Interstate 85 Widening and Improvements
Mile Marker 80 – 96
Spartanburg and Cherokee Counties

Environmental Assessment

U.S. Department of Transportation
Federal Highway Administration

SCDOT

I-85 Widening and Improvements
Spartanburg and Cherokee Counties

Environmental Assessment

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

10/15/2015
Date of Approval

S.C. Department of Transportation

10/19/2015
Date of Approval

Federal Highway Administration

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Project No. P27114

Date: 10/12/2015	SCDOT NEPA ENVIRONMENTAL COMMITMENTS FORM	

Project ID : 027114 | County : Cherokee | District : District 4 | Doc Type: EA | Total # of Commitments: 12

Project Name: I-85 Widening (MM80-96)

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: Mr. Brad Reynolds **PHONE #:** (803)-737-1440

ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Water Quality Responsibility: CONTRACTOR

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

Non-Standard Commitment Responsibility: CONTRACTOR

Floodplains

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

A hydraulic analysis will be performed for each encroachment of a FEMA-regulated floodplain and a detailed hydraulic analysis will be performed during final design. The proposed project will be designed to meet the "No-Rise" requirements.

Non-Standard Commitment Responsibility: CONTRACTOR

Noise

Contractors on all highway construction projects are required to adhere to SCDOT Standard Specification Section 107.1 – Laws to Be Observed, which states in part that the contractor shall "Keep fully informed of, and at all times observe and comply with, all federal, state, and local laws, ordinances, regulations, and all orders and decrees of bodies or tribunal having any jurisdiction or authority…" unless the necessary variance is obtained. Low-cost, easy-to-implement measures may be incorporated into project plans and specifications, where applicable, including: work-hour limits; equipment muffler requirements; locations of haul roads; elimination of "tail gate banging;" ambient sensitive back-up alarms; community rapport; and, complaint mechanisms.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment | Responsibility: CONTRACTOR

Cultural Resources

SCDOT has committed to use curb and gutter to reduce the ROW, and require fencing or other barriers between the construction and several mature trees during construction at 119 Canty Way to preserve those trees that are crucial to the character of the property. The contractor shall be responsible for having a licensed arborist identify the extent of the root balls for the trees. Temporary orange construction fencing will placed outside of the limits of the roots and no impacts to the root systems will be allowed.
Proposed project improvements will not intrude into the eligible boundary area of Resource 186-0198 (the Blanton Farm Complex) and will not result in a noticeable change to the view to or from the site.

Non-Standard Commitment | Responsibility: CONTRACTOR

Northern long-eared bat

SCDOT committed to performing acoustic or mist netting surveys for the Northern Long Eared Bat prior to construction during the survey window (May 15 through August 15) or to only perform clearing of trees greater than 3 inches in diameter between November 15 and March 31. If a survey is completed, SCDOT will consult with USFWS on the results of this survey and will follow any USFWS regulations/requirements resulting from that consultation.

Non-Standard Commitment | Responsibility: CONTRACTOR

Northern long-eared bat

Bridges/Structures have been inspected and there is no evidence of bat activity. Prior to construction/demolition of the bridges/ structures the Resident Construction Engineer (RCE) will coordinate with SCDOT ESO Compliance Office to perform an additional inspection 7 business days prior to initiating work at each bridge/structure location. After this coordination it will be determined whether construction/demolition can begin. Based on the results of the inspection(s), any bridges/structures suspected of providing habitat for any species of bat will be removed from work schedules until such time that SCDOT has obtained clearance from USFWS. If during construction/demolition bats are observed that were not discovered during the biological surveys, the contractor will cease work and immediately notify the RCE, who will contact SCDOT ESO Compliance Office. After this coordination, it will be determined whether construction/demolition can resume or whether a temporary moratorium will be put into effect.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Displacements Responsibility: CONTRACTOR

The SCDOT will acquire all new right-of-way and process any relocations in compliance with the Uniform Relocation Assistance and Real Property Acquisition policies Ace 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.

USTs/Hazardous Materials Responsibility: CONTRACTOR

If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed. Hazardous materials will be tested and removed and/or treated in accordance with the United States Environmental Protection Agency and the SCDHEC requirements, if necessary.

Non-Standard Commitment Responsibility: CONTRACTOR

Wetlands

Bridges will be used to cross streams at the interchanges at Exit 87 and 96. At Exit 87 a bridge will be used to cross the streams for the relocated Overbrook Drive frontage road in the southeast quadrant of the interchange. At Exit 96 a bridge will be used where the relocated WIlcox Avenue crosses a stream in the northeast quadrant of the interchange. In addition, headwalls will be used to avoid stream impacts in those locations where the headwall would not exceed 10 feet in height.

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ENVIRONMENTAL COMMITMENTS FOR THE PROJECT

Non-Standard Commitment Responsibility: CONTRACTOR

Water Quality

The contractor will follow the guidance contained in Engineering Directive Memorandum (Number 23), dated March 10, 2009, regarding Department procedures to be followed in order to ensure compliance with S.C. Code of 72-400, Standards for Stormwater Management and Sediment Reduction. SCDHEC may require additional water quality and stormwater measures during and after construction, which will be determined during the 404/401 permitting process.

Non-Standard Commitment Responsibility: CONTRACTOR

Air Quality

State and local regulations regarding dust control and other air quality emission reduction controls will be followed. Current state best management practices (BMPs), 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.

Individual Permit Responsibility: CONTRACTOR

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.

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CHAPTER 1 PURPOSE AND NEED

Interstate 85 (I-85) extends a total of 667 miles through Virginia, North Carolina, South Carolina, Georgia, and Alabama between I-95 in Petersburg, Virginia and I-65 in Montgomery, Alabama[1] and is an important link in the interstate system. It also connects the upstate of South Carolina with the Charlotte, North Carolina and Atlanta, Georgia metropolitan areas. In addition to being a corridor for transporting people and freight between urban areas, I-85 serves other specific regional and local needs, including:

