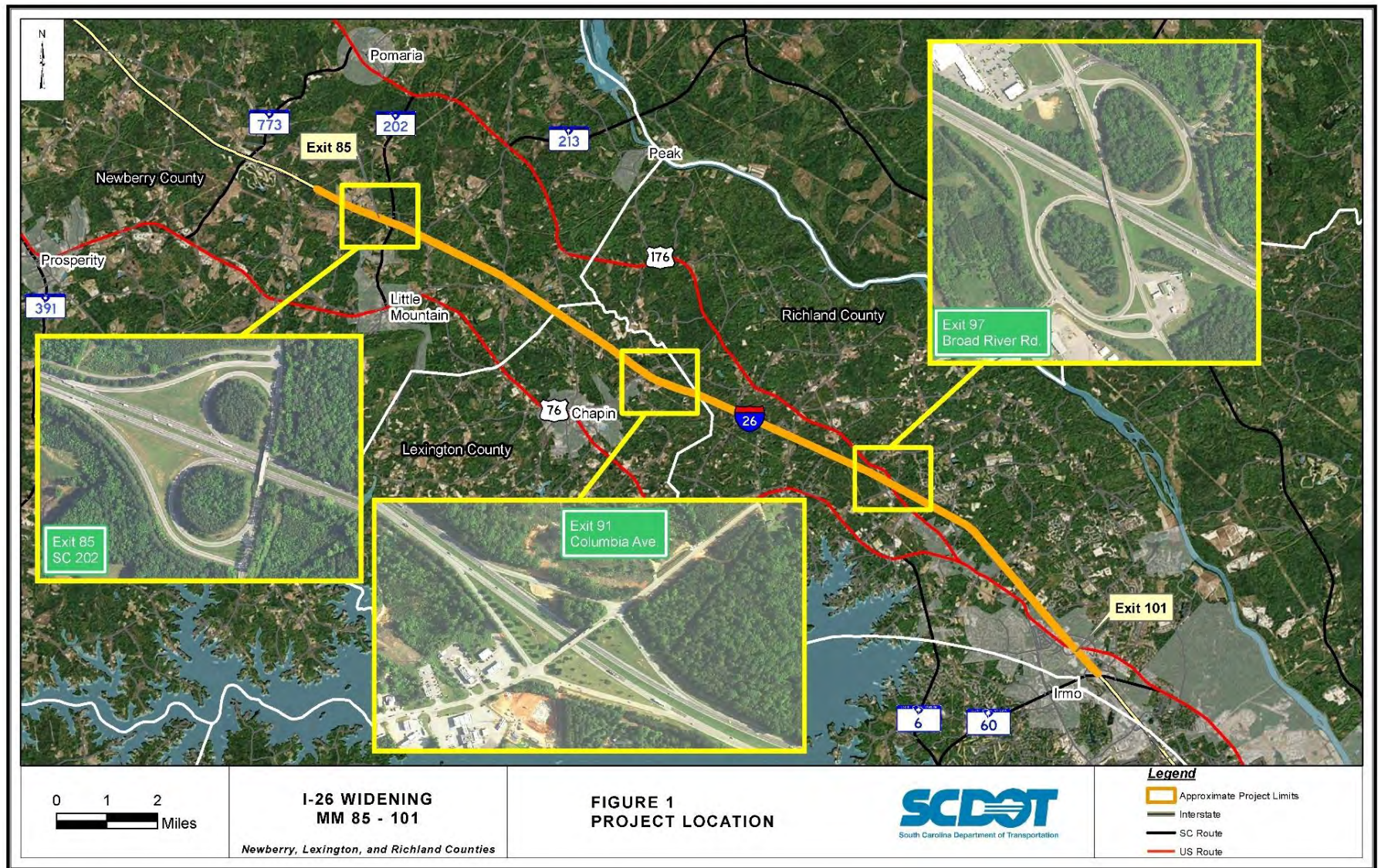
1 INTRODUCTION

The South Carolina Department of Transportation (SCDOT), in coordination with the Federal Highway Administration (FHWA), proposes improvements and upgrades to Interstate 26 (I-26) to support increasing vehicular use. SCDOT proposes widening I-26 and reconstructing three interchanges from mile marker (MM) 85 near Little Mountain to MM 101 near Irmo in Newberry, Lexington, and Richland counties. Improvements would take place from 1.6 miles west of the SC 202 (Exit 85) interchange to the US 176 (Exit 101) interchange (Figure 1). The improvements would widen the mainline of I-26 from Exit 85 to Exit 101. I-26 would be widened for a total of 6 lanes, three in each direction from Exit 85 to Exit 97 and 8 lanes, four in each direction from Exit 97 to Exit 101. Interchange improvements would be provided at Exits 85, 91, and 97.

This Environmental Assessment (EA) is being submitted pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended, in accordance with FHWA regulations in 23 CFR § 771 and Council on Environmental Quality (CEQ) regulations 40 CFR § 1500. The project, as proposed, would result in certain modifications to the human and natural environment. However, SCDOT has not identified any significant impacts that would occur and; therefore, the project meets the criteria under 23 CFR § 771.115(c) for processing and review through the scope of an EA. Environmental studies were conducted in the early stages of project development and are discussed in this EA. These studies and an understanding of the project's scope of work were considered in the decision for this level of documentation and are either summarized and attached or appended by reference to this document.

Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment

Figure 1: Project Location



1.1 Project Location

SCDOT proposes improvements to an approximately 16-mile long section of the I-26 corridor designed to increase capacity and upgrade interchanges and overpass bridges to meet state and federal design requirements. The interchanges at Exits 85, 91, and 97 would also be improved. A total of seven overpasses that cross I-26 would be replaced including S-36-167 (Parr Road), S-36-39 (Holy Trinity Church Road), S-32-49 (Peak Street), S-40-405 (Old Hilton Road), S-40-234 (Mt. Vernon Church Road), S-40-80 (Shady Grove Road), and S-40-58 (Koon Road). The truck weigh station near MM 94 would be improved as a weigh-in-motion station.

1.2 Where does the project start and stop?

FHWA regulations (23 CFR Part 771.111(f)) require transportation improvement projects to have logical beginning and end points to guide decisions regarding project limits. Project termini were selected based on existing and future traffic needs with the eastern terminus reflecting AADT volumes approaching 102,000 and from there westerly decreasing to 83,600 AADT west of the project. To provide an acceptable Level of Service (LOS) in the 2040 design year, widening would need to take place from near MM 85 to MM 101.

The western terminus of the project is located approximately 1.6 miles west of MM 85 near the Exit 85 Little Mountain interchange. This would allow for improvements to the Exit 85 SC 202 interchange and widening to Exit 85, followed by a tapering of lanes to transition safely back to a two lane roadway in both the eastbound and westbound directions.

The eastern terminus of the project is located near the Exit 101 interchange. This location was selected so that four lanes in each direction can be constructed to reduce congestion. If widening did not extend to Exit 101, the traffic congestion, or LOS, would reach a failing level, resulting in substantial delays to travelers.

FHWA regulations also require that the project have "independent utility", i.e. be a usable and reasonable expenditure even if no additional transportation improvements are made, and not restrict consideration of alternatives for other reasonably-foreseeable transportation improvements.

By the design year of 2040, traffic predictions indicate that the LOS along the I-26 project study area would be unacceptable at either E or F levels (with the exception of a portion of I-26 from Exit 85 to Exit 97 operating at LOS B or D). Widening I-26 from near MM 85 to MM 101 would increase capacity in the study area and would not require any other portions of I-26 to be widened to achieve these improvements. These needs are specific to the I-26 project and would be a reasonable expenditure of funds even if no additional transportation improvements are

made in the area. The improvements made as part of the project have the ability to function as stand-alone improvements without forcing other actions which may have impacts.

1.3 What are the existing characteristics of the roadway?

I-26 is an east-west interstate highway that begins at the junction of U.S. Route 11 and U.S. Route 23 in Kingsport, Tennessee. From this origin, I-26 runs generally southeastward through Tennessee, North Carolina, and South Carolina, where it ends at U.S. Route 17 in Charleston, South Carolina. Along its nearly 306-mile length, I-26 provides access to Johnson City, Tennessee; Asheville, North Carolina; and Spartanburg, Columbia and Charleston, South Carolina. In South Carolina, I-26 covers about 221 miles, and provides connections to I-85 northwest of Spartanburg, to I-20 west of Columbia, to I-77 south of Cayce, and to I-95 south of Providence.

The major portion of I-26 is located within South Carolina, with smaller portions in North Carolina (54 miles) and Tennessee (31 miles). The portion of I-26 within South Carolina traverses ten counties. Major cities that are bisected by I-26 include Charleston, Columbia, and Spartanburg in South Carolina, as well as Asheville in North Carolina, and Johnson City in Tennessee. I-26 is a direct link to additional interstates including I-85, I-385, I-20, I-77, and I-95. In addition to being a corridor for transporting people and freight between urban areas, I-26 serves other specific needs, including:

- Daily commuting routes for intra- and interstate travelers;
- Access to primary distribution centers in Columbia for companies such as Michelin, Honeywell, and Amazon Corporation;
- Access to one of the nation's leading container ports in Charleston and to heavy industry associated with the port; and
- Access to the Appalachian Mountains.

Throughout most of the corridor, I-26 provides a total of four lanes (two lanes in each direction). From Exit 85 southeastward, the four-lane section is maintained until it is widened from four to six lanes approaching Exit 101. East of Exit 101, I-26 has six lanes entering the study area, which begin to narrow down to four lanes (two in each direction) west of Exit 101.

The posted speed limit throughout most of the I-26 project study area (PSA) is 70 miles per hour. The posted speed limit decreases to 60 miles per hour in the eastbound direction approximately 1,700 feet west of the Exit 101 off-ramp. In the westbound direction, the speed limit changes from 60 to 70 miles per hour approximately 2,700 feet northwest of the on-ramp at Exit 101. I-26 currently consists of a four-lane interstate with a grassed or concrete median for most of its length.

Interchanges considered in this analysis are located at MM 85, 91, and 97 (Figure 1, page 2). In Lexington County, the interchange considered in this analysis is a diamond configuration located at MM 91. The Newberry County interchange is located at MM 85 and is a partial cloverleaf interchange with a loop on-ramp in the southwest quadrant and a loop off-ramp in the northwest quadrant. The Richland County interchange is located at MM 97.

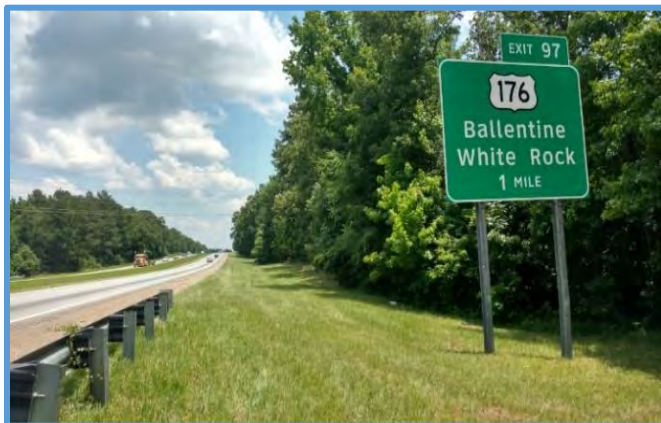


Figure 2: I-26 near Exit 97

This interchange is a partial cloverleaf interchange with loop on-ramps in the northeast and southwest quadrants. At the interchanges ramp termini currently intersect with arterial roadways. Several frontage roads are adjacent to the interstate and state roads cross over I-26 through seven existing overpasses. A parallel frontage road system is present at portions of both sides of I-26 throughout the study area.

Two closed rest areas (without facilities) are located within the PSA, one on westbound I-26 at approximately MM 88 (just east of the Holy Trinity Church Road overpass) and one on eastbound I-26, just east of MM 84. A weigh station is located on westbound I-26, just west of MM 94.

1.4 How would the project be funded?

The proposed project is consistent with the Central Midlands Council of Governments (CMCOG) Long Range Transportation Plan and is included in SCDOT's Statewide Transportation Improvement Program (STIP) for Richland, Lexington, and Newberry Counties.¹ The federal National Highway Performance Program (NHPP) identifies funds for construction in the system upgrade interstate program. The federal Advanced Construction program identifies funds for construction, also in the system upgrade interstate program. Additionally, funds are identified in the NHPP for construction from the pavement and reconstruction program. There are currently \$223,741 million dollars allocated in the STIP for this project. SCDOT has identified additional funds to meet the total project cost of \$530 million, and this additional funding would be included in an upcoming STIP amendment in early 2018.

2 PURPOSE AND NEED FOR ACTION

The CEQ, the agency responsible for coordinating Federal environmental efforts, provides a brief description of the Purpose and Need: "The statement shall briefly specify the underlying Purpose-

¹ SCDOT, *Statewide Transportation Improvement Program 2017 – 2022*, Amended November 17, 2017.

and-Need to which the agency is responding in proposing the alternatives, including the proposed action.” (40 CFR 1502.13).

The FHWA technical advisory T 6640.8A (1987) states that the Purpose-and-Need statement will: “Identify and describe the proposed action and the transportation problem(s) or other needs which it is intended to address (40 CFR 1502.13). This section should clearly demonstrate that a “need” exists and should define the “need” in terms understandable to the general public. The discussion should clearly describe the problems which the proposed action is to correct. It will form the basis for the “no action” discussion in the “Alternatives” section, and assist with the identification of Reasonable Alternatives and the selection of the Preferred Alternative.”

2.1 What is the purpose of this project?

The proposed project has two primary purposes:

- increase roadway capacity to address the projected increased traffic volumes; and,
- correct geometric deficiencies along the mainline and at several interchanges and overpasses in this section of I-26 by bringing them into compliance with current state and federal design standards.

The secondary purpose is to improve safety which will be enhanced by improving the geometric design of the facility.

2.2 Why is the project needed?

The needs for this project were identified through information in the Interstate 26 Widening Traffic Analysis Report and the Accident Analysis Report (refer to Appendix A), as well as that collected through meetings with SCDOT; federal, state and local agencies; project stakeholders, and the public. The following needs have been identified in connection with the proposed federal action within the study area:

- Increase capacity of the roadway system to account for peak hour demand which leads to congestion, delays, and crashes;
- Improve interchanges to meet traffic and safety requirements; and
- Improve public safety through reducing traffic congestion.

2.2.1 What are the traffic conditions?

Existing traffic volumes along I-26 from Exit 101 to Exit 97 are higher than the current facility can accommodate at an acceptable Level of Service (LOS), particularly during afternoon peak travel times. Peak travel times are considered business rush hours between 7:00 a.m. and 10:00 a.m.

and 4:00 p.m. and 7:00 p.m. As traffic increases over time, congestion would also increase in this segment and in all segments of I-26.

The Transportation Research Board's (TRB) *Highway Capacity Manual* (2010) defines the capacity of a facility as the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a roadway during a specified time period under typical roadway, traffic, and control conditions. Capacity can also be described as the maximum traffic flow obtainable on a given roadway using all available lanes. Design criteria refers to the requirements and guidance for the design of facilities. These criteria change over time, reflecting improvements to designs that improve efficiency and operational performance.

Currently, average annual daily traffic (AADT) volumes on I-26 in the project area range from a low of 42,300 AADT from Exit 85 to Exit 91, to a high of 52,300 AADT between Exit 97 and Exit 101. From Exit 91 to Exit 97, the existing AADT is 51,200. Projected traffic volumes for the year 2040 along this corridor vary between 84,600 AADT between Exits 85 and 91 and 102,400 between Exits 91 and 97. From Exit 97 to Exit 101 the 2040 future AADT is estimated at 104,600².

LOS is a qualitative measure that characterizes the ease or difficulty of moving within a traffic stream or flow and is measured by letter designations A through F. LOS A generally represents the best, free-flow operating conditions, and LOS F represents the worst operating conditions. The LOS criteria for freeway segments are shown in Figure 3, and are based on definitions from the TRB's *Highway Capacity Manual*. Density of traffic is measured in passenger cars per mile per lane. LOS A through D are acceptable under most







LEVELS OF SERVICE for Freeways			
Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		70	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. No delays
B		70	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. No delays
C		67	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. Minimal delays
D		62	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. Minimal delays
E		53	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. Significant delays
F		<53	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. Considerable delays

Figure 3: Level of Service (LOS)

² Interstate 26 Widening Traffic Analysis Report. STV, Inc. February 2018.

circumstances and are considered below capacity. LOS E is generally considered at-capacity and LOS F is over capacity. LOS E and F are generally considered unacceptable (Highway Capacity Manual, 2010).

A freeway segment analysis of LOS was completed to determine the number of lanes that would be needed to sufficiently increase roadway capacity along I-26. While AADT volumes remain similar between Exits 91/97 and 97/101, traffic analysis of peak hour volumes and LOS determined that three lanes would be sufficient between Exits 91 and 97 while four lanes would be required between Exits 97 and 101. The analysis showed that a three lane segment in each direction between Exit 91 and Exit 97 would operate at an acceptable LOS (LOS D or better) in the 2040 Build condition. The freeway segment analysis showed that between Exit 97 and Exit 101, a three lane eastbound freeway segment would operate at LOS F during the morning peak hour (but would operate at an acceptable LOS during the afternoon peak hour), while a three lane westbound freeway segment would operate at LOS F during the afternoon peak hour (but would operate at an acceptable LOS during the morning peak hour).

The segments operating at LOS F with three lanes were analyzed having four lanes. With four lanes in each direction between Exit 97 and Exit 101, the eastbound freeway segment is expected to operate at LOS D during the 2040 Build morning peak hour, while the westbound freeway segment is expected to operate at LOS D during the afternoon peak hour. Therefore, it is recommended that four lanes be provided in each direction on I-26 between Exit 97 and Exit 101, and three lanes be provided between Exit 91 and Exit 97 to accommodate design year build traffic.

For the No-Build scenario, the increased traffic volumes by 2040 would result in increased traffic density and reductions of LOS (Table 1). The projected traffic growth would increase congestion along the corridor and would result in higher density for the No-Build alternative. Without improvements to the current facility, the majority of the segments would operate at LOS D, E, or F by 2040, and the efficiency of the mainline roadway would be degraded. The additional capacity provided by the construction of additional lanes along I-26 would result in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to, or better than, those experienced under existing conditions.

Table 1: Segment Capacities and Level of Service (LOS) along I-26.

SEGMENT	DIRECTION	AM PEAK HOUR			PM PEAK HOUR		
		2016 EXISTING LOS	2040 No- BUILD LOS	2040 BUILD LOS	2016 EXISTING LOS	2040 No- BUILD LOS	2040 BUILD LOS
Exits 101-97	Westbound	C	E	B	F	F	D
Exits 97 – 91	Westbound	B	D	B	C	F	D
Exits 91 – 85	Westbound	B	B	A	C	D	B
Exits 85 – 91	Eastbound	B	D	B	C	D	B
Exits 91 – 97	Eastbound	C	F	C	C	F	C
Exits 97 – 101	Eastbound	F	F	D	D	F	C

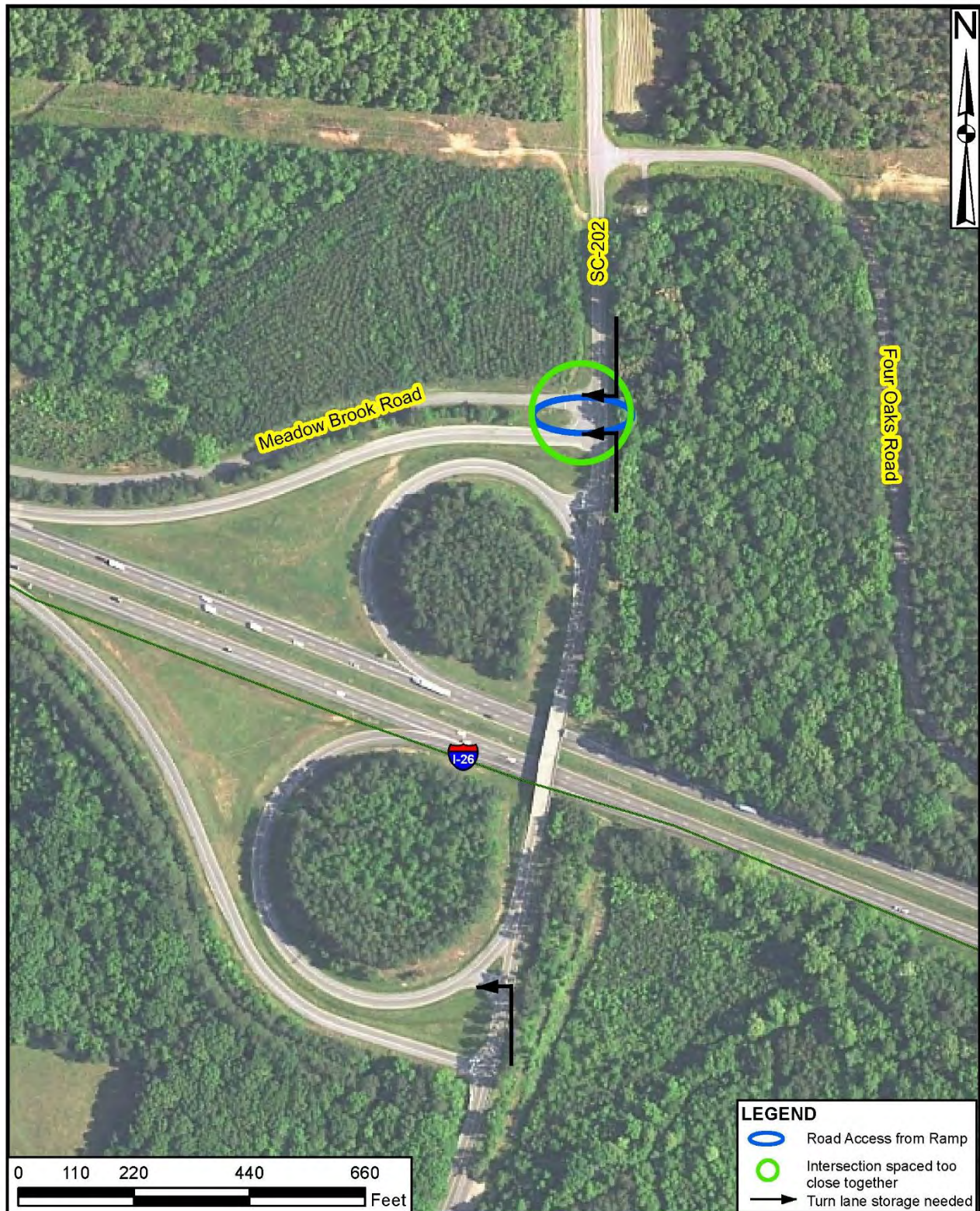
Source: Interstate 26 Widening Traffic Analysis Report. STV, Inc. February 2018.

2.2.2 What are the roadway design deficiencies?

Based upon recent accident data, there is a need for improving accessibility and creating safer connections to surrounding roadways along the I-26 project area. Modifications at the three interchanges would bring them into compliance with current design standards and improve safety at and around those interchanges.

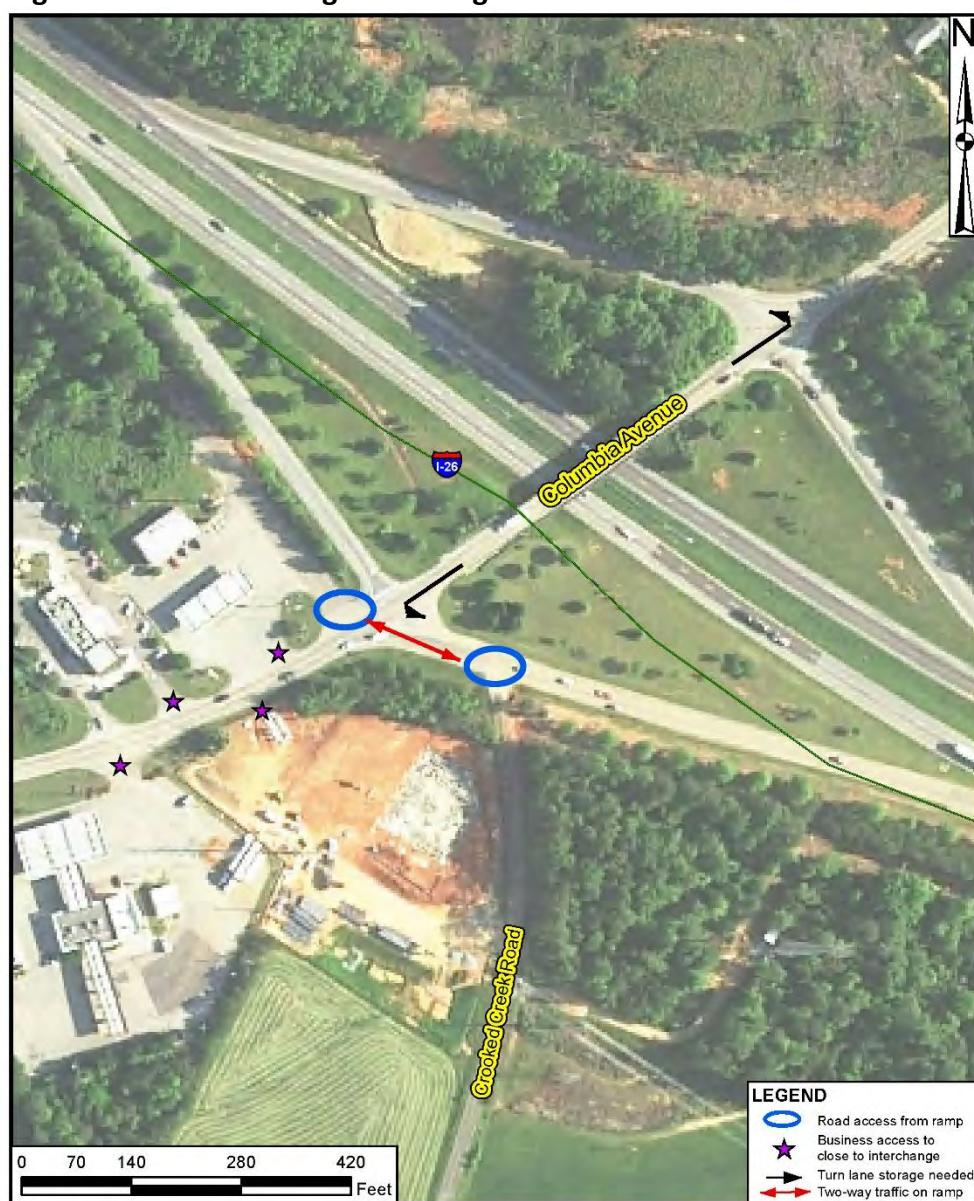
At Exit 85 the westbound on-ramp is adjacent to Meadow Brook Road, which is located to the north of the on-ramp and separated by approximately 45 feet (Figure 4). Meadow Brook Road would be realigned further north to meet spacing requirements for safety between intersections as required by SCDOT's Access and Roadside Management Standards (ARMS). The intersection of Four Oaks Road with SC 202 is too close to other existing intersections. No vehicle storage turn lanes are provided for the northbound left turn traffic from SC 202 merging onto the eastbound loop on-ramp. At the westbound on-ramp intersection, no vehicle storage turn lanes are provided for the northbound left-turn traffic or the southbound right-turn traffic from SC 202. Overall, the Exit 85 interchange would be improved by providing on-ramps and off-ramps that separate the interstate traffic from local traffic, are long enough to allow traffic to merge onto the interstate, and are long enough to store traffic that is exiting the interstate during peak hours.

Figure 4: Exit 85 Existing Interchange Deficiencies



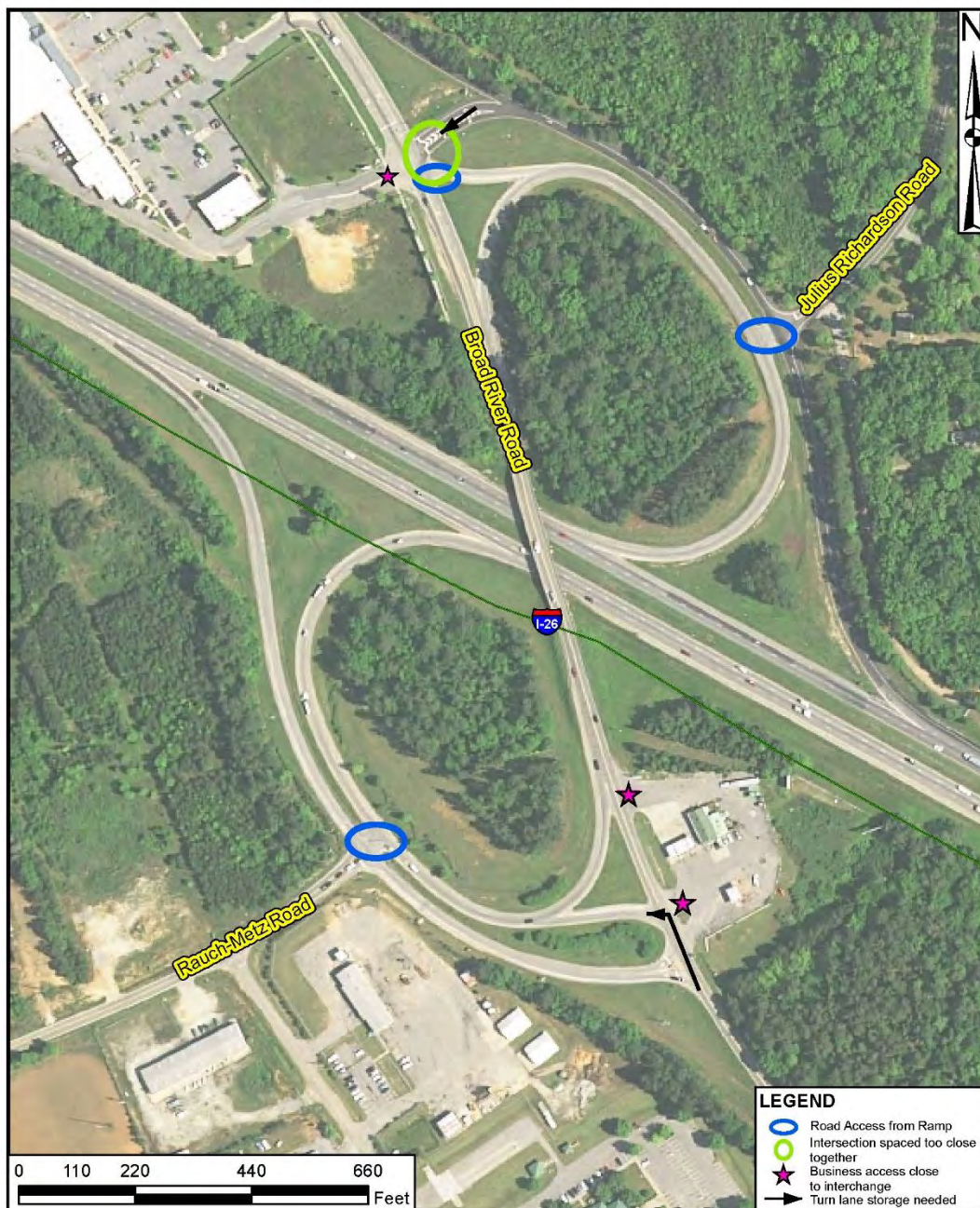
At Exit 91 the safety at the interchange would be improved by providing on-ramps and off-ramps that separate the interstate traffic from local traffic (Figure 5). The interchange would also be brought into compliance with current safety and design standards by limiting access to adjacent businesses in close proximity to the interchange, as defined by SCDOT's ARMS Manual. Two-way traffic is present for approximately 120 feet on the eastbound on-ramp between Columbia Avenue and Crooked Creek Road. This ramp would be improved by allowing only one-way traffic. No vehicle storage turn lanes are provided for southbound left turns from Columbia Avenue onto the eastbound ramp intersection or for northbound left turns at the westbound ramp intersection.

Figure 5: Exit 91 Existing Interchange Deficiencies



At Exit 97 the current network of state and local roads that intersect with the interchange ramps is complex, does not meet current design or safety standards, and contributes to congestion during peak travel times (Figure 6). Intersections are closely spaced together and there is a lack of storage turn lanes to access the interstate ramps. Rauch-Metz Road intersects with the I-26 eastbound off-ramp which is an unexpected condition for motorists to encounter. Julius Richardson Road intersects with the westbound on-ramp and off-ramp, creating an unsafe condition that does not meet design standards.

Figure 6: Exit 97 Existing Interchange Deficiencies



2.2.3 Why is safety an issue and why is it a secondary need?

Eleven freeway segments exceed the 2015 rural or urban statewide average Actual Crash Rate (ACR). Ten of the segments are rural segments that exceed the statewide average rural ACR of 0.626 crashes per one million vehicle miles (MVM). One urban segment exceeds the statewide average urban ACR of 1.431 MVM.

Seven of the ten freeway segments with the highest total ACR are located between ramps at individual interchanges or on weaving sections between adjacent interchanges. These include:

- Both segments between the ramps/loop ramps in both directions at Exit 85
- Both segments between the off-ramp and loop on-ramps in both directions at Exit 97
- Both weaving sections in both directions between Exit 101 and Exit 102

The two freeway segments between interchanges with the highest ACR (exceeding the statewide average urban or rural ACR) include:

- Eastbound between Exit 85 and Exit 91
- Eastbound between Exit 97 and Exit 101

Weaving segments and loop ramp merge/diverge areas are elements in nine of the ten segments with the highest rural or urban ACR.

The geometric conditions resulting from merge/diverge areas of loop ramps and weaving sections of the interchanges can play a role in the frequency of the crashes. Merging distance at on-ramps and diverging distances at off-ramps should be improved to SCDOT standards where these standards are not already met.

Modifying interchanges to eliminate loop ramps at Exit 85 and Exit 97 may also reduce crashes on the segments adjacent to the loop ramps. Study area hot spots for crashes along the interchange arterials include:

- Frequent crashes at Exit 91 along Columbia Avenue at business driveways to the west of the eastbound off-ramp intersection. Access controls as part of the proposed diverging diamond interchange improvement would improve this condition.
- There is a substantial cluster of crashes at Exit 97 at the unsignalized eastbound off-ramp intersection with Broad River Road. Interchange improvement concepts at Exit 97 would address the possible causes of the frequent crashes at this location.
- At Exit 101, there are several clusters of crashes that occur at or near the signalized intersection of Broad River Road with Lordship Lane, at the unsignalized intersection with Royal Tower Drive (S-40-1862), and at the signalized intersection at the eastbound on-ramp. Since no improvements are anticipated at this interchange as part of this project,

these crash locations are being evaluated as part of the proposed Carolina Crossroads Project.

The proposed interchange improvements would increase safety by providing longer on-ramps and off-ramps to help vehicles enter and exit both the interstate and the intersecting roads. The longer exit ramps would also alleviate back-up onto the interstate during heavy traffic periods and help to reduce the high number of rear-end collisions occurring throughout the study area.

3 ALTERNATIVES

During the early stages of the project a wide range of solutions that would improve the project corridor were considered by SCDOT. These solutions, or alternatives, were developed by SCDOT for the mainline of I-26 and for the interchanges at Exit 85 and Exit 97. SCDOT, in cooperation with Lexington County, also developed alternatives for the interchange at Exit 91 near Chapin.

3.1 How were the alternatives developed and evaluated?

The alternatives for Exits 85 and 97 were developed based upon the needs indicated by traffic projections contained within the Interstate 26 Widening Traffic Analysis Report³, Interchange Modification Reports (IMR) for Exits 85⁴ and 97⁵, state and federal design requirements for highway design that are contained within the Roadway Design Criteria for I-26 Widening document, and consideration of the natural and man-made resources found within the study area (Appendix B, D).

The alternatives at Exit 91 were developed by Lexington County and SCDOT, as part of an earlier planned project. The same process was used as with Exits 85 and 97 as stated above. An IMR⁶ was prepared to evaluate each Exit 91 interchange alternative to determine which best met the purpose and need with the least impacts to the surrounding environment (Appendix C).

Only one mainline alternative was developed with the intent of adding additional lanes within the existing inside median of the interstate. The majority of the corridor has a large center median and widening would take place in this area where possible. The corridor was analyzed to determine if the interstate needed to be widened to three or four lanes to reduce congestion. Widening to the center of the existing lanes is preferred because:

- the median is within the existing right-of-way, which minimizes the amount of additional right-of-way that would be needed;

³ Ibid.

⁴ Interchange Modification Report, Interstate 26 Exit 85. STV, Inc. 2017.