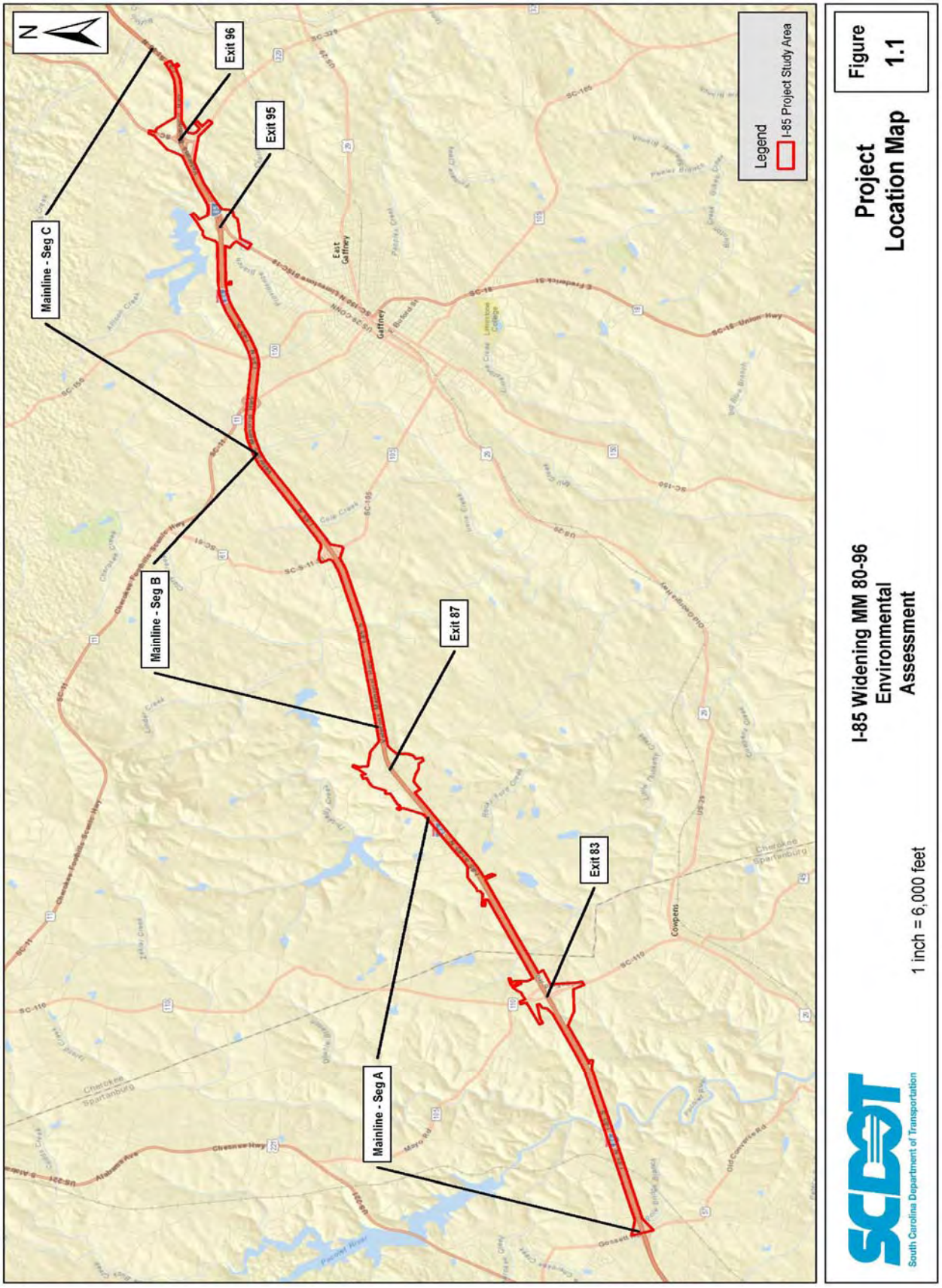
- Daily commuting routes for intra- and interstate travelers;
- Access to the Greenville-Spartanburg Airport;
- Access to the new Inland Port at Greer;
- Access to the UPS Terminal at Exit 95; and,
- Access to businesses with more than local appeal such as the Gaffney Premium Outlets at Exit 90.

1.0 Project Description

The South Carolina Department of Transportation (SCDOT) proposes improvements to an approximately 17-mile long section of the I-85 corridor designed to increase capacity and upgrade interchanges and overpass bridges to meet state and federal design requirements. SCDOT intends to widen I-85 from four to six lanes beginning at the existing six lanes near Exit 80 – Gossett Road (S-57) in Spartanburg County and ending within 0.25 mile of the Broad River Bridge, which is approximately 1.5 miles north of Exit 96 – Shelby Highway (SC 18) in Cherokee County (Figure 1.1, page 2). Along the approximately 18-mile project area, interchanges at Exit 83 – Battleground Road (SC 110), Exit 87 – Green River Road (S-39), Exit 95 – Pleasant School Road (S-82), and Exit 96 – Shelby Highway (SC 18) will be modified to bring them into compliance with state and federal design requirements. A frontage road on the northeast side of Exit 90 – Hyatt Street (SC 105) will be reconfigured to improve traffic flow. Lastly, the overpass bridge at Sunny Slope Drive (S-131) will be replaced to provide greater vertical clearance to meet design standards.

Pursuant to Federal Highway Administration (FHWA) regulations (23 CFR Part 771.111(f)), a project should have rational endpoints (termini) for transportation improvements as well as rational endpoints for evaluating environmental impacts. As described above, the southern terminus for the proposed project has been defined as the end of the existing six-lane portion of I-85 at Exit 80. This portion of the interstate carries approximately 58,600 vehicles per day. The northern terminus for the proposed project has been defined as approximately 1.5 miles north of Exit 96 – Shelby Highway, which will tie into the existing six-lane bridge approach at the Broad

[1] Federal Highway Administration, *The Dwight D. Eisenhower System of Interstate and Defense Highways, Part II – Mileage*, http://www.fhwa.dot.gov/highwayhistory/data/page02.cfm


N
Exit 96
Exit 95
Exit 87
Exit 83
Mainline - Seg C
Mainline - Seg B
Mainline - Seg A
Legend
I-85 Project Study Area
Figure 1.1
Project Location Map
I-85 Widening MM 80-96 Environmental Assessment
1 inch = 6,000 feet
SCDOT
South Carolina Department of Transportation

River Bridge. This section of the interstate carries approximately 43,200 vehicles per day. The drop in traffic at Exit 96 makes it a logical place to stop the widening to six lanes. However, the project has been extended north from Exit 96 to include the northbound slip ramp at Gaffney Ferry Road, which is being removed, to the median barrier south of the existing Broad River Bridge. This extension, to the median barrier, provides continuity and avoids a gap in the median barrier of less than 1,000 feet. Additionally, the extended project limits allow for the reduction of travel lanes in the northbound direction from three to two along the outside of the interstate, which is the recommendation for interstate lane reduction in the American Association of State Highway and Transportation Officials (AASHTO) guidelines.

The project, as proposed, would result in certain modifications to the human and natural environment. SCDOT and FHWA have determined that the project meets the criteria under 23 CFR 771.115(c) for processing as an Environmental Assessment (EA). Environmental studies were conducted in the early stages of project development and are discussed in Chapter 3 *Existing Conditions and Environmental Consequences*. These studies and an understanding of the project's scope of work were considered in the decision for this level of documentation and are appended by reference to this document.

1.1 What roadway elements are in place now?

The section of I-85 between Exit 80 and the Broad River Bridge currently consists of a four-lane interstate with a grassed median for most of its length. The existing right-of-way is approximately 100 feet to either side of the center line (200 feet total). At the southern end of the corridor, the roadway widens to six lanes facility near Exit 80 (Gossett Road).

The project study area includes six interchanges and 15 major bridge structures over the interstate, including one railroad bridge crossing one mile north of Exit 80. Frontage roads parallel one or both sides of the interstate for most of the length of this project.

The existing project interchanges are described below:

Exit 82 (Buds Drive): This exit consists solely of a northbound off-ramp, which diverges from I-85 with a 400 feet long parallel deceleration lane. The off-ramp is very short, with a length of approximately 360 feet. This access point is considered as part of Exit 83 and will be replaced by the Exit 83 interchange improvements.

Exit 83 (Battleground Road/SC 110): This interchange is an unconventionally oriented diamond interchange. The off-ramps in both directions tie directly into two-way frontage roads running

parallel to the interstate. The northbound off-ramp is about 430 feet long and the southbound off-ramp is about 300 feet long. The northbound on-ramp is approximately 330 feet long. The southbound on-ramp begins at the intersection of Truck Stop and Horry Roads and is about 125 feet long. A traffic "loop" in the northeast quadrant is created by existing roads (Battleground Road, Philips Road, Horry Road, and Truck Stop Road) which encircle Mountain View Baptist Church. All ramps and the "loop" have direct driveway access to several businesses and residences. Included in this interchange is a short, southbound slip ramp that provides access to and from Truck Stop Road. Substantial improvements are planned for this interchange.

Exit 83 – Battleground Road

Exit 87 – S. Green River Road

Exit 87 (S. Green River Road): This interchange is a diamond with all four ramps directly connected to frontage roads. The ramp in the northwest quadrant has direct access to two businesses. The northbound and southbound off-ramps are approximately 520 and 690 feet long, respectively. The northbound and southbound on-ramps are approximately 870 and 935 feet long, respectively. Substantial improvements are planned for this interchange.

Exit 90 (Hyatt Street/SC 105): This interchange is a diamond and all four ramps have direct access to the interstate. The northbound and southbound off-ramps are approximately 925 and 1,040 feet long, respectively. The northbound and southbound on-ramps are approximately 1,215 and 1,140 feet long, respectively. The frontage road in the northeast quadrant will be realigned.

Exit 92 (Chesnee Highway/SC 11): This interchange is a partial clover leaf with loops in the northeast and southwest quadrants. All four ramps have direct access to the interstate. The northbound and southbound off-ramps are each approximately 1,500 feet long. The northbound and southbound on-ramps are approximately 1,215 and 1,080 feet long, respectively. Plans include extending the on-ramp lengths at this interchange.

Exit 95 (Pleasant School Road/S-82): This interchange is a partial diamond and is "three-legged" (no northbound on-ramp) with the northbound off-ramp exiting directly onto a frontage road. Wilcox Avenue, the frontage road in the northern quadrant, does not intersect the southbound ramps; however, there is minimal space between the frontage road and the exit ramp intersections. The northbound and southbound off-ramps are approximately 680 and 650 feet long. The

Exit 95 –Pleasant School Road

southbound on-ramp is approximately 600 feet long. Substantial improvements are planned for this interchange.

Exit 96 –Shelby Highway

Exit 96 (Shelby Highway/SC 18): The interchange is a diamond with the northern quadrant ramps intertwining with frontage roads. The southbound on-ramp in the northwest quadrant contains direct access to two businesses. The northbound and southbound off-ramps are approximately 930 and 650 feet long, respectively. The northbound and southbound on-ramps are approximately 775 and 915 feet long, respectively. Substantial improvements are planned for this interchange and the slip ramp onto I-85 from Gaffney Ferry Road will be removed.

1.2 What changes to the I-85 facilities are proposed?

SCDOT performed an analysis of the I-85 corridor and determined that if projected growth occurs the current capacity of the facility will be exceeded and congestion will become worse in the future. Additional lanes would be needed to accommodate these future traffic volumes. Field observations revealed bridges with insufficient vertical (height) and/or horizontal (width) clearances and where horizontal clearances would need to be increased to accommodate future widening. The alignment of several frontage roads and their interaction with the mainline ramps results in intertwining entrance, exit, and slip ramps that do not meet current design standards and "contribute to the safety problems on the corridor."[2]

SCDOT proposes the following modifications:

- Adding a travel lane toward the median, primarily within the right-of-way, in each direction (some additional right-of-way would be required at certain locations);
- Modifying four interchanges and their on- and off-ramps:
  - Exit 83 – Battleground Road
  - Exit 87 – Green River Road
  - Exit 95 – Pleasant School Road, and
  - Exit 96 – Shelby Highway;
- Replacing the overpass bridge at Sunny Slope Drive (S-131) to improve vertical clearance;
- Realigning frontage roads at Exit 90 to improve the geometry of the intersections; and,
- Constructing walls for the six-lane section between the interstate mainline and frontage roads to minimize the amount of right-of-way needed. These walls will accommodate a future widening to an eight-lane section in the event it is needed.

[2] SCDOT Office of Planning, *I-85 Corridor Analysis Spartanburg and Cherokee Counties*, January 10, 2014

As currently proposed, the existing four-lane section would be widened to six lanes, utilizing existing right-of-way as much as is practical. Figure 1.2, page 7, shows a view of a cross-section of the proposed facility.

SCDOT proposes interchange modifications at Exit 85, Exit 87, Exit 95 and Exit 96. The interchange modifications would eliminate the existing on/off slip ramps and connect the ramps directly to the crossing arterial roadways at these exits. The configurations of the interchanges are expected to be a diamond configuration but may include loop ramps, as determined during preliminary design, to mitigate environmental impacts. Improvements to the frontage road configuration at Exit 90 also are proposed to improve the intersection alignment of the frontage roads with Hyatt Street to meet AASHTO recommendations. The slip ramps off of the interstate at mile marker 83 to Bud Arthur Drive and onto the interstate near mile marker 97 from Gaffney Ferry Road will be removed as part of the improvements to the adjacent interchanges, Exits 83 and 96, respectively.

1.3 What is the purpose of the I-85 Improvement 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-85 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.