⁵ Interchange Modification Report, Interstate 26 Exit 97. STV, Inc. 2017.

⁶ Interchange Modification Report I-26 at S-48 (Columbia Ave) Interchange Improvements. AECOM. Dec 2016.

- the existing frontage roads are often very close to the interstate and widening to the outside could cause them to be relocated outward; and,
- it would minimize impacts to adjacent properties and natural resources.

To simplify the evaluation of alternatives, this project was considered in two parts, the mainline widening and the interchanges to be improved. This allows each preliminary interchange alternative to be compared against the others for that interchange and one Preferred Alternative to be identified for each interchange. The best interchange alternatives can then be combined with the best mainline alternative to produce an overall Preferred Alternative for the project.

3.2 Alternatives considered and eliminated

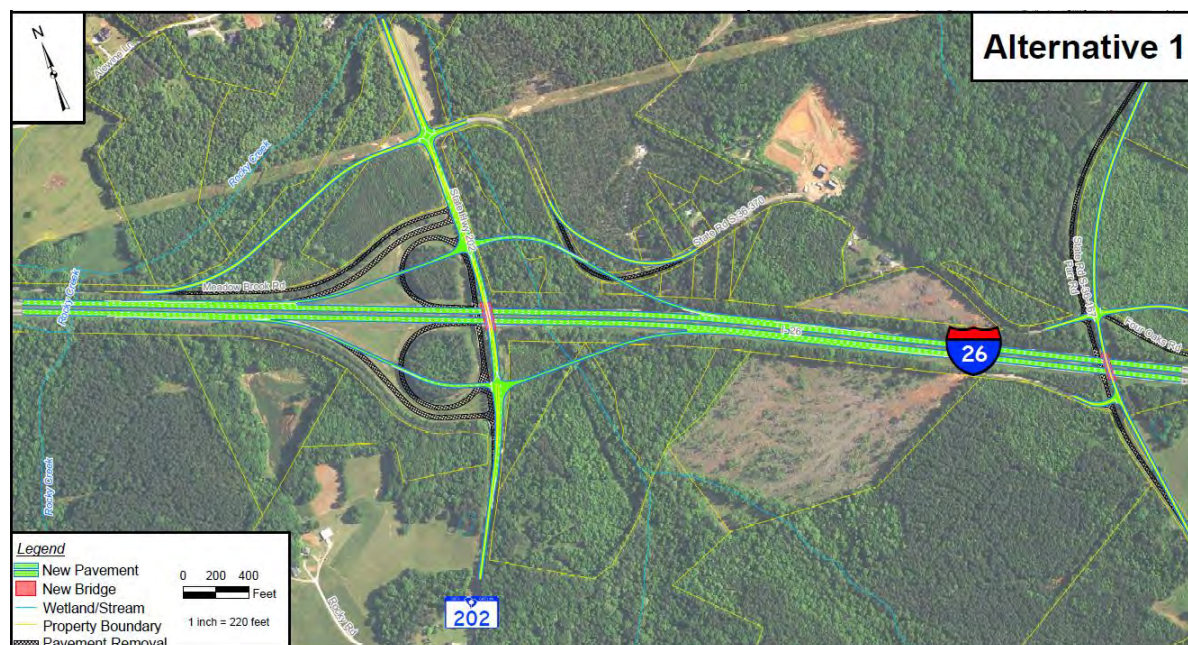
3.2.1 Exit 85

There were several preliminary alternatives developed for the interchange at Exit 85. Many of the alternatives had similar interchange designs and provided similar traffic improvements, but with slightly different ramp and frontage road alignments. These alignment variations resulted in substantially higher impacts to residential homes and streams, without providing a greater improvement to the roadway network and traffic flow when compared to other alternatives. Therefore, several of these alternatives were eliminated in consultation with the design, traffic, and environmental members of the project team, primarily based upon their similarity to other designs or design issues and concerns. Specifically, there were five preliminary alternatives initially developed for Exit 85 and two of those were considered and then eliminated. Those considered but eliminated options, Alternatives 1 and 2, are discussed in the following sections.

3.2.1.1 Exit 85 Alternative 1 (Eliminated)

Alternative 1 is a diamond-shaped interchange configuration that would provide new on-ramps and off-ramps for both eastbound and westbound traffic (Figure 7).

Figure 7: Exit 85 Alternative 1 (Eliminated)



Alternative 1 was initially considered because it provides safety improvements by correcting geometric deficiencies at the Exit 85 interchange. Alternative 1 is comparable to Alternative 1A, with both alignments similarly improving geometric deficiencies. When compared to Alternative 1A, Alternative 1 was eliminated as a result of public comments, higher impacts to residential homes, and higher stream impacts (Table 2). Alternative 1 would have required three homes to be relocated and would have impacted 1,859 feet of streams. This impact to streams is substantially higher than any of the other build alternatives. Alternative 1A was carried forward as a reasonable alternative for Exit 85.

Table 2: Exit 85 Alternatives 1 and 1A Impacts Matrix.

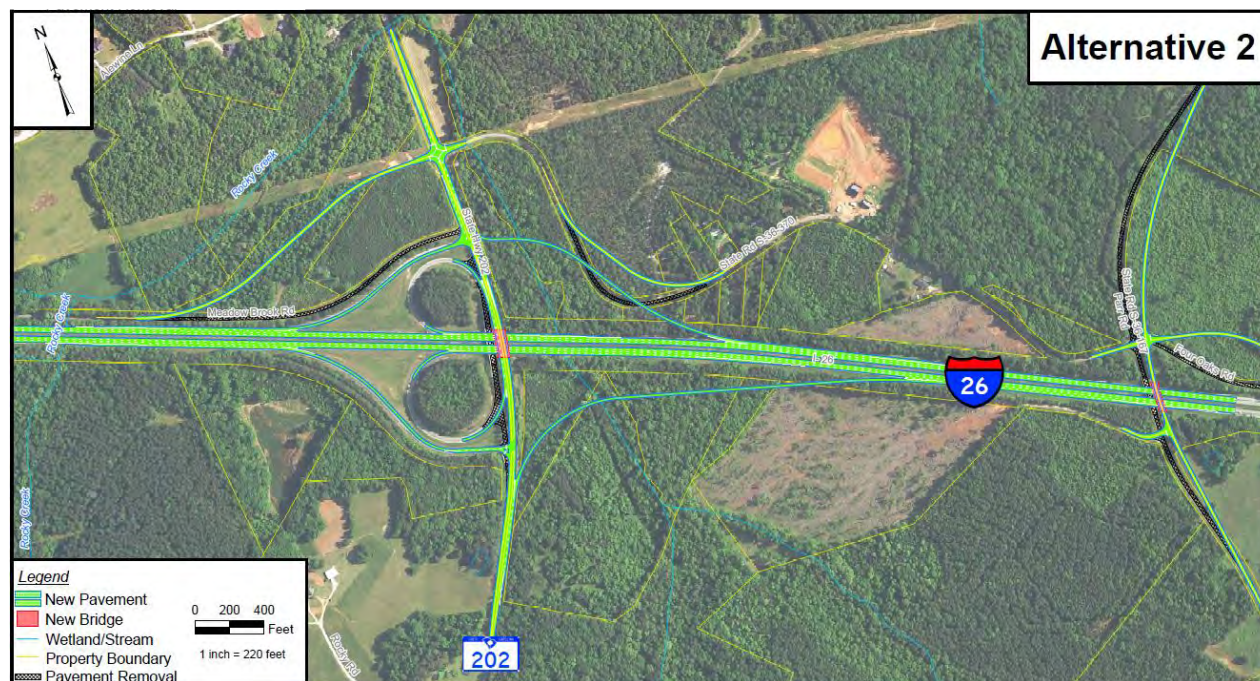
POTENTIAL IMPACT	EXIT 85 ALTERNATIVE 1 (ELIMINATED)	EXIT 85 ALTERNATIVE 1A
Residential Relocations	3	0
Stream Impacts	1,859 feet	1,460 feet

Note: All other environmental impacts are the same for both alternatives.

3.2.1.2 Exit 85 Alternative 2 (eliminated)

Alternative 2 (Figure 8), a partial cloverleaf-shaped interchange, was also eliminated because it would have resulted in relocating three residential homes when compared to Alternative 2A (Table 3).

Figure 8: Exit 85 Alternative 2 (Eliminated)



Alternative 2 had higher impacts to residential homes when compared to Alternative 2A and was eliminated from further consideration at Exit 85. Alternative 2A was carried forward as a reasonable alternative for Exit 85.

Table 3: Exit 85 Alternatives 2 and 2A Impacts Matrix.

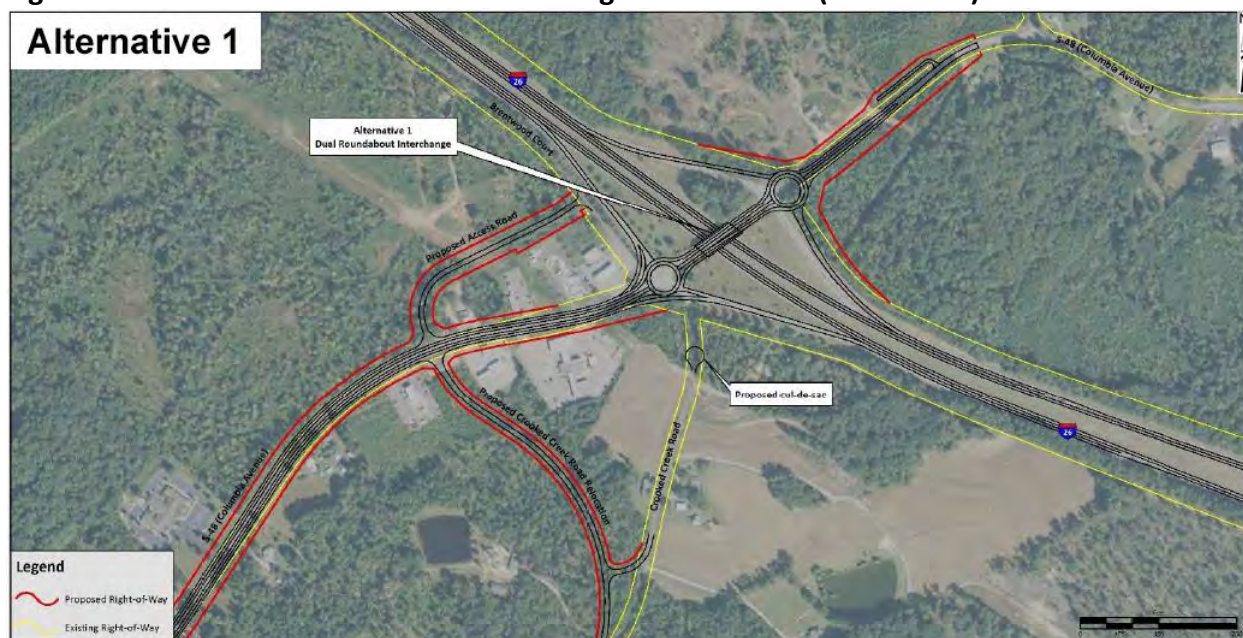
POTENTIAL IMPACT	EXIT 85 ALTERNATIVE 2 (ELIMINATED)	EXIT 85 ALTERNATIVE 2A
Residential Relocations	3	0

Note: All other environmental impacts are the same for both alternatives.

3.2.2 Exit 91

Three preliminary interchange alternatives were evaluated for Exit 91, including a dual roundabout, a partial cloverleaf, and a diverging diamond. The dual roundabout design (Exit 91, Alternative 1) would construct a new interchange that includes a roundabout at either end of the I-26 overpass (Figure 9).

Figure 9: Exit 91 Dual Roundabout Interchange Alternative 1 (Eliminated)



A roundabout is a circular intersection in which traffic flows in one direction around a center island. This type of interchange allows traffic to flow through an interchange without the need for traffic signals. Traffic studies conducted for the IMR indicate that the Exit 91 Alternative 1 would operate at LOS F during afternoon peak traffic hour; therefore, the IMR determined that it should not be considered a viable alternative. Due to the inability to provide an acceptable LOS, the dual roundabout interchange would not meet the project's intended purpose; therefore, Alternative 1 at Exit 91 was eliminated from further consideration. Alternatives 2 and 3 were carried forward as Reasonable Alternatives, as discussed in Section 3.5.2.

3.2.3 Exit 97

Three preliminary alternatives were evaluated at Exit 97 including a diverging diamond, partial cloverleaf, and single point urban interchange. All had similar operational performance and impacts. Thus, all were carried forward as reasonable alternatives for Exit 97. At Exit 97 there were no alternatives that were considered but eliminated from further study.

3.3 No-Build Alternative

The No-Build alternative, which consists of SCDOT making no improvements to the roadway, was considered as a baseline for comparison. The No-Build alternative would not provide for the proposed improvements that are necessary to increase roadway capacity or correct geometric deficiencies along this corridor. The interstate would not be widened and the interchanges would not be modified. Only typical maintenance activities would be provided along I-26. As a result of this alternative, there would be no direct construction impacts to the natural or human

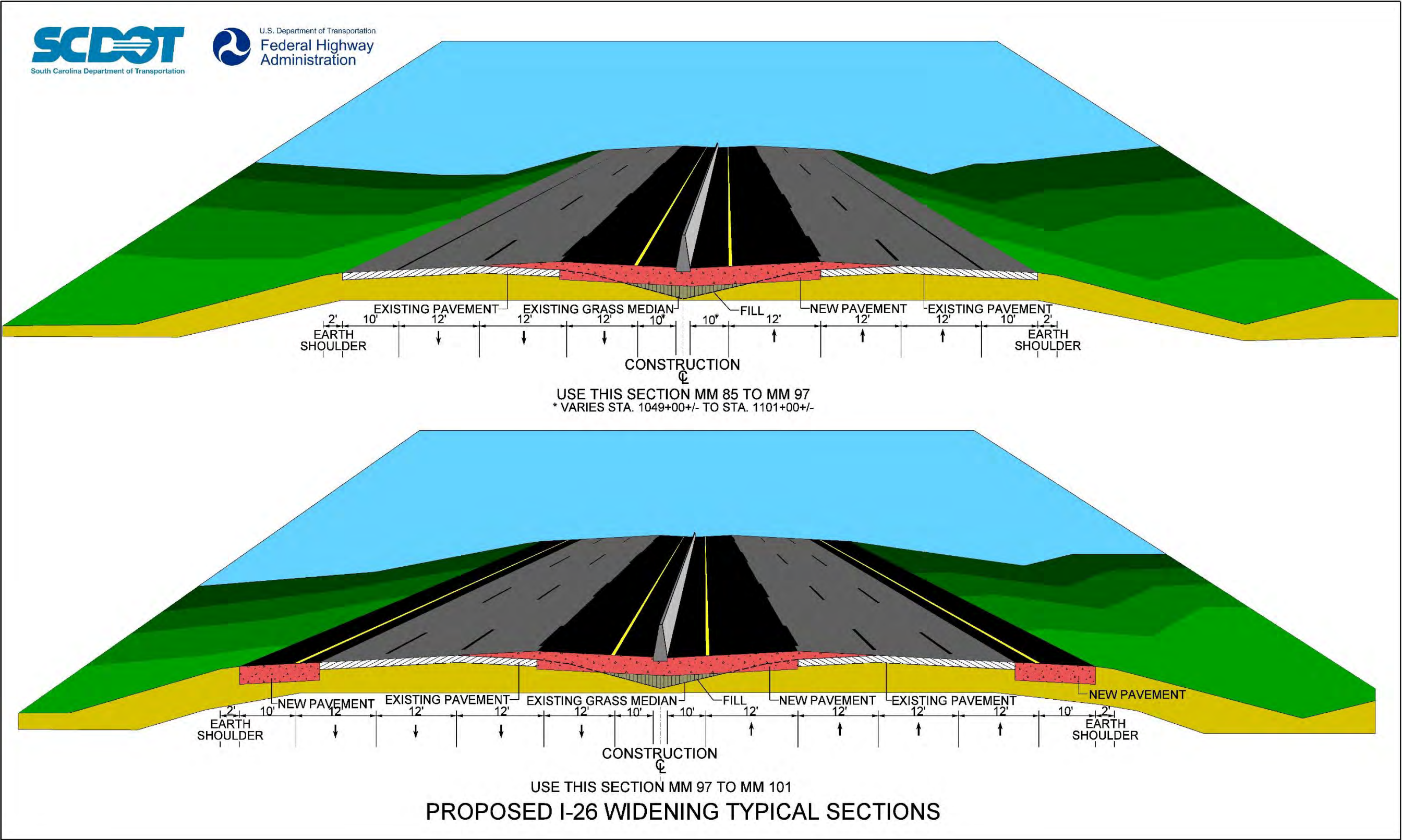
environment; no right-of-way or construction costs; nor disruptions during construction. If improvements are not implemented, I-26 roadway congestion would increase. Based upon the increasing use of I-26 and the need to provide for public safety, the No-Build alternative is not considered acceptable. Projections with the increase of traffic for the No-Build alternative would have adverse impacts such as economic costs with time lost due to congestion and an increased potential for vehicular accidents. The No-Build alternative would not improve the LOS along the project corridor, and would therefore not satisfy the project's intended purpose. Due to the inability to improve traffic congestion within the project corridor, the No-Build alternative was eliminated from further consideration. However, the No-Build alternative was retained as a baseline for comparison and evaluation.

3.4 What is the I-26 mainline build Reasonable Alternative?

3.4.1 I-26 Mainline Build Alternative

As noted in Section 3.4, there is one build alternative for the mainline of I-26. The widening of I-26 to 6 lanes would begin from 1.6 miles west of the Exit 85 interchange to the Exit 97 interchange. This would widen the mainline of I-26, providing additional through travel lanes in both directions from near Exit 85 to Exit 97. From near Exit 97 to Exit 101, two additional through travel lanes would be added for a total of four lanes in each direction of this segment. The through lanes would each be 12 feet wide (Figure 10). The outside shoulders would primarily be paved for 10 feet, with an additional earthen shoulder of 2 feet. The inside shoulders would be paved for 10 feet with an inside concrete barrier or paved for 10 feet with an additional earthen shoulder of 2 feet.

Figure 10: I-26 Typical Sections



Some areas beyond the outside paved shoulder would be regraded to provide additional clear zone areas. In addition to mainline widening, other improvements to the main travelway would include:

- Replace the overpass bridge at S-36-167 (Parr Road).
- Realign Parr Road and Four Oaks Road near the Parr Road overpass.
- Replace the overpass bridge at S-36-39 (Holy Trinity Church Road).
- Adjust the Beagle Run Road and Clark Road alignment near the Holy Trinity Church Road overpass.
- Close the access to the partially constructed rest area access near MM 88 (no facilities are available here but a paved ramp area was constructed).
- Replace the overpass bridge at S-32-49 (Peak Street).
- Replace the overpass bridge at S-40-405 (Old Hilton Road).
- Convert and improve the weigh station near MM 94 as a weigh-in-motion station.
- Replace the overpass bridge at S-40-234 (Mt. Vernon Church Road).
- Replace the overpass bridge at S-40-80 (Shady Grove Road).
- Replace the overpass bridge at S-40-58 (Koon Road).

The mainline alternative widens I-26 to the center grassed median from MM 85 to MM 97. This reduces the overall project footprint and minimizes additional impacts to the natural and manmade environment. Final design of the roadway would determine areas where widening outside of the median may be necessary. At this phase in design, it is expected that widening outside of the median would occur from MM 97 to MM 101. The addition of two through lanes in each direction from Exits 97 to 101 would create a wider road footprint, requiring the outside through lanes to be added to the outside of the existing outer lanes. In this approximate 4.5 mile section, the widening would occur to the median and on the outside of the existing lanes and shoulder. Bridge overpasses would be constructed on new alignment because there are no appropriate detours for the traffic at most of the replacement locations. The exception is Koon Road which would be replaced on existing alignment. A detour for local traffic that would normally use the Koon Road overpass over I-26 would be put in place temporarily (Figure 11). Motorists would take either Old Tamah Road to Shady Grove Road or Koon Road to Broad River Road.

The mainline build alternative is selected as the Preferred Alternative because it satisfies the purpose of the project and results in the lowest impacts to the manmade and natural environment. A summary and comparison of costs and impacts to both the natural and human environment are provided in the alternatives matrix (Table 4).

Figure 11: Koon Road Detour

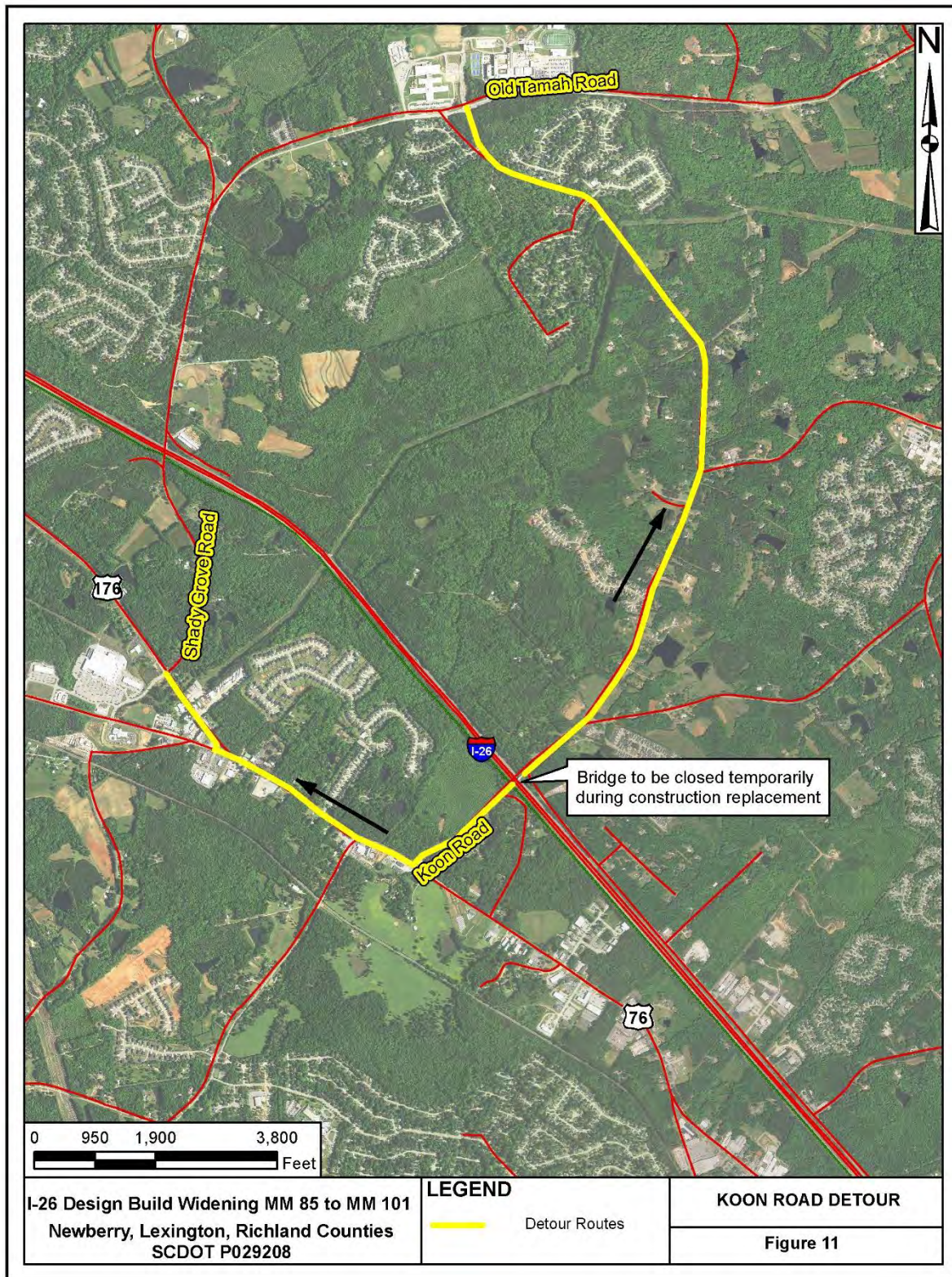


Table 4: Reasonable Alternatives Impact Matrix

Categories	Mainline Build Alternative*	Exit 85 Alternative 1A (Diamond w/ Partial Cloverleaf) *	Exit 85 Alternative 2A (Partial Cloverleaf)	Exit 85 Alternative 3 (Bowtie)	Exit 91 Alternative 2 (Partial Cloverleaf)	Exit 91 Alternative 3 (Diverging Diamond)*	Exit 97 Alternative 1 (Diverging Diamond)*	Exit 97 Alternative 2 (Partial Cloverleaf)	Exit 97 Alternative 3 (Single Point Urban Interchange)
Construction Cost	-	\$13,300,000	\$16,500,000	\$11,200,000	\$22,890,000	\$22,421,500	\$23,800,000	\$24,000,000	\$31,100,000
Wetlands (Acres)	0.26	0	0	0	0.21	0	0.17	0.22	0.17
Streams (Linear Feet)	2,124	1,460	1,520	1,781	460	142	158	261	175
Floodplain Potential Crossings	4	3	3	2	0	0	0	0	0
Protected Species	No	No	No	No	No	No	No	No	No
Historical Sites	No	No	No	No	No	No	No	No	No
Archaeological Sites	No	No	No	No	No	No	No	No	No
Right of Way (Acres)	38	17	32	13	18	8	12	16	15
Relocations: Business	0	0	0	0	1	1	1	1	1
Relocations: Residential	0	0	1	3	0	0	0	3	0
Environmental Justice Communities Present	Yes	Yes	Yes	Yes	No	No	No	No	No
Section 4(f)/6(f) Sites	No	No	No	No	No	No	No	No	No
Noise (receptors impacted)	244	5	5	5	12	13	9	11	8
Hazardous Materials Sites	0	0	0	0	1	2	6	6	6

* Preferred Alternative

3.4.2 I-26 Congestion Management Strategies and the Build Alternative

3.4.2.1 What is congestion management?

Congestion management is the application of a strategy or combination of strategies that help to reduce congestion, improving the system performance and reliability of the transportation system. FHWA identifies several strategies that can be applied to manage congestion:

Demand Management Strategies

Travel demand management (TDM), nonautomotive travel modes, and land use management can help reduce vehicle trips, relieving congestion. Types of TDM include ridesharing, flexible/alternative work schedules, pedestrian travel, bicycling, high occupancy toll lanes, parking management, park and ride integration, and land use controls.

Traffic Operations

Traffic operations seek to enhance the existing system with actions such as ramp metering, access management, commuter lanes, traffic signal optimization, geometric road improvements, short term traffic surge management (work zones, special events, emergencies), and interchange reconfigurations.

Intelligent Transportation Systems (ITS)

An ITS is an advanced application which aims to provide innovative services relating to different modes of transport and traffic management to enable various users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks. Examples are vast and can include incident management, crash investigation sites, and real time transit update applications.

Public Transportation

Vehicle trips can also be reduced by improving transit operations such as bus and rail systems. Expanding transit operations and improving access to them can lead to increased ridership. Bus rapid transit, bicycle/pedestrian connects, real time updates for travelers, reserved transit travel lanes, and improving hours of service can reduce congestion during peak hours.

Road Capacity

This category of strategies addresses adding more base capacity to the road network, such as adding additional lanes and building new highways, as well as redesigning specific bottlenecks (such as interchanges and intersections) to increase their capacity. Examples include

constructing new HOV or HOT lanes, adding free flow travel lanes, intersection improvements, and adding center turn lanes.

3.4.2.2 What is a Congestion Management Process?

A congestion management process (CMP) is a systematic and regionally-accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. A CMP is required in metropolitan areas with population exceeding 200,000, known as Transportation Management Areas (TMAs). For the I-26 project, the TMA extends from the eastern project limits near MM 101 to the Newberry County line. The CMP was completed for the nearby SCDOT I-20/26/126 Carolina Crossroads Corridor Project (Appendix E). This project is adjacent to the I-26 widening project and also includes some overlap in study areas at MM 101 and at the Exit 91 and Exit 97 interchanges. The findings and recommendations from this CMP are being applied to the I-26 project and are summarized below.

3.4.2.3 Recommended congestion management strategies

Demand Management Strategies

Alternative work schedules would reduce vehicles trips during peak hours in the transportation network. This could include work actions like telecommuting, compressed work weeks, and flextime to adjust schedules to outside of the peak travel period. This could benefit the I-26 corridor but would not be implemented by SCDOT. Local employers and stakeholders would be the responsible party for alternative work schedules.

Potential park and ride locations were studied in the I-20/26/126 Carolina Crossroads CMP at Exits 91 and 97. Peak hour trips could be reduced if park and ride facilities are built here and utilized to maximum capacity. As part of the I-20/26/126 Carolina Crossroads Corridor Project, SCDOT will continue to evaluate park and ride locations in the next phase of that project.

Traffic Operations

Improved interchange configurations have been incorporated into the overall design to meet the purpose and need of the project. Geometric improvements, including improved sight distances and shoulder widths, have been incorporated into the design.

Intelligent Transportation Systems (ITS)

Current design standards would require increased height of the median barrier walls, reducing glare from oncoming traffic and reducing rubber necking during crashes. The I-26 project would incorporate new standards for median barrier walls.

Driver Removal laws require drivers involved in typically minor incidents to move the vehicles from the travel lanes, exchange information, and report the crash information as required. To raise driver awareness, signs can be posted notifying those involved in crashes to move vehicles when possible. The I-26 project will consider such signs as part of the project signing plan.

Public Transportation

There are currently no premium transit (commuter rail, light rail) services available in the region. The only regional/interstate passenger rail services in the Central Midlands region is provided by Amtrak. The Central Midlands Regional Transit Authority (CMRTA), known as the COMET, is currently the only public transit service provider that operates in the vicinity of the project. SCDOT is prepared to assist COMET/CMRTA efforts through such measures as accommodating transit (bus) stops at interchange locations.

Road Capacity

Road capacity will be addressed by the I-26 project with the addition of through travel lanes. The interchanges at Exits 85, 91, and 97 will all be redesigned to limit conflict points and upgrade to safer conditions. Turn lanes and interstate ramps will be lengthened, increasing capacity.

The following table summarizes congestion management strategies considered in the I-20/26/126 Carolina Crossroads CMP and notes the potential for use as they relate to the I-26 project.

Table 5: Congestion Management Toolbox

CONGESTION MANAGEMENT STRATEGY		PERFORMANCE MEASURE	UNDER CONSIDERATION FOR THE PREFERRED ALTERNATIVE	RESPONSIBLE PARTY
TDM	Flextime, Compressed Workweek, Transit subsidy	Peak hour Reduction in Trips	Regional, ongoing coordination	Local Employers
	Park and Ride	Reduction in Traffic Volumes	Additional evaluation	
Operations	Interchange Reconfiguration	Reduce conflict points Improve operations on mainline Improve connection to/from mainline Reduce geometric deficiencies Interchange under, at, or over capacity	Yes	SCDOT
	HOV/HOT lanes	Benefits to LOS, speeds and travel time; geometric considerations	No	N/A
	Geometry	Reduce geometric deficiencies	Yes	SCDOT
	Ramp Metering	N/A	No	N/A
Public Transportation	Improved Existing Service	Percent reduction in Automobile trips	Ongoing Coordination	CMRTA/COMET
	Express Bus		No	N/A
	BRT		No	N/A
	Rail	N/A	No	N/A
ITS/Incident Management	TMC/SHEP	N/A	Ongoing Coordination	SCDOT
	Accident Investigation Sites	N/A	No	N/A
	Move Vehicle Signs	N/A	Yes	SCDOT
	Visual Barrier	Taller height median barrier	Yes	SCDOT
Capacity	Add general purpose lanes	Improve mobility and enhance traffic operations by reducing existing traffic congestion	Yes	SCDOT

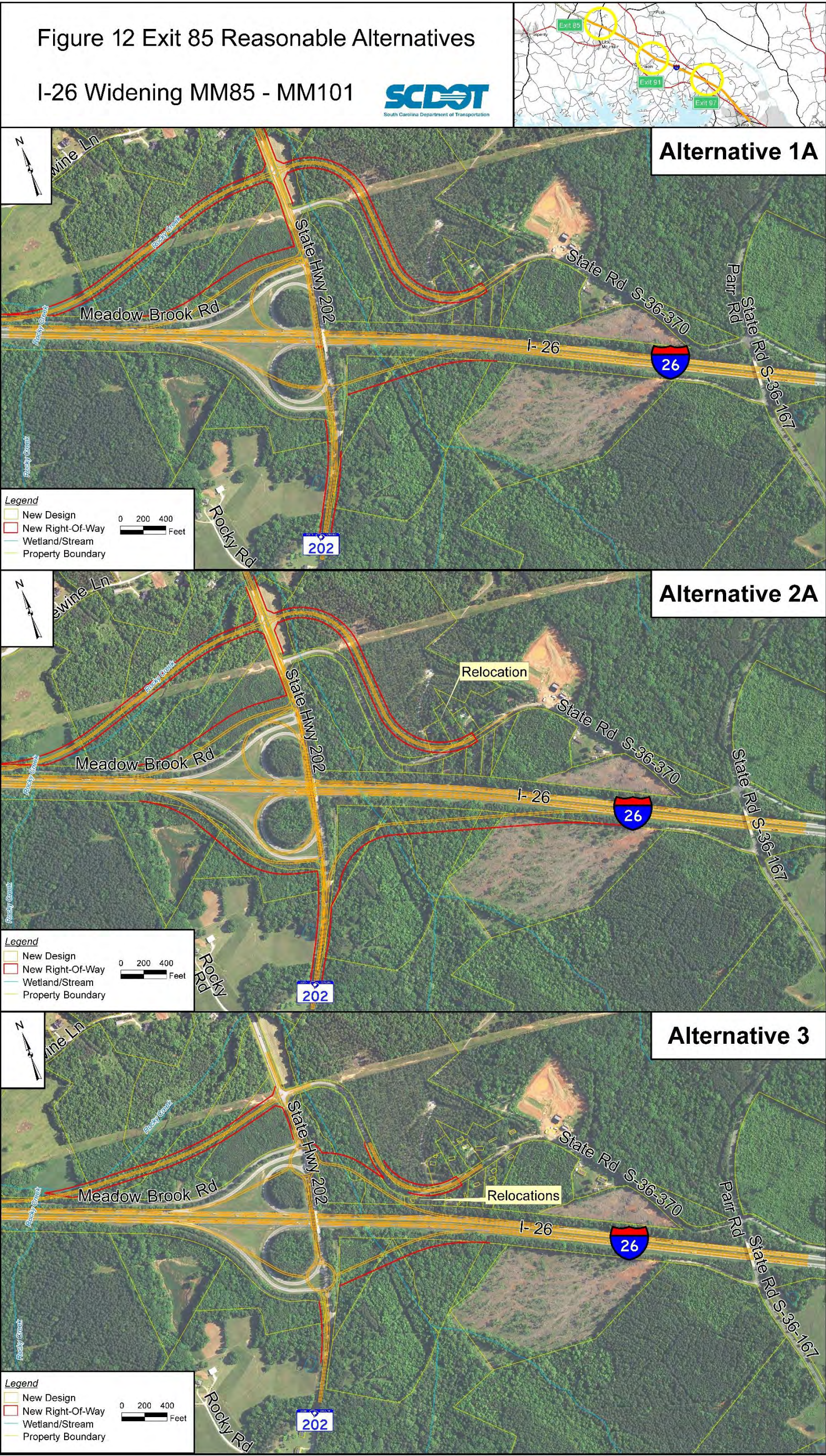
Source: Congestion Management Process Technical Memorandum. Carolina Crossroads I-20/26/126 Corridor Project. February 15, 2018.

3.5 What are the interchange build Reasonable Alternatives?

3.5.1 Exit 85 Little Mountain Interchange

There are three Reasonable Alternatives developed for Exit 85 and they share several common features (Figure 12). They all would meet the purpose of the project by bringing the interchange into compliance with current state and federal design requirements. The safety at the interchange would be improved by providing on-ramps and off-ramps that separate the interstate traffic from local traffic, are long enough to allow traffic to merge onto the interstate, and are long enough to store traffic that is exiting the interstate during peak hours. The interchange alternatives are also all similar in that they provide a LOS of A or B in the future year of 2040, resulting in relatively free flowing traffic with little delay.

Figure 12: Exit 85 Reasonable Alternatives



Meadow Brook Road currently terminates near the I-26 westbound on-ramp and under each alternative it would be realigned further north to meet spacing safety requirements between intersections as required by SCDOT's ARMS manual. There is also a major overhead powerline and associated easement in this area and the realignment of Meadow Brook Road would be situated to impact the powerline easement to the least extent possible.