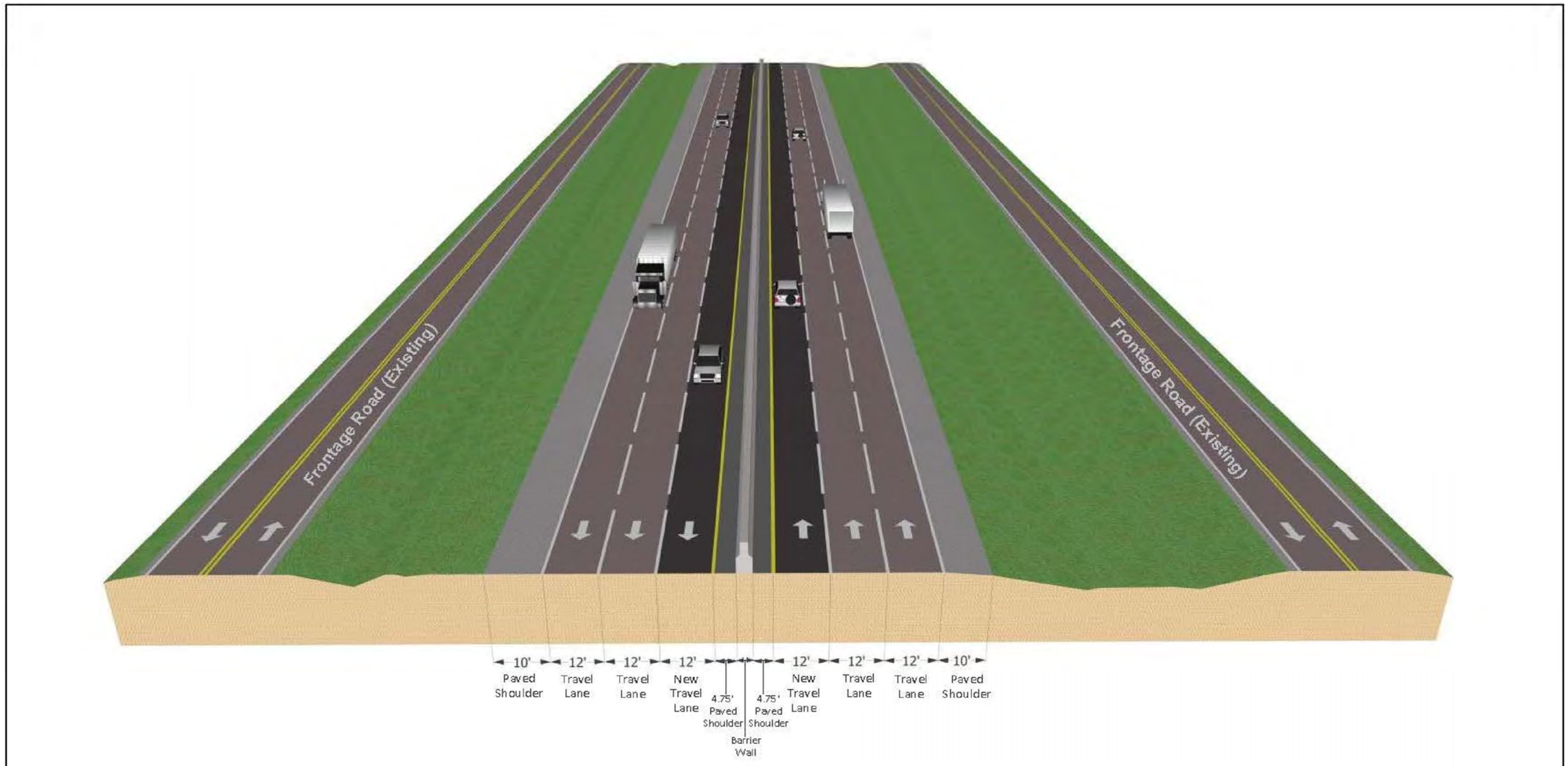
1.4 Why is the project needed?

The needs for this project were identified through a comprehensive review of previous studies along with the analysis of current data compiled for this study. This includes information in the Interstate 85 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.

Existing traffic volumes along I-85 at the southern end of the project study area are higher than the current facility can accommodate at an acceptable level of service, particularly during afternoon peak travel times. Peak travel times are considered business rush hours between 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m.[3] As traffic increases over time the congestion will also increase.

A high volume of truck traffic further reduces the facility's capacity to carry traffic. The average percentage of large truck traffic for a rural interstate is 24 percent.[4] The percentage of large truck traffic along I-85 through the study area is 25 percent during the morning and afternoon/evening peak hour, which is average for the state.[5] However, during non-peak hours the truck percentage along this segment of I-85 increases to 30 percent. This higher percentage

[3] STV Incorporated, *Interstate 85 Widening Traffic Analysis Report*, June 19, 2015
[4] *Ibid*
[5] *Ibid*



South Carolina Department of Transportation

Not To Scale

I-85 Widening MM 80-96 Environmental Assessment

Proposed Typical Section

Figure 1.2

of large truck traffic during the non-peak hours combined with rolling terrain along the corridor contributes to the congestion in the area.

The unimproved interchanges reduce the safety performance within the I-85 project area. The effect of current interchange configurations is reflected in the higher than average occurrence of traffic accidents[6] (refer to section *1.4.2 Why is safety an issue and why is it a secondary need?,* page 13). The proposed interchange improvements will increase safety by providing longer on- and off-ramps to help vehicles enter and exit both the interstate and the intersecting roads. The longer exit ramps will 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 I-85 study area.

1.4.1 Why are increasing capacity and correcting design deficiencies at interchanges the primary needs?

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.

1.4.1.1 Capacity

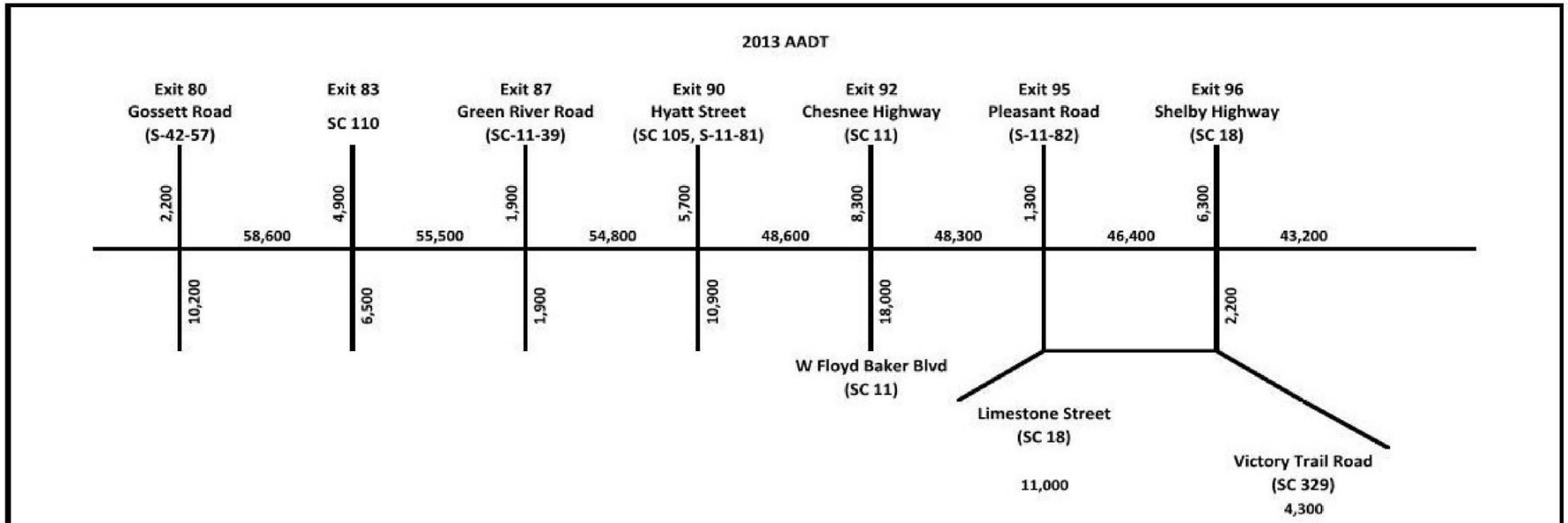
Currently, traffic volumes on I-85 in the project area range from a low of 43,200 AADT near Exit 96, to a high of 58,600 AADT between Exit 80 and Exit 83 – Battleground Road. Projected traffic volumes for the year 2040 along this corridor vary between 64,600 AADT near Exit 96 and 87,600 AADT between Exit 80 and Exit 83, as shown in Figure 1.3, page 9.