For all alternatives, the intersection of SC 202 and Four Oaks Road (continuing as S-36-370) would be relocated to the SC 202/Meadow Brook Road intersection to provide adequate spacing requirements between intersections as required by ARMS.

Each of the three alternatives would avoid impacting wetlands, historic sites, historic archaeological sites, potential hazardous materials sites, and protected plant and animal species. Noise impacts to five receptors are anticipated under all of the Exit 85 build alternatives (see Section 4.11).

3.5.1.1 Exit 85 Alternative 1a (Preferred Alternative)

Alternative 1a would replace the existing Exit 85 interchange with a combination of a diamond-shaped and partial cloverleaf-shaped interchange. The I-26 westbound traffic would exit into the cloverleaf section of the interchange, where vehicles would then turn either left or right onto SC 202. Traffic coming from Little Mountain onto I-26 westbound would enter through a ramp adjacent to the cloverleaf. This partial cloverleaf was incorporated into Alternative 1a to avoid impacting a major stream crossing between Four Oaks Road and SC 202. Four Oaks Road would not be realigned with this alternative. The existing off-ramp and loop on-ramp for I-26 eastbound would be replaced with a traditional diamond-type ramps.

Alternative 1a meets the purpose and need, has the lowest overall construction cost, does not require any residential or commercial relocations, requires the lowest acreage of new right-of-way, and results in the lowest impact to streams making it the least environmentally damaging practicable alternative. Therefore, this alternative was selected as the Preferred Alternative.

3.5.1.2 Exit 85 Alternative 2a

The existing eastbound and westbound loop ramps would be upgraded as a partial cloverleaf-shaped interchange, similar to the existing alignment. Traffic on I-26 westbound would continue to exit through a loop ramp and enter I-26 westbound through the adjacent on-ramp. However, to meet safety standards, the loop would be expanded to facilitate exiting at safe speeds. Since major reconstruction to the existing loops would be required because of the new alignment of SC 202, the design speed for each loop would be increased to meet the minimum speed based on the SCDOT Highway Design Manual (HDM). Also, the deceleration and acceleration ramp lengths would be increased to facilitate exiting and entering at safe speeds. Four Oaks Road

would be slightly realigned to the north to intersect with the realigned Meadow Brook Road at a four-way intersection. Traffic in the eastbound direction would move in a similar alignment of the existing loop on-ramp and adjacent off-ramp.

Alternative 2a was not selected as the Preferred Alternative because it would not provide greater improvements to congestion or safety when compared to other alternatives. Additionally, Alternative 2a is the most expensive of the Exit 85 improvements for construction costs and requires almost twice the amount of new right-of-way. The slight realignment of Four Oaks Road would require the relocation of one residential home and would result in the second highest impacts to streams. Because of the higher impacts to the human and natural environment this alternative was not selected as the Preferred Alternative.

3.5.1.3 Exit 85 Alternative 3

The dual roundabout design of Alternative 3 would construct a new interchange that includes a roundabout at either end of the I-26 overpass. This type of interchange allows traffic to flow through an interchange without the need for traffic signals. Vehicles traveling in the westbound direction would enter a ramp and then navigate through a roundabout. Similarly, on the opposite side of I-26, vehicles moving eastbound would enter a different roundabout located south of I-26. The roundabouts minimize complete stops by vehicles near the interchange.

The dual roundabout design requires a relatively large footprint, resulting in the highest impacts to streams of all the alternatives. This alignment would also require that three homes be relocated; the highest number among all of the alternatives. Due to the high stream and residential home impacts, this alternative was not selected as the Preferred Alternative.

3.5.2 Exit 91 Columbia Avenue Interchange

Each of the Exit 91 interchange reasonable alternatives share some common features. Alternatives 2 and 3 are discussed further below, as Alternative 1 was considered but eliminated (Section 3.2.2). The safety at the interchange would be improved by providing on-ramps and off-ramps that separate the interstate traffic from local traffic. The interchange would be brought into compliance with current safety and design standards by limiting access to adjacent businesses in close proximity to the interchange, as defined by SCDOT's ARMS Manual. During construction, traffic at the interchange would be maintained so that motorists can continue to access I-26 and Columbia Avenue as improvements are being constructed.

Crooked Creek Road currently terminates at the eastbound entrance ramp to I-26. To meet current AASHTO and SCDOT standards, each alternative would terminate Crooked Creek Road prior to the I-26 ramp. A new location roadway would relocate traffic from Crooked Creek Road north to Columbia Avenue, approximately 1,000 feet west of the interchange. This terminus

location was selected based on its compliance with interchange/intersection spacing requirements and its ability to avoid relocating any local businesses in this area.

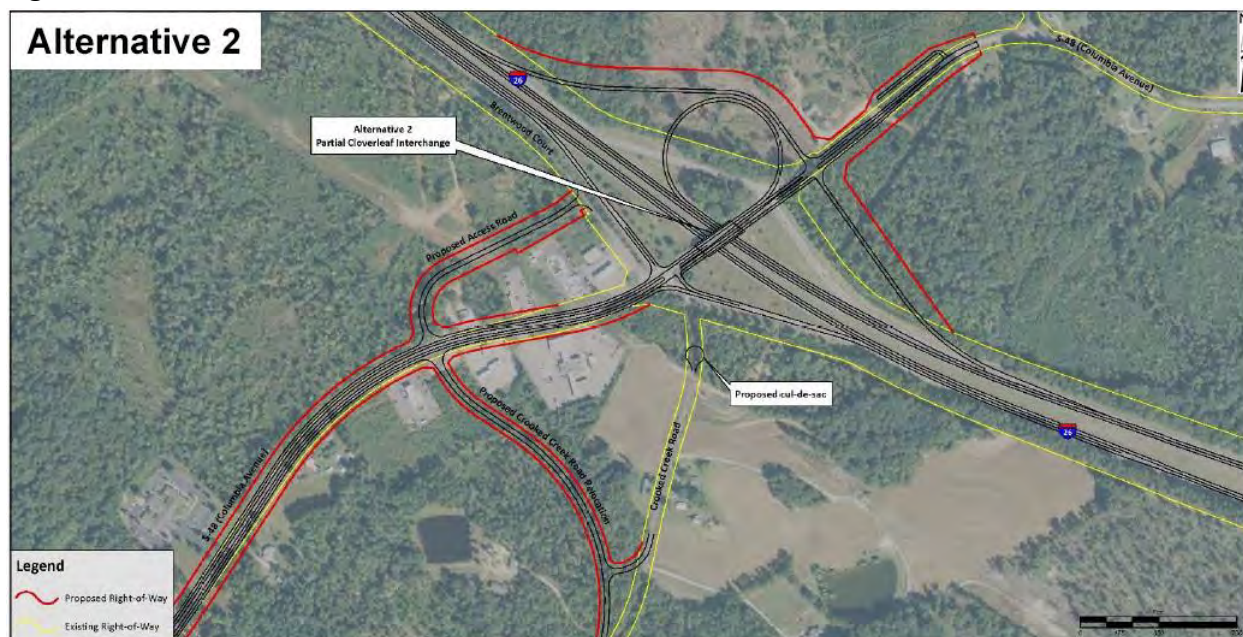
Each alternative would also change access to several businesses near the interchange. There is currently a gas station/convenience store and two restaurants located in the northwest quadrant of the interchange. Current safety and design standards require the elimination of full access to these properties from Columbia Avenue. Each alternative would establish a new location roadway to provide full access to these businesses from the rear and/or side of their property. Additionally, a gas station/convenience store and a furniture store are currently located in the southwest quadrant of the interchange. Each alternative would limit access to the gas station/convenience store to eastbound traffic only and provide access to the furniture store from a new entrance located along Crooked Creek Road.

One structure would also be relocated by each alternative. The relocation is an outbuilding of a lumber company, located approximately 1,000 feet west of the existing interchange, which is used to store building materials. Additionally, each alternative would require the acquisition of right-of-way from one potential hazardous material site. A leaking underground storage tank associated with the Pitt Stop 7 site (648 Columbia Avenue) was confirmed in 2008. Noise impacts to 12 receptors are anticipated under all of the Exit 91 build alternatives (see Section 4.11).

3.5.2.1 Exit 91 Alternative 2

The partial cloverleaf interchange would allow for peak traffic flows to navigate the interchange more freely than the existing condition (Figure 13).

Figure 13: Exit 91 Alternative 2



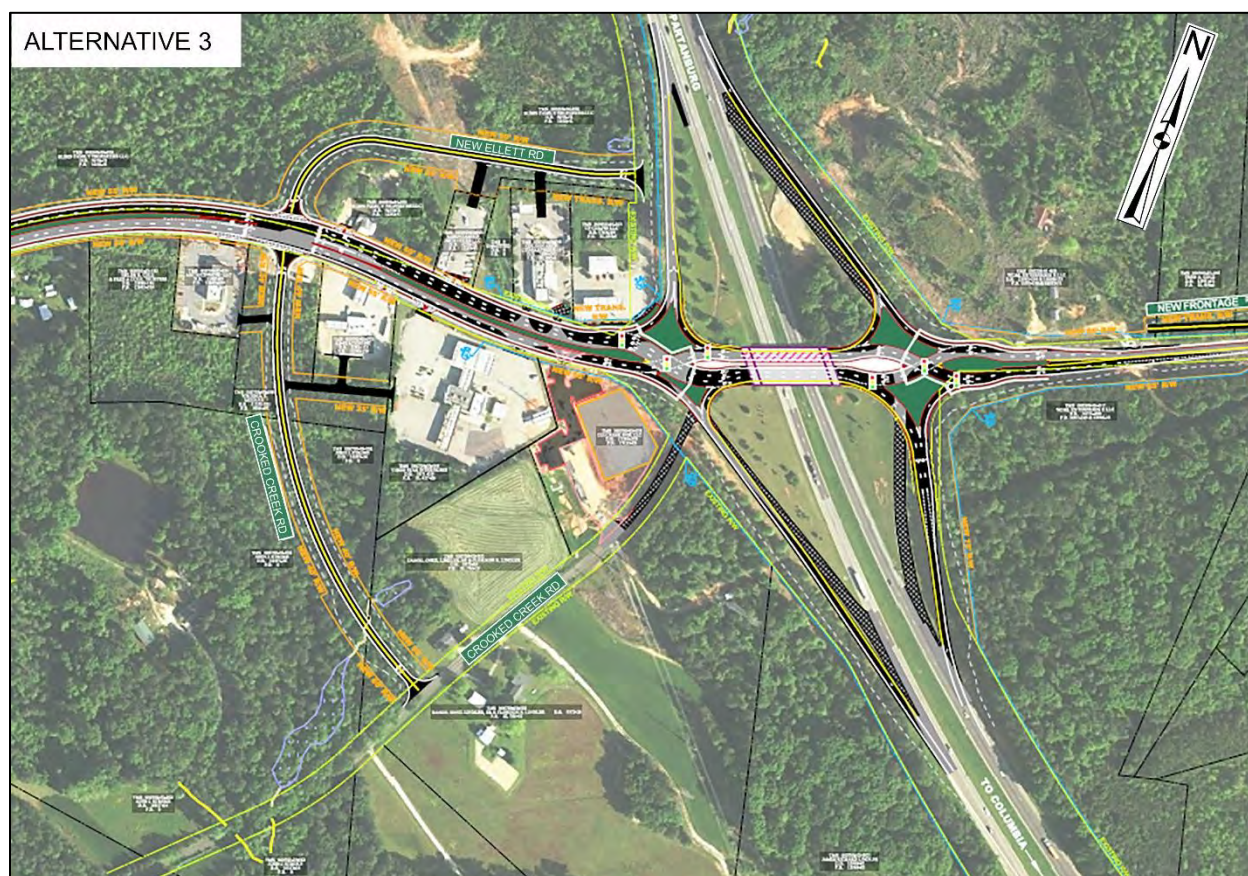
In the morning peak hour traffic, eastbound Columbia Avenue traffic turns right onto the eastbound I-26 entrance ramp, similar to the existing condition. In the afternoon, westbound I-26 traffic would utilize the cloverleaf to merge onto westbound Columbia Avenue without a signalized intersection. This movement would eliminate the need for a traffic signal and result in a more efficient traffic flow.

According to traffic studies included in the IMR, Alternative 2 would provide the best LOS of the alternatives for eastbound traffic. This alternative would impact slightly fewer parcels than Alternative 3; however, it would require more than twice as much additional right-of-way. Alternative 2 would also have greater impacts to wetlands and streams and would cost more to construct. Due to the impacts this alternative would have on the surrounding human and natural environment, Alternative 2 is not the preferred interchange alternative.

3.5.2.2 Exit 91 Alternative 3 (Preferred Alternative)

Alternative 3 would replace the existing Exit 91 interchange with a diverging diamond interchange (Figure 14). A diverging diamond system is similar to a traditional diamond interchange, except the Columbia Avenue lanes would be allowed, through signalization, to cross each other twice, once on each side of I-26. This allows all interstate entrances and exits to avoid crossing the opposite direction of traffic and saves one signal phase of traffic lights each. Motorists traveling westbound on I-26 would exit on a new off-ramp that would then split to head west on Columbia Avenue, or east to a new traffic signal onto Columbia Avenue. Motorists traveling eastbound on I-26 would exit on new off-ramp that would also split into a west or east direction onto Columbia Avenue. The diverging diamond aspect of the alignment would allow motorists that wish to enter I-26 eastbound from the eastern side of the interstate to make a protected left turn. Vehicles coming from the western, or Chapin, side of the interstate would enter I-26 eastbound via a separate access to the eastbound on-ramp. Alternative 3 would provide an acceptable LOS overall and is projected to operate at a similar LOS as Alternative 2 for westbound traffic. The major traffic flow during the morning peak hour is eastbound along Columbia Avenue to eastbound I-26. Alternative 3 would allow this traffic a free-flow movement to access eastbound I-26, similar to what drivers currently experience. While traffic studies indicate the eastbound traffic would operate at LOS C, the major movement in the morning peak hour traffic from Columbia Avenue onto I-26 would flow freely at a LOS A.

Figure 14: Exit 91 Alternative 3



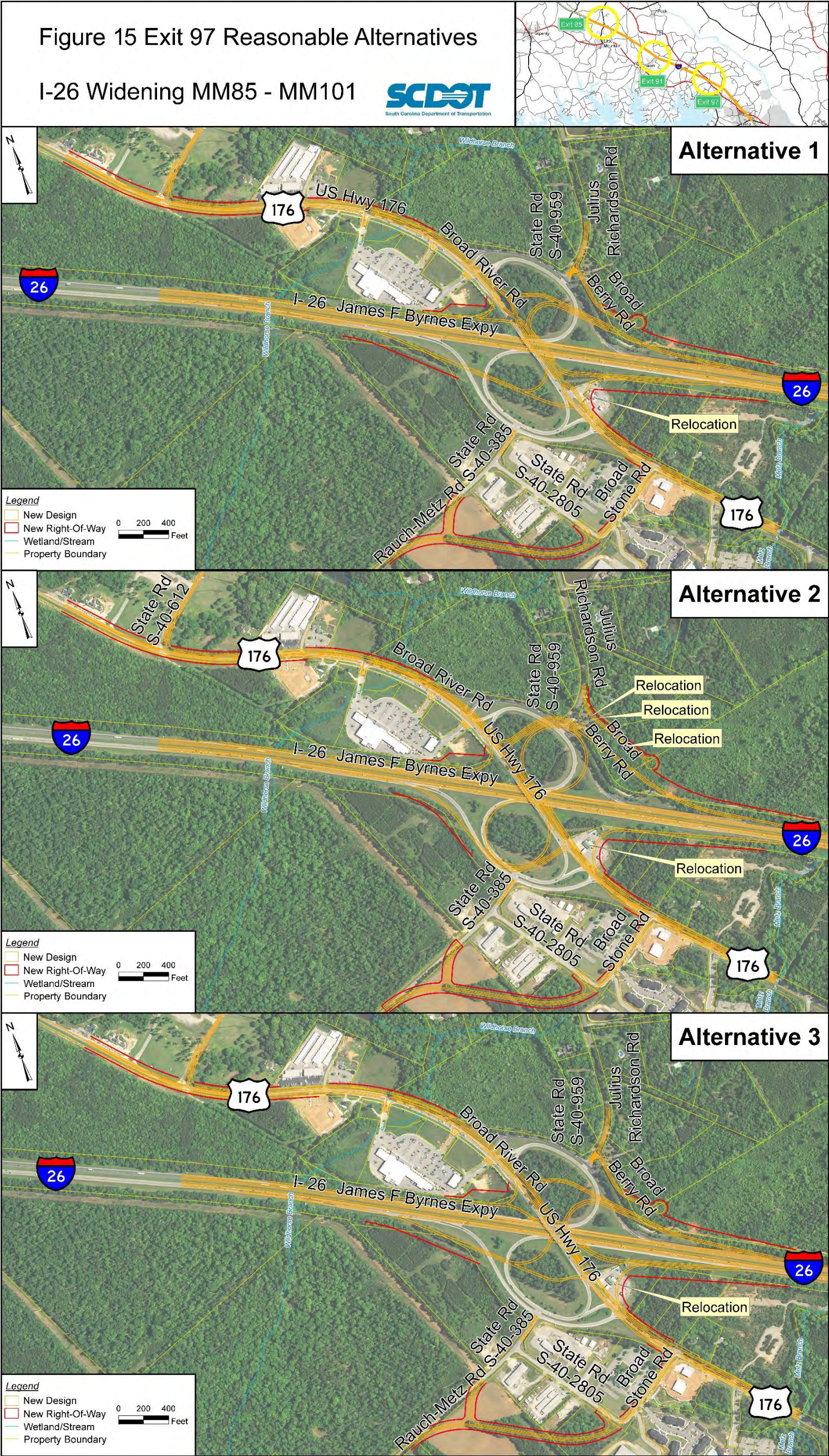
The diverging diamond interchange would require less right-of-way than Alternative 2 and would result in fewer impacts to streams and wetlands. The diverging diamond interchange would also cost less to construct. This alternative would, however, impact two additional parcels. These parcels are located in the northwest quadrant of the interchange and include one additional potential hazardous material site. According to the Phase I Environmental Site Assessment, leaking underground storage tanks associated with this site, the Corner Pantry 132 (661 Columbia Avenue), were confirmed in 1986 and 2008. A “No Further Action” notice has not been issued for either release and the site is currently recommended for a risk assessment.

Alternative 3, the diverging diamond interchange, was selected as the Preferred Interchange Alternative because it meets the purpose of the proposed project and is the least environmentally damaging practicable alternative to the human and natural environment.

3.5.3 Exit 97 Broad River Road

There are three Reasonable Alternatives developed for Exit 97 (Figure 15) and they share some common features. They all would meet the purpose and need for the project by reducing congestion and bringing the interchange into compliance with current state and federal design requirements.

Figure 15: Exit 97 Reasonable Alternatives



The current network of state and local roads that intersect with the interchange ramps is complex, does not meet current design or safety standards, and contributes to congestion during peak travel times. Each alternative would improve these conditions by:

- installing new traffic signals at the Broad River Road intersections with both Broad Stone Road and West Shady Grove Road;
- shifting Rauch-Metz Road traffic away from the eastbound ramps to Broad Stone Road;
- shifting Julius Richardson Road traffic away from the westbound ramps to West Shady Grove Road; and
- widening or improving Broad River Road between Broad Stone Road and West Shady Grove Road.

Shifting the traffic away from Rauch-Metz Road would mean that the current access to businesses on Broad Stone Road would only be possible from Broad River Road to Broad Stone Road or from the newly realigned Rauch-Metz Road to Broad Stone Road. This is needed to eliminate the current intersection of Rauch-Metz Road with the I-26 eastbound off-ramp, which is currently an unsafe condition.

Julius Richardson Road currently intersects with the westbound on-ramp and off-ramp, creating an unsafe condition, especially during peak travel times. Each alternative would improve this area by closing off the southern end of Julius Richardson Road. Motorists on this road that wish to reach I-26 would do so by traveling north on Julius Richardson Road to West Shady Grove Road. West Shady Grove Road to Broad River Road would provide access to the I-26 on-ramps and off-ramps.

With each interchange alternative, the existing intersection of Broad River Road and the I-26 westbound ramps/shopping center access would be eliminated near Food Lion. Instead, travelers leaving the shopping center would travel from either of the more westerly exits onto Broad River Road and then would turn right onto the new westbound on-ramp that would be adjacent to I-26. Broad River Road would be widened through the interchange area between Broad Stone Road and the Food Lion shopping center driveways.

Each of the three alternatives would avoid impacting historic sites, historic archaeological sites, and protected plant and animal species. Due to the proximity of the Corner Pantry Exxon gas station near the I-26 eastbound on-ramp, each alternative would require its relocation. According to the Phase I Environmental Site Assessment prepared for the project there are several known hazardous materials sites that could pose a risk to all of the alternatives. These sites are discussed in detail in Section 4.12 and are summarized as follows:

- Corner Pantry 154 site, located at 11090 Broad River Road

- Former Liberty Truck Stop, located at 11107 Broad River Road
- Former Char-Lees Service Station, located at I-26 and Highway 76 (suspected to have been located near the former Liberty Truck Stop)
- Ballentine Section Shed, located at 1050 Broad Stone Road
- Pitt Stop 02 site, located at 11047 Broad River Road
- Jac's Dolls (former gasoline service station), located at 11214 Broad River Road

These sites may need further assessment, pending development of the final road design.

3.5.3.1 Exit 97 Alternative 1 (Preferred Alternative)

Alternative 1 would replace the existing Exit 97 interchange with a diverging diamond interchange. A diverging diamond system is similar to a traditional diamond interchange, except the Broad River Road lanes would be allowed, through signalization, to cross each other twice, once on each side of I-26. This allows all interstate entrances and exits to avoid crossing the opposite direction of traffic and saves one signal phase of traffic lights each. Motorists traveling westbound on I-26 would exit on a new off-ramp that would then split to head south on Broad River Road, or north to a new traffic signal onto Broad River Road. Motorists traveling eastbound on I-26 would exit on new off-ramp that would also split into a north or south direction onto Broad River Road. The diverging diamond aspect of the alignment would allow motorists that wish to enter I-26 eastbound from the northern side of the interstate to make a protected left turn. Vehicles coming from the southern side of the interstate would enter I-26 eastbound via a separate access to the eastbound on-ramp. The existing partial cloverleaf ramps would then be removed.

Alternative 1 would impact the least amount of streams and wetlands, when compared to the remaining reasonable alternatives, making this the least environmentally damaging practicable alternative. It requires the least amount of new right-of-way and has the lowest overall estimated construction cost. The diverging diamond would also reduce congestion and provide a safer interchange, satisfying the project purpose and need. The intersections of Broad River Road and the I-26 ramps would be improved from LOS E or F to LOS C or better. Because of these reasons, Alternative 1 was selected as the Preferred Alternative.

3.5.3.2 Exit 97 Alternative 2

Alternative 2 would replace the existing interchange with a partial cloverleaf interchange. The existing loop ramps on both sides of I-26 would be slightly realigned and improved, however the general traffic pattern for entering and exiting I-26 would be similar to the current patterns that motorists follow. The existing eastbound and westbound ramp intersections with Broad River Road would be eliminated with the reconstruction of the partial cloverleaf. A new on-ramp to I-

26 eastbound would be built to eliminate the conflicts of northbound Broad River Road traffic turning left to access I-26 eastbound.

The Alternative 2 improvements would result in the greatest impact to both wetlands and streams. The construction costs for this alternative are slightly higher than that of Alternative 1, but are lower than the costs for Alternative 3. Alternative 2 would impact the highest number of sensitive noise receptors (11) when compared to the other reasonable alternatives. Alternative 2 would satisfy the project purpose and need and result in, improving the LOS at the intersections of Broad River Road and the I-26 ramps from LOS E or F to LOS C or better. The eastbound entrance loop will be at or slightly over capacity in the design year according to the SCDOT HDM. Because of the higher environmental impacts and potential loop capacity issue, this alternative was not selected as the Preferred Alternative.

3.5.3.3 Exit 97 Alternative 3

Alternative 3 replaces the existing Exit 97 interchange with a Single Point Urban Interchange (SPUI). A SPUI is a modification of the diamond interchange and has its ramps meet at one point on the Broad River Road overpass that crosses I-26. This requires only one set of traffic signals, increasing its efficiency and capacity when compared to a diamond interchange.

The SPUI alternative would cost the most for overall construction and would cause the second highest stream impacts. It would impact noise receptors similarly when compared to Alternative 1 (8 versus 9, respectively). Alternative 3 would satisfy the project purpose and need, improving the LOS at the intersections of Broad River Road and the I-26 ramps from LOS E or F to LOS D or better. This improvement is not as great (to LOS C) that can be achieved with the other alternatives. Because of the higher environmental impacts, higher construction cost, and LOS D in by the year 2040, this alternative was not selected as the Preferred Alternative.

3.6 What is the project Preferred Alternative?

The mainline alternative widens I-26 to the center grassed median where possible from MM 85 to MM 97. From MM 97 to MM 101, widening to the outside of the existing lanes is also necessary. This reduces the overall project footprint and avoids additional impacts to the natural and manmade environment. Bridge overpasses are proposed to be replaced on new adjacent alignment, except for Koon Road. The mainline build alternative is selected as the Preferred Alternative because it satisfies the purpose of the project and results in the lowest impacts to the environment.

Alternative 1a (Figure 16) was selected as the Preferred Alternative at Exit 85 because it meets the purpose and need, has the lowest overall construction cost, does not require any residential

or commercial relocations, requires the lowest acreage of new right-of-way, and results in the lowest impact to streams, making it the least environmentally damaging practicable alternative.

Alternative 3 (Figure 17), the Preferred Alternative at Exit 91, would replace the existing I-26 interchange at Columbia Avenue with a new diverging diamond interchange at Exit 91. The existing roadways in the vicinity of the interchange would also be upgraded to meet SCDOT's current design and safety standards. Crooked Creek Road would be terminated prior to its intersection with the I-26 entrance ramp. This traffic would be rerouted with a new location roadway from Crooked Creek Road north to Columbia Avenue. A new location roadway would also be constructed in the northwest quadrant of the interchange to maintain access to businesses in the area. Alternative 3 was selected as the Preferred Interchange Alternative at Exit 91 because it meets the purpose of the proposed project and is the least damaging practicable alternative to the human and natural environment.

At Exit 97, Alternative 1 (Figure 18) was selected as the Preferred Alternative. Alternative 1 would impact the least number of streams and wetlands when compared to the remaining build alternatives, making this the least environmentally damaging practicable alternative. It also requires the least amount of new right-of-way and has the lowest overall estimated construction cost. The diverging diamond would reduce congestion and provide a safer interchange, satisfying the project purpose and need. The intersections of Broad River Road and the I-26 ramps would be improved from LOS E or F to LOS C or better. Because of these reasons, Alternative 1 was selected as the preferred Exit 97 interchange alternative.

As a result of the mainline widening and overpass bridge replacements, there would be no impacts to historic sites, historic archaeological sites, parks, environmental justice communities, or protected plant and animal species (see Table 6). Two cemeteries, located off of Parr Road and Peak Road would be avoided (see Section 4.14). The mainline widening would result in impacts to Waters of the U.S., including 0.26 acres of wetlands and 2,124 feet of streams. A potentially hazardous materials site, the former Edenfield Heating and Air (and previous gasoline station), located at 1024 Mount Vernon Church Road is located adjacent to and partly within the study area. Pending final design, additional assessment of this site may be needed to determine if hazardous materials could be impacted. Noise impacts to 244 receptors are expected following the widening of the mainline. Noise abatement is further discussed in Section 4.11. Overall the Preferred Alternative would cost approximately \$530 million to widen the mainline of I-26 and improve the interchanges at Exits 85, 91, and 97.

Table 6: Potential Impacts from the I-26 Preferred Alternatives

Potential Impacts	Mainline Build Alternative	Exit 85 Alternative 1A (Diamond w/ Partial Cloverleaf)	Exit 91 Alternative 3 (Diverging Diamond)	Exit 97 Alternative 1 (Diverging Diamond)
Wetlands (Acres)	0.26	0	0	0.17
Streams (Linear Feet)	2,124	1,460	142	158
Floodplain Potential Crossings	4	3	0	0
Protected Species	No	No	No	No
Historical Sites	No	No	No	No
Archaeological Sites	No	No	No	No
Right of Way (Acres)	38	17	8	12
Relocations: Business	0	0	1	1
Relocations: Residential	0	0	0	0
Environmental Justice Communities	No	No	No	No
Section 4(f)/6(f) Sites	No	No	No	No
Noise (receptors impacted)	244	5	13	9
Hazardous Materials Sites	0	0	2	6

Figure 16: Exit 85 Alternative 1A, Preferred Alternative

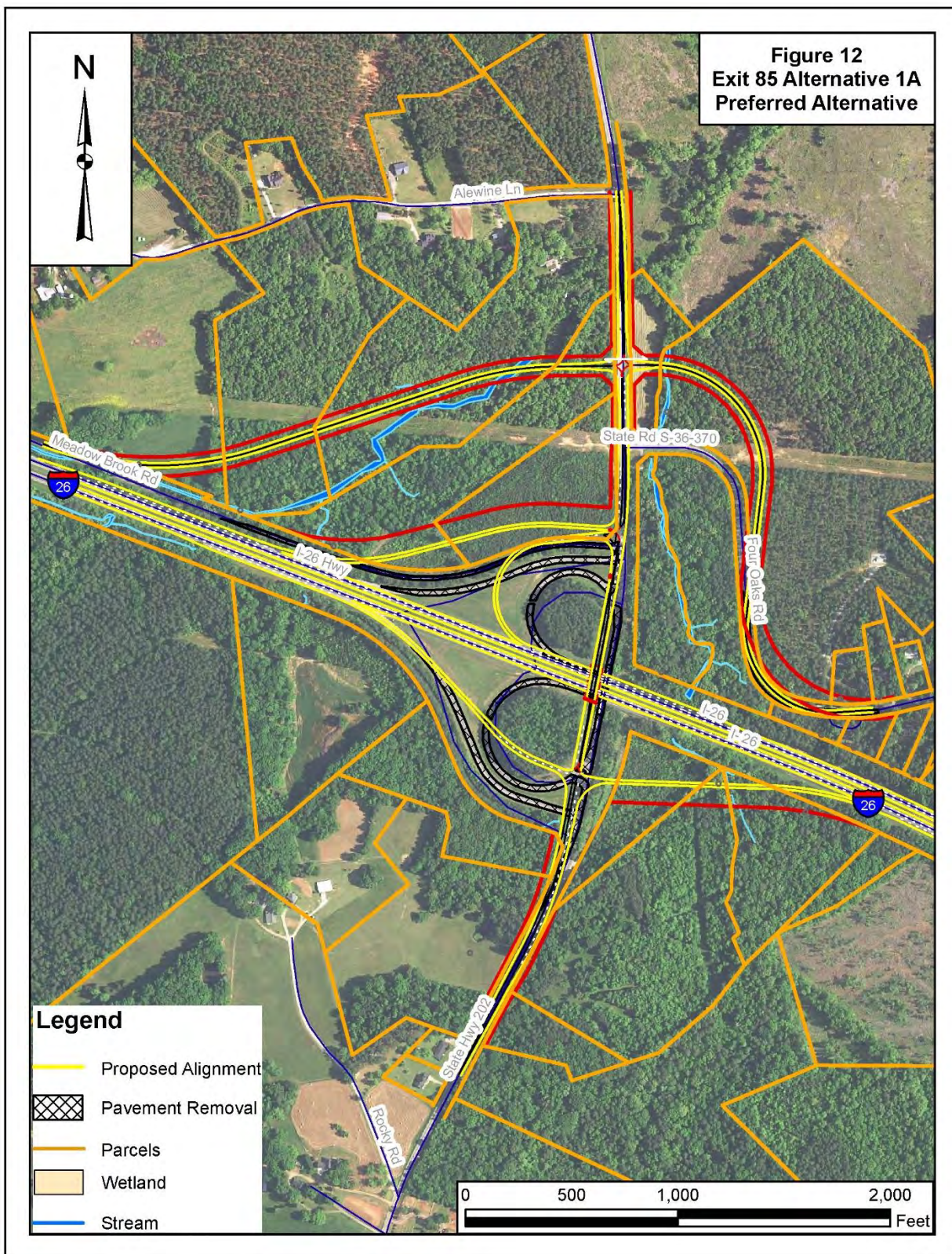


Figure 17: Exit 91 Alternative 3, Preferred Alternative

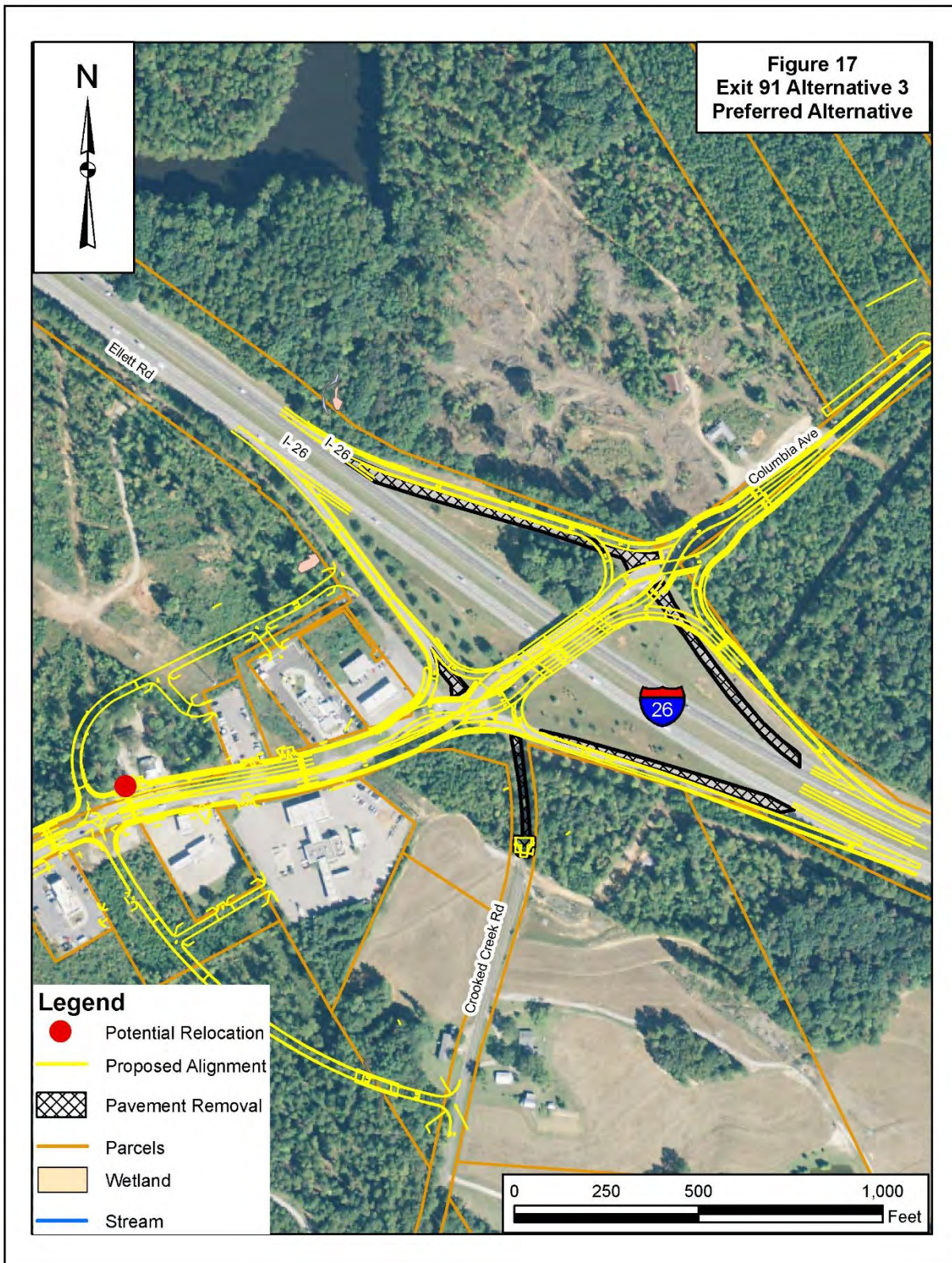
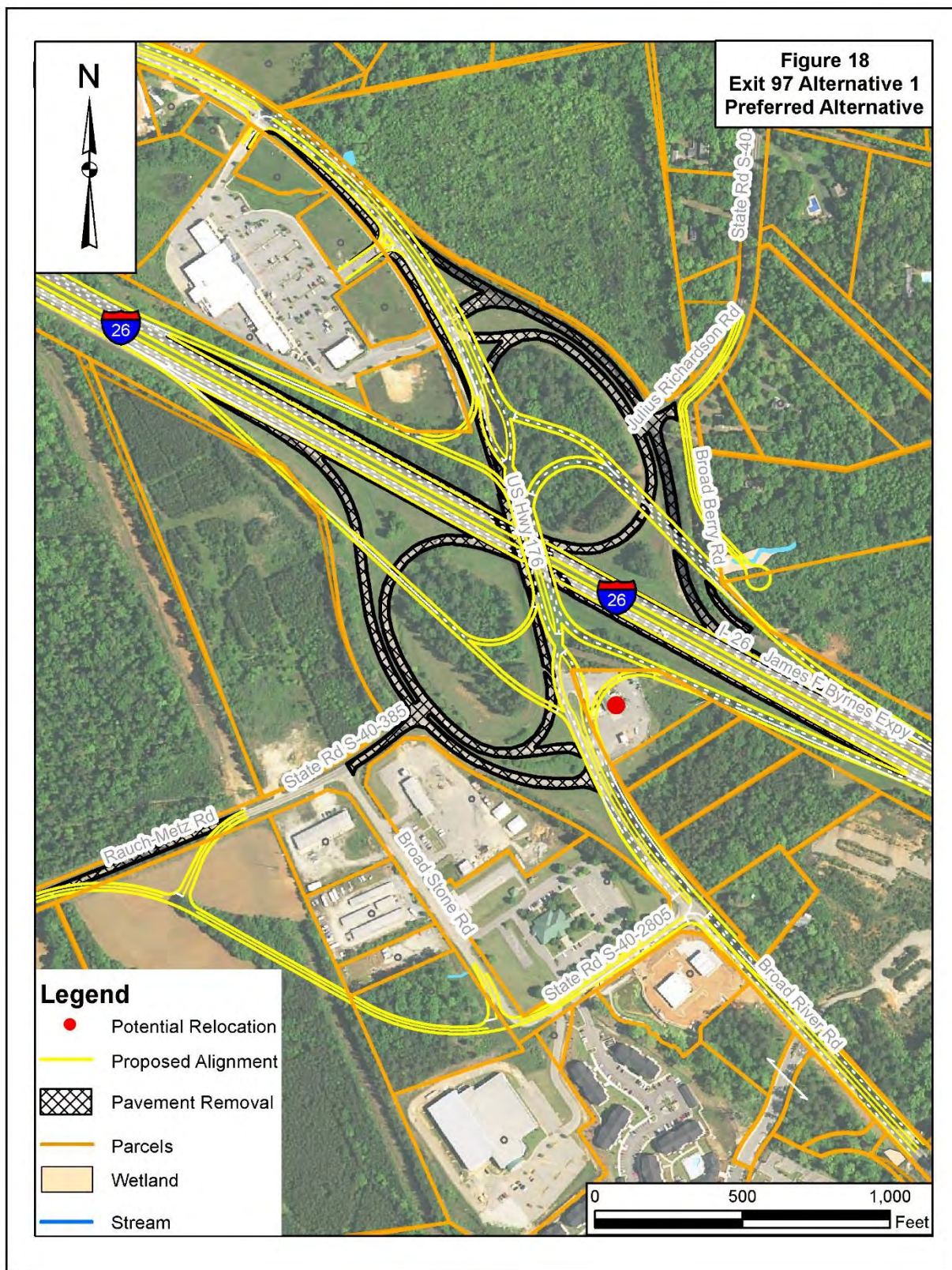