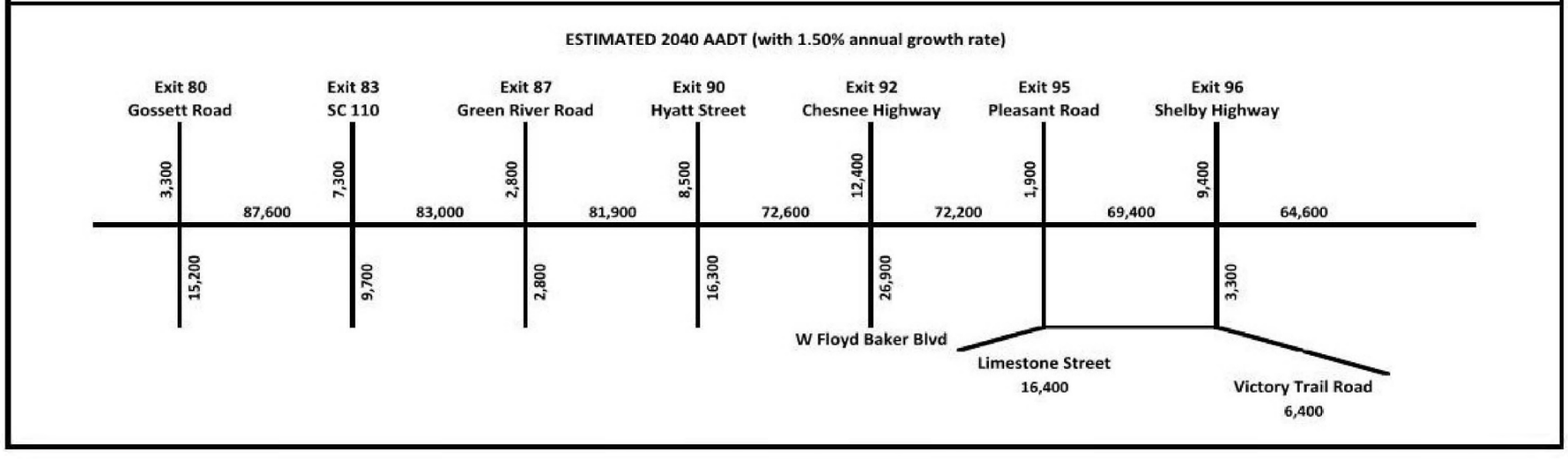
Annual Average Daily Traffic. (AADT) is defined as the yearly average of the number of cars per day that use the road.

Level of service (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 Table 1.1, page 10, and are based on definitions from the TRB's *Highway Capacity Manual* (2010). Density of traffic is measured in passenger cars per mile per lane.

LOS A through D are acceptable under most 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). Table 1.2, page 11, includes a

[6] Bihl Engineering, LLC, *Accident Analysis Report, I-85 Widening Project MM 80 to MM 96 Spartanburg and Cherokee Counties, SC*, December 2014 (rev. March 2015)





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Not To Scale

I-85 Widening MM 80-96 Environmental Assessment

Annual Average Daily Traffic

Figure 1.3

Table 1.1 Level of Service Criteria		
Freeway Segment		
LOS	**Density**	**Definition**
A	≤11	Free flow. Individuals unaffected by others in traffic stream.
B	>11 and ≤18	Free flow, but presence of other vehicles begins to be noticeable. Slight decline in freedom to maneuver.
C	>18 and ≤26	Stable flow, but the beginning of the range in which the influence of traffic density on operations become marked. Maneuvering requires substantial vigilance. Average traffic speed may begin to show some reduction
D	>26 and ≤35	High density flow in which ability to maneuver is severely restricted by increasing volumes. Only minor traffic disruptions can be absorbed without effect.
E	>35 and ≤45	Flow at or near capacity. Unstable. Most traffic disruptions will cause queues to form and service to deteriorate.
F	>45	Breakdown flow. Traffic exceeds capacity. Queues form behind such locations, which are characterized by extremely unstable stop and go waves.

Source: Transportation Research Board, Highway Capacity Manual 2010

summary of existing and future no-build and build LOS and densities for segments along I-85 in the project area. These segments were also analyzed as part of the aforementioned Traffic Analysis Report (refer to Appendix A).

Based on the 2014 traffic analysis data, the existing I-85 corridor at Exit 80 carries a LOS C at morning (AM) peak hours (58,600 AADT) and a LOS E at afternoon/evening (PM) peak hours. At Exit 96, I-85 carries a LOS B (43,200 AADT), with a LOS C at AM peak hours and a LOS D at PM peak hours.

For the capacity analysis, the project was divided into 10 segments for northbound and seven segments for southbound interstate travel. Using the existing design hour volumes for the AM and PM peak hours, the analysis indicates that during the AM peak hours, all freeway segments operate at a LOS B or C. During the PM peak hours, all freeway segments operate at a LOS D or E.

Table 1.2
Existing and Future Conditions for Segments

Segment	2014 Existing AM Peak LOS/Density	2014 Existing PM Peak LOS/Density	2040 No-Build AM Peak LOS/Density	2040 No-Build PM Peak LOS/Density	2040 Build AM Peak LOS/Density (6 lanes)	2040 Build PM Peak LOS/Density (6 lanes)	*Last Year at LOS D*
I-85 Northbound							
Exit 80 – 82	C / 22.3	E / 44.8	E / 38.3	F / 1531.4	C / 22.3 *	E / 43.1*	*2031*
Exit 82 – 83	C / 22.0	E / 43.1	E / 37.3	F / 592.1			
Exit 83 – 87	C / 21.1	E / 38.6	D / 34.8	F / 201.6	C / 21.0	E / 38.4	*2036*
Exit 87 – 90	C / 21.2	E / 36.6	E / 35.0	F / 149.5	C / 21.1	E / 36.4	*2036*
Exit 90 – 92	C / 18.9	D / 33.4	D / 29.6	F / 102.8	C / 18.9	D / 33.2	-
Exit 92 – 95	C / 18.9	D / 33.2	D / 29.5	F / 99.7	C / 8.9	D / 33.0	-
Exit 95 – 96	B / 17.1	D / 31.0	C / 26.0	F / 80.8	B / 16.8	D / 32.5	-
Exit 96 – 97	B / 16.8	D / 29.6	C / 25.4	F / 70.7	B / 16.8 *	D / 29.6*	-
Exit 97 – 98	B / 16.9	D / 29.7	C / 25.6	F / 71.4			-
Exit 98 – 100	B / 16.6	D / 29.6	C / 25.0	F / 70.7			-
I-85 Southbound							
Exit 96 – 100	B / 17.0	D / 31.5	C / 25.7	F / 84.5	B / 16.9	D / 31.5	-
Exit 96 – 95	C / 18.4	D / 33.6	D / 28.4	F / 105.1	C / 18.3	D / 33.4	-
Exit 95 – 92	C / 18.1	D / 33.9	D / 27.9	F / 108.0	C / 18.1	D / 33.7	-
Exit 92 – 90	B / 17.8	D / 33.8	D / 28.4	F / 106.6	B / 17.7	D / 33.6	-
Exit 90 – 87	C / 20.5	E / 40.0	D / 33.3	F / 257.3	C / 20.5	E / 39.7	*2035*
Exit 87 – 83	C / 21.9	E / 40.7	E / 37.1	F / 296.1	C / 21.8	E / 40.4	*2034*
Exit 83 – 80	C / 25.2	E / 43.5	F / 48.5	F / 708.2	C / 25.2	E / 43.2	*2032*

* Northbound slip ramps have been eliminated, creating a single segment

Source: Interstate 85 Widening Traffic Analysis Report

The segments that currently operate at LOS E are located between Exits 80 and 90 on the southern end of the study area and include the interchanges at Exits 83 and 87. The existing and projected conditions of the I-85 project corridor reflect the typical operational characteristics of an interstate roadway where the capacity of the mainline is dictated by the density of traffic along the mainline segment. The majority of the study area segments currently operate at a LOS E or better.