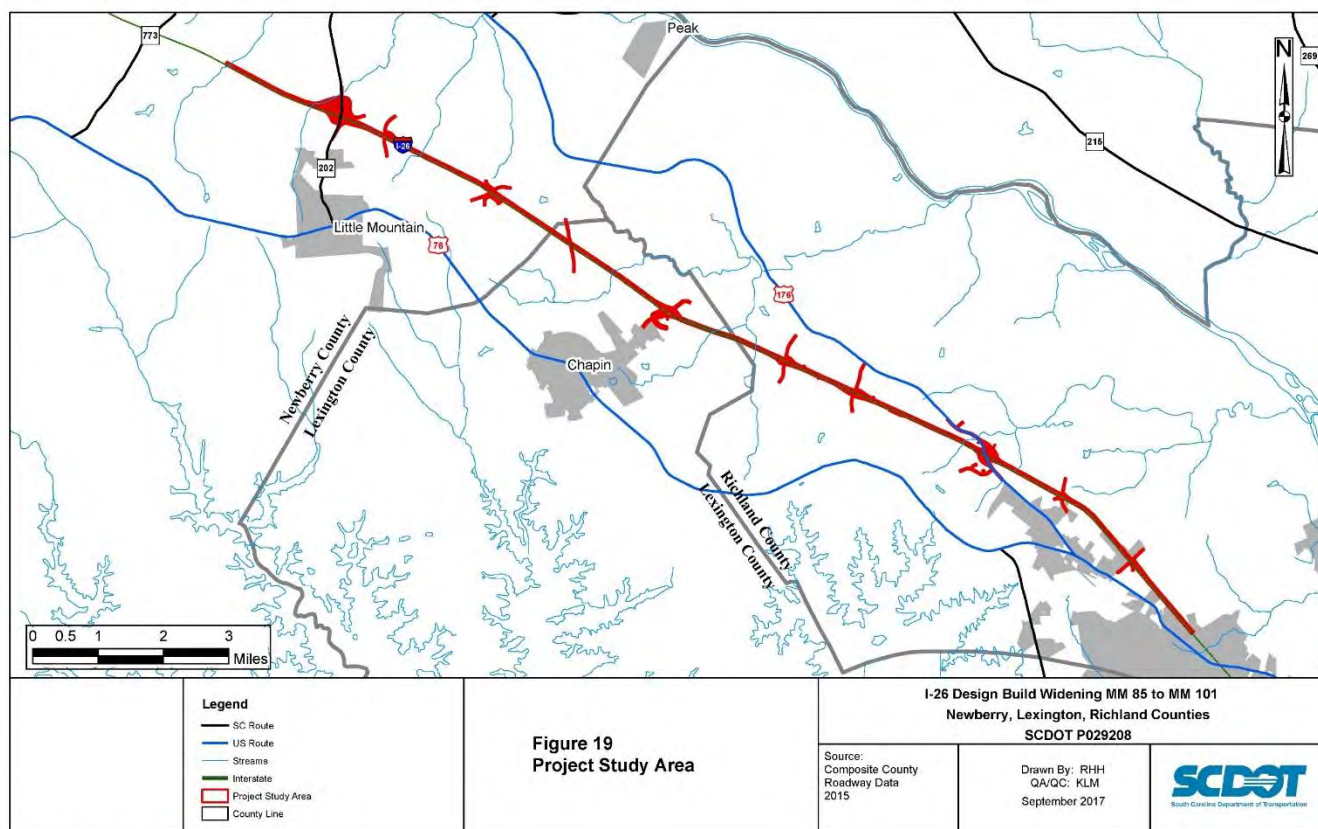
Figure 18: Exit 97 Alternative 1, Preferred Alternative



4 EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

This section includes a discussion on the existing conditions of the human and natural environment in the PSA, as well as the probable beneficial and adverse social, economic, and environmental effects of the Preferred Alternative. In addition, it describes the measures proposed to mitigate any adverse impacts. Existing conditions refers to the current state of the human environment in the PSA (Figure 19). The No-Build Alternative is a continuation of the existing conditions of the roadway into the future, without making any of the proposed project changes to the mainline or the interchanges. The environmental consequences are the effects that would result from the Preferred Alternative compared to the No-Build Alternative. If these improvements were not made, the impacts described in this section would not occur. These effects are discussed in more detail for each of the categories considered in this chapter. There can be consequences from the No-Build Alternative as well. However, for most of these categories there would be no impact associated with the No-Build Alternative. The following sections provide a brief overview of the environmental findings.

Figure 19: Project Study Area



4.1 Land Use

4.1.1 What is the existing land use in the study area?

The project corridor is located primarily within unincorporated areas of Newberry, Lexington, and Richland Counties, but includes small portions of the Towns of Irmo and Chapin. Existing land uses are primarily forested land and commercial businesses with areas of rural residential and light industrial operations. The closest incorporated municipalities are the City of Columbia to the southeast; the Town of Irmo to the southwest; the Town of Chapin to the southwest; the Town of Little Mountain to the south and the City of Newberry to the northwest.

Along the mainline of I-26, land uses consist mainly of forested land but become increasingly mixed with commercial and residential properties moving from west to east towards Columbia. A small industrial park (Chapin Business and Technology Park) and a planned residential/commercial neighborhood are located southwest of Exit 91. The industrial park has infrastructure and zoning in place but no buildings as of yet. The adjacent residential/commercial area is in the planning stages.

An approximate 23-acre area along Old Hilton Road, north of I-26 was observed to be protected with a Richland County Conservation Easement (Figure 20). This tract consists of three parcels identified by Richland County Tax Map Numbers 01700-10-04, 01700-10-22, and 01700-10-26. The street addresses of the parcels with dwellings are 2400 Chapin Road and 1132 Old Hilton Road Chapin, SC 29063. Much of tract 01700-10-04 is forested and undeveloped. A single-family home is located on 01700-10-22. There is no current public use of the property. In December of 2010, Roger Troutman and Mildred Ganus deeded “perpetual restrictions on the uses which can be made of the property” to Richland County. The primary purpose of the easement is to enable the property to remain in traditional use by preserving and protecting its rural nature and other conservation features. Per the easement, no activity which significantly impairs the conservation purpose of the property would be permitted. The protection document also states that “to the extent that the preservation and protection of the natural, historic, recreational, habitat or scenic values referenced in this easement is consistent with the primary purpose stated above, it is also the purpose of this easement to protect those values, and no activity which shall significantly impair those values shall be permitted.”



Figure 20: Richland County Conservation Easement

The owners may sell, lease, or divide the property but the Conservation Easement restricts development to those activities associated with maintaining the land for forestry and farming.

Regarding future road construction at the property, the easement states that “construction and maintenance of unpaved roads that may be reasonably necessary and incidental to carrying out the improvements and uses permitted on the property by this easement are permitted. Other than the approved roads, no portion of the property shall be paved or otherwise covered with concrete, asphalt, or any other impervious paving material, without the permission of grantee.” The design of the roadway improvements would need to take this easement into consideration. Preliminary design along Old Hilton Road has been shifted away from this property to the maximum extent feasible to minimize impacts. A small area of the property (approximately less than 0.1 acre) would need to be utilized to tie-in with the road improvements. This would impact a vegetated area that is currently adjacent to Old Hilton Road. Impacts to the tracts should be minimized to the maximum extent practicable during final design. This could possibly be accomplished through the ROW process as a “permission only tract”. This would not require the property ownership to change and land would not be directly acquired. Improvements could also take place through direct acquisition of the portion of land needed, either through negotiations or condemnation. The Richland County Conservation Division has indicated that to impact the property, ROW would need to be acquired through eminent domain and possibly condemnation (see Appendix F). Any ROW acquisition or use of the property would need to be coordinated with the property owner and Richland County.

The project interchanges within the corridor contain residential properties in addition to higher concentrations of commercial and industrial properties, as described below:

Exit 85 – SC 202

Properties surrounding this interchange are largely undeveloped. Land use appears to be forested and cleared land with no commercial businesses and low density residential parcels.

Exit 91 –Columbia Avenue

The majority of the development surrounding this interchange is to the southeast; in the direction of the town of Chapin. Property to the north and east are forested and cleared land mixed with residential homes. The property to the south of the interchange is the newly-built (2015) Chapin Furniture retail furniture store. Properties to the immediate southwest include a BP gasoline retailer and McDonald’s restaurant. Properties further to the southwest include two gasoline retailers, two fast-food restaurants, and a small building supply business on forested land. Property to the immediate west is forested land and property further west includes the undeveloped Chapin Business and Technology Park. The Chapin Business and Technology Park

has some infrastructure already in place and is accessible from Columbia Avenue via Brighton Boulevard.

Exit 97 – Broad River Road

Land uses surrounding this interchange consist of light industrial, commercial, low-density residential, and open/forested land. Low-density residential land, off of Julius Richardson Road, and forested land is located to the north and northeast of the interchange. To the east of the interchange is the Evergreen 123 BP gas station and forested land. An SCDOT section shed and the SC Department of Motor Vehicles office are located to the south of the interchange. Small commercial businesses occupy this area as well. To the southwest of the interchange are two utility rights-of-way and forested land. To the northwest of the interchange is a commercial shopping center with several small businesses, anchored by the Food Lion grocery store.

4.1.2 What local planning documents contribute to land use planning within the study area?

Local planning documents that contributed to the land use planning within the PSA are listed and described below:

Richland County Comprehensive Plan (2015)

The Richland County Comprehensive Plan is a document intended to guide and shape future growth of the community. It addresses several elements including population, housing, cultural resources, natural resources, economic development, transportation, priority investment, community facilities, and land use. Each element includes an inventory of existing conditions, statement of needs and goals of the community, and implementation strategies to achieve these goals. The future land use map designates a mix of uses along the I-26 corridor including rural, low density neighborhood, and high density residential areas. The area at the Exit 101 interchange has been identified as a priority investment area because of the potential location for a future transit station. Opportunities to create transit-oriented developments through the redevelopment of aging commercial centers is encouraged. Investment opportunities include partnering with the Town of Irmo to foster redevelopment within the corridor, and to develop master plans for future transit station development.

The area near the Exit 97 interchange is also identified as a priority investment area. Richland County has identified opportunities to provide neighborhood scale commercial businesses for nearby citizens to access, reducing vehicle miles traveled (VMT) and providing convenient access to daily needed goods and services. Desired investments include necessary infrastructure, streetscape improvements, signage, and lighting improvements.

Lexington County Comprehensive Plan (2012)

A small portion of the project is located in Lexington County near the Exit 91 interchange. This area is designated as a mix of residential and commercial land uses with an identified zone for intensive development.

Newberry County Comprehensive Plan (2013)

The Newberry County Comprehensive Plan guides the unincorporated area of Newberry County in each of the elements of the plan for development in accordance with existing and future needs and promotes the public health, safety, morals, convenience, order, appearances, prosperity, and general welfare of the community. The area near I-26 is classified as a mix of rural and residential uses.

Columbia Area Transportation Study (COATS) 2040 Long Range Transportation Plan

The CMCOG is the designated Metropolitan Planning Organization (MPO) responsible for carrying out the urban transportation planning process for the COATS. The Long Range Plan notes that adding travel lanes to I-26, modernizing interchanges, raising low clearance bridges, and replacing the US 176 Broad River Road bridge are needed improvements to I-26. The interstate improvements section of the plan specifies that widening I-26 from US 176 to Little Mountain is needed to maintain an acceptable level of service on the interstate. The proposed project is consistent with the COATS 2040 Long Range Transportation Plan.

4.1.3 How would the alternatives impact land use in the project study area?

With anticipated population growth and the corridor's proximity to Columbia, residential, commercial and industrial development are expected to continue within the PSA, for the No-Build and the Preferred Alternatives.

Mainline

Along the mainline of I-26 in the PSA, the land use consists mainly of forested land, with areas of commercial, residential, and light industrial uses. The proposed widening of the mainline is not expected to substantially change land uses along the mainline of the interstate. The replacement of 8 overpasses (as described in Section 3.4) would be constructed on new alignment because there are no appropriate detours for the traffic at most of the replacement locations. The new alignment construction will be located immediately adjacent to the existing overpasses. This will result in conversion of a portion of the existing undeveloped property at the overpasses to new roadway infrastructure. The exception is Koon Road which would be replaced on existing alignment. A small area of the property protected by a Richland County Conservation Easement (approximately less than 0.1 acre) would need to be utilized to tie-in with the road

improvements. This would impact a vegetated area that is currently adjacent to Old Hilton Road, converting it to a transportation use.

Interchanges

The proposed project provides improvements to three interchanges along I-26. The interchange reconstruction would provide improved interstate access reflecting current design standards that would be attractive to local and through motorists that would utilize these facilities.

The project is being advanced in accordance with local plans and is expected to positively impact land use in the area by providing improvements to existing access for motorists to reach industrial, commercial and residential establishments. However, some relocations and land acquisition would be required, which would convert the current land use to transportation uses. Relocations are discussed further in Section 4.16.1.1.

4.2 Farmlands

4.2.1 How is farmland protected?

The Farmland Protection Policy Act (FPPA) of 1981 requires evaluation of farmland conversions to nonagricultural uses. Pursuant to 7 CFR § 658.3(c), the FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland. Farmland can be prime farmland, unique farmland, or farmland of statewide or local importance. Prime farmland soils are those that have characteristics favorable for economic production of sustained high yields of crops. These soils may or may not be presently used as cropland.

4.2.2 What are the types and the amounts of protected farmland soils?

The PSA is comprised of approximately 995 acres of land within Lexington, Newberry, and Richland Counties. Of the total area, 136 acres are prime farmland and 221 acres are designated as farmland of statewide importance. Soils designated as prime farmland within and adjacent to the PSA are primarily undeveloped and exist as woodland habitats. Existing farmed areas account for only 8.3 acres of the total PSA. Conversion of prime farmland has previously occurred through construction of roadways, residences, and commercial developments.

In accordance with the FPPA, a Farmland Impact Conversion Rating Form for Corridor Type Projects (NRCS-CPA-106) was completed for the Preferred Alternative. The purpose of the Farmland Impact Conversion Rating Form is to help identify and approximate the amount of farmland that would be converted by the Preferred Alternative. Two values were



Figure 21: Pasture within PSA

determined using the Farmland Impact Conversion Rating Forms, including the Relative Value and the Total Corridor Assessment value. The Relative Value is the relative value of farmland to be converted by the Preferred Alternative, on a scale of zero to 100 points. The Total Corridor Assessment value is on a scale of zero to 160 points, and pertains to the land use, the availability of farm support services, investments in existing farms, and the amount of farmland that would be converted to nonagricultural use due to the construction of the Preferred Alternative. Sites receiving highest scores, up to a maximum of 260, are considered most suitable for protection while those with lowest scores are considered least suitable. Sites receiving scores less than 160 are to be given minimal consideration for protection.

The proposed project received a Total Corridor Assessment score of 130, assuming a Relative Value of 100. Since this Total Corridor Assessment score is under the 160-point threshold described above, neither consideration of alternative sites nor additional studies for the study area are required under the FPPA. The Farmland Impact Conversion Rating Form is located in Appendix G.

4.3 Water Quality

During project construction, the potential of impacts to water resources exists. Activities that would result in impacts are clearing and grubbing on water conveyances, riparian canopy removal, in-water construction, fertilizer and pesticide use for re-vegetation, obstruction and redirection of surficial surface water, and pavement/culvert installation. In addition, the addition of impervious surfaces (pavement) would result in increased runoff into nearby ditches and streams.

4.3.1 What drainage basin is the study area located in?

The PSA is located within the Broad River Sub-Basin which is divided into 17 watersheds. The PSA is located within the Lower Broad River Watershed (HUC 03050106-07). The watershed is located in Newberry, Fairfield, and Richland Counties and consists of the Broad River and its tributaries from the Parr Shoals dam to its confluence with the Saluda River. The watershed occupies 148,599



Figure 22: Wateree Creek Stream Crossing

acres of the Piedmont region of South Carolina. Land use/land cover in the watershed includes 59.4% forested land, 21.4% urban land, 13.0% agricultural land, 3.0% forested wetland, 2.0% water, 0.8% barren land, and 0.4% scrub/shrub land (SCDHEC, 2007). Within the PSA, numerous streams and drainages are present which convey storm water and perennial flows.

4.3.2 What is the existing water quality of the surface waters in the study area?

SCDHEC's Watershed and Water Quality Information was reviewed through an online query in September 2017. Stations B-800 and B-801 are impaired based on macroinvertebrate community data. These stations are located along Rocky Creek and Wateree Creek respectively and are within 6 linear miles or 9 river miles of the PSA. In addition, a Total Maximum Daily Load (TMDL) for fecal coliform has been established within HUC 03050106, as stated in the Basinwide Watershed Water Quality Assessment Report for the Broad River Basin (SCDHEC, 2007)⁷. Please see Appendix C within the Natural Resources Technical Memo located in Appendix H for a copy of the SCDHEC Watershed and Water Quality Information Reports and SCDOT Permit Determination Form.

4.3.3 How would the project affect water resources and water quality?

Increased pavement would result in an increase in run-off to the surface waters adjacent to the project. This run-off could contain sediments and contaminants resulting from the operation of motor vehicles. During construction activities, temporary siltation may occur in adjacent waters and erosion would be increased. However, the proposed project is not anticipated to contribute to these impairments or have long term impacts on water quality within the watershed.

⁷ TMDL for Fecal Coliform For Broad River Basin

http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_lwrbrd_fc.pdf

Water quality concerns would be avoided and/or mitigated through compliance with regulations covering watershed protection, floodplain protections, stream and river buffers, and storm water management. Adherence to these regulations, as well as the implementation of SCDOT's Best Management Practices should help to minimize impacts to water resources during the construction, maintenance, and repair activities.

The contractor would be required to minimize possible water quality impacts through implementation of BMPs, reflecting policies contained in 23 CFR § 650B and the Department's Supplemental Specification on Erosion Control Measures (latest edition) and Supplemental Technical Specifications on Seeding (latest edition). Other measures including seeding, silt fences, sediment basins, etc. as appropriate would be implemented during construction to minimize impacts to water quality.

Stormwater control measures, both during construction and post-construction, are required for SCDOT projects with land disturbance and/or constructed in the vicinity of 303(d), TMDL, and other sensitive waters in accordance with the SCDOT's MS4 Permit. Due to the existing water quality impairments and approved TMDL within the project watershed, SCDHEC may require additional water quality protection and stormwater treatment measures during and after construction. Specific mitigation requirements for impacts to water quality will be established during the Section 404/401 permitting process. The selected contractor would be required to minimize potential stormwater impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and SCDOT's Supplemental Specifications on Seed and Erosion Control Measures (latest edition).

4.3.4 Are there wild and scenic rivers in the study area?

The Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) of 1968 allows for preservation of reaches of selected rivers that are recognized for scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, be preserved in free-flowing condition, and that they and their immediate environments be protected for the benefit and enjoyment of present and future generations. Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Each river is administered by either a federal or state agency. Designated segments need not include the entire river and may include tributaries.

There are no designated Wild and Scenic Rivers; streams on the Nationwide Rivers Inventory or their tributaries; or unique or important aquatic habitats within or near the PSA. Therefore, evaluation under the Wild and Scenic Rivers Act is not required for the proposed project.

4.4 Waters of the US

Waters of the U.S. (WOUS), as it applies to the jurisdictional limits of the authority of the U.S. Army Corps of Engineers (USACE), is defined in 33 CFR § 328, and includes:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds;
- All impoundments, tributaries, and adjacent wetlands to the waters defined above;
- The territorial seas.

Potential WOUS were identified within the PSA, and the proposed project was evaluated to determine the level of impacts anticipated within these areas. It is anticipated that construction would require approval from appropriate regulatory agencies, which ensures that impacts are avoided and minimized where practicable and feasible.

4.4.1 What are wetlands and streams?

Wetlands are defined by Section 404 of the Clean Water Act as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils conditions”. The USACE utilizes specific hydrologic, soils, and vegetation criteria in establishing the boundary of wetlands within their jurisdiction as described in the 1987 Corps of Engineers Wetlands Delineation Manual.

Streams, or tributaries, are defined as seasonal or perennial. Seasonal tributaries flow at least three months a year, but do not have constant flow. Perennial tributaries flow year-round.

The evaluation of potential jurisdictional WOUS included a review of available data, specifically:

- U.S. Geological Survey (USGS) 7.5 minute topographic quadrangles. Irmo, South Carolina (1971, photorevised 1990); Richtex, South Carolina (1971, photorevised 1990); Chapin, South Carolina (1971), and Little Mountain
- Natural Resource Conservation Service (NRCS) Soil Data Mart, Soil Series Mapping. Newberry, Lexington, and Richland, South Carolina (1971)

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Wetlands On-Line Mapper (via the internet and Google Earth kmz files)
- NRCS-USDA National List of Hydric Soils Database; National List, All States. (Last updated March 2014; reviewed: April 2017)
- SCDHEC. Integrated Report for 2016. Part I: Section 303(d) List of Impaired Waters

4.4.2 How were wetlands and streams identified within the study area?

Digital NWI Seamless Wetlands Data provided by the USFWS (USFWS, 2015) was reviewed to initially locate potential wetlands and streams. In addition, USGS topographic maps and aerial imagery data were analyzed to identify primary areas where the likelihood of aquatic resources would be found. Following the data review, the boundaries of WOUS were delineated during May and June 2017. Wetlands were determined using the Routine On-Site Determination Method as defined in the USACE Wetland Delineation Manual (USACE, 1987) and the Eastern Mountains and Piedmont Regional Supplement to the Manual (USACE, 2012). Limits of stream boundaries were determined through identification of characteristics as outlined through Regulatory Guidance Letter 05-05. Delineated WOUS in the field were identified and the boundaries demarcated with orange flagging tape with alpha and numeric numbering for unique identification. The boundaries of wetlands were additionally marked and recorded in the field using a Trimble Geo 7x data logger with a Hurricane L1 Pro X antennae. Data were post-processed and corrected for spatial accuracy through Pathfinder and analyzed using ESRI ArcGIS 10.5 to depict boundaries and limits of each aquatic resource. See Appendix H for extents of WOUS. In addition, representative photos of the identified aquatic features along with wetland and upland data points were recorded.

Jurisdictional determination and verification of delineated boundaries of waters of the U.S. by the USACE is pending.

4.4.3 What wetlands and streams are located within the study area?

A total of 14 areas were identified within the PSA during site reviews which met the criteria for classification as wetlands. These wetlands are identified in the figures of the Natural Resources Technical Memorandum (Appendix H to this document), in Appendix A. Wetlands were classified based upon type of hydrophytic species present, along with percentage of cover within the recorded data point.

Field surveys identified 14 areas encompassing 1.48 acres designated as palustrine emergent (PEM) and palustrine forested (PFO) wetland communities.

The site visits identified 79 streams within the PSA which exhibited characteristics consistent with Regulatory Guidance Letter 05-05 for classification as a jurisdictional waterbody or “non-wetlands waters”. These streams are identified in the figures of the Natural Resources Technical Memorandum (Appendix H to this document), in Appendix A. The identified features within the PSA included first and second order streams with ephemeral flows reliant on storm water discharges to perennial flows. As the PSA bisects numerous geological and soil units, streams were variable in substrate ranging from silt/sand to bedrock/cobble. A total of 28,567.50 linear feet of streams are present within the PSA.



Figure 23: Wateree Creek Tributary

4.4.4 What kind of impacts would occur to wetlands and streams as a result of the proposed project?

Impacts to identified wetlands and streams would occur as a result of widening the road, extending existing culverts, and replacement or construction of bridges. Based on preliminary design, the mainline widening is estimated to impact 2,124 linear feet of streams and the interchange improvements would impact 1,760 linear feet of streams for a total of 3,884.5 linear feet of impacts (Table 7). These estimated impacts result in effects to approximately 13.5% of the total amount of streams found within the I-26 PSA. These impacts are calculated from approximate construction limits and right of way limits and may be modified as final design is completed. This results in impacts to 44 of the 79 streams found in the PSA. Of those 44 waterways identified as streams, roughly half (19 streams) of these aquatic resources are functioning as small drainages that primarily convey intermittent water flows and/or flows that are driven by surface water drainage through stormwater. The remaining 25 impacted streams are functioning as natural drainage areas that are identified as blue line streams on USGS topographic maps.

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

Table 7: Estimated Stream Impacts

Stream Identification	Impact (LF)	Condition
Non-wetlands waters 4	52.9	Natural
Non-wetlands waters 7A	31.8	Natural
Non-wetlands waters 8A	65.7	Natural
Non-wetlands waters 8B	59.3	Drainage
Non-wetlands waters 8C	85.6	Drainage
Non-wetlands waters 12	53.1	Natural
Non-wetlands waters 13	68.0	Natural
Non-wetlands waters 15	31.5	Natural
Non-wetlands waters 17	374.3	Natural
Non-wetlands waters 18	23.0	Natural
Non-wetlands waters 19A	27.3	Natural
Non-wetlands waters 20	30.6	Natural
Non-wetlands waters 25A	55.0	Drainage
Non-wetlands waters 26	35.1	Natural
Non-wetlands waters 27	22.2	Natural
Non-wetlands waters 28	42.8	Natural
Non-wetlands waters 29	30.3	Natural
Non-wetlands waters 30A	42.5	Natural
Non-wetlands waters 30B	2.0	Drainage
Non-wetlands waters 32	26.7	Drainage
Non-wetlands waters 33A	3.7	Drainage
Non-wetlands waters 36A	302.1	Natural
Non-wetlands waters 36B	17.1	Drainage
Non-wetlands waters 36D	30.8	Drainage
Non-wetlands waters 38A	43.3	Natural
Non-wetlands waters 38B	10.3	Natural
Non-wetlands waters 38D	8.2	Natural
Non-wetlands waters 39A	61.9	Drainage
Non-wetlands waters 40A	666.0	Natural
Non-wetlands waters 40D	60.0	Drainage
Non-wetlands waters 40E	111.8	Drainage
Non-wetlands waters 43	22.4	Natural
Non-wetlands waters 45A	445.6	Natural
Non-wetlands waters 45B	275.9	Drainage
Non-wetlands waters 54A	21.2	Drainage
Non-wetlands waters 54B	12.9	Drainage
Non-wetlands waters 54C	185.1	Drainage
Non-wetlands waters 60	80.9	Drainage
Non-wetlands waters 103	47.5	Natural
Non-wetlands waters 104	86.6	Drainage
Non-wetlands waters D	85.0	Drainage
Non-wetlands waters HA	22.5	Natural
Non-wetlands waters J	33.9	Natural
Non-wetlands waters N	142.7	Drainage
TOTAL	3884.5	

Based on preliminary design the mainline improvements to I-26 would impact 0.26 acres of wetlands and the interchange improvements would impact 0.17 acres for a total of 0.43 acres of wetland impacts (Table 8). These wetland impacts are calculated from approximate construction limits and right of way limits and may be modified as final design is completed. These impacts represent less than one-third of the total wetlands in the PSA (1.48 acres). Eight of the 14 wetland areas identified in the PSA would be impacted and the majority of the impacts at each of these wetlands would be less than 0.1 acre.

Table 8: Estimated Wetland Impacts

Wetland Identification	Impact (acres)	Wetland Type
Wetland B	0.10	PFO
Wetland C	0.01	PEM
Wetland D	0.17	PFO
Wetland E	0.02	PFO
Wetland G	0.01	PFO
Wetland L	0.001	PFO
Wetland M	0.11	PFO
Wetland J	0.01	PFO
TOTAL	0.43	

**PFO - Palustrine Forested Wetland*

**PEM - Palustrine Emergent Wetland*

4.4.5 How would the impacts be mitigated?

Compensatory mitigation is normally required to offset unavoidable losses of waters of the U.S. The CEQ has defined mitigation in 40 CFR § 1508.20 to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. Three general types of mitigation include avoidance, minimization, and compensatory mitigation. Avoidance has been practiced by the relocation of road segments to avoid impacts. Impacts have been minimized by increasing headwall heights, thus reducing the lengths of culverts and pipes used within streams.

Compensatory mitigation consists of the restoration of existing degraded wetlands or waters, or the creation of wetlands/waters of equal or greater value than those to be impacted. This type of mitigation is only undertaken after avoidance and minimization actions are exhausted and should be undertaken, when practicable, in areas near the impact site. Executive Order 11990 – Protection of Wetlands was issued, in furtherance of NEPA, to avoid impacts to wetlands wherever there is a feasible alternative. Executive Order 11990 requires new construction in wetlands to be avoided unless there are no practicable alternatives to the impacts, and the project incorporates all practicable measures to minimize impacts. The assessment of the

applicability of alternatives to wetland and stream impacts and the incorporation of avoidance measures considers economic, environmental, and other pertinent factors. Therefore, aquatic resources were given special consideration during development and evaluation of this project. It was determined that the Preferred Alternative would pose the least disruption to wetlands and streams other than the "No-Build" alternative. Implementing erosion control measures, which include seeding of slopes, hay bale emplacement, sediment tubes, silt fences, and sediment basins as appropriate, would also minimize impact on adjacent wetlands and streams. Other best management practices would be required of the contractor to ensure compliance with policies reflected in 23 CFR § 650B.

Based on the above considerations, it appears that there is no practicable alternative to the proposed new construction in these wetland and stream areas, thus the proposed project complies with Executive Order 11990. In addition, the proposed action would include all practicable measures to minimize impacts to wetlands that may result from construction. The USACE typically requires compensatory mitigation for any wetland impacts for which a Section 404 permit application is submitted. Currently, there is no USACE-approved mitigation bank with a suitable amount of credits to purchase as compensatory mitigation. If a mitigation bank is not utilized, a permittee responsible mitigation plan may need to be developed by the design-build contractor, in cooperation with the SCDOT, which would require USACE approval. This requires protection and restoration of a wetland and/or stream system, typically within the same watershed as the impact site. Specific mitigation requirements would be established during the Section 404/401 permitting process.

4.5 Permits and Certifications

Environmental permits and/or certifications from both state and federal regulatory agencies would be needed prior to construction of the project. Permits are required for activities that are located in or affect WOUS. The design-build contractor would be responsible for obtaining the required permits for the project, as well as securing the required mitigation, in cooperation with the SCDOT.

4.5.1 What environmental permits would be required for the proposed project?

Prior to commencement of construction, submittal and review of a CWA Section 404 permit to the USACE would be required for activities that may impact WOUS. The discharge of dredge and/or fill material is prohibited unless the type, quantity, and location has been approved. Regulated discharges would include, but are not necessarily limited to, the placement of fill material, riprap, pipes, culverts, etc., into WOUS. The extents of impacts of the proposed project would determine the level and type of permitting necessary for compliance. Section 404 permitting requirements range from activities considered exempt or preauthorized; to those

requiring pre-construction notification under authorization of a Nationwide Permit; General Permit; or, Individual Permit (IP) from the USACE.

Based upon preliminary review of the Preferred Alternative and the anticipated impacts to wetlands and/or streams, regulatory review pursuant to Individual Permitting requirements is anticipated. Impacts to WOUS would be quantified when the design is finalized. Specific permitting requirements and strategies for the project would be finalized once impacts to WOUS are quantified, following establishment of design and construction limits.

Section 401 of the Clean Water Act

In addition to the Section 404 permit, SCDHEC must grant, deny, or waive a Water Quality Certification (WQC), in accordance with Section 401 of the CWA. Waters considered by SCDHEC to be sensitive may also require additional consideration during the 401 WQC process. These include, but are not limited to, Outstanding Resource Waters, Shellfish Harvesting Waters, trout waters, areas draining to waters included on the 303(d) list of impaired waters, and areas draining to waters with an approved TMDL. As discussed in Section 4.3, the PSA drains to waters listed as a water with an EPA approved TMDL. Depending on the type of impairments, extent of the project, and other factors, SCDHEC may require additional water quality protection and storm water treatment measures during and after construction.

Section 402 of the Clean Water Act

Section 402 of the CWA authorizes the EPA to regulate stormwater discharge. The regulatory authority that oversees this regulation is the SCDHEC Bureau of Water. Stormwater discharges are regulated through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. Stormwater runoff and discharges can be sources of water-borne pollutants, which lower the water quality of a water body. Section 402 compliance would be completed prior to the commencement of construction of the project.

4.6 Invasive Species Management

Invasive species are classified as plants and/or animals, that occur purposefully or accidentally, are non-native to an ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm. Many of these species are considered noxious weeds and even some native plants can be considered invasive species. Transportation projects result in the disturbance of vegetated areas, which can allow invasive plant species to overtake an area when re-vegetation occurs. However, Best Management Practices contained in the SCDOT Standard Specifications for Highway Construction would be used to reduce the introduction or spread of invasive species. Cleared areas would be seeded with both temporary and permanent

seed mixtures. Vegetative matting and or other techniques may also be used to stabilize areas that are cleared of vegetation, preventing the growth or spread of invasive species.