Traffic volumes are projected to increase at an annual rate of 1.5 percent per year, which was determined using historic traffic data and the South Carolina Statewide Travel Demand Model).[7] For the No-Build scenario, the increased traffic volumes by 2040 would result in increased traffic

[7] STV Incorporated, *Interstate 85 Widening Traffic Analysis Report*, June 19, 2015

density and reductions of LOS. 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 2040 No-Build PM Peak hour densities range from about 1.6 to about 34.0 times **higher** than the threshold density for LOS F, which is 45.*

The additional capacity provided by the construction of a third lane in each direction along I-85 will result in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions. Projections for 2040 show the I-85 corridor at Exit 80 carrying 87,600 AADT, with a LOS C at AM peak hours and a LOS E at PM peak hours. At Exit 96, I-85 is projected to carry 64,600 AADT in 2040, with both a LOS B and LOS C at AM peak hours and a LOS D at PM peak hours (refer to Figure 1.3, page 9 and Table 1.2, page 11).

The 2040 Build analysis results indicate that during the AM peak hour, all freeway segments operate at LOS B or C and during the PM peak hour, all freeway segments operate at LOS D or E. The segments that operate at LOS E are located between Exits 80 and 90 on the southern end of the study area and include the interchanges at Exits 83 and 87.

1.4.1.2 Design Criteria

Substandard interchanges included in this project corridor need to be brought into conformance with state and federal design criteria. Their lack of adequate merging and sight distances, as well as their inadequate on- and off-ramp designs require substantial improvements to bring them up to current standards.

The interchanges at Exits 85, 87, 95 and 96 contain slip ramps that connect the interstate directly to frontage roads rather than to the crossing roadways as in typical interchanges. These slip ramps have insufficient lengths causing motorists to either decelerate while on the mainline when approaching the exit or to quickly decelerate with limited distance on the slip ramp. When motorists slow down to utilize the slip ramps, the free flow of interstate traffic is inhibited. When motorists exit the interstate too fast they have less time to react to traffic moving along the frontage roads. The shorter on-ramps do not provide adequate distance for vehicles entering the interstate to reach the posted speed limit before attempting to merge with traffic. The proposed interchange modifications at Exits 85, 87, 95 and 96 would upgrade the interchanges to meet current roadway design criteria and requirements and eliminate the slip ramps, therefore improving mobility along the interstate.

Vertical clearances are currently insufficient at the following overpasses: SC 110 (Exit 83); S-131 (Sunny Slope Drive, mile marker 85); S-39 (Exit 87); and, S-11-82 (Exit 95).[8] As the roadway is widened to six lanes along the study area, the horizontal clearance would be insufficient to meet

[8] SCDOT Office of Planning, *I-85 Corridor Analysis Spartanburg and Cherokee Counties*, January 10, 2014

current design standards. Therefore, improvements to vertical and horizontal clearances at these locations are part of this project.

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

Based upon recent accident data, there is a need for improving accessibility and creating safer connections to surrounding roadways along the I-85 project area. Modifications at the four interchanges would bring them to design standards and help improve safety at and around those interchanges. Therefore, the secondary purpose of this project is to enhance the overall travel safety in the corridor.

SCDOT provided accident data for the I-85 study area, which includes access points at the following interchanges:

- Exit 82 (Bud's Drive)/Exit 83 (Battleground Road);
- Exit 87 (S. Green River Road);
- Exit 95 (SC 18 – Gaffney); and,
- Exit 96 (Shelby Highway).

According to SCDOT data, the average SC interstate crash rate is 85.62 crashes per 100 million miles traveled. The crash rate for this project corridor was determined to be 108.50 crashes per 100 million miles traveled, which is nearly 27 percent more than the State crash rate.

The Accident Analysis Report (refer to Appendix A) shows that between January 2011 and December 2013, a total of 1,019 accidents (average of 339 per year) occurred along the I-85 project area, including interchanges and intersecting roadways.[9] A summary of accident data for I-85 is included in Table 1.3, page 14. The most common accident type was "collision with fixed object," comprising 358 of the 902 total crashes (40 percent) occurring on the interstate mainline and ramps. Another 117 crashes occurred on surrounding roads in the vicinity of each of the interchanges. The mainline/interstate accidents resulted in 155 injuries and six fatalities during this time period. These collisions are attributable to the lack of adequate merging distances (short on- and off-ramps) and include collisions with a guardrail, median or fence due to their close proximity to the road. Rear-end collisions (27 percent) and sideswipes in the same direction (14 percent) were the next most common crash types along the I-85 project corridor. Rear-end collisions tend to occur as a result of congestion along a roadway with stop-and-go traffic. Traffic slowing to below the prevailing travel speed on the interstate, prior to exiting or entering the interstate, contributes to congestion along the roadway.[10]

[9] Bihl Engineering, LLC, *Accident Analysis Report I-85 Widening Project MM 80 to MM 96 Spartanburg and Cherokee Counties, SC*, December 2014 (rev. March 2015)
[10] *Ibid*

Table 1.3
Accident Summary for I-85 Between Mile Markers 80 and 96
January 2011 through December 2013

Location on I-85	Total Crashes	Injuries	Fatalities	Rear End	Angle	Side	Other*
Between Mile Marker 80 and Exit 82	117	17	0	59	7	14	36
Exit 82	97	17	1	34	3	9	51
Exit 83	116	13	0	38	6	20	52
Between Mile Marker 83 and Exit 87	59	8	2	16	4	6	33
Exit 87	58	7	0	15	3	8	31
Between Exit 87 and Exit 95	287	64	2	57	27	44	158
Exit 95	56	10	0	11	0	17	28
Exit 96	112	19	1	18	9	14	71
Total Interstate & Interstate Ramp crashes	902	155	6	248	59	132	460
Surrounding Roadways	117	n/a	n/a	n/a	n/a	n/a	n/a
Total	1,019	155	6	248	59	132	460

**includes "not a collision with a motor vehicle," head-on, rear-to-rear*
n/a – data not available
Source: Accident Analysis Report I-85 Widening Project MM 80 to MM 96 Spartanburg and Cherokee Counties, SC

The surrounding roadways at Exit 95 east of I-85 (Hampshire Drive and SC 18 from Matthew Drive to the S-82 Overpass) experience approximately half of the crashes that occurred on the surrounding/non-interstate roadways in the study area. Modifications at this interchange would improve operations in this area leading to a reduction in the number of accidents.

Design improvements to these interchanges that make them consistent with federal and state design and safety standards, including longer on- and off-ramps, would aid in reducing the frequency of crashes. Many on-ramps have limited merging areas and the configuration of the ramp intersections with the frontage roads are not typical and are contrary to drivers' expectations, causing driver confusion and reducing safety.

An analysis was conducted to compare crash rates at the interchanges of Exit 83 and Exit 90. Exit 83 is considered to have a substandard interchange geometric design; while Exit 90 is an upgraded interchange and includes a geometric design that meets state and federal design standards. The analysis showed that Exit 83, with its substandard geometric interchange design,

had about a 1.7 times higher crash rate than Exit 90. This demonstrates the benefits the proposed improvements would provide to improve safety.