In 1999, a Presidential Executive Order on Invasive Species (EO 13112) was issued to direct all federal agencies to address invasive species concerns and refrain from actions likely to increase invasive species problems.

SCDOT would comply with the intent of EO 13112 regarding Invasive Species by actively stabilizing all temporarily disturbed areas with protective measures and/or seed mixtures that would not include invasive species.

4.7 Floodplains

4.7.1 What is a floodplain?

Floodplains are defined by the Federal Emergency Management Agency (FEMA) as “any land area susceptible to being inundated by floodwaters from any source”. They are typically low-lying areas adjacent to rivers, streams, and other waterbodies that are susceptible to inundation during rain events. These areas also can provide important functions in the natural environment such as providing storage for flood waters, protecting the surrounding environment from erosion, and providing habitat for wildlife. As such, agencies are required to take actions that reduce the risk of impacts to floodplains and their associated floodway, or main channel of flow.

Floodplain and floodway protection is required under several federal, state, and local laws, including Executive Order 11988, entitled “Floodplain Management,” which requires federal agencies to avoid making modifications to and supporting development in floodplains wherever practical. Floodplains subject to inundation by the 100-year flood event (one-percent-annual-chance of occurring) are regulated by FEMA.

FEMA publishes maps which depict areas of regulated floodplains and floodways. The Flood Insurance Rate Map (FIRM) is the most common of these flood maps. FIRMs depict the boundaries of flood hazard areas and differentiate them by Zone.

Zone A floodplains are areas subject to inundation by the 1% annual chance flood event and are generally determined using approximate methodologies. Detailed hydraulic analyses have not been performed for Zone A floodplains; therefore, Base Flood Elevations (BFEs) or flood depths are not depicted on FIRMs. Zone AE floodplains are areas inundated by 1% annual chance flooding, for which BFEs have been developed.

4.7.2 Is the study area within the floodplain?

Based upon a review of the floodplain mapping and a GIS analysis of the PSA, the proposed project crosses or encroaches on several floodplains. Table 9 lists these floodplains by their associated waterbody. The extents of each floodplain are illustrated in Figures 1 through 3 in Appendix I.

Table 9: Floodplains and Existing Crossings in the I-26 Widening PSA

FLOODPLAIN	FIRM PANEL ID	DATE EFFECTIVE	FEMA ZONE	EXISTING CROSSING
Metz Branch	45079C0090K	December 21, 2017	Zone AE	Culvert
Wateree Creek	45079C0090K	December 21, 2017	Zone AE	Culvert
Moccasin Branch	45079C0206L	December 21, 2017	Zone AE	Culvert
Risters Creek	45063C0040G	February 9, 2000	Zone A	Culvert
Unnamed Tributary to Wateree Creek	45063C0040G	February 9, 2000	Zone A	Culvert
Rocky Creek	45071C0410C	September 16, 2011	Zone A	Culvert
Crims Creek	45071C0410C	September 16, 2011	Zone A	Culvert
Unnamed Tributary to Rocky Creek	45071C0410C	September 16, 2011	Zone A	Culvert

The remainder of the proposed project area is located within Zone X, an area of minimal flood hazard outside of the 0.1 percent and 0.2 percent annual-chance (500-year) flood area, as defined FEMA.

4.7.3 How will the proposed project affect floodplains and flood elevations?

The Preferred Alternative interchanges and mainline includes a total of eight Zone A or AE floodplain crossings. These crossings currently have culverts in place. Following final design and modeling, the culverts may need to be improved by either extending or replacing them. To provide for the realignment of Four Oaks Road and Meadow Brook Road, two additional crossings of either a bridge or culvert may be needed. As the preliminary design is developed, precise potential impacts to the floodplain can be calculated.



Figure 24: Metz Branch Stream Crossing

In accordance with Executive Order 11988, a hydraulic analysis must be conducted for an encroachment of a FEMA-regulated floodplain. The hydraulic analysis is used to determine if the project is likely to increase the risk of flooding within the floodplain (refer to SCDOT Floodplains Checklist, Appendix I).

These encroachments are not anticipated to increase the risk of flooding within these floodplains and the proposed project would be designed to meet the “No-Rise” requirements. A detailed hydraulic analysis would be performed for each encroachment of a FEMA-regulated floodplain during final design. The contractor would send a set of final plans and a request for floodplain management compliance to the local County Floodplain Administrator(s).

4.8 Other Plant and Wildlife Resources

4.8.1 What other plant and wildlife resources are being assessed?

Migratory Birds

The Migratory Bird Treaty Act (MBTA) protects a wide variety of bird species, making it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations (16 USC § 703–712). Executive Order 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds” also directs and guides Federal agencies in implementing the MBTA. The migratory bird species protected by the MBTA are listed in 50 CFR § 10.13. The USFWS has statutory authority and responsibility for enforcing the MBTA. Any activity which results in the “take” of migratory birds is prohibited unless authorized by USFWS. Ground nests, arboreal nests, and nests built on man-made structures could occur within the project area. Active nests of both the barn swallow (*Hirundo rustica*) and the Eastern phoebe (*Sayornis phoebe*) were documented on many box culverts and structures in the project corridor.

Habitat Types

Maintained Development

Maintained developments were classified as areas or regions which have altered the native state of the land for consumptive human use. Man-maintained and disturbed communities within the PSA include areas routinely maintained or disturbed, including roadside shoulders and utility rights of way. Most of the naturally-occurring plants associated with these maintained or disturbed communities have been destroyed and replaced with cultivated grasses or taken over by naturally occurring opportunistic species characteristic of disturbed areas. These areas encompass land uses such as residential homes, commercial developments, roadway surfaces, parking lots, and agricultural fields. The majority of maintained developments were located

within urban centers and also serve as frontage roads to the mainline of travel. Agricultural fields were present within the PSA occupying areas outside of the mainline of travel. Most of the disturbed roadway edges are comprised of herbaceous species and a few shrubs, including various grasses such as common fescue (*Festuca sp.*), ryegrass (*Lolium perenne*), and bluegrass (*Poa sp.*).

Pine Forest

Pine forests consist of areas where timber has been harvested and re-planted for the production of pine trees. The systematic removal and planting of pine trees changes the landscape to function as a monoculture dominated by loblolly pine (*Pinus taeda*). Fast growing, opportunistic vegetation, such as red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*) may be present within the early stages of re-growth. The disturbed habitat provides for other shrub species such as Chinese privet (*Ligustrum sinense*) until the pine trees are able to dominate. Groundcover vegetation is more prevalent in the early stages of growth and later may disappear with the dense coverage of pine needles deterring growth.

Mixed Pine/Hardwood Forest

Mixed pine/hardwood forest is the dominant community type located throughout the majority of the PSA. Dominant vegetation consists of pine and hardwood tree species, including sweetgum, red maple, loblolly pine, water oak (*Quercus nigra*), eastern red cedar (*Juniperus virginiana*), and American holly (*Ilex opaca*).

Successional Forest

Successional forests are sparsely scattered throughout portions of the PSA and include areas that have been logged or cleared within the past five years. Changes to the landscape as a result of logging or land clearing alter the climax community and the natural trend in forest succession. The community may experience an infiltration of non-native species adept at rapid colonization of disturbed regimes. Vegetation in successional forests experiences a quick colonization of rudimentary herbaceous species mixed with a shrub and sapling component. These species tend to be more widespread and occupy numerous habitat types.

Bottomland Hardwood Forest

Bottomland hardwood forest are present in limited locations within the boundaries of the PSA. These areas are confined to the floodplain zones of creeks and perennial tributaries where out of bank flooding seasonally inundates benches and terraces. These areas are typically mapped within flood zones of waterways. This community type within the PSA is comprised of dominant vegetation of hardwood tree species that includes red maple, tulip poplar (*Liriodendron tulipifera*), sweetgum, and water oak. Mid canopy species comprise a low density layer of

younger individuals where gaps within the upper canopy allow for sunlight to penetrate. Shrub components within the community may be comprised of Chinese privet and giant cane (*Arundinaria gigantea*). Herbaceous ground cover is sparse to bare, with a dense duff layer holding moisture at the top of the soil column for extended periods.

4.8.2 How would the project impact other plant and wildlife resources?

Migratory Birds

To avoid impacts to nesting birds, the contractor shall notify the Resident Construction Engineer (RCE) at least four weeks prior to construction/demolition/maintenance of bridges and box culverts. The RCE will coordinate with SCDOT Environmental Services Office (ESO), Compliance Division, to determine if there are any active birds using structures. After this coordination, it would be determined when construction/demolition/maintenance can begin. If a nest is observed that was not discovered after construction/demolition/maintenance has begun, the contractor will cease work and immediately notify the RCE, who will notify the ESO Compliance Division. The ESO Compliance Division will determine the next course of action. The use of any deterrents by the contractor designed to prevent birds from nesting, shall be approved by the RCE with coordination from the ESO Compliance Division.

Habitats

Construction activities along the existing right-of-way corridors are anticipated to cause temporary, localized disturbances within the vicinity of the PSA as vegetation would need to be cleared in some areas. The majority of the habitat impacts would occur in the maintained areas such as road and utility rights of way. Major impacts to native habitat types are not expected.

4.9 Threatened, Endangered, and Protected Species

Protected species are plants and animals that are afforded protection by state and/or federal regulations due to the concern for their long-term survival. The Federal Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), is the federal regulatory tool that serves to administer permits, implement recovery plans, and monitor protected species. The USFWS and the National Oceanic and Atmospheric Administration-National Marine Fisheries Service administer the ESA and establish a list of protected species.

Species with the federal classification of Endangered (E) or Threatened (T) are protected. Listed animals are protected from being taken and being traded or sold. A "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Listed plants are protected if they are located on federal lands, or if federal actions are involved, including federal permits. Because of the federal nexus of the proposed

project, consultation with USFWS would be required under Section 7 of the ESA for actions that “may affect” federally classified endangered and threatened species.

4.9.1 What federal and state protected species may occur within the study area?

Bald eagle (*Haliaeetus leucocephalus*) – Bald and Golden Eagle Protection Act

Adult bald eagles tend to have a blackish-brown back and breast with a white head, neck, and tail and a yellow bill. Juveniles tend to be brown and white with a black bill. Female bald eagles are approximately 35 to 37 inches long while the male bald eagles are approximately 30 to 34 inches. This bird nests in mature live pines or cypress trees in the transition zone between mature forests and large bodies of water. Nests are very large, up to six feet in width, and constructed of large sticks and soft materials such as dead vegetation, grasses, and pine needles. Nesting trees are usually less than two miles from open water. Winter roosts are usually in mature trees, similar to nesting trees, but may be somewhat farther from water.

Red-cockaded woodpecker (*Picoides borealis*) – Federal/State Endangered

Adult red-cockaded woodpeckers are approximately 18 to 20 cm long with a wingspan of 35 to 38 cm. Adults have a black cap, throat, and stripe on the side of the neck and white cheeks and underparts. The back is barred with black and white horizontal stripes. Adult males have a small red spot on each side of the black cap. The bird is native to southern pine forest and typically nests within open pine stands containing trees 80 years or older. Habitat preference typically consists of long leaf pine stands with open grassland understory. Roosting cavities are excavated within live pines, which are often infected with a fungus. Foraging may occur in pine and/or mixed pine/hardwood stands 30 years or older with trees 10 inches or larger in diameter at breast height.

Wood stork (*Mycteria americana*) – Federal Threatened

Wood storks are the largest wading bird and only stork species that breeds in the United States. These birds are large, long legged with a head to tail length of up to 45 inches and a wingspan of up to 65 inches. Adult wood storks are white except for the primary and secondary wing feathers and the tail feathers, which are black with a greenish sheen. Adults also have an unfeathered head and neck with a long, thick black bill. The breeding range of the wood stork extends down the southeastern coast of the United States, including South Carolina. Wood storks typically nest in extensive forested wetlands within the upper branches of swamp black gum (*Nyssa biflora*) or bald cypress trees in standing water.

Atlantic Sturgeon (*Acipenser oxyrinchus*) – Federal Endangered

The Atlantic sturgeon is an anadromous fish species, similar in habitat requirements and appearance to the shortnose sturgeon. The Atlantic sturgeon can be distinguished by their large

size, smaller mouth, different snout shape and scutes. They can grow up to 14 feet in length and weigh up to 800 pounds. The Atlantic sturgeon is bluish-black or olive brown dorsally with paler sides and a white belly. The sides of its body also contain five rows of scutes. Adults are commonly found in brackish and estuarine waters along the coastline. The adult Atlantic sturgeon will migrate upstream to fresh water to spawn in the spring, and can go as far inland as the fall line in South Carolina to spawn, as long the stream is unobstructed. Suitable habitat for the shortnose sturgeon is not present within the PSA, since riverine, estuarine, or marine habitats are not present. Streams present within the PSA have been channelized, dammed, and/or blocked with pipes and culverts downstream, thereby preventing access to the portions of channel within the PSA.

Shortnose sturgeon (*Acipenser brevirostrum*) – Federal Endangered

The shortnose sturgeon is an anadromous fish species which spends most of the year in brackish or salt water and moves into fresh water only to spawn. Spawning season for the shortnose sturgeon occurs from late winter to early spring. The shortnose sturgeon is dark-colored on its dorsal side and light on the ventral side. This species of sturgeon has a wide mouth pointed downward beneath a short snout and can grow up to three feet long. The sides of its body contain five rows of sharp, pointed plates. The shortnose sturgeon inhabits the lower portions of large rivers and coastal rivers along the Atlantic Coast. Suitable habitat for the shortnose sturgeon is not present within the PSA, since riverine, estuarine, or marine habitats are not present.

Canby's dropwort (*Oxypolis canbyi*) – Federal Endangered

Canby's dropwort is a perennial herbaceous plant with tuberous roots and pale, fleshy rhizomes and erect stems up to 39 inches tall. The stems may be purplish at the base, and the leaves resemble quills. The flowers are small and white with five petals and grow in umbels or flat-topped clusters. Canby's dropwort grows in moist areas in the coastal plain and sandhills, including wet meadows, wet pineland savannas, ditches, sloughs, and around the edges of Cypress-pine ponds. The plant seems to be more prolific when the habitat has been burned.

Michaux's sumac (*Rhus michauxii*) – Federal Endangered

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from one to three feet in height. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit is produced through the months of August to October. Michaux's sumac grows in sandy or rocky open woods in association with basic soils. This plant survives best in areas where some form of disturbance has provided an open area. Several populations in North Carolina are on highway rights-of way,

roadsides, or on the edges of artificially maintained clearings. Two other populations are in areas with periodic fires, and two populations exist on sites undergoing natural succession. One population is situated in a natural opening on the rim of a Carolina bay. There are no known wild populations of Michaux's sumac known in South Carolina.

Rough-leaved loosestrife (*Lysimachia asperulaefolia*) – Federal Endangered

Rough-leaved loosestrife is a rhizomatous, perennial herb with slender stems at one or two feet tall. Whorls of three to four bluish-green leaves encircle the stem at intervals beneath the showy yellow flowers. The leaves are smooth and flowering occurs from mid-May through June, with fruits present from July through October. Rough-leaved loosestrife favors pocosins, especially on the edges (ecotones) between longleaf pine sandhills and pond pine pocosins. It has also been found on deep peat in the low shrub community of Carolina bays. It has been found in roadside depressions, firebreaks, and power line rights-of-way adjacent to pocosins. These habitats depend on naturally occurring fires to keep the understory clear.

Smooth coneflower (*Echinacea laevigata*) – Federal Endangered

The smooth coneflower is an herbaceous perennial that is characterized by light pink to purple drooping flowers from May to July. The plant has smooth stems and few leaves. It is usually restricted to open sites with low competition that are maintained by fire, grazing, mowing, or other methods. Historically the plant was associated with prairie-like habitats or oak-savannas, but today most often occurs in openings in woods (i.e. clear-cuts), along roadsides, utility line rights-of-way, and on dry limestone bluffs. In addition, the plant is typically found on magnesium and calcium rich soils associated with diabase and marble. The project area includes open areas associated with transportation and utility right-of-way; however, the soil along the project is not particularly magnesium or calcium rich.

4.9.2 Would any species be impacted by the project?

This project would have No Effect on species identified as state and/or federally threatened or endangered. The data collected from online resources and databases, in addition to the field site visits, did not identify species that may be found within or directly adjacent to the PSA. Suitable habitat for protected species was not identified within the PSA. The county lists referenced include species found in Newberry, Lexington, and Richland Counties. Supporting documentation is provided in Appendix H.

As the PSA traverses undeveloped as well as urban land use, no foraging habitat for the bald eagle is located within the PSA. The nearest known bald eagle nest is located approximately 1 mile from the PSA in Chapin, near Lake Murray (SCDNR 2016). Table 10 provides a summary of all federally protected species and potential project impacts to these species.

Table 10: Federally Protected Species and Potential Project Impacts

SPECIES	PROTECTION STATUS	COUNTY	SUITABLE HABITAT	POTENTIAL PROJECT IMPACTS
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)	Endangered	Lexington, Richland	Not Present	No effect
American wood stork (<i>Mycteria Americana</i>)	Threatened	Richland	Not Present	No effect
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA*	Lexington, Newberry,	Not Present	No effect
Canby's dropwort (<i>Oxypolis canbyi</i>)	Endangered	Richland	Not Present	No effect
Michaux's sumac (<i>Rhus michauxii</i>)	Endangered	Richland	Not Present	No effect
Red-cockaded woodpecker (<i>Picoides borealis</i>)	Endangered	Newberry, Richland	Not Present	No effect
Rough-leaved loosestrife (<i>Lysimachia asperulaefolia</i>)	Endangered	Richland	Not Present	No effect
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered	Richland	Not Present	No effect
Smooth coneflower (<i>Echinacea laevigata</i>)	Endangered	Lexington, Richland	Not Present	No effect

*BGEPA - Protected under Bald and Golden Eagle Protection Act

Source: Interstate 26 Widening and Improvements MM85 to MM101, Natural Resources Technical Memorandum. January 2018.

4.10 Air Quality

4.10.1 What are the air quality concerns for this project?

This project was evaluated for its consistency with state and federal air quality goals. The pollutants studied include ozone, CO, and PM_{2.5}, and mobile source air toxics (MSATs). Results indicated that the project is in compliance with both state and federal air quality standards. The following narrative provides a more detailed discussion of the analysis and results.

4.10.2 What does it mean that a project “conforms” to air quality standards and regulations?

The 1990 Clean Air Act Amendments (CAAA) and guidelines, issued by the U.S. Environmental Protection Agency (EPA), set forth guidelines to be followed by agencies responsible for attainment of the National Ambient Air Quality Standards (NAAQS). The CAAA Section 176(c) requires that Federal transportation projects are consistent with state air quality goals, found in the State Implementation Plan (SIP), which is developed by the South Carolina Department of

Health and Environmental Control. The process to ensure this consistency is called Transportation Conformity.

Conformity to the SIP means that transportation activities will not cause new violations of the NAAQS, worsen existing violations of the standards, or delay timely attainment of the relevant standard. In complying with these guidelines, it must be demonstrated that no new local violations to air quality will be created as a result of the proposed project.

4.10.3 What is the difference in an attainment and nonattainment designation?

Section 107 of the CAA requires that EPA publish a list of all geographic areas in compliance with the NAAQS, as well as those not in compliance with the NAAQS. The designation of an area is made on a pollutant-by-pollutant basis. The EPA's current designations are shown in Table 11. The PSA is designated as in attainment/unclassified.

4.10.4 What are priority air pollutants, and which ones were considered for this project?

The NAAQS have been established for air pollutants that have been identified by the EPA as being of concern nationwide. These air pollutants, referred to as criteria pollutants, are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), ozone (O₃) and sulfur dioxide (SO₂).

Table 11: Attainment Classifications and Definitions.

ATTAINMENT	UNCLASSIFIED	MAINTENANCE	NONATTAINMENT
Area is in compliance with the NAAQS.	Area has insufficient data to make determination and are treated as being in attainment.	Area once classified as nonattainment but has since demonstrated attainment of the NAAQS.	Area is not in compliance with the NAAQS.

Source: USEPA, 2010

The sources of these pollutants, effects on human health and the nation's welfare, and occurrence in the atmosphere vary considerably. In addition to the criteria air pollutants the EPA also regulates MSATs. Due to their association with roadway transportation sources, O₃, CO, PM_{2.5}, and MSATs are typically reviewed for potential effects on nearby receptors with respect to roadway projects

4.10.5 How would the I-26 widening project affect air quality?

4.10.5.1 Ozone (O₃)

On April 30, 2012, the EPA issued final area designations for the 2008 ozone NAAQS. At that time, all of South Carolina was classified as unclassifiable/attainment with the exception of a portion

of York County. The proposed project is not located within York County and, therefore, is considered to be in attainment for O₃.

4.10.5.2 Carbon Monoxide (CO)

South Carolina does not have any areas that are considered nonattainment for CO. No analysis is required for this project to determine impacts to CO concentrations.

4.10.5.3 Particulate Matter (PM₁₀ and PM_{2.5})

On March 10, 2006, EPA issued a final rule regarding the localized or “hot-spot” analysis of PM_{2.5} and PM₁₀ [40 CFR § 93]. This rule requires that PM_{2.5} and/or PM₁₀ hotspot analysis be performed for transportation projects with significant diesel traffic in areas not meeting PM_{2.5} and/or PM₁₀ air quality standards. The project area is classified as an attainment area for both PM₁₀ and PM_{2.5}. As such, a hotspot analysis was not required for particulate matter.

4.10.5.4 Mobile Source Air Toxics (MSATs)

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 Sources⁸ and identified a group of 93 compounds emitted from mobile sources that are part of USEPA’S Integrated Risk Information System (IRIS). In addition, USEPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA).⁹ 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 EPA rules.

According to EPA, 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 vehicle miles travelled (VMT) data. MOVES2014 incorporates the effects of three new Federal emissions standard rules not included

⁸ Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007

⁹ USEPA, “National Air Toxics Assessment,” <https://www.epa.gov/national-air-toxics-assessment>, (December 8, 2016).

in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017¹⁰, heavy-duty greenhouse gas regulations that phase in during model years 2014-2018¹¹, and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025¹². Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide, 5 EPA 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. 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.

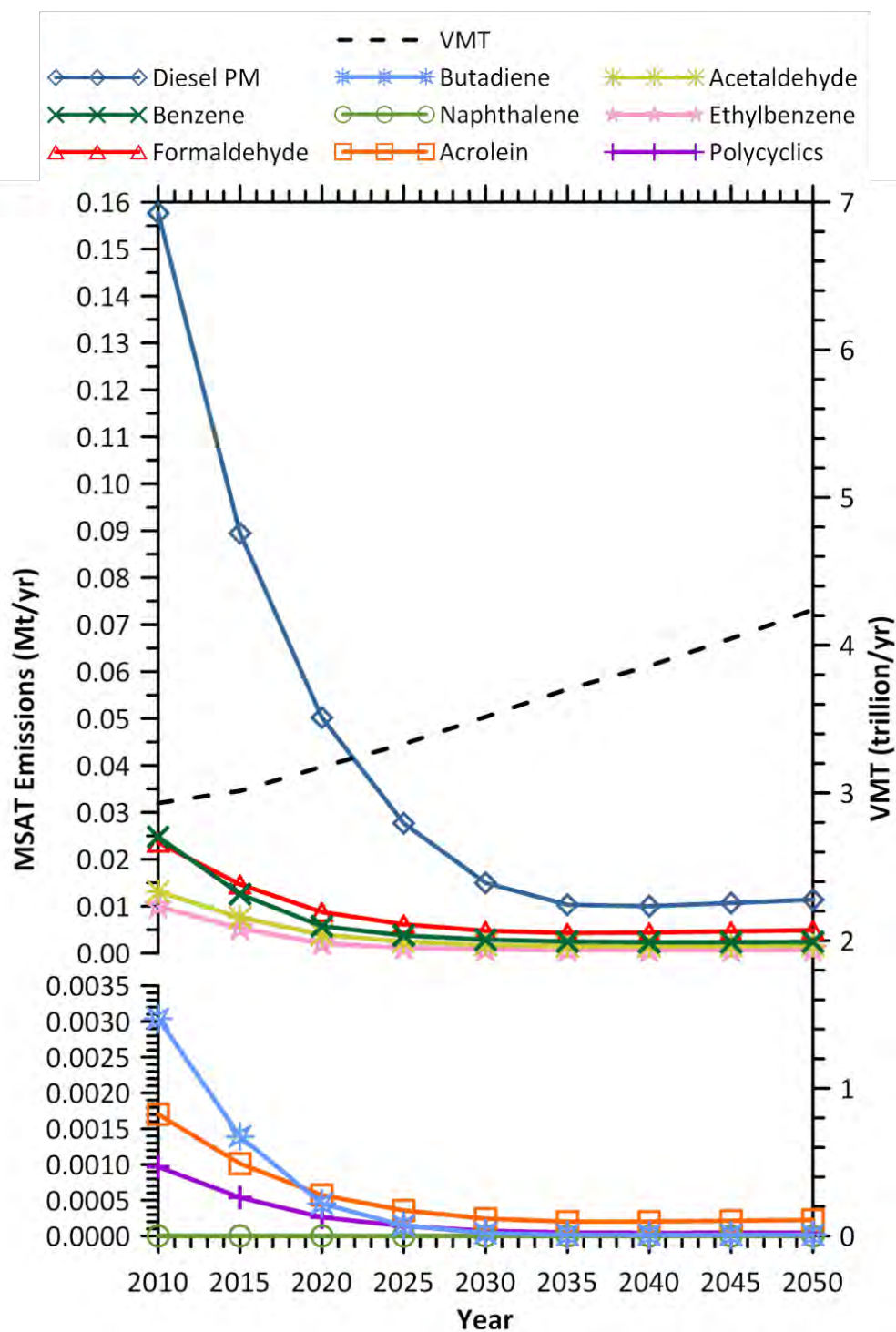
EPA's MOVES2014a model, as shown in Figure 25, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

¹⁰ 79 FR 60344

¹¹ *Ibid.*

¹² *Ibid.*

Figure 25: FHWA Projected National MSAT Emissions Trends 2010-2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model



Source: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Document. October 18, 2016.

Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at:

[www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source
air_toxics/msatemissions.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm)

Based on traffic projections associated with the project, the estimated AADT for the year 2040 would be 84,600 between Exits 85 and 91 and 102,400 AADT between Exit 91 and Exit 97. From Exit 97 to Exit 101 the 2040 future AADT is estimated at 104,600. Therefore, as the design year traffic (2040) is not projected to meet the 140,000 to 150,000 AADT criteria as high potential for MSAT effects in FHWA's recommendations, the proposed project falls within the category for projects with a low potential for MSAT effects.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

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 concentrations¹³ 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 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.¹⁴ 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-

¹³ 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-reviewliterature-exposure-and-health-effects>, November 2007, (December 8, 2016).

¹⁴ *Ibid.*

response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk.”¹⁵.

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.¹⁶

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 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 each alternative in this EA, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT is calculated by multiplying the AADT by the project length. To calculate

¹⁵ USEPA, IRIS Database, “Diesel Engine Exhaust, Section II.C.”
https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal, (December 8, 2016).

¹⁶ 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)

VMT for this project, the length of the I-26 widening was used with the distance broken down by the three major interchanges cited in the report.

The AADT for each of the segments depicted below was used in arriving at the total vehicle miles traveled (Table 12). The AADT is projected to be the same under the Build and No-Build alternatives; therefore, the VMT for both the Build and No-Build alternatives would be the same.

Table 12: Year 2040 Build/No-Build Vehicle Miles Travel (VMT)

MAINLINE SEGMENT	ALL VEHICLES	SEGMENT LENGTH	VEHICLE MILES TRAVELED
Exit 85-91	84,600	5.8	490,680
Exit 91-97	102,400	5.3	542,720
Exit 97-101	104,600	4.5	470,700
Project Total:			1,504,100

This increase in VMT would lead to higher MSAT emissions for the preferred alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. 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.

Because the estimated VMT under each of the Alternatives are nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent between 2010 and 2050 (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016). 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 EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives 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 Preferred Alternative than the No-Build Alternative, particularly where the interchanges are realigned. 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, when a highway is widened, the localized level of MSAT emissions for the Preferred Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (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 regionwide MSAT levels to be significantly lower than today.

4.10.5.5 Construction Impacts on Air Quality

Construction-related effects of the project would be limited to short-term increased fugitive dust and mobile-source emissions during construction. State and local regulations regarding dust control and other air quality emission reduction controls will be followed. These recommendations are described below.

Fugitive Dust Emissions

Fugitive dust is airborne particulate matter, generally of a relatively large particulate size. Construction-related fugitive dust would be generated by haul trucks, concrete trucks, delivery trucks, and earth-moving vehicles operating around the construction sites. This fugitive dust would be due primarily to particulate matter re-suspended ("kicked up") by vehicle movement over paved and unpaved roads, dirt tracked onto paved surfaces from unpaved areas at access points, and material blown from uncovered haul trucks. Generally, the distance that particles drift from their source depends on the size, the emission height, and the wind speed.

To minimize the amount of construction dust generated, current state best management practices, will be followed during the construction of the project. These include covering earth-moving trucks to keep dust levels down, watering haul roads, and refraining from open burning, except as may be permitted by local regulations.

Mobile CO Emissions

Since CO emissions from motor vehicles generally increase with decreasing vehicle speed, disruption of traffic during construction (such as the temporary reduction of roadway capacity and the increased queue lengths) could result in short-term, elevated concentrations of CO. In order to minimize the amount of emissions generated, every effort should be made during the construction phase to limit disruption to traffic, especially during peak travel hours.

The construction equipment would also produce slight amounts of exhaust emissions. The EPA has listed a number of approved diesel retrofit technologies; these could be deployed as emissions mitigation measures for equipment used in construction, at the discretion of the contractor, in consultation with SCDOT.

4.10.5.6 Summary

This project was evaluated for its consistency with state and federal air quality goals, including ozone, CO, and PM_{2.5}, and MSATs as part of this assessment. Results indicated that the project is consistent with the SIP for the attainment of clean air quality in South Carolina and is in compliance with both state and federal air quality standards.

The proposed project is located outside the limits of the ozone non-attainment area of the Rock Hill – Fort Mill Area. South Carolina does not have any areas that are considered nonattainment for CO. No analysis is required for this project to determine impacts to CO concentrations. The area is classified as an attainment area for PM_{2.5}.

The proposed project would be classified as a Tier 2 project with Low Potential MSAT Effects. Therefore, this project required a qualitative analysis of MSAT emissions relative to the Build Alternative. Based on this analysis, it is anticipated that the project will have no appreciable impact on regional MSAT levels. It is acknowledged that the project may result in increased exposure to MSAT emissions in certain locations.

Construction-related effects of the project would be limited to short-term localized increased fugitive dust and mobile-source emissions during construction. State and local regulations regarding dust control and other air quality emission reduction controls shall be followed.

4.11 Noise

4.11.1 What is noise and how is it measured?

Noise is typically defined as unwanted or undesirable sound. The basic parameters of noise that affect humans are frequency content, variation with time, and intensity or level. Intensity is determined by the level of sound, which is expressed in units of decibels (dBA). On a relative basis, a 3dBA change in sound level generally represents a barely perceptible change in a common outdoor setting, to someone with average hearing. A 5 dBA positive change presents a “noticeable” change, and a 10 dBA positive change is typically perceived as a doubling in the loudness.

Because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used. Sound levels measured using this weighting system are called “A-weighted” sound levels, dBA, are widely accepted as a proper unit for describing environmental noise. The evaluation of impacts was done in compliance with 23 USC Section 109(h) and (i), FHWA established guidelines (23 CFR Part 772) for the assessment of highway traffic-generated noise. The noise assessment for the widening of I-26 was prepared in accordance with 23 CFR Part 772 and SCDOT Highway Traffic Noise Abatement Policy (September 1, 2014). The I-26 Traffic Noise

Analysis Report is in Appendix J and contains the technical details of the modeling and impact analysis.

Many factors affect noise. Traffic noise level at a site depends on many site features (distance, land cover, topography, etc.) and traffic characteristics (volume, vehicle type, speed, truck numbers, etc.) of proposed roadways. Noise levels from trucks are much greater than noise levels from automobiles. Assuming similar vehicle mix and travel speeds, a doubling in traffic volume produces a doubling in the sound energy. A doubling in sound energy corresponds to a barely perceptible 3 dBA increase in noise level.

4.11.2 How were noise conditions studied in this area?

Noise for this project was modeled using the FHWA's Transportation Noise Model (TNM), version 2.5. To ensure the model is accurate in calculating noise levels at these sensitive receivers, the model is validated by collecting field measurements with a sound level meter and counting the traffic volumes on the roads during the field data collections. If results from the TNM model are within 3 dBA of the measurement collected in the field, the model is considered valid to calculate noise levels for the project. For the I-26 widening project all of the field measurements were within 3 dBA of the modeled results.



Figure 26: Noise Study Equipment

4.11.3 How would the project affect noise levels?

Pursuant to the SCDOT Noise Policy, two methods are used for predicting a noise impact. The first is a comparison of predicted noise levels with Noise Abatement Criteria (NAC) (Table 13).

Table 13: NAC for Land Use Categories

ACTIVITY CATEGORY	L _(EQ)	DESCRIPTION OF ACTIVITY CATEGORY
A	57 dBA (Exterior)	Lands on which serenity and quiet 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 is intended purpose.
B	67 dBA (Exterior)	Residential

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

ACTIVITY CATEGORY	L _(EQ)	DESCRIPTION OF ACTIVITY CATEGORY
C	67 dBA (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 dBA (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	72 dBA (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 772

For the I-26 widening project noise sensitive receivers were assigned NAC category B, C, D, E, F, or G. For the purpose of this noise study, approach means within one dBA of the noise abatement criterion. If the receptor approaches or exceeds the NAC threshold, it is considered impacted.

The second method of determining noise impacts involves the amount of increase from the existing noise levels to the predicted future noise levels. An impact occurs when there is a substantial increase from existing levels. According to SCDOT Noise Policy, a “substantial increase” occurs when the future predicted noise levels increase at least 15 dBA or more over existing levels.

For the project area modeled in the noise assessment, in the existing condition 112 receptors are predicted to approach or exceed the NAC criteria levels. For the design year (2040) No-Build Alternative 191 receptors are predicted to approach or exceed the NAC criteria levels. For the design year (2040) Build Preferred Alternative, 271 receptors are predicted to be impacted by noise from the proposed project (Appendix J). There were no receptors that met the substantial

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

increase criteria. Table 14 summarizes the results of the noise analysis for the existing condition, the No-Build Alternative, and the preferred Alternatives.

Table 14: Summary of Receivers Approaching or Exceeding NAC

Alternative (P) denotes Preferred Alternative	Number of Receivers Approaching or Exceeding NAC Threshold							Substantial Noise Level Increase	Total Receivers Approaching or Exceeding NAC
	A	B	C	D	E	F	G		
2017 Existing Mainline	0	93	1	0	6	0	0	0	100
2040 No-Build Mainline	0	158	2	0	9	0	0	0	169
2040 Build Mainline (P)	0	226	2	0	16	0	0	0	244
Exit 85 Existing	0	4	0	0	0	0	0	0	4
No-Build	0	5	0	0	0	0	0	0	5
Alternative 1A (P)	0	5	0	0	0	0	0	0	5
Alternative 2A	0	5	0	0	0	0	0	0	5
Alternative 3	0	5	0	0	0	0	0	0	5
Exit 91 Existing	0	1	0	0	1	0	0	0	2
No-Build	0	5	0	0	3	0	0	0	8
Alternative 3 (P)	0	8	0	0	5	0	0	0	13
Exit 97 Existing	0	3	0	0	3	0	0	0	6
No-Build	0	5	0	0	4	0	0	0	9
Alternative 1 (P)	0	5	0	0	4	0	0	0	9
Alternative 2	0	7	0	0	4	0	0	0	11
Alternative 3	0	4	0	0	4	0	0	0	8
PROJECT BUILD (P) TOTALS	0	243	2	0	25	0	0	0	271

4.11.4 How can noise impacts be mitigated?

The FHWA requires evaluation of noise abatement for impacted receivers resulting from the proposed project. The evaluation considers both the feasibility and reasonableness of noise abatement measures. Primary consideration is given to exterior areas where frequent human use occurs. In accordance with 23 CFR Part 772, the following noise abatement measures were considered and evaluated as means to reduce or eliminate the traffic noise impacts.