1.5 What funding is in place to build the project?

The proposed project is consistent with the Spartanburg Area Transportation Study (SPATS) Long Range Transportation Plan and is included in SCDOT's Statewide Transportation Improvement Program (STIP) for Spartanburg and Cherokee Counties.[11] Act 98 of 2013 provided additional funding for bridge, resurfacing and mainline interstate projects. Act 98 provides an annual appropriation of $50 million to SCDOT, which in turn transfers an equivalent amount to the South Carolina Transportation Infrastructure Bank (SCTIB) to be utilized to finance an estimated $550 million of interstate improvements. This I-85 Improvement project is fully funded by approximately $262 million of the $550 million SCTIB funds.

[11] SCDOT, *Statewide Transportation Improvement Program October 1, 2013 – September 30, 2019*, August 15, 2013

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CHAPTER 2 ALTERNATIVES

During the development of the project there have been several proposed solutions for addressing the needs that have been identified. These solutions, or alternatives, were created for the mainline of I-85 and for each interchange. Some of these alternatives were eliminated from further consideration because preliminary evaluation showed that they were either very similar to other alternatives, had elements that made them function poorly, or had substantially greater impacts or costs than other alternatives. Alternatives that can be eliminated early in the process are termed *Alternatives considered, but eliminated*.

The remaining alternatives have to be evaluated in greater detail to fully understand the benefits and costs. These are termed *Reasonable Alternatives* and are analyzed more thoroughly in order to determine which would be the best to accomplish the purpose for the project while minimizing impacts to the human and natural environments. Only after completion of this more rigorous assessment can an alternative be designated as the *Preferred Alternative*.

2.0 How were the alternatives developed and evaluated?

The alternatives were developed based upon the needs indicated by the *I-85 Corridor Analysis Spartanburg and Cherokee Counties*,[12] traffic projections contained within the *Interstate 85 Widening Traffic Analysis Report*,[13] state and federal design requirements for highway design that are contained within the *I-85 Design Criteria* document,[14] and consideration of the natural and man-made features found within the study area.

Only one mainline alternative was developed with the intent of adding the additional lanes to the inside of the interstate, in the existing median. This is because:

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

There were locations where the separation between the interstate and frontage road is too narrow to accommodate the required clear zone or where the differences in elevation require some construction between the interstate and the frontage road to overlap and encroach on one of the other. In these cases the widening extended beyond the existing right-of-way for the interstate. After an initial design for the mainline widening was developed, the alignment was refined at specific locations to minimize impacts to the extent possible. Thus, there was only one

[12] SCDOT Office of Planning, *I-85 Corridor Analysis Spartanburg and Cherokee Counties*, January 10, 2014
[13] STV Incorporated, *Interstate 85 Widening Traffic Analysis Report*, June 19, 2015
[14] Infrastructure Consulting and Engineering, PLLC, *I-85 Spartanburg/Cherokee Counties MM 80-96 South Carolina Design Criteria*, April 2015 (rev.)

build mainline alternative, with modifications made in response to comments and where design changes could be made that would result in reductions of impacts.

There were many alternatives developed for the interchanges. Each interchange had unique challenges. Streams are found around the interstate interchanges at each of the alternatives. Separating the frontage roads from the interchange ramps at each interchange meant relocating the frontage roads while maintaining the existing connectivity. At Exit 83, Mountain View Baptist Church and the existing commercial and light industrial development around the interchange provided constraints on the design. At Exit 87, the existing commercial development and communities along the frontage road, at both Old Post Road and at Webber Road, affected the design options for the frontage road relocations. Exit 95 was perhaps the most challenging, constrained by existing development, the Providence Branch and Lake Whelchel floodplains, significant elevation changes, and the necessity to maintain the elevation of the Lake Whelchel spillway. Exit 96 had to be designed with consideration for Cherokee Speedway and address proposed future traffic needs of the proposed Lee Nuclear Station power generating facility currently in the permitting process.

Initially, there were six alternatives developed for Exit 83, the Battleground Road exit (Alternatives 1, 2, 3, 4, 4a, and 5); four for Exit 87, the Green River Road exit (Alternatives 1 through 4); four for Exit 95, the Pleasant School Road exit (Alternatives 1, 1a, 2, and 2a); and four for Exit 96, the Shelby Highway exit (Alternatives 1, 1b, 2, and 2b). After reviewing these alternatives, several were eliminated (these are discussed in Section 2.2.2, *What alternatives were considered but eliminated, and why?*).

This first screening resulted in the conceptual alternatives that were presented at the two Public Information Meetings held in March 2015 (refer to Public Comment Summaries for *Public Information Meetings for March* in Appendix B for graphics of these alternatives). There were three alternatives for Exit 83, three for Exit 87, two for Exit 95, and three for Exit 96. The public and local officials provided many comments on the various alternatives, recommendations for changes, and suggestions for new alternatives.

As a result of comments received at the Public Information Meetings, changes were made to many of the alternatives. The proposed new road connecting Phillips Road and Truck Stop Road for Alternative 1 at Exit 83 was shifted east and a cul-de-sac was added for the CPC Commodities parcel along Edgefield Road. At Exit 87 the Webber Road frontage road replacement was extended west to Victoria Road for Alternative 3. The spacing was reduced between the frontage road on the southern side of the interchange ramp intersection at Exit 96 for Alternative 1. This allowed the use of existing Shelby Highway instead of moving the road south that lowered costs and avoided impacts to an unnamed stream south of Shelby Highway.

The revised alternatives were then evaluated for their ability to satisfy the purpose and need for the project and their potential impacts to features of the human and natural environments, including:

- Wetlands;
- Streams;
- Floodplains;
- Protected species;
- Cultural resources (historical and archaeological sites);
- Air quality;
- Land use types;
- Section 4(f) resources (certain historical sites and parks);
- Relocations of residences and businesses;
- Socioeconomics;
- Communities (including environmental justice evaluations);
- Noise;
- Farmlands; and
- Hazardous material sites;

as well as the constructability of the alternatives, potential impacts to the traveling public during construction, and the cost of constructing each alternative.

Constructability is a measure of the effect on the operation of existing interchanges during construction. Segments of all the interchanges would be closed at some point during the construction process. Some for duration as short as a day others for as long as six months. The determination of a rating for "constructability" is based upon the extent of the closure, both the amount of the interchange that would be closed at the same time and the length of time it would be closed.

Certain of these impact categories are essentially the same for all the alternatives. The air quality for each of the Reasonable Alternatives are essentially the same. It should be noted that the No-Build may have air quality impacts that the Reasonable Alternatives would not. There is the potential for the Northern long-eared bat (NLEB), a recent addition to the list of protected species, to be found in the study area. A survey of the bridges found no evidence of the NLEB, however the generic nature of the summer habitat of the bat means that it could be found through most of the study area. SCDOT has accepted restrictions on the time of certain construction activities throughout the project to avoid potential impacts to the bat.

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 interchange alternative to be compared against the others for that interchange and one Preferred Alternative to be identified for each interchange. The best interchanges can then be combined with the best mainline alternative to produce an overall Preferred Alternative for the project.