Traffic management measures

Traffic management techniques such as the restriction of truck traffic, use by only certain types of vehicles, restricting use to certain times of the day, traffic calming devices, and reduction in operating speeds were considered for noise abatement measures to the impacted receivers. Due to the nature of this project, traffic management techniques would not be consistent with the functional purpose of the project. Traffic management techniques are not considered reasonable noise abatement measures for the impacted receivers.

Altering the horizontal and/or vertical alignment

A change in alignment was considered to reduce noise impacts. The proposed alignment was chosen because it met all design standards and policies while also causing the least amount of environmental impacts to the project area in a cost-effective manner. The Preferred Alternative was chosen based on a variety of environmental and design factors. Furthermore, given the locations of receivers along the project corridor, a shift in alignment significant enough to achieve the required noise reduction levels would result in impacts at otherwise non-impacted receivers. A shift in alignment is not considered a reasonable noise abatement measure.

Noise insulation of public use or nonprofit institutional structures

There are no affected public use or nonprofit structures so this measure was eliminated.

Acquisition of property rights for a buffer zone

The acquisition of property to create a buffer zone between developed areas and roads is most effective prior to development of areas adjacent to the road, or in areas of new roadway alignment. Based on the proximity of the receivers to the road, there is insufficient area to allow for an effective buffer distance. For this reason, buffer zone designations are not considered reasonable or feasible noise abatement measures for the impacted receivers.

Acquiring property rights to construct noise barriers

The acquisition of property explicitly for construction of noise barriers is not considered a reasonable abatement measure, as this could result in additional displacements of sensitive receivers.

Constructing noise barriers within or outside existing right of way

The SCDOT Traffic Noise Abatement Policy requires consideration of barrier construction to assist in abating future traffic noise impacts where practicable. Under these guidelines a barrier must be shown to be both reasonable and feasible as defined as follows:

Feasibility

Acoustic Feasibility - It is SCDOT's policy that a noise reduction of at least five dBA be achieved for 75% of those receivers determined to be impacted for the noise abatement measure to be acoustically feasible. Feasibility is related to engineering considerations. The ability to achieve noise reduction may be limited by:

1. Topography - Determine if the abatement measure could be constructed given the topography of the location.
2. Safety - Maintaining a clear recovery zone, sight distance and accommodation of disabled vehicles.
3. Drainage - Issues created by directing water along, under, or away from an abatement measures.
4. Utilities - Large overhead power lines, underground water, sewer, gas, oil, etc., can have a significant impact on costs and design options.
5. Maintenance - Potential issues from location of abatement measure and construction materials.
6. Access - Refers to the ingress and egress to properties that would be affected by the noise abatement measure.
7. The exposed height of the noise abatement measure cannot exceed 25 feet based on constructability constraints.

Reasonableness

There are three mandatory reasonable factors, all of which must be met, for a noise abatement measure to be considered reasonable. Failure to achieve any one of the reasonable factors will result in the noise abatement measure being deemed not reasonable.

1. Viewpoints of the property owners and residents of the benefited receptors

SCDOT shall solicit the viewpoints of all affected receptors 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.

2. Cost effectiveness

The allowable cost of the abatement will be based on \$35.00 per square foot. This construction cost will be divided by the number of benefited receptors. If the cost per benefited receptor is less than \$30,000 then the barrier is determined to be cost effective. 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.

3. Noise reduction design goal

It is SCDOT's policy that a noise reduction of at least eight dBA must be achieved for 80% of those receivers in the first two building rows and considered benefited.

Under the mainline and interchange build alternatives, impacted receivers were assessed to determine if noise abatement could be suitable. Of the 271 impacted receptors, an analysis of feasible and reasonable mitigation measures was conducted. Many of these receptors did not meet the feasible and reasonableness criteria for noise reduction levels and cost effectiveness. Preliminary barrier studies were undertaken for those "isolated" or single structures found to receive noise levels higher than the NAC for that land use. The critical factor in this instance is whether barrier construction can achieve at least a five dBA reduction over future build noise levels at a cost of \$30,000 or less per receiver. These two requirements are part of specific criteria listed in the SCDOT Traffic Noise Abatement Policy guidelines for noise barrier construction. Of these receptors analyzed, in each instance, the cost to construct a barrier wall exceeded the SCDOT requirement of no more than \$30,000 per receiver benefited receiver.

For each alternative, further analysis of noise abatement locations was focused on clusters of impacted receivers where a noise abatement measure might be feasible and reasonable, based on preliminary design plans, location of receptors, and modeling results. This resulted in further investigation of 11 Noise Analysis Areas (NAA) to determine if construction of noise abatement measures might be considered. A preliminary model for locations of potential noise barriers was analyzed to determine if barriers would be both feasible and reasonable to construct. Table 15 provides a summary of these findings.

Table 15: Noise Analysis Areas and Preliminary Determination of Barrier Effectiveness

NOISE ANALYSIS AREA (NAA)	5 DBA REDUCTION FOR 75% OF IMPACTED RECEIVERS?	8 DBA REDUCTION FOR 80% OF FIRST AND SECOND ROW BENEFITED RECEIVERS?	COST EFFECTIVE? (\$30,000/BENEFITED RECEIVER)	NOISE BARRIER SUPPORTED BY PROPERTY OWNERS AND RESIDENTS?
1	Yes	Yes	No	N/A
2	Yes	Yes	No	N/A
3	Yes	Yes	No	N/A
4	Yes	No	No	N/A
5	Yes	Yes	Yes	To be determined*
6	Yes	Yes	Yes	To be determined*
7	Yes	No	No	N/A
8	Yes	No	No	N/A
9	Yes	Yes	No	N/A
10	Yes	Yes	No	N/A
11	Yes	Yes	No	N/A

*Note: SCDOT will contact affected property owners and residents to determine if greater than 50% of those affected support construction of a barrier wall.

Of the 11 Noise Analysis Areas, two (Areas 10 and 11) are commercial while the remainder are residential. Their locations can be seen in Figures 27 through 36. Based on preliminary studies Areas 5 and 6 remain under consideration for barrier abatement measure. The other 9 locations shown in the preceding table would not meet the criteria of “reasonableness” as the cost of abatement per receiver benefited would substantially exceed the allowable amount of \$30,000.

Based on the studies thus far accomplished, SCDOT intends to install highway traffic noise abatement measures in the form of a barrier at NAA 5 and 6 (Westcott Ridge and Arbor Springs). These preliminary indications of likely abatement measures are based upon preliminary design for a barrier cost of \$35.00 per square foot that will reduce the noise level by at least 5 dB(A) for residences. If it subsequently develops during final design that these conditions have substantially changed, the abatement measures might not be provided. A final decision of the installation of the abatement measure(s) will be made upon completion of the project’s design and the ongoing public involvement processes.

Figure 27: Noise Analysis Area 1

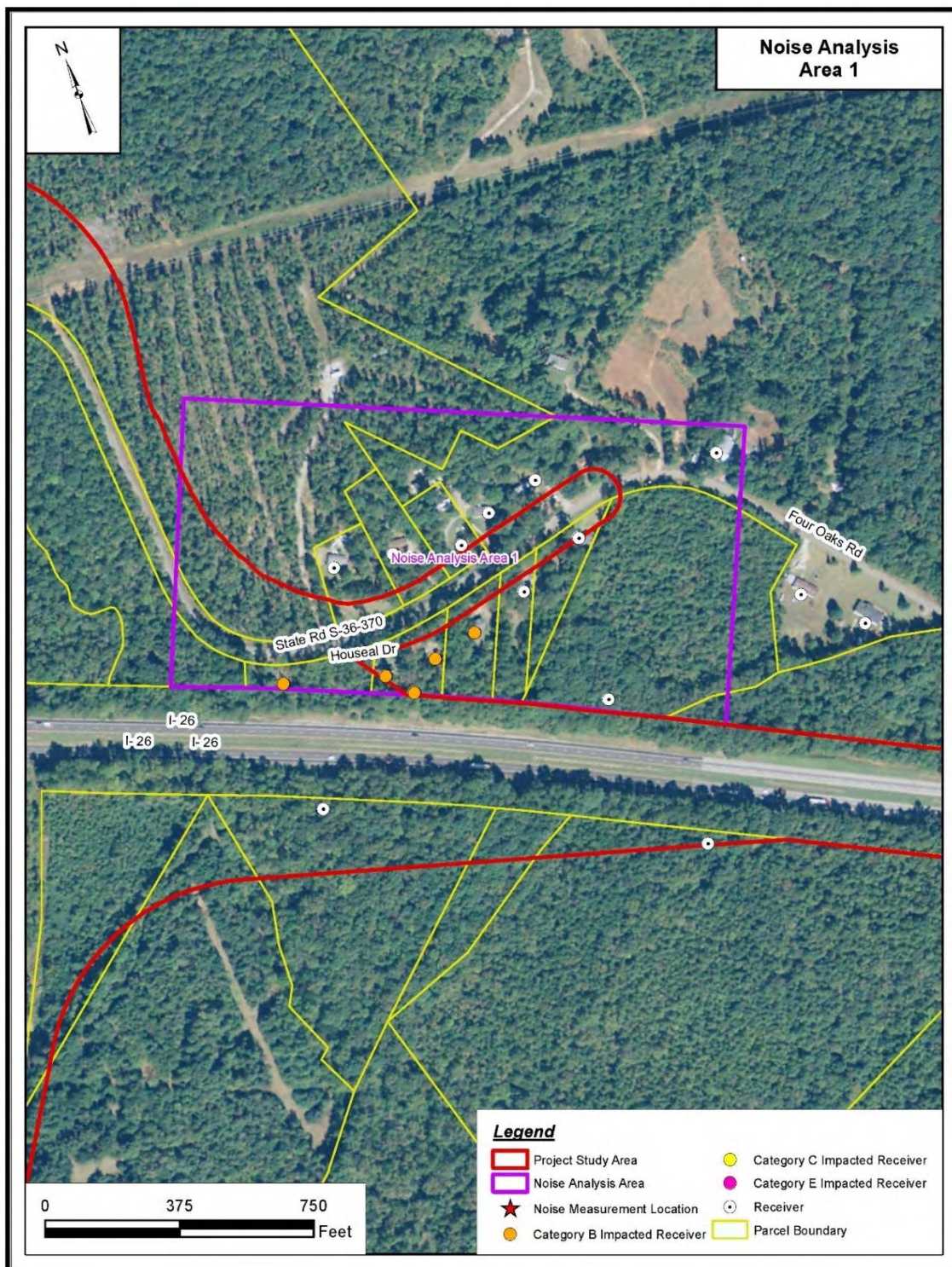


Figure 28: Noise Analysis Area 2

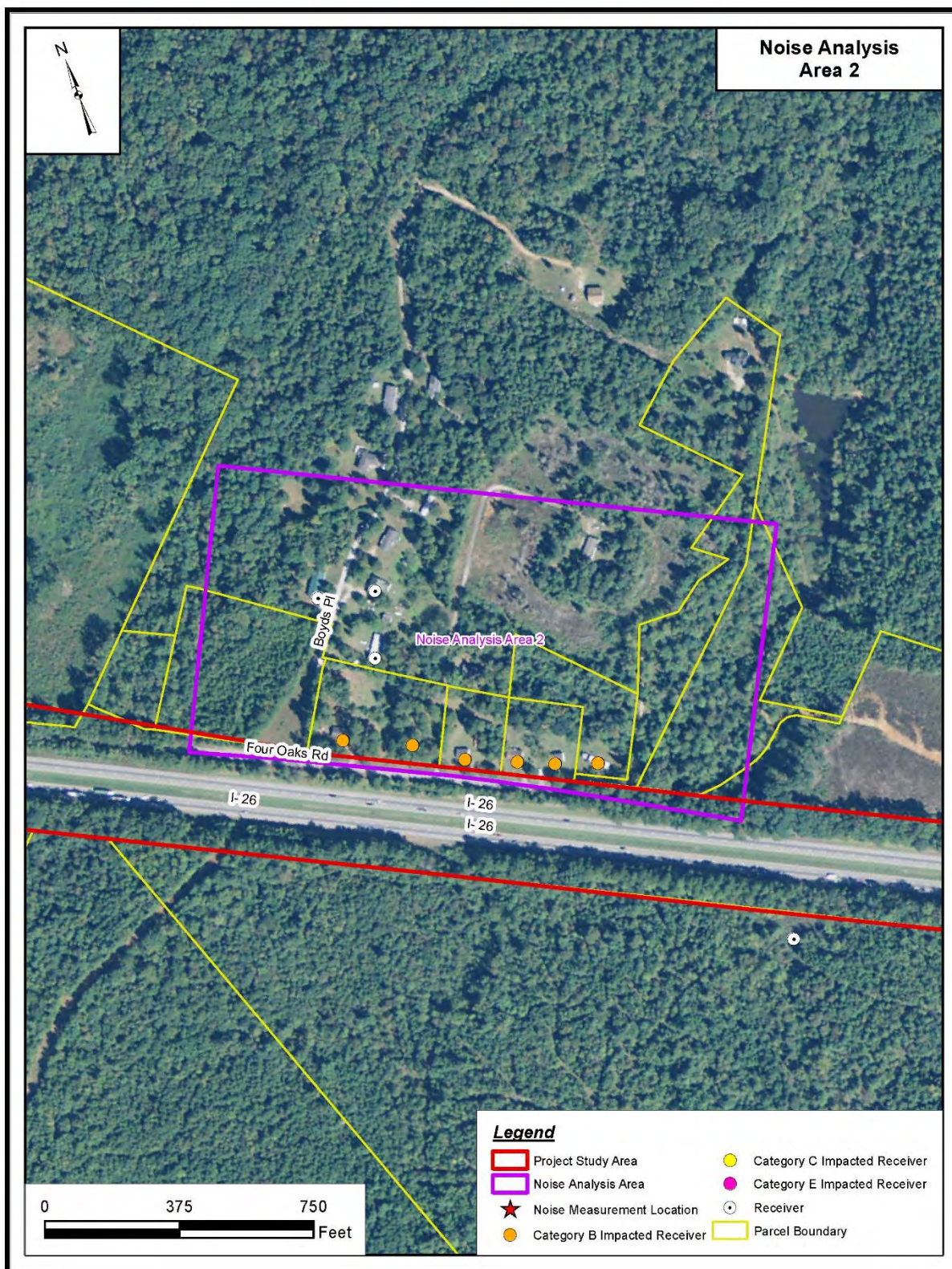


Figure 29: Noise Analysis Area 3

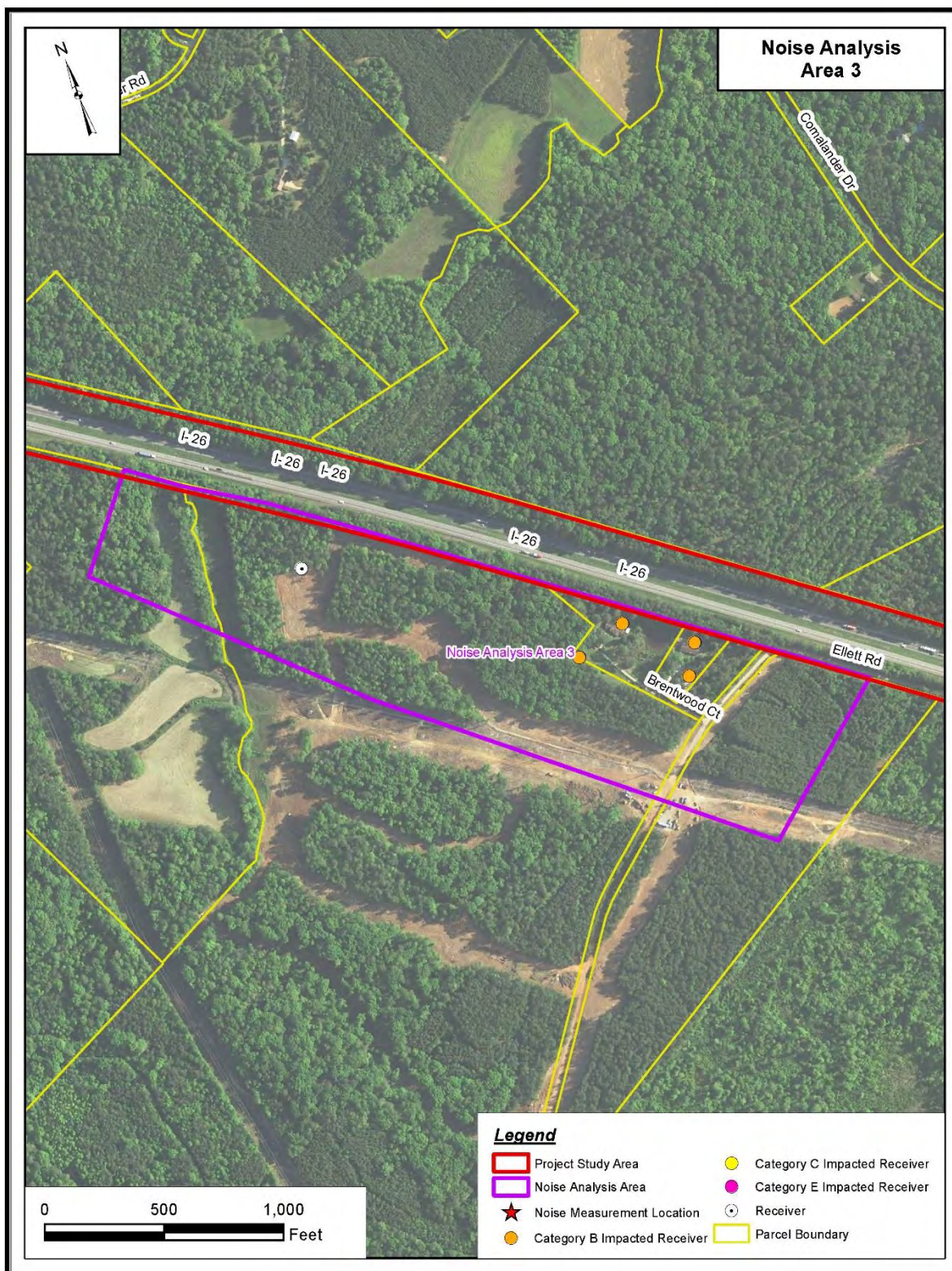


Figure 30: Noise Analysis Area 4

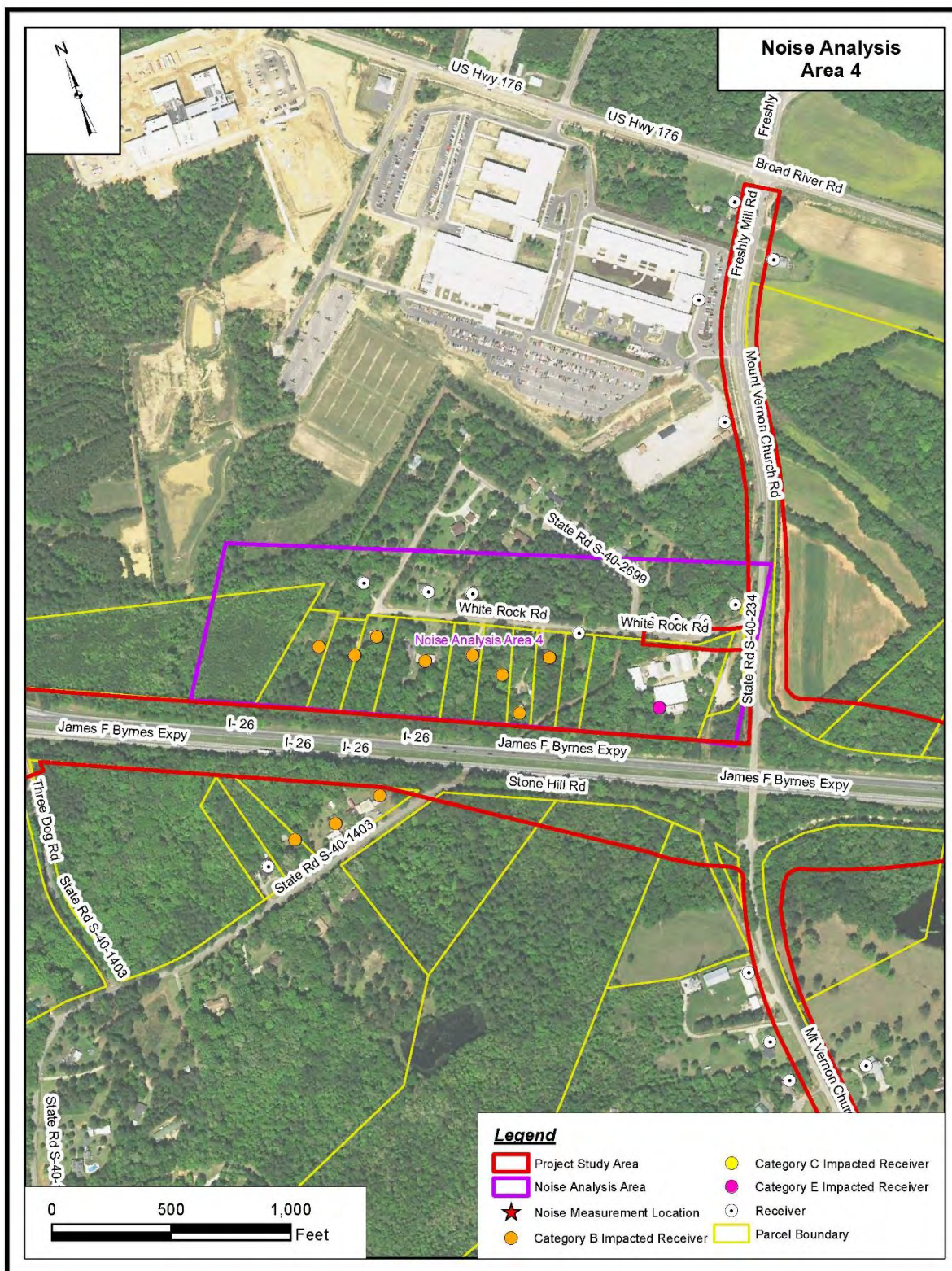
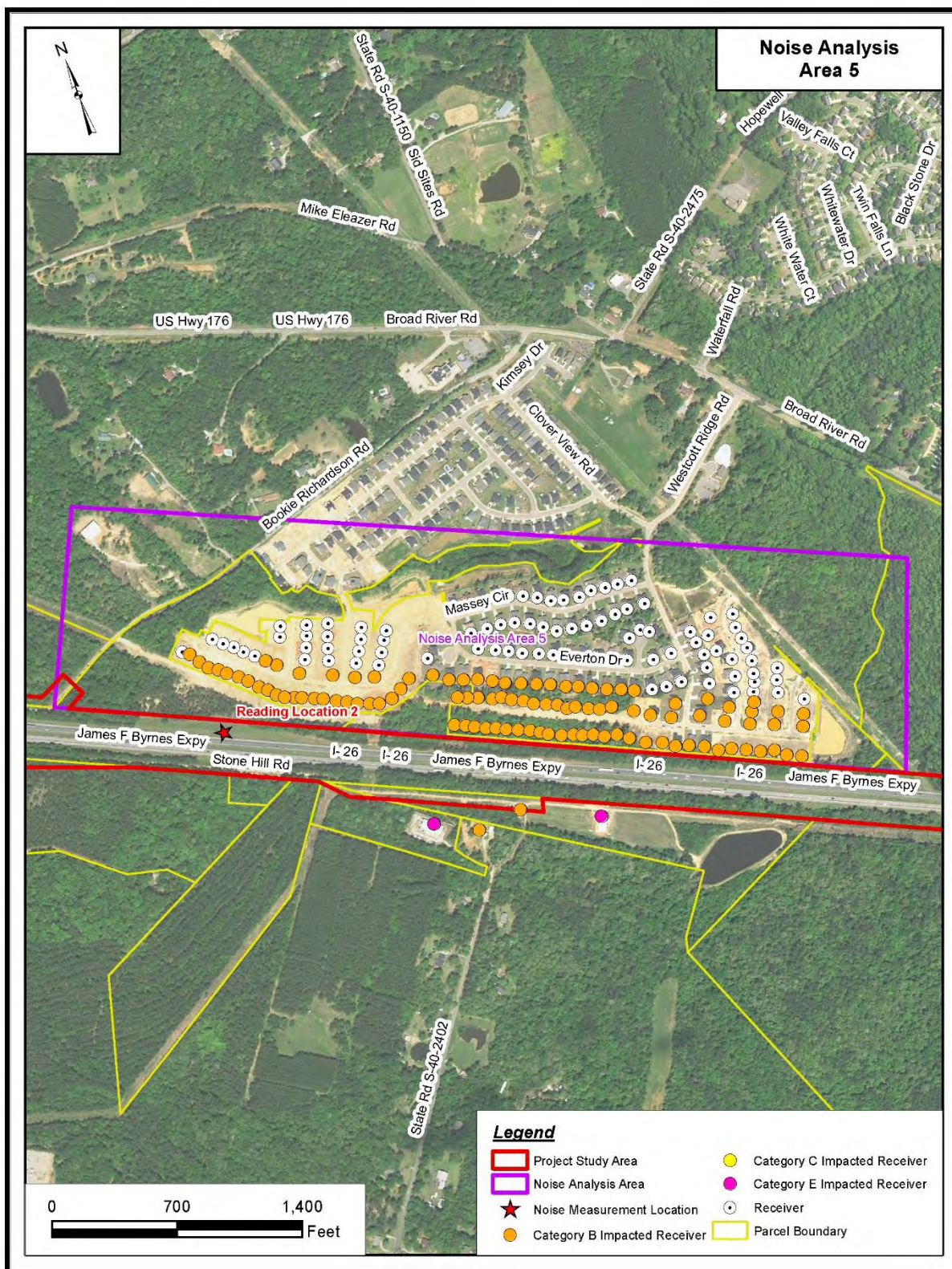


Figure 31: Noise Analysis 5



Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment

Figure 32: Noise Analysis Area 6

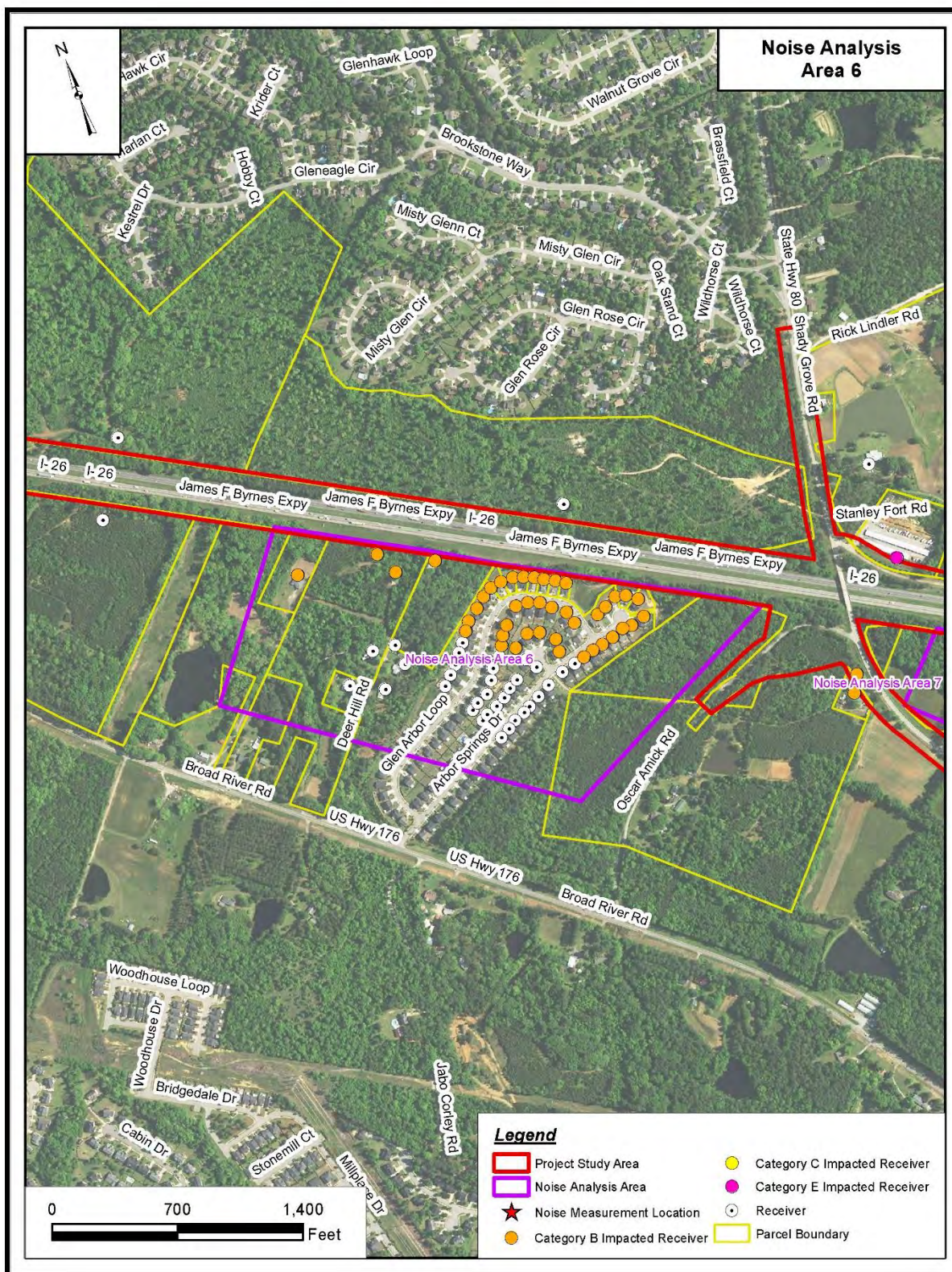


Figure 33: Noise Analysis 7

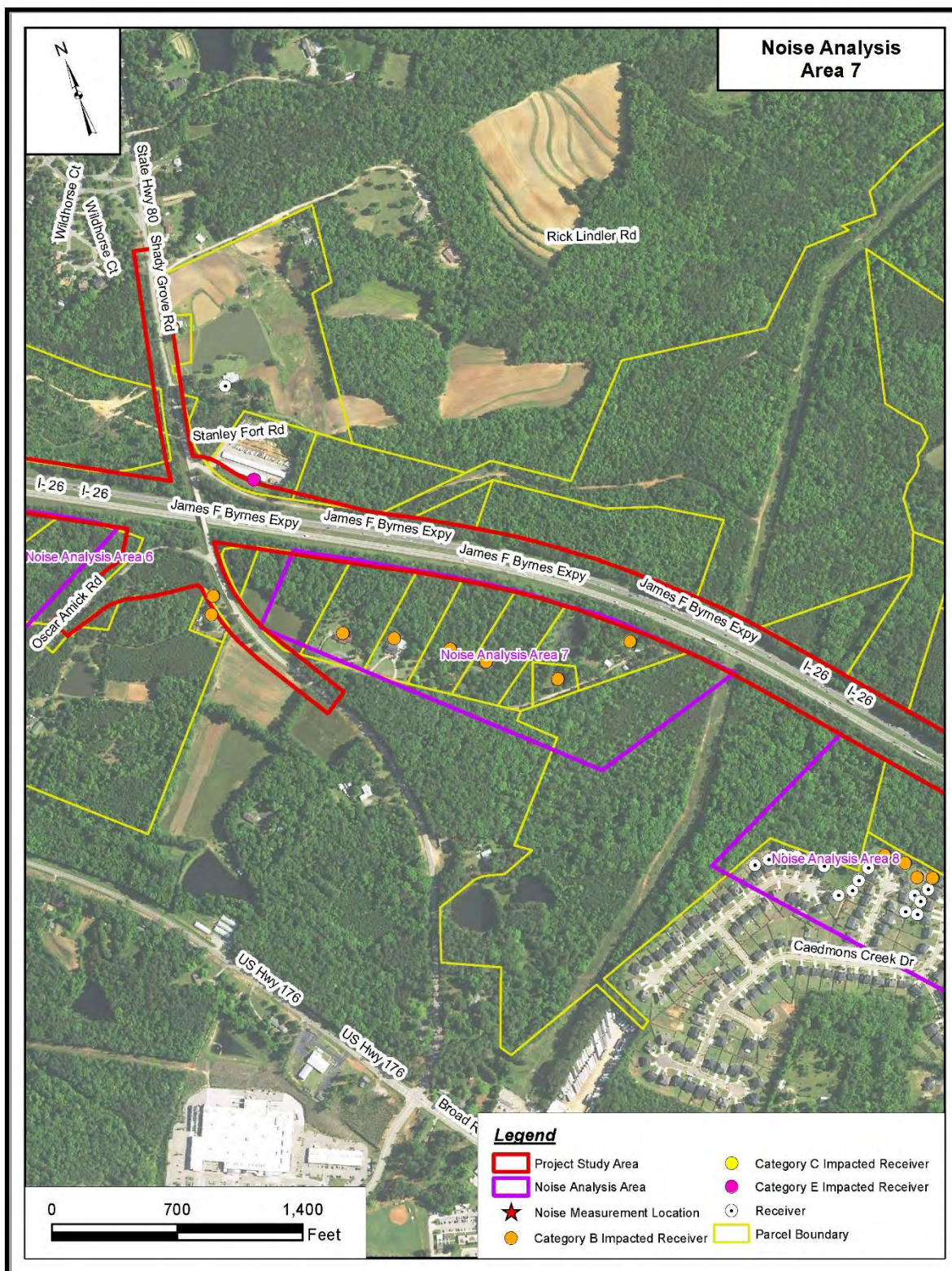
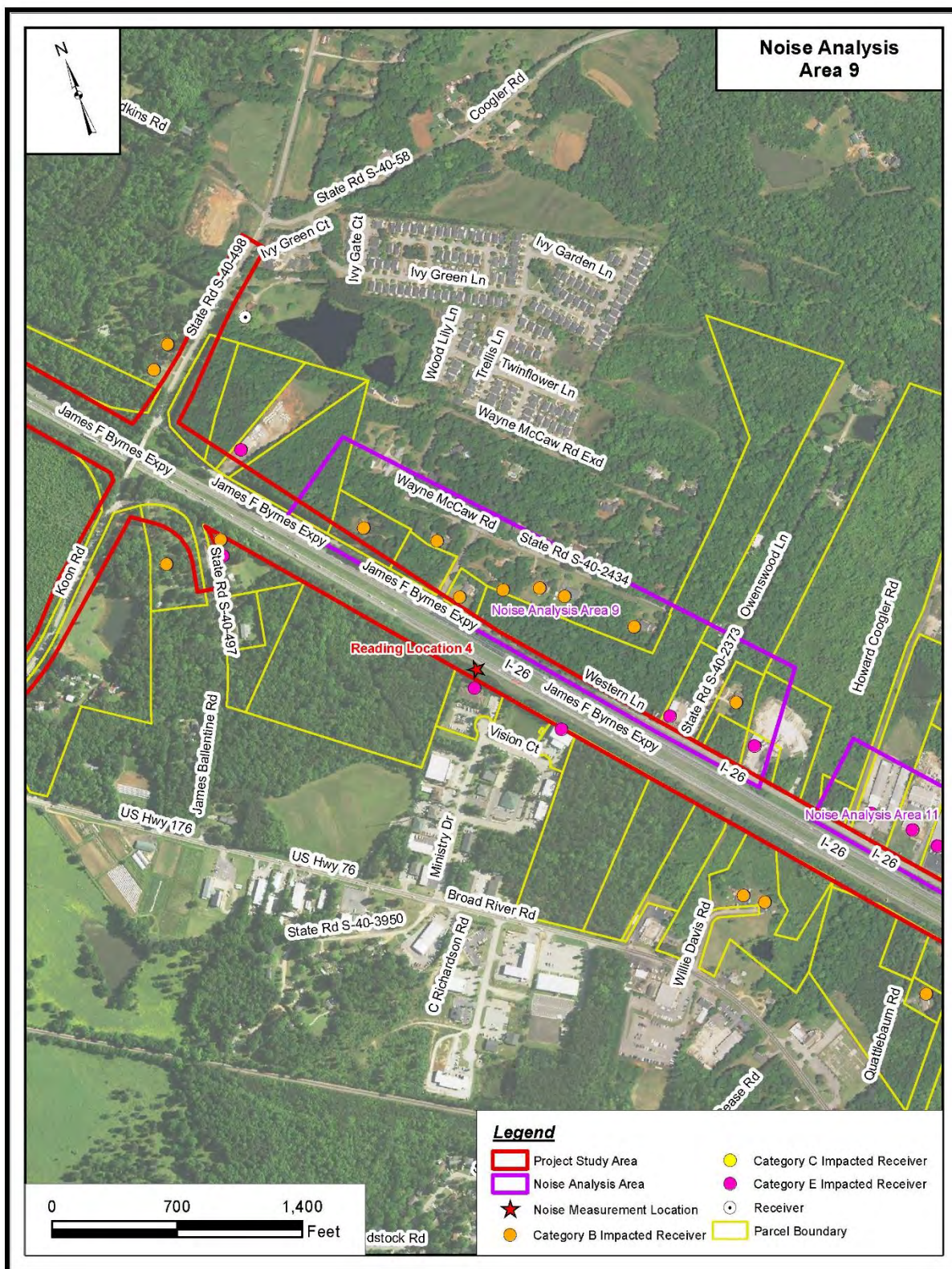
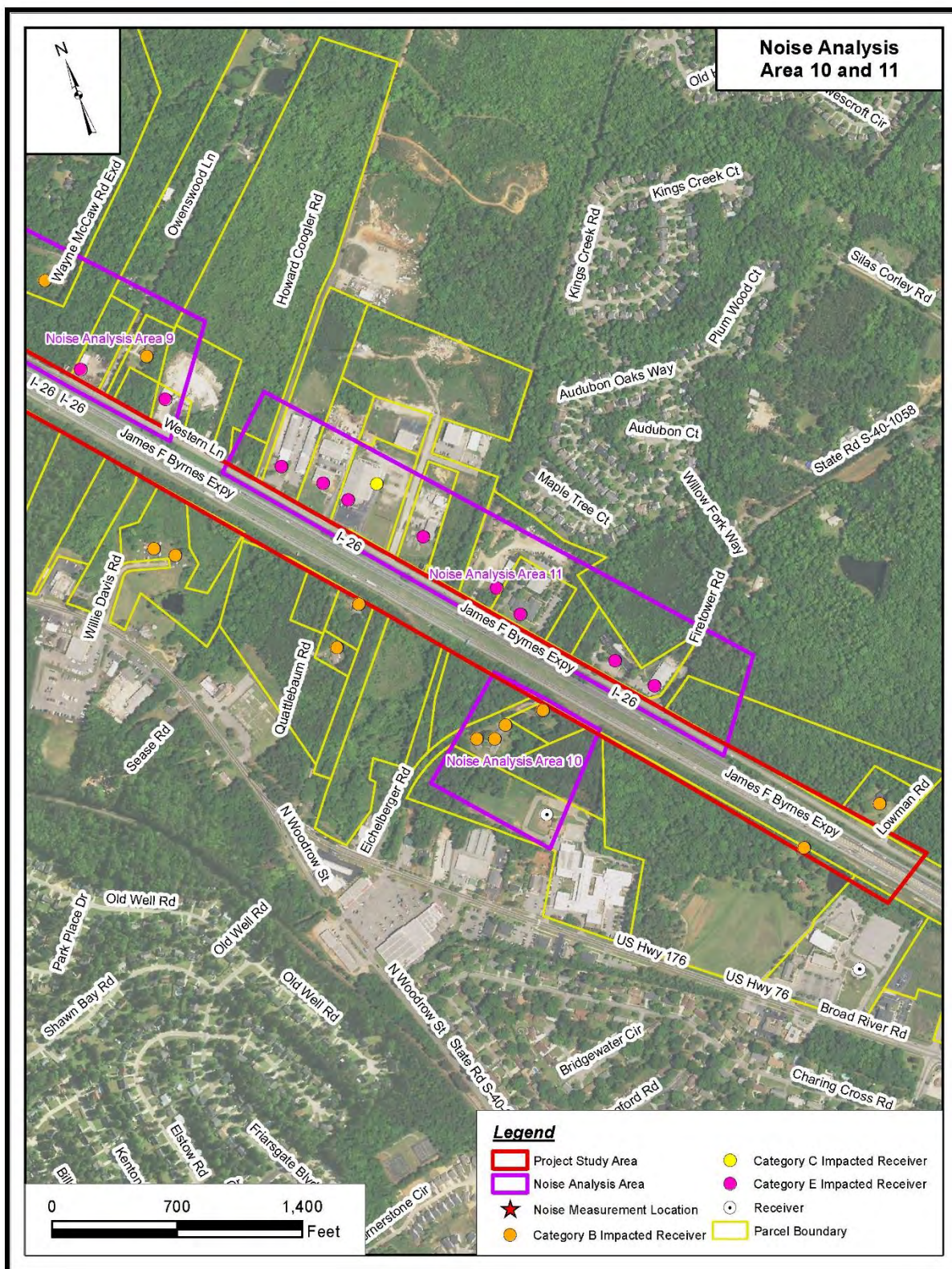


Figure 35: Noise Analysis Area 9



**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

Figure 36: Noise Analysis Areas 10 and 11



4.11.5 What noise impacts occur from construction?

The major construction elements of this project are expected to be earth removal, hauling, grading, and paving. General construction noise impacts, such as temporary speech interference for passers-by and those individuals living or working near the project, can be expected particularly from paving operations, and earth moving equipment during construction.

However, considering the relatively short-term nature of construction noise it is expected that these impacts would not be substantial. To avoid or minimize lane closures during peak traffic hours, some work would be required during non-peak traffic hours that could include night and/or weekend work. These activities may impact adjacent residential areas and thus an approved work plan would be necessary regarding work during these time periods to minimize impact to adjacent residential areas.

The contractor would be required to comply with applicable local noise ordinances and OSHA regulations concerning noise attenuation devices on construction equipment.

4.11.6 How with noise information be shared with local officials?

Per 23 CFR part 772.17, SCDOT will provide local and county planning officials of future generalized noise levels to occur within the project study area. Local governments may use their authority to regulate land development to prohibit noise-sensitive land uses adjacent to a highway, or require developers to plan, design, and construct projects that minimize highway traffic noise impacts on adjacent properties. Table 16 summarizes the minimum distance from the nearest edge of pavement that would result in approaching each NAC's impact criteria.

Table 16: Edge of Pavement Distances where NAC threshold would be exceeded.

MAINLINE LOCATION	NAC FOR B & C	DISTANCE (FEET)
Exit 85-91	67	340
Exit 91-97	67	365
Exit 97-101	67	460

This information will be shared with planning officials in Newberry, Lexington, and Richland Counties.

4.12 Hazardous Waste and Underground Storage Tanks (HAZMAT)

4.12.1 What are hazardous waste sites?

Hazardous waste/material sites are those regulated by the Resource Conservation and Recovery Act (RCRA), as amended, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, and the Superfund Amendments and Reauthorization Act of 1986. Potential hazardous material sites include landfills, dumps, pits, lagoons, salvage yards, and industrial sites, as well as above and below ground storage tanks.

Service/gas stations are one of the most common generators of potential hazardous material sites. As older underground storage tanks (USTs) deteriorate, they pose a threat to leak and contaminate surrounding soil and groundwater with gasoline and other petroleum products. SCDHEC maintains a database of these potential contamination sites and regulates activities associated with the monitoring and/or remediation of a leaking underground storage tank (LUST). SCDHEC may also issue a letter of “no further action” for sites that no longer show evidence of contaminants present at the site or that have been remediated in accordance with applicable laws.

A Phase 1 Environmental Site Assessment (ESA) was conducted using the American Society for Testing and Materials (ASTM) E 1527-13, Standard Practice for Environmental Site Assessments: Phase I ESA Process. The purpose of the Phase I ESA is to identify, pursuant to ASTM E 1527-13, recognized environmental conditions (RECs) in connection with the proposed project’s study area. ASTM defines the term “recognized environmental condition” as the presence or likely presence of hazardous substances or petroleum products on the property under conditions that are indicative of an existing release, a past release, or a material threat of a release of hazardous substances or petroleum products into the structures on the property or into the ground, groundwater, or surface water of the site. The report, including detailed descriptions of the databases and acronyms used below, is included in Appendix K.

4.12.2 Are there any potentially contaminated sites located within the study area?

Several sites were identified through the Phase I ESA as sites of potential environmental concern. Ten of the sites represent a moderate to high potential for adverse impacts and may need to be assessed on a case-by-case basis. An additional six sites represent a low to moderate potential for adverse impacts and do not require further assessment. Finally, six sites were identified through the Phase I ESA as being of potential concern but these sites are well outside of the PSA and would not be impacted by the project. Therefore, there is no further discussion of these six sites.

Based on the findings of this assessment and the available information, the following ten sites are considered to represent a moderate to high potential for impacts to the study area:

- Corner Pantry 132 site, located at 661 Columbia Avenue, within the study area.
- Pitt Stop 7 site, located at 648 Columbia Avenue, within the study area.
- Rainbow Gas Garden 12, located at 650 Columbia Avenue, adjacent to and partly within the study area.
- Corner Pantry 154 site, located at 11090 Broad River Road, within the study area.
- Former Liberty Truck Stop, located at 11107 Broad River Road, adjacent to the study area.
- Former Char-Lees Service Station, located at I-26 and Highway 76 (suspected to have been located near the former Liberty Truck Stop site above), adjacent to the study area.
- Ballentine Section Shed, located at 1050 Broad Stone Road, adjacent to the study area.
- Pitt Stop 02 site, located at 11047 Broad River Road, adjacent to and partly within the study area.
- Former Edenfield Heating and Air (former gasoline service station), located at 1024 Mount Vernon Church Road, adjacent to and partly within the study area.
- Jac's Dolls (former gasoline service station), located at 11214 Broad River Road, adjacent to and partly within the study area.

Upon completion of more detailed design plans of the Preferred Alternative, it may be warranted to conduct detailed investigations of those suspect sites potentially impacted by the roadway improvements, or any portion of the PSA that has the potential to have been adversely impacted by any of the referenced environmental sites. The determination of areas that may warrant Phase II Assessment services should be site specific, based on hydrogeologic

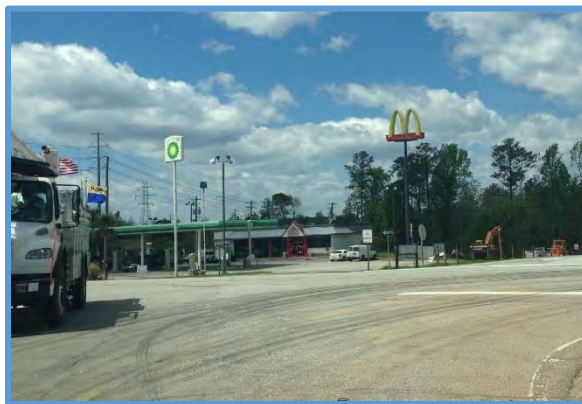


Figure 37: Corner Pantry at Exit 91

conditions, distance from specific environmental concerns, and other relative factors. Specific Phase II Assessment recommendations can be formulated upon review of engineering and right of way plans and may include soil sampling, groundwater sampling, and/or additional regulatory file review under the freedom of information act process.

Based on the findings of this assessment and the available information, the following six sites are considered to represent a low to moderate potential for adverse impacts to the study area:

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

- R.O.W. Clearing, LLC / DS Utilities site, located at 1644 Holy Trinity Church Road, adjacent to the study area.
- 1000 Julius Richardson Road site (fuel spill), located within the study area.
- Martin Engineering site (UST), located at 127 Stone Hill Road, adjacent to the study area.
- Equipment Yard, located on Meadow Brook Road (Newberry County), adjacent to the study area.
- Colonial Fuel and Lubricant bulk plant site, located at 1031 Broad Stone Road, adjacent to and partly within the study area.
- Vacant former residential lot, located at 101 Lexington Avenue (Chapin), within the study area.

Table 17, identifies the ten regulated sites located within close proximity to the project, and includes details regarding the concern at each site. Five of these sites were included in the LUST database. Of these five on the LUST database, two are noted on the South Carolina Groundwater Contamination Inventory (SC GWCI) database. SC GWCI sites are known or have been known to have groundwater contamination associated with the LUST over a federal Maximum Contaminant Level (MCL).

Two of the sites are undergoing assessment by SCDHEC and have not been issued a letter of “no further action.” The other four of the LUST sites are classified as a Low Priority LUST and have been granted a “no further action” determination by SCDHEC. However, due to the previous contamination at these sites, each is considered a potentially contaminated site.

Table 17: Potentially Hazardous Materials Sites

SITE	FACILITY NAME/ LOCATION	POTENTIAL CONCERN	DATABASES/ LISTINGS	STATUS
1	Corner Pantry 132 (661 Columbia Ave.)	Active UST site/ LUST / Groundwater Contamination	UST/ LUST/ GWCI	REC / Conduct Assessment
2	Pitt Stop 7 (648 Columbia Ave.)	LUST	UST/ LUST	REC/ Awaiting Funding
3	Rainbow Gas Garden (650 Columbia Ave)	Active UST site	UST	No releases
4	Evergreen 123 (aka Corner Pantry 154 [11090 Broad River Road])	Active UST site/ LUST	UST/LUST/ GWCI	Open
5	Former Liberty Truck stop (11107 Broad River Road)	Former release	LUST	Redeveloped – USTs removed
6	Former Char-Lees Service Station	May have conducted	RCRA Non-	Redeveloped

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

SITE	FACILITY NAME/ LOCATION	POTENTIAL CONCERN	DATABASES/ LISTINGS	STATUS
	(I-26 and Hwy 76)	automotive maintenance activities/ no listing available	Generating	
7	Ballentine Section Shed (1050 Broad Stone Rd)	Active UST site/ LUST	UST/ LUST	Not within project area
8	Pitt Stop 02 (11047 Broad River Road)	Active UST site	UST	No releases
9	Former Edenfield Heating and Air (former service station) (1024 Mount Vernon Church Road)	May have conducted automotive maintenance activities/ no listing available	N/A	Redeveloped
10	Jac's Dolls (former service station) (11214 Broad River Road)	May have conducted automotive maintenance activities/ no listing available	N/A	Redeveloped

Source: Phase I ESA for I-26 Widening MM85 to MM101. ARM Environmental Services. June 2017. (Appendix K)

4.12.3 Would the Preferred Alternative impact potentially contaminated sites?

The proposed project would require the acquisition of property identified as sites of environmental concern and/or potentially contaminated sites. Construction activities within contaminated sites have the potential for construction workers to come into contact with contaminated soils, and can pose health risks. Further assessment of sites directly impacted by the project may be warranted during the development of the project's final design. Assessments may include, but are not limited to, Phase II Environmental Site Assessments, in accordance with ASTM E1527-13. Only one direct impact to a potentially contaminated site is presented in the alternatives. The Evergreen 123 site is found on the UST, LUST, and GWCI databased. Under the interchange Preferred Alternative, this business would need to be relocated and a Phase II ESA is recommended.

It is SCDOT's practice to avoid the acquisition of USTs and other hazardous waste materials where possible. If soils that appear to be contaminated with petroleum products are encountered during construction, SCDHEC is to be informed. If avoidance is not a viable alternative, tanks and other hazardous materials would be tested and removed and/or treated in accordance with the EPA and SCDHEC requirements. Costs necessary for clean-up would be taken into consideration during the right-of-way appraisal and acquisition process for the Preferred Alternatives.

4.13 Lead-Based Paint and Asbestos

4.13.1 What regulations exist for lead-based paint and asbestos?

EPA and SCDHEC regulations (No. 61-86.1) define asbestos containing material as any material greater than one percent asbestos. The Occupational Safety and Health Administration (OSHA) recommends that a negative exposure assessment be conducted to establish appropriate personal protection equipment needed (if any) for all persons that might disturb asbestos materials.

Asbestos surveys have been conducted for all ten existing project bridges in accordance with the Asbestos Hazard Emergency Response Act guidelines, as required by the EPA and the SCDHEC prior to renovation or demolition of public or commercial structures. Additionally, lead-based paint surveys were conducted on four of these ten structures. Additional lead-based paint surveys on the remaining six structures must be completed prior to modification or demolition of these structures.

EPA guidelines define lead-based paint as any paint with equal to or greater than 1.0 milligram of lead per square centimeter of painted surface (mg/cm²) when measured. SCDHEC guidelines define lead-based paint as any paint with equal to or greater than 0.7 mg/cm² when measured. The OSHA Lead in Construction Standard (29 CFR 1926.62) is applied if any lead is present in the sample.

4.13.2 What structures may contain lead or asbestos?

In March 2013 SCDOT contracted asbestos surveys to be completed on seven of the ten bridges in the PSA (Appendix K) including the S-32-49 (Peak Street), S-40-58 (Koon Road), S-40-80 (Shady Grove Road), S-40-234 (Mt. Vernon Church Road), S-40-405 (Old Hilton Road), S-48 (Columbia Ave), and US 176 (Broad River Road) bridges. The results of those surveys found that all of those seven bridges have asbestos containing materials (ACM) such as transite utility conduits, expansion joint material, and/or interior bent pads. During the 2017 Phase I ESA inspections, asbestos inspections were performed for the three remaining structures, the S-36-39, the S-36-167, and SC 202 bridges located over I-26, in Newberry County, South Carolina (Appendix K). The results of this asbestos survey indicate that the transite bridge drains are an ACM on all three structures.

Lead-based paint surveys were conducted on four of the ten bridges. Lead-based paint was found on the S-36-167 (Parr Road), S-36-39 (Holy Trinity Church Road), SC 202, and S-48 (Columbia Ave) bridges. The results of the analyses indicate that all of the metal components of the bridge structures, except for the galvanized metal guard rails are coated with lead based paint. These

materials include the anchor bolt plates, bolts, and the bridge shoes. Table 18 details the findings of the asbestos and lead surveys.

Table 18: Potential for Asbestos or Lead within I-26 Bridges.

BRIDGE	ASBESTOS PRESENT?	ASBESTOS CONTAINING MATERIAL	LEAD-BASED PAINT PRESENT?
SC 202	Yes	Transite bridge drains	Yes
S-36-167 (Parr Road)	Yes	Transite bridge drains	Yes
S-36-39 (Holy Trinity Church Road)	Yes	Transite bridge drains	Yes
S-32-49 (Peak Street)	Yes	Transite Utility Pipe	To be determined+
S-32-48 (Columbia Avenue)	Yes	Scuppers, End bent felt pads	Yes
S-40-405 (Old Hilton Road)	Yes	Expansion joint material, Interior bent cap felt pads	To be determined+
S-40-234 (Mount Vernon Church Road)	Yes	Interior bent cap felt pads	To be determined+
US-176 (Broad River Road)	Yes	Expansion joint material	To be determined+
S-40-80 (Shady Grove Road)	Yes	Expansion joint material, Transite pipes	To be determined+
S-40-58 (Koon Road)	Yes	Expansion joint material, Interior bent cap felt pad	To be determined+

Sources: SCDOT Asbestos Containing Materials Investigation Reports. March 2013.

ARM Asbestos and Lead-Based Paint Survey Reports. May 2017.

+ A lead-based paint survey would need to be completed for these bridges prior to modifications or demolition of the structure.

In its present condition, and without major disturbance, there is a low potential for substantial concentrations of asbestos fibers to be released from this material. However, it is recommended that this material be removed suitably prior to any renovation, demolition, or other process that might disturb the material, or render it friable. The results of the asbestos surveys are limited to the sampled materials, which are considered to be representative of the homogeneous areas from which the samples were collected. In the event that any suspect asbestos containing materials that were not addressed in this survey are encountered, the materials should be presumed to contain asbestos until laboratory analysis can be conducted. If demolishing or renovating any of the ten bridges, a copy of this report and a notification of demolition or renovation forms must be submitted to the SCDHEC at least ten working days prior.

4.13.3 How would the project impact lead/asbestos structures?

SCDHEC regulations will not allow for a Category II ACM to be left in place during demolition activities. Based on the potential for the ACM to be rendered friable during the removal process, it is recommended that the removal of this material be conducted by a licensed abatement contractor.

If these bridge components are disturbed during renovation or demolition, contractors and workers should be informed as to the presence of lead-based paint and appropriate work

practices and personal protective equipment should be used to prevent exposure to lead dust/fumes or spreading lead contamination from the work site. The OSHA lead standard for construction work (29CFR 1926.62) would apply to all demolition or renovation activities that disturb any of the materials containing lead. Lead-based paint surveys must be taken on 6 of the 10 bridges included within the project area and results submitted to SCDOT ESO for review prior to demolition or reconstruction. Excluded from additional surveys are S-167 (Parr Road), S-39 (Holy Trinity Church Road), SC 202, and S-48 (Columbia Ave) which have already tested positive for the presence of lead-based paint. The existing structures shall be removed and disposed of by the Contractor in accordance with Subsection 202.4.2 of the Standard Specifications. The Contractor's attention is called to the fact that this project may require removal and disposal of structural components containing lead-based paints. Removal and disposal of structural components containing lead-based paints shall comply with all applicable Federal, State, and Local requirements for lead as waste, lead in air, lead in water, lead in soil, and worker health and safety.

4.14 Cultural Resources

4.14.1 What are cultural resources and historic properties?

Cultural resources are properties and places that illustrate aspects of prehistory or history or have long-standing cultural associations with established communities and/or social groups. Cultural resources can include archaeological sites, structures such as bridges, buildings, and groups of any of these resources, among others. Sometimes cultural resources are significant enough that they are eligible for listing on the National Register of Historic Places (NRHP). These resources are protected under the National Historic Preservation Act (NHPA). Section 106 of this Act requires federal projects, or those using federal funding, to assess the project's impacts on sites eligible for listing on the NRHP. The NRHP significance criteria in 36 CFR 60.4 defines eligible cultural resources as buildings, structures, objects, sites, and districts that have integrity of location, design, setting, materials, workmanship, feeling, and association and that meet one or more of the following criteria.

- Criterion A: Association with events that have significantly contributed to the broad patterns of history;
- Criterion B: Association with persons significant in the past;
- Criterion C: Possession of the distinctive characteristics of a type, period, or method of construction; exemplification of the work of a master architect, engineer, or artist; embodiment of high artistic values; or evidence of a significant and discernible entity whose components may lack distinction on their own; and
- Criterion D: Ability to yield information significant to prehistory or history.

A resource may be eligible under one or more of these criteria. Criteria A, B, and C are most frequently applied to historic buildings, structures, non-archaeological sites, objects, and districts. Criterion D is most often, but not exclusively, used to evaluate archaeological sites. A general guideline of 50 years of age is used to define “historic” in the NRHP evaluation process, but more recent resources may be considered if they display “exceptional” significance.

4.14.2 Why are cultural resources being considered for this project?

4.14.2.1 How were the cultural resources surveys conducted?

A literature review and records search were undertaken prior to the field surveys. Background research was conducted to identify all previously recorded cultural resources located within the PSA of the proposed project and to develop a cultural and historic context to evaluate newly recorded resources identified within the study area of the proposed project during the cultural resource field survey.

In spring and summer of 2017 archaeological resources and historic architectural field surveys were conducted to identify archaeological sites and record and evaluate all historic architectural resources (buildings, structures, objects, designed landscapes, and/or sites with above-ground components) in the PSA. The cultural resources field assessment was conducted in accordance with Section 106 of the NHPA (36 CFR § 800), which requires the identification of historic properties within the study area, assessment of adverse effects, and resolution of adverse effects, if any. The results of the analysis are located in Appendix L, *Phase I Cultural Resource Survey for Proposed Widening of Interstate 26*.

The intensive architectural resources survey was designed to record and evaluate all historic architectural resources (buildings, structures, objects, designed landscapes, and/or sites with above-ground components) in the PSA. The architectural resources survey area generally corresponded to the PSA, but was expanded, where necessary, to include architectural resources located outside the PSA.

The integrity of a historic architectural resource is a primary consideration for inclusion in the Statewide Survey of Historic Properties (SSHP), as well as on the NRHP. While in the field, the project historian evaluated the integrity of each identified historic architectural resource. All historic architectural resources located within or adjacent to the PSA that retained sufficient integrity to be included in the SSHP were recorded. The location of each historic



**Figure 38: House at
Archaeological Site 38NE1359**

architectural resource was recorded on USGS topographic maps and a SCSS Intensive Survey site form was prepared for each historic architectural resource.

4.14.3 What cultural resources and historic properties exist in the study area and how would they be affected by the proposed project?

As a result of the survey, seven sites were identified and recorded (38NE1354 through 38RD1455). None of these sites were recommended eligible for listing on the NRHP. Please see Table 19 below for details regarding these sites.

Table 19: Archaeological Resources Documented in the I-26 PSA.

ARCHAEOLOGICAL RESOURCES				LOCATION (NAD 1983 17N)	
SITE NUMBER	SITE TYPE	DATE RANGE	NRHP ELIGIBILITY	NORTHING	EASTING
38NE1354	artifact scatter	Woodland Period	Not Eligible	3786937	461739
38NE1355	rubbish dump	early/mid-twentieth century	Not Eligible	3787173	462304
38NE1356	lithic scatter	unknown precontact	Not Eligible	3784130	467020
38NE1357	lithic scatter	unknown precontact	Not Eligible	3784108	466876
38NE1358	artifact scatter	unknown precontact / mid-nineteenth - twentieth century	Not Eligible	3784719	465826
38NE1359	house site	late nineteenth-twentieth century	Not Eligible	3786679	463497
38RD1455	Poultry house	early/mid-twentieth century	Not Eligible	3777650	479988

4.14.3.1 What historical resources were found during the survey?

Twenty-six previously identified architectural resources were known to be within the proposed PSA. The majority are unidentified homes or named homesteads and have been previously deemed ineligible for inclusion on the NRHP. These resources are listed in Table 20.

Table 20: Previously Identified Architectural Resources in the I-26 PSA.

SITE NUMBER	HISTORIC USE	CONSTRUCTION DATE	NRHP ELIGIBLE	COUNTY
U/63/1938	Funerary	ca. 1872	No	Lexington
U/63/0888	Residential (Commercial)	ca. 1915	No	Lexington
U/63/0889	Residential	ca. 1920	No	Lexington
U/63/0906	Agricultural	ca. 1900	No	Lexington
U/71/1091	Residential (vacant)	ca. 1910	No	Newberry
U/71/1103	Residential	ca. 1880	No	Newberry
U/71/1103.01	Agricultural	ca. 1920	No	Newberry

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

SITE NUMBER	HISTORIC USE	CONSTRUCTION DATE	NRHP ELIGIBLE	COUNTY
U/71/1131	Residential	ca. 1910	No	Newberry
U/71/1133	Residential	ca. 1915	No	Newberry
243-4710	Agricultural	ca. 1940	No	Richland
243-4711	Residential	ca. 1880	No	Richland
243-4712	Residential	ca. 1880	No	Richland
243-4712.01			No	Richland
426-4707	Residential	ca. 1900	No	Richland
U/79/4950	Residential	1883	No	Richland
U/79/4950.01	Residential (Agricultural)	ca. 1910	No	Richland
U/79/4950.02	Residential	ca. 1950	No	Richland
U/79/4950.03	Agricultural	ca. 1910	No	Richland
U/79/4951	Residential	ca. 1930	No	Richland
U/79/4952	N/A	N/A	No	Richland
U/79/4952.01	Agricultural	ca. 1920	No	Richland
U/79/4952.02	Agricultural	ca. 1920	No	Richland
U/79/4952.03	Agricultural	ca. 1920	No	Richland
U/79/4952.04	Agricultural (vacant)	ca. 1940	No	Richland
U/79/4953	Residential	ca. 1925	No	Richland
U/79/4993	Residential	ca. 1925	No	Richland

A total of twenty-seven architectural resources were newly identified within the PSA. Nine newly identified architectural resources (79-6456 through 79-6464,) were noted within the study area in Richland County. Five of these resources are bridges over I-26. Ten newly identified architectural resources (63-0974 through 63-0979) were noted within the PSA in Lexington County. Two of these resources are bridges over I-26. Eight newly identified architectural resources (71-1943 through 71-1949) were noted within the PSA in Newberry County. Three of these resources are bridges over I-26. No architectural resources identified within the study area were recommended eligible for inclusion on the NRHP. Bridges were determined “Not Eligible” for inclusion on the NRHP in the South Carolina Bridge Survey. These resources are listed in Table 21.

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

Table 21: Newly Identified Architectural Resources in the I-26 PSA.

SITE NUMBER	LOCATION	HISTORIC USE	CONSTRUCTION DATE	ELIGIBLE FOR NRHP	COUNTY
U/71/1943	34 Houseal Rd	Residential	ca. 1955	No	Newberry
U/71/1944	322 Four Oaks Rd	Residential	ca. 1950	No	Newberry
U/71/1944.01	322 Four Oaks Rd – garage	Residential	ca. 1950	No	Newberry
U/71/1945	Parr Road Cemetery	Funerary	ca. 1840	No	Newberry
U/71/1946	Bridge carrying 202 over I-26	Structure	1959	No	Newberry
U/71/1947	Bridge carrying Parr Rd over I-26	Structure	1959	No	Newberry
U/71/1948	Bridge carrying Holy Trinity Church Rd over I-26	Structure	1959	No	Newberry
U/71/1949	1395 Four Oaks Rd	Residential	ca. 1965	No	Newberry
U/63/0974	810 Columbia Ave – old house	Residential (vacant)	ca. 1901	No	Lexington
U/63/0974.01	810 Columbia Ave – outbuilding 1	Agricultural	ca. 1901	No	Lexington
U/63/0974.02	810 Columbia Ave – outbuilding 2	Agricultural	ca. 1901	No	Lexington
U/63/0974.03	810 Columbia Ave – outbuilding 3	Agricultural	ca. 1901	No	Lexington
U/63/0975	803 Columbia Ave	Residential	1962	No	Lexington
U/63/0976	1232 Crooked Creek – house	Residential	1966	No	Lexington
U/63/0976.01	1232 Crooked Creek – garage	Residential	1966	No	Lexington
U/63/0977	471 Brentwood Ct	Residential	1965	No	Lexington
U/63/0978	Bridge carrying Peak St over I-26	Structure	1959	No	Lexington
U/63/0979	Bridge carrying S-48 over I-26	Structure	1959	No	Lexington
U/79/6456	1002 Julius Richardson Rd	Residential	1940	No	Richland
U/79/6457	608 Koon Rd	Residential	ca. 1965	No	Richland
U/79/6458	1001 White Rock Rd	Residential	1967	No	Richland
U/79/6459	Shady Grove Rd	Residential (vacant)	ca. 1920	No	Richland
U/79/6460	Bridge carrying Old Hilton Rd over I-26	Structure	1959	No	Richland
U/79/6461	Bridge carrying Mt Vernon Church Rd over I-26	Structure	1958	No	Richland

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

SITE NUMBER	LOCATION	HISTORIC USE	CONSTRUCTION DATE	ELIGIBLE FOR NRHP	COUNTY
U/79/6462	Bridge carrying US 176 (Broad River Road) over I-26	Structure	1958	No	Richland
U/79/6463	Bridge carrying Shady Grove Rd (S-40-80) over I-26	Structure	1959	No	Richland
U/79/6464	Bridge carrying Koon Rd over I-26	Structure	1958	No	Richland

Two cemeteries were noted during the survey process. One is the previously identified Comalander Cemetery (site number 1938). This resource is located at 840 Peak Street, Chapin, SC and has been deemed not eligible for the NRHP. It is a small family cemetery and was used from 1865 – 1955. The second is a newly identified Parr Road Cemetery. This resource is located near Parr Road in Newberry County and has been deemed not eligible for the NRHP.

4.14.4 What would be the potential impacts to cultural resources?

The Comalander Cemetery is located southeast of where Peak Street crosses I-26. The northern boundary of this resource is located approximately 105 feet southwest of the centerline of the eastbound lane of I-26. This resource is located along Peak Street to the east. Based on the distance from I-26 and the fact that no changes are planned for Peak Street; this project will have No Effect on this resource. The Summer-Counts Cemetery is located off of Parr Road, near the intersection with Four Oaks Road. There would be no impacts to this area.

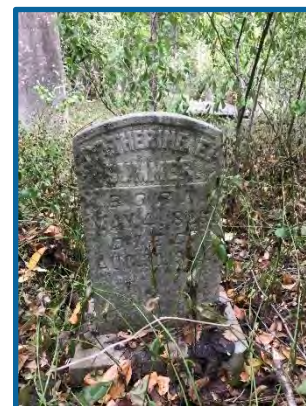


Figure 39: Headstone at the Summer-Counts

The Department will ensure that the existing known limits of the Comalander and Summer-Counts Cemeteries are identified and delineated in the field. Prior to construction activities near these cemeteries a construction barrier fence or other appropriate barrier will be erected a minimum of 10 feet beyond the known cemetery limits. This will ensure that these cemeteries and any potential unmarked graves associated with them will be protected. As currently designed, these cemeteries are not proposed to be impacted by the project. However, if construction would need to impede into a delineated area, the Department will provide an archaeologist on site to monitor all ground disturbing activities near the affected area(s).

Cemeteries are protected by several South Carolina Codes (27-43-10, Removal of Abandoned Cemeteries; 27-43-20, Remove to Plot Agreeable to Governing Body and Relatives; 27-43-30, Supervision of Removal Work; and 16-17-6000, Destruction of Graves and Graveyards), and these

should be adhered to if work uncovers unexpected human remains. 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 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.

The resources revisited and identified during the Phase I process have been deemed “Not Eligible” for inclusion on the NRHP. The cultural resources survey containing these findings was forwarded to tribal historic preservation officers for the Catawba Indian Nation Tribal Historic Preservation Office, the Eastern Band of the Cherokee Indians, and the United Keetoowah Band of Cherokee Indians. No cultural resources that could be considered eligible for NRHP listing were identified during the archaeological and historic resource surveys of the interchange alternatives or the mainline alternative. As a result, the proposed improvements will have No Effect on cultural resources. A copy of the cultural resources survey and the findings have been forwarded to SHPO and to the tribal historic preservation office (THPO) for the Eastern Band of Cherokee Indians, the United Keetoowah Band of Cherokee Indians, and the Muscogee (Creek) Nation. No response has been received from tribal historic preservation offices. The SHPO has concurred with the findings of no effect and this coordination is included in Appendix M.

4.15 Sections 4(f) and 6(f)

4.15.1 What are Sections 4(f) and 6(f)?

Section 4(f) of the US Department of Transportation Act of 1966 and Federal regulations 23 CFR § 771.135 (49 U.S.C. 303) regulate how publicly-owned properties such as parks, recreational lands, wildlife and waterfowl refuges, and historic sites that are on or eligible for the NRHP, are used for transportation projects. Section 4(f) takes into account many types of impacts to the resources, whether it is of a direct, temporary or constructive use.

The Land and Water Conservation Fund (LWCF) Act of 1965 established funding to provide matching grant assistance to states and local governments for the planning, acquisition and development of outdoor public recreation sites and facilities. Section 6(f) of the Act requires that properties using LWCF grants must be maintained as public recreational facilities in perpetuity. Section 6(f) prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of Interior’s National Park Service. Replacement lands of equal fair market value, location and usefulness must be provided to the facility if land is converted.

4.15.2 What are the existing Section 4(f) and 6(f) resources located in the study area?

No publicly-owned parks, recreation lands or wildlife and waterfowl refuges are located within the PSA. Historic properties are considered a Section 4(f) resource if they are eligible for or listed on the NRHP. A Cultural Resources Survey was completed by New South Associates. No resources that are eligible for the NRHP were identified. No Section 4(f) resources have been identified within the study area, therefore no Section 4(f) impacts would result from this project.

4.15.3 Would any Section 4(f) and 6(f) resources be impacted by the proposed project?

No Section 4(f) or 6(f) resources have been identified within the study area, therefore no impacts would result from this project.

4.16 Communities

4.16.1 What impacts could occur to communities?

Features that define a community include shared beliefs and attitudes as well as common behavior patterns, i.e. use of local facilities and participation in local organizations and activities.¹⁷ An interstate widening project such as this one, which includes improvements to existing interchanges, could have an impact on the surrounding communities within the project area. If travel patterns are changed, or if access to businesses and community facilities is changed, the impact could be negative. On the other hand, if accessibility is improved, the changes could be perceived as a benefit to the community or neighborhood. In addition, direct impacts may occur if property is taken or if residences or businesses need to be relocated.

4.16.1.1 What homes, businesses, and other facilities would be relocated?

As a result of the project, one business may be required to relocate. Under Exit 97 Preferred Alternative 1, the Evergreen 123 Exxon station at 11090 Broad River Road would need to be relocated. This business is a gasoline retailer and convenience store located near Exit 97. Additionally, one outbuilding associated with a lumber company, Chapin Building Supply, is proposed to be relocated. At Exit 91, the outbuilding is located approximately 1,000 feet west of the existing interchange and is used to store building materials. In addition, there would be partial acquisition, or strip takes, of properties adjacent to the roadway improvements, resulting in a total of approximately 75 acres of ROW being acquired.

The SCDOT would 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

¹⁷ Federal Highway Administration, *CIA: A Quick Reference for Transportation*. September 1996.

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.

4.16.1.2 What are the Population Demographics for the Project Area?

Richland, Lexington, and Newberry Counties have seen a steady increase in population since the 1950's. More specifically, the eastern portion of Newberry and Lexington Counties have seen a sharp increase in commercial and residential development in the last decade. Much of this is related to the recent growth of jobs in Richland County as many workers in these bedroom communities travel to the City of Columbia for work. In fact, 85.2% of commuters who commute out of Lexington County are commuting to Richland County (U.S. Census Bureau – County Worker Flows 2013). Lexington and Newberry Counties have historically been rural and the majority of their economies based on agriculture. Richland County is a more urban county and has historically had a manufacturing-based economy built on the textile industry. During the last several decades these industries have given way to more of a service-based economy in the central portion of South Carolina. Over 70% of jobs in the region are in service-producing industries, followed by goods producing (17%) and government (8%) (Comprehensive Economic Development Strategy -Central Midlands Council of Governments 2012).

According to the 2010 Census, Newberry County has approximately 37,500 residents, Lexington County has approximately 262,500 residents and Richland County has approximately 384,500. Between 2000 and 2010, Newberry County saw a 3.7% increase in population, Lexington County saw a 17.7% increase in population and Richland County saw a 16.6% increase in population.

According to the South Carolina Revenue and Fiscal Affairs Office, Newberry County is expected to continue to see gradual population growth between 2010 and 2030¹⁸, while Lexington County is expected to see more substantial population growth by 2030. The same source estimates Richland County's population would continue to grow but possibly at a slower rate than from 2000 to 2010. Table 22 presents population growth and projections for the three counties.

¹⁸ S.C. Revenue and Fiscal Affairs Office, *County Population Projections 2000-2030*, http://www.sccommunityprofiles.org/census/proj_c2010.html

Table 22: Population Growth in the I-26 PSA.

COUNTY	2000 POPULATION	2010 POPULATION	2030 POPULATION	2000 – 2010 % GROWTH	2010 – 2030 % GROWTH
Newberry	36,108	37,508	39,800	3.7%	5.6%
Lexington	216,014	262,391	333,200	17.7%	21.3%
Richland	320,677	384,504	456,000	16.6%	15.7%

Source: http://www.sccommunityprofiles.org/census/proj_c2010.html

The United States Census Bureau’s decennial data for 2000 and 2010 were used to determine the demographic composition of the State, the three Counties, and the 10 Census tract block groups that fall within the PSA. The Census Bureau’s American Community Survey (2011-2015) was also used. Table 23 presents race, age, poverty, and growth percentages for South Carolina compared with Newberry, Lexington, and Richland Counties.

Comparisons of the data indicate the percentage minority population in Richland County (53.3%) and Newberry County (34.7%) is above the reported State percentage (31.5%) while the percentage minority population in Lexington County (19.7%) is below the reported State percentage. The percentage of the population age 65 and older in Newberry County (18.9%) is higher than South Carolina as a whole (15.2%) while the percentage of the population age 65 and older in Richland County (12.1%) and Lexington County (15.0%) is lower than South Carolina as a whole. The percent of the population with an income below the poverty level is slightly lower for Lexington County (14.2%) but is higher for both Newberry County (17.6%) and Richland County (17.1%) compared to South Carolina (16.6%). Although all three counties experienced population growth between 2000 and 2010, growth in Newberry County was well below (3.88%) the 15.3% growth experienced by South Carolina as a whole; Lexington experienced 21.5% growth, while the population in Richland County grew by 19.9%.

Table 23: Population Makeup in Lexington, Newberry, and Richland Counties

CATEGORY	SOUTH CAROLINA	NEWBERRY COUNTY	LEXINGTON COUNTY	RICHLAND COUNTY
Percent that is white	68.9%	65.3%	80.3%	46.7%
Percent that is minority	31.1%	34.7%	19.7%	53.3%
Percent age 65 and over	15.2%	18.9%	15.0%	12.1%
Percent with income below poverty level	16.6%	17.6%	14.2%	17.1%
Percent change in population (2000-2010)	+15.3%	+3.88%	+21.5%	+19.9%

Source: Census Bureau’s American Community Survey 2011-2015

The PSA intersects ten U.S. Census Block Groups. Three of these Block Groups are in Newberry County, one is in Lexington County, and six are in Richland County. Tables 17-19 provide demographic information for each County's Block Groups. The categories include: minority populations; populations with incomes below the 2015 poverty level; and, persons age 65 and over.

Of the three Census Block Groups in Newberry County, two tracts exceeded Newberry County's minority population of 34.7%. Tract 9506.01 Block Group 1 reported an average minority population of 36.6%. This area is near the western limits of the project near MM 83, adjacent to the eastbound lanes of I-26. Tract 9506.02-Block Group 1 reported a minority population of 41.3% and is located along I-26 from near MM 83 to near the Peak Street overpass over I-26.

The one Census Block Group in Lexington County is below the county minority population of 19.7%. Tract 0212.04 Block Group 2 reported a minority population of 9.4%.

Of the six Census Block Groups in Richland County, none exceeded the County threshold for minority population averages. All six Block Groups reported percentages that were below the County percentage of 53.3%.

In 2015, the Census Bureau reported the poverty rates for Newberry, Lexington, and Richland Counties as 17.6%, 14.2%, and 17.1% respectively. Of the ten Block Groups within the project area, two reported poverty levels exceeding that of their respective counties.

The poverty rates in the Newberry County Block Groups were 18.5%, 10.9% and 12.8%. Tract 9506.01 Block Group 1 reported an 18.5% poverty rate which exceeds this countywide poverty level of 17.6% and the statewide poverty level of 16.6%. This area is near the western limits of the project near MM 83, adjacent to the eastbound lanes of I-26.

The poverty rate in the Lexington County Block Group was 6.2%. The countywide poverty rate for Lexington County is 14.2%.

The poverty rate in the Richland County Block Groups is predominantly below the county rate of 17.1%. Tract 0103.05 Block Group 1 reported a poverty rate of 18.9% which is higher than the county rate. This area is generally adjacent to the eastbound side of I-26 from Koon Road to Exit 101 and includes the Friarsgate area.

The American Community Survey performed between 2011 and 2015 analyzed the age of residents. The percentage of residents age 65 or older is 18.9% for Newberry County, 15.0% for Lexington County, and 12.1% for Richland County. Of the ten Block Groups within the PSA, six reported that the percentage of residents over age 65 exceeded the countywide percentage.

**Interstate 26 Widening MM 85 - MM101, Newberry, Lexington, Richland Counties, SC
Environmental Assessment**

The three Census Block Groups assessed in Newberry County exceeded the countywide percentage of 18.9% of the population that is 65 or older (Table 24). Census Tract 9506.01 Block Group 1, Census Tract 9501.00 Block Group 2, and Census Tract 9506.02 Block Group 1 reported percentages of 19.9%, 20.0% and 20.4% respectively.

The Lexington County Census Block percentage exceeded the countywide percentage of people age 65 or older (Table 25). Census Tract 0212.04 Block Group 2 reported that 25.3% of the population was 65 or older compared with the countywide percentage of 15.0%.

Only two (2) Census Block Groups in Richland County reported high percentages of residents were 65 and older (Table 26). Census Tract 0103.07 Block Group 2 and Census Tract 0103.08 Block Group 1 reported percentages of 13.1% and 13.7% respectively. This exceeds the countywide percentage of residents over the age 65 or older (12.10%).

Table 24: Newberry County Population Demographics by Census Tract and Block Group (BG)

	NEWBERRY COUNTY	TRACT 9506.01 BG 1	TRACT 9501.00 BG 2	TRACT 9506.02 BG 1
MINORITY	34.7%	36.6%	15.7%	41.3%
AGE 65 & OVER	18.9%	19.9%	20.0%	20.4%
POVERTY	17.6%	18.5%	10.9%	12.8%

Source: Census Bureau's American Community Survey 2011-2015

Table 25: Lexington County Population Demographics by Census Tract and Block Group (BG)

	LEXINGTON COUNTY	TRACT 0212.04 BG 2
MINORITY	19.7%	9.4%
AGE 65 & OVER	15.0%	25.3%
POVERTY	14.2%	6.2%

Source: Census Bureau's American Community Survey 2011-2015

Table 26: Richland County Population Demographics by Census Tract and Block Group (BG)

	RICHLAND COUNTY	TRACT 0103.05 BG 1	TRACT 0103.06 BG 2	TRACT 0103.07 BG 1	TRACT 0103.07 BG 2	TRACT 0103.07 BG 3	TRACT 0103.08 BG 1
MINORITY	53.3%	40.4%	26.0%	3.4%	4.3%	25.9%	27.3%
AGE 65 & OVER	12.1%	5.9%	9.0%	7.6%	13.1%	11.2%	13.7%
POVERTY	17.1%	18.9%	7.6%	7.3%	0.5%	0.6%	2.6%

Source: Census Bureau's American Community Survey 2011-2015

4.16.2 Would the project disproportionately impact Environmental Justice communities?

4.16.2.1 What is environmental justice?

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify community issues of concern during the NEPA planning process, particularly those issues relating to decisions that may disproportionately impact low-income or minority populations.

4.16.2.2 How were environmental justice communities identified?

EPA identifies the following populations as minority for the purpose of Environmental Justice: Hispanics, Asian-Americans and Pacific Islanders, African-Americans, and American Indians and Alaskan Natives. The guidelines for low-income communities, those living in “poverty” as defined by the Department of Health and Human Services, are updated annually.

US Census Data and the EPA’s EJScreen tool were utilized to determine the presence of minority and low-income communities within the project area, and the results from these data sets and tools identified environmental justice communities. The American Communities Survey (2001-2015) for South Carolina as well as the Census Block Groups within the project area are shown in Tables 20-23. The determination of an Environmental Justice community is made when the percentage of a population within a Census Block Group either exceeds the corresponding county percentage or is 50% or more of the total block group population.

The criteria for Environmental Justice communities are met in two Block Groups in Newberry County and one Block Group in Richland County (three total):

- Newberry County, Census Tract 9506.01 BG 1: based on minority population (36.6% minority compared with 34.7% for Newberry County) and poverty (18.5% compared with 17.6% for Newberry County);
- Newberry County, Census Tract 9506.02 BG 1: based on minority population (41.3% minority compared with 34.7% for Newberry County);
- Richland County, Census Tract 0103.05 BG 1: based on poverty (18.9% compared with 17.1% for Richland County).

4.16.2.3 What impacts would occur to environmental justice communities?

The Preferred Alternative does not propose to relocate any residences or structures within environmental justice communities. Additionally, there are no impacts of any type near MM 83 within the Newberry County Census Tract 9506.01 BG 1.

Noise impacts to residences within Newberry County, Census Tract 9506.02 BG 1 (near Exit 85) and within Richland County, Census Tract 0103.05 BG 1 are expected. Noise levels in these areas are currently high based on existing traffic and would increase as traffic increases. As discussed in Section 4.11, a noise barrier analysis was conducted in these areas to determine if noise impacts could be mitigated. Barrier walls 1 through 11 were analyzed and of those, barriers 1, 2, and 10 are located adjacent to environmental justice communities. The construction of barrier walls at these locations is not warranted because the cost per benefited receptor exceeds the cost threshold.

While minority populations are present within the study area, no notably adverse community impacts are anticipated with this project; thus, impacts to minority and low-income populations do not appear to be disproportionality high and adverse.

4.17 What economic impacts could the project have?

4.17.1 Existing Conditions

I-26 is an important commercial corridor. It connects the port of Charleston, SC to several metropolitan areas and interstate networks before terminating in Kingsport, Tennessee. The economic characteristics of Newberry, Lexington, and Richland Counties were studied to identify the area's economic trends. Additionally, an evaluation of the economic impacts of the proposed project assessed the project's effects on local business and employers within the surrounding areas of the project corridor. The project corridor is located in a primarily rural area with a mixture of commercial, industrial, and residential development. This region becomes increasingly sub-urban travelling from west to east towards downtown Columbia.

The historic development of the region was expedited when the capital was moved to Columbia from Charleston in 1786. This area was chosen for the state capital based on its central location. While Newberry and Lexington Counties remained relatively rural until the 1950's, Richland County is considered more urban because it houses Columbia. Though Newberry County has an emerging manufacturing sector and Lexington County has doubled in population in the past 30 years, both of these counties have towns that serve as bedroom communities for Columbia. Table 27 presents recent past and current economic conditions for Newberry, Lexington, and Richland Counties.

Table 27: Economic Conditions for Newberry, Lexington, and Richland Counties

	SOUTH CAROLINA	NEWBERRY COUNTY	LEXINGTON COUNTY	RICHLAND
	Population			
2000	4,012,012	36,108	216,014	320,677
2010	4,549,150	37,508	262,391	384,504
Percent	13.4%	3.9%	21.5%	19.9%
	Median Household Income			
2000	37,082	32,867	44,659	39,961
2010	44,779	41,815	52,205	47,922
Percent	20.8%	27.2%	16.9%	19.9%
	Unemployment Rate			
2000	3.6%	4.7%	2.6%	4.3%
2010	6.9%	9.2%	6.4%	8.6%

Source: US Census 2010 & 2000; American Community Survey 2009-2013

Newberry County's top sources of employment by industry are Manufacturing (5,008); Administrative and Support and Waste Management and Remediation Services (1,483); Healthcare and Social Assistance (1,482); Retail Trade (1,434); and Education Services (1,290). The median income has increased by 27.2% from 2000 to 2010.

Newberry County's top five employers include Kraft Foods, Westfraser, Newberry County Memorial Hospital, Walmart Super Center, and Valmont composite structures.¹⁹

Lexington County's top sources of employment by industry are Retail Trade (17,043); Health Care/ Social Assistance (16,142); Accommodation and Food Service (11,715); Education Services (10,443); and Manufacturing (10,413):

The median income for Lexington County has risen by 16.9 percent. The county's top five employers include Lexington Medical Center, Women's Imaging and Mammography, Amazon.com Fulfillment Center, South Carolina Electric and Gas, and SCANA Resources.²⁰

Richland County's top sources of employment by industry are Healthcare/ Social Assistance (33,250); Public Administration (28,048); Retail Trade (21,642); Education Services (21,525); and Accommodation and Food Services (20,937).

¹⁹ SC Works, *Largest Employers by County*,
https://jobs.scworks.org/vosnet/lmi/emp/LargestEmployers.aspx?session=faq&geo=4504000063&faq=8&apane=LMI_LMF_EMP

²⁰ Ibid.

The median income for Richland County has risen by 19.9 percent. The county's top five employers include Palmetto Health (9,000), Blue Cross and Blue Shield of SC (6,773), the University of South Carolina (6,713), Richland School District 1 (4,009), and Richland School District 2 (3,341).

4.17.2 Potential Economic Impacts

Providing improved interstate capacity and improved access to the interchanges could help support existing business, strengthening economic opportunities in the region. The project is not being proposed to initiate any economic development plans, nor to serve any particular development. Increased capacity for I-26 could help to accommodate growth. However, induced development resulting from the improvements is consistent with the City and Counties' plans for the area.

Improved access would lead to a reduction in travel times in the area; this could lead to greater productivity, a reduction in transportation costs, and more competitive pricing for goods produced or shipped to the upstate region. Businesses as well as consumers benefit from productivity gains, reduced transportation costs, and more competitive pricing of goods and services. Furthermore, as the competitiveness of a region increases, the region becomes more attractive for new business location.

As a result of the proposed I-26 widening, economic development opportunities would be encouraged by:

- reducing congestion and improving travel times on the interstate, making the area more desirable for businesses and industries to locate
- providing opportunities for development of underused parcels near the interstate and improving access to those parcels
- increasing the carrying capacity of I-26 and volume of traffic flows through the area, which would sustain and increase the potential for economic activities that serve pass-through travelers.

Some businesses could be negatively impacted as a result of the proposed project. However, several local businesses could benefit economically from the widening of I-26 due to improved accessibility and connection.

- As a result of the project, two businesses would be directly impacted. An outbuilding associated with Chapin Building Supply would need to be relocated to another portion of the property. The main structure would remain in place and the address of the business would remain the same.

- The Evergreen 123 Exxon gasoline retailer at Exit 97 would need to be relocated. To improve this interchange from a partial cloverleaf to a diverging diamond, this business would need to be relocated in its entirety.

SCDOT would 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.

Mainline

With anticipated population growth and the corridor's proximity to Columbia, residential, commercial and industrial development is expected to continue to grow along the project mainline, with or without the project.

Interchanges

The interchanges slated for improvements vary from relatively undeveloped rural land (Exit 85) to moderately developed with small retailers and commercial properties (Exits 97 and 91).

Exit 85 – SC 202

Several factors make this interchange prime for small retail development as opposed to larger industrial development. Several streams and a floodplain are located in this sloped area making it difficult to develop a large tract without natural resources impacts. Industrial parks are located at the interstate interchange to the east of Exit 85 (at Exit 91) and to the west of this interchange (Exit 82). SC 202 is a main thoroughfare leading into the Town of Little Mountain and this interchange is one that commuters would use daily to reach Richland County for work.

Exit 91 – Columbia Ave

The proposed improvements would reduce congestion and improve access to businesses. Properties to the north and east of the interchange are low-density residential or undeveloped commercial tracts.

One business would be impacted by the proposed improvements but would not be required to relocate. Chapin Building Supply has an outbuilding that would need to be relocated, possibly to another portion of the property, but the primary commercial structure would remain.



Figure 40: Chapin Furniture Building

Exit 97 – Broad River Road

Because this is the easternmost interchange (closest to Columbia) and involves a major thoroughfare (Broad River Road), there are more commercial, residential, and institutional, establishments surrounding this interchange than the other interchanges. The majority of the development consists of small commercial businesses to the northwest and southeast of the interchange. A South Carolina Department of Motor Vehicles office and an SCDOT section shed are located to the immediate south of the interchange. Low-density residential parcels are located to the northeast and high-density multi-family units are located further to the south of the interchange. Undeveloped land is located west of the interchange. One business would be impacted and would be required to relocate. The Evergreen 123 Exxon Station located at 11090 Broad River Road would be in the path of the eastbound on-ramp to I-26 and would need to be relocated.

4.18 Indirect and Cumulative Effects

4.18.1 What are Indirect and Cumulative Effects and why is an analysis needed?

Indirect effects (also known as secondary effects) are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable. These effects may be the result of induced growth and/or related to changes that would not occur without the project implementation, in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems (40 CFR § 1508.8). Two resources were identified as a result of public comment, agency comment, and evaluation of potential impacts for study as part of the Indirect and Cumulative Impact Analysis. These resources are streams/water quality and land use. Analysis of these impacts follow the eight steps outlined in the National Cooperative Highway Research Program Report (NCHRP) 466: *Estimating the Indirect Effects of Proposed Transportation Projects*.

Cumulative effects result from the incremental impact to resources resulting from past, present, and reasonably foreseeable future actions regardless of who performs the action. The CEQ developed *Guidance for Preparers of Cumulative Impact Analysis: Approach and Guidance* (2005) which includes an eight-step process for preparing cumulative impact assessments.

The purpose of the Qualitative Indirect and Cumulative Effects (ICE) Assessment is, to the extent reasonable and practical, assess the potential indirect and cumulative effects that may result from the proposed improvements to I-26 in the project region. The qualitative assessment was conducted using available guidance from federal and state regulatory agencies, including:

- *Considering Cumulative Effects under the National Environmental Policy Act*. CEQ Guidance. (1997).

- *Interim Guidance: Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process.* FHWA. (January 2003).

The following basic elements comprise the ICE assessment:

1. Definition of Study Area Boundaries
2. Identification of Study Area Trends and Goals
3. Inventory of Notable Features
4. Identification of Impact-Causing Activities of the Proposed Action
5. Identification and Analysis of Potential Indirect and Cumulative Effects
6. Analysis of Indirect and Cumulative Effects
7. Evaluation of Analysis Results
8. Assessment of Consequences and Development of Mitigation

Table 28 provides a summary of the distinction between direct, indirect and cumulative impacts.

Table 28: Direct, Indirect, and Cumulative Effects

TYPE OF EFFECT	DIRECT	INDIRECT	CUMULATIVE
Nature of Effect	Typical/Inevitable/ Predictable	Reasonably Foreseeable/ Probable	Reasonably Foreseeable/ probable/ have already occurred
Cause of Effect	Project	Projects direct and indirect effects	Projects direct and indirect effects and effects of other activities
Timing of Effect	Project construction and implementation	At some future time other than direct effect	In the past, at time of project construction, or in the future
Location of Effect	At the project location	Within the boundaries of systems affected by the project	Within boundaries of systems affected by the project

Source: National Cooperative Highway Research Program Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects. Louis Berger Group, 2002.

4.18.2 What study area is used for analysis (Study Area Boundaries)?

Indirect and cumulative impacts are analyzed for resources of concern within particular geographic boundaries over some period of time. This allows for the appropriate context to be developed for each resource. Study area boundaries are developed through consideration of the resource to be impacted relative to the project location. Two resources were identified for study as part of the Indirect and Cumulative Impact Analysis; they are land use and streams/water quality.

The PSA boundaries are shown in Figure 15, however the study area for the land use analysis was broader. It includes:

- Seven Oaks to near Exit 104 (Seven Oaks is a census-designated area in Lexington County);
- St. Andrews to near Exit 104 (St. Andrews is a census-designated area in Richland County);
- The Town of Irmo (eastern Irmo);
- White Rock (a community in unincorporated northwestern Richland County);
- The Town of Chapin (northeastern Chapin);
- The Town of Little Mountain; and
- Unincorporated areas of Richland, Lexington, and Newberry Counties.

For the stream and water quality analysis, the project is located in the lowest portion of the Broad River sub basin, the Lower Broad River Watershed. The study area for this analysis was expanded to include the entire Broad River sub basin to assess water quality and stream impacts.

The period of time refers to the years within which cumulative impacts may occur. The boundaries established for the cumulative effects analysis include a past year of 1960 and a future year of 2040. The past year was determined by examining population trends and previous key events of influence on transportation and land use in the cumulative effects study area. The year 1960 was chosen due to the construction of I-26 in 1959, with the first segment in Columbia being opened in 1960. The future year was chosen due to the traffic analysis using a forecast year of 2040. The further ahead in time that is used as a forecast date, the less reliable the impact estimates become.

4.18.3 How were community trends and goals analyzed (Study Area Communities, Trends, and Goals/Methodology)

Baseline conditions within the study area were evaluated to identify trends and community goals. An understanding of the area's transportation and land use planning goals provide a useful platform to assess the proposed project's potential for indirect impacts. The land contained within the PSA is primarily comprised of undeveloped forestland, roadway and utility rights-of-way, agricultural lands, residential, and commercial development. In general, land use patterns increase in density in the areas closer to Chapin, Irmo, and Columbia. Due to the proximity to urban towns with supportive infrastructure, the project area is generally considered a desirable area for residential and commercial growth. Baseline conditions within the study area were evaluated to identify trends and community goals. An understanding of the area's transportation and land use planning goals provide a useful platform to assess the proposed project's potential for indirect impacts.

The County Comprehensive Plans support a mix of land uses within the study area. The COATS LRTP supports transportation improvements that are needed to accommodate increasing demands on the interstate and local roadway networks. Additional detail is provided in Section 4.1 - Land Use.

The proposed project is not expected to change existing land use or change the timing or density of development in the area. The project is not known to be in conflict with any plan, existing land use or zoning regulation. Therefore, the overall trends and goals of surrounding communities would not be negatively affected by the proposed project.

The Basinwide Watershed Water Quality Assessment Report for the Broad River Basin (SCDHEC, 2007) and the S.C. List of 303(d) List of Impaired Waters (SCDHEC, 2016) were reviewed for information pertaining to water resources and water quality. According to SCDHEC's List of Impaired Waters, there are locations impaired for all uses based on macroinvertebrate community data. According to the SCDHEC Total Maximum Daily Load According to the SCDHEC TMDL development for the Upper Broad River Basin, a TMDL has been developed by SCDHEC in 2005 and approved by the EPA for the Broad River Basin (HUC 03050106) to determine the maximum amount of fecal coliform it can receive from nonpoint sources and still meet water quality standards.

4.18.4 What are notable environmental features?

The identification of the two resources, land use and streams/water quality, was based upon input received during the agency coordination and public involvement process. These resources were inventoried and described in the following technical memoranda and/or sections of this EA:

- Chapter 4: Existing Conditions and Environmental Consequences, Section 4.1 Land Use
- Interstate 26 Widening and Improvements, MM 85 to MM 101 Natural Resources Technical Memorandum (NRTM)
- Chapter 4: Foreseeable Environmental Impacts, Sections 4.3 (Water Quality) and 4.4 (Waters of the U.S.)

Information obtained from these reports and sections of this EA was used to assess potential indirect impacts to these resources based on location, proximity to the project, and relationship to the project.

4.18.5 What is the context of the affected resources?

Land Use

The project corridor is located within unincorporated areas of Newberry, Lexington, and Richland Counties and the Town of Chapin. Existing land uses are primarily rural residential, forested undeveloped land, and areas of industrial and commercial development. Land use is further detailed in Section 4.1 Land Use.

Streams/Water Quality

The project is located in the lowest portion of the Broad River sub basin, the Lower Broad River Watershed the Broad River Basin, as defined by SCDHEC. A total of 79 streams, or tributaries, were identified within the PSA during site reviews. The streams are listed and detailed in the NRTM in Appendix H. Water quality has been impaired in the region and a TMDL has been developed by SCDHEC to determine the maximum amount of fecal coliform the watershed can receive.

4.18.6 What are the impact-causing activities of the proposed project?

The indirect effects of transportation projects are commonly related to changes in travel patterns that lead to changes in land use. It would be reasonable to expect that improvements to the mainline roadway and interchanges would have more limited potential to cause indirect impacts than would a new location project. For a project like this, where access is being changed, the proposed improvements at existing interchanges along I-26 have the potential to facilitate improved growth in the area. There are also direct impacts to existing businesses, either through relocation or changes in access. When a transportation improvement project is constructed, increased mobility, improved access, and reduced congestion could make an area more attractive for development. The changes in land use from undeveloped land to development with increased impermeable surfaces could result in impacts to the area's water quality and the loss or diminishment of aquatic habitat in streams through filling or relocation of stream channels.

4.18.7 What are the potential indirect impacts?

Land Use

The study area is comprised of residential, commercial, industrial, and undeveloped land uses. There is potential for increased development at the project interchanges and along adjacent frontage roads, primarily resulting from growth in the project area due to its proximity to Columbia and the benefits of a location on the I-26 corridor between the three of the largest metropolitan areas of South Carolina. The improvements proposed to the interstate and at the interchanges would also make these areas more attractive to new development or

redevelopment of existing facilities. Along the I-26 mainline, the proposed improvements are not expected to have indirect impacts to existing land uses.

Examples of indirect impacts that could occur from the proposed I-26 Improvements would be an influx of businesses that depend upon proximity to an interstate as well as increased business patronage at existing businesses due to improved access from the interstate. Similarly, the potential for residential development could be enhanced due to the benefits of improved mobility resulting from the interstate widening and upgrading of the interchanges.

Streams/Water Quality

Development of currently undeveloped property has the potential to indirectly impact water quality through increasing impermeable areas and thus increasing volumes of stormwater runoff, which would contain various levels of pollutants. Runoff is dependent upon numerous variables, and therefore the specific impacts are both site- and event-specific. The increase in impervious area with an associated transportation use is not expected to increase specific pollutant loading related to fecal coliform bacteria and the established TMDL.

There would be potential for increased development at the project interchanges, primarily at Exits 85 and 97, due to the presence of undeveloped land. Refer to Section 4.1 for additional information on potential development and land use impacts at each interchange.

4.18.8 How were the results analyzed?

Qualitative methods were used to identify and analyze the potential indirect impacts to the various resources of concern resulting from this proposed project. These methods and/or resources included:

- Field research and surveys;
- Internet research;
- Public involvement information;
- Aerial photographs and USGS maps;
- Newberry County Comprehensive Plan;
- Lexington County Comprehensive Plan; and
- Richland County Comprehensive Plan

Potential indirect impacts were analyzed using local land use and transportation plans and development ordinances. The proposed project is consistent with local plans. It is anticipated that any indirect land use impacts would follow proposed land use designations; see Section 4.1 for a list and description of the local plans.

4.18.9 What are the cumulative impacts and reasonable foreseeable actions?

Past actions that have affected the area have been the creation of I-26 which facilitated conversion of agricultural lands into commercial and residential uses near the interchanges, and the rise of new industries in the region. Based on the existing land use in the area and land use plans and goals for growth, the project has a potential to support accelerate growth in undeveloped areas at the interchanges. This would potentially accelerate due to improved access to the interchanges. The growth that has occurred and is anticipated to continue has impacted water quality by removing or relocating streams and eliminating wetlands. This is also expected to continue as new roadways and developments are constructed.

Other actions that are planned within the study area include various transportation improvements, including the proposed improvements of I-20/I-26/I-126 Carolina Crossroads project. This large-scale project would have land use and stream impacts because of improvements that are needed to reduce congestion in this interstate corridor. Lexington County is currently developing a widening and improvement project for Columbia Avenue in Chapin that would tie-in to the improvements to the Exit 91 interchange. Over the next 20 years, the Richland County Transportation Penny sales tax will provide \$1 billion dollars for transportation improvements across the County. In this program, Broad River Road is proposed to be widened to a five-lane section between Royal Tower Drive and Dutch Fork Road. There are also several dirt roads in the County program that would be resurfaced to paved facilities. The nature of the improved transportation resulting from these projects would facilitate additional development in this area.

Lexington County has developed a 220-acre business and technology park near the entrance-way to Chapin and I-26. The Chapin Technology Park is substantially complete and will be fully operational in early 2018. In addition, the Mungo Company is planning a 200-acre residential and commercial complex adjacent to the park, near the intersection of Brighton Boulevard and Columbia Avenue. This will provide a new work-live-play community.

The cumulative impact of these projects would be changes in existing land use, loss of aquatic habitat, and impacts to water quality. The conversion of land use would, in turn, increase the amount of impermeable surface. This could lead to larger volumes of runoff to the remaining streams and rivers with the accompanying additional pollutant loading. It could also result in loss of aquatic habitat due to filling streams and tributaries for site construction.

4.18.10 How would these impacts be mitigated?

Land use impacts are mitigated by being in conformance with local land use and transportation plans and development ordinances. The proposed project is in accord with land use and transportation plans and is not anticipated to alter future land use plans. The expected

development is planned to positively impact land use in the area by providing efficient access for motorists to reach commercial and residential establishments.

Water quality impacts would be mitigated by stormwater control measures, both during construction and post-construction. Increased impermeable surfaces would be remediated through appropriate best management practices during construction and operation such as overland sheet flow, grassed side slopes, detention of stormwater runoff, and natural wetland filtration. Developers would be required to obtain the necessary permits (401, 402, or 404) prior to construction. This would ensure best management practices would be followed.

Impacts to aquatic habitat are addressed through the Section 404 permitting process. Approval of a permit to impact streams, rivers, wetlands and other Waters of the United States is required through the USACE. The USACE typically requires compensatory mitigation for any impacts to jurisdictional areas for which a permit application is submitted to ensure that there is no net loss of WOUS. Compensatory mitigation is normally required to offset unavoidable losses of WOUS and is only undertaken after avoidance and minimization actions are exhausted.

5 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

Public involvement is an important part of the NEPA and transportation decision-making process. Promoting two-way communication and establishing trust between SCDOT and the public is accomplished when information is shared and input is solicited from the community and stakeholders. Informal informational meetings provide an opportunity for an individualized, relaxed exchange of objectives, plans, and concerns. Formal sessions provide a structured opportunity to present an outline of the project and receive responses from citizens.

5.1 How have the regulatory and resource agencies been involved in the project?

On September 6, 2016, SCDOT sent a Letter of Intent (LOI) to representatives of federal, state and local agencies as well as non-governmental organizations. The LOI provided general project information and requested comments on potential environmental issues and concerns within the study area. The LOI and a response from the USFWS are included in Appendix N. An Agency Coordination Effort (ACE) meeting was held on June 9, 2016. SCDOT gave an overview of the project to agency personnel and the method for completing the project Jurisdictional Determination was discussed.

5.2 What information was shared during the Public Information Meeting?

Public Information Meeting (October 11 and 13, 2016)

SCDOT hosted two informal drop-in open Public Information Meetings on October 11, 2016 at the Chapin High School Cafeteria and October 13, 2016 at the Chapin Middle School Cafeteria. Public notice of the meetings was advertised through placement of informational signage placed at interchange access points, advertised through the SCDOT's website, and through local media outlets.



Figure 41: Public Meeting Signage

Meeting attendees were initially greeted as they entered and requested to sign in at the registration table. Attendees were provided an informational handout describing the project and a form to provide comments. Displays depicting the study corridor and examples of the proposed interchanges were available for review and discussion.

The purpose of the two meetings in October was to provide the local community, citizens, and project stakeholders an introduction to the project as well as to gather information from the public and any interested organizations. The comments received were considered when the alternatives were later developed during the design and environmental evaluation process. A total of 25 people attended the October 11 meeting. A total of 26 people attended the October 13 meeting. Meeting summaries are included in Appendix O.

Changes were made to the project as a result of public feedback. Alternatives 1 and 2 at Exit 85 were eliminated due to concerns from the public regarding the relocation of several residences.

Public Information Meeting (May 23, 2017)

A second Public Information meeting was held on May 23, 2017 at the Chapin High School cafeteria as an open house format. The purpose of the meeting was to present preliminary alternatives for the improvements to the mainline and interchanges and receive comment on those designs from the public. Advertisement of the meeting was through the use of web site postings, media coverage, and road signs posted at interchanges. Meeting attendees were initially greeted at the entrance to the cafeteria,



Figure 42: Public Information Meeting

requested to sign in at the registration table; and provided handout materials that included a project overview handout of the design alternatives and a comment sheet. Attendees were directed towards display maps where the project design team was available to answer questions and explain in further detail the alternatives. A total of 115 community stakeholders attended the May 23, 2017 meeting. During the meeting, attendees were provided the opportunity to submit written comments regarding the project. Comments that were received at the meeting and during the public comment period are summarized and included in Appendix O.

5.3 Public Hearing

SCDOT will advertise and conduct a public hearing to give local governmental officials and citizens an opportunity to further review and comment on the project. The public will be held to present the project Preferred Alternative for the interchanges and mainline design. In addition, the EA will be made available for public review and comment 15 days prior to the public hearing date.

6 REFERENCES

Cowardin, L.M, et al. 1979. Classification of U.S. Wetland and Deepwater Habitats of the United States. Department of the Interior, U.S. Fish and Wildlife Service.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Griffith, G.E., et al 2002. Ecoregions of North Carolina and South Carolina, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey.

Horton, J.W., and V.A Zullo. 1991. The Geology of the Carolinas. The University of Tennessee Press, Knoxville, Tennessee.

South Carolina Department of Health and Environmental Control (SCDHEC). 2005. Watershed Water Quality Assessment: Broad River Basin. Technical Report No. 013-05. Bureau of Water, Columbia, South Carolina.

SCDHEC. 2007. TMDL for Fecal Coliform For Broad River Basin

http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_lwrbrd_fc.pdf

South Carolina Department of Natural Resources (SCDNR). 2006. South Carolina Rare, Threatened, & Endangered Species Inventory Species Found In Charleston County. Available at:

http://www.dnr.sc.gov/pis/heritage/county_species.select_county_map. Accessed December

2008. SCDNR. 2016. South Carolina's Bald Eagles – Nest Locations. Available at:

<http://www.dnr.sc.gov/wildlife/baldeagle/locations.html>. (Accessed September 2017.)

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service. 2009. Soil Data Mart. Available at: <http://soildatamart.nrcs.usda.gov/Survey.aspx?State=SC>

U.S. Environmental Protection Agency (USEPA). 2007. Envirofacts Data Warehouse. Available: http://oaspub.epa.gov/enviro/ef_home2.water.

U.S. Fish and Wildlife Service. National Wetlands Inventory Wetlands Mapper. 2009. Available at: <http://wetlandsfws.er.usgs.gov/wtlnds/viewer.htm>. Accessed August 2009.

U.S. Fish and Wildlife Service. 2009. South Carolina Distribution Records of Endangered, Threatened, Candidate and Species of Concern. Available at: http://www.fws.gov/charleston/docs/listed_endangered_species_in_sc.htm