The mainline widening of I-85 refers to the portions of the interstate outside the areas of interchange improvements. The mainline was divided this way because each interchange alternative has slightly different designs that affect the ramp locations and lengths. These in turn affect the mainline. Therefore, the segment of the mainline within each interchange alternative were considered as part of the interchange. The mainline includes the bridge replacement at

Sunny Slope Drive and the frontage road realignments at Exit 90. The Sunny Slope Drive bridge replacement alternatives were compared against one another and are included with the mainline impacts (refer to Table 2.1, Alternatives Analysis Matrix, page 21).

2.1 What are the alternatives for the Mainline Widening of I-85?

2.1.1 What is the No-Build Alternative?

The No-Build Alternative is the alternative that represents the existing conditions and no changes to those conditions. The No-Build serves as the baseline for measuring impacts, compared against the Build (Reasonable) Alternatives. In the No-Build scenario, the mainline would not be widened. Many of the impacts associated with the construction would not occur, but the improvements to traffic flow would also not happen.

While the No-Build Alternative would have none of the impacts associated with the construction of the Preferred Alternative, it would not satisfy the purpose and need. The projected traffic congestion for the No-Build would have impacts, such as economic costs from time lost while stuck in traffic, increased accidents, and increased air emissions from idling engines, which would not result from the Build Alternatives. This congestion results from increased traffic without adding capacity, especially at peak hours.

In 2040, the No-Build PM Peak Levels of Service (LOS) and traffic densities for the project area are projected to be F/70.7 to F/1531.4 (refer to Table 1.2 – Existing and Future Conditions for Segments, page 11). The 2040 No-Build AM Peak LOS/Density is projected to be C/25.0 to F/48.5. A LOS F, the lowest LOS rating, occurs when the volume of traffic exceeds the capacity of the facility. As such, the 2040 projections indicate that the No-Build Alternative would result in traffic densities many times greater than the threshold density for the LOS F for all segments in the PM peak, thus greatly increasing congestion along the interstate. The No-Build AM peak LOS varies between C and F. The Build Alternatives would have PM LOS that ranges from D to E, while the AM traffic LOS ranges from B to C.

Density of traffic is measured in passenger cars per mile per lane, per the Highway Capacity Manual.

2.1.2 What alternatives were considered but eliminated, and why?

For the mainline there were no alternatives considered but eliminated. However, changes were made to the mainline alternative to reduce impacts to adjacent properties and resources where allowed by design criteria and other considerations.

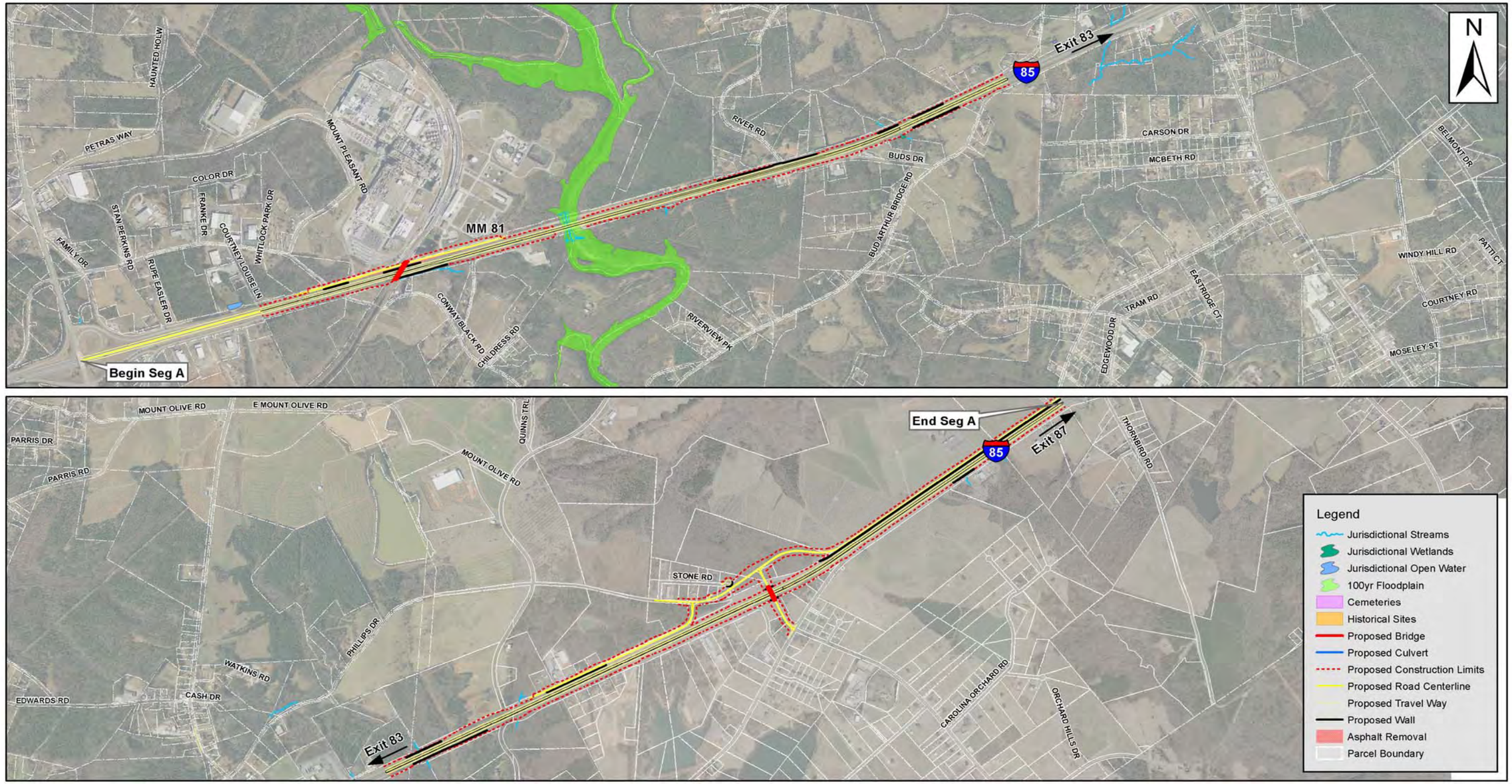
2.1.3 What are the Reasonable Alternatives that were further evaluated?

There is one mainline Reasonable Alternative that was further evaluated (refer to Figures 2.1A-C, pages 22 to 24). However, it includes two alternative designs for the Sunny Slope bridge replacement (refer to Figures 2.2 and 2.3, pages 25 and 26). The mainline for I-85 adds the two new travel lanes in the median. There are areas where the frontage road is too close to the outside lane of the existing interstate to meet current clear zone requirements, which lead to the shifting of the adjacent frontage road.

Table 2.1
Reasonable Alternatives Analysis Matrix

Categories	**Mainline Alt 1**	**Sunny Slope Alt 1**	**Sunny Slope Alt 2**	**Exit 83 Alt 1**	**Exit 83 Alt 2**	**Exit 83 Alt 3**	**Exit 83 Alt 4**	**Exit 87 Alt 1**	**Exit 87 Alt 2**	**Exit 87 Alt 3**	**Exit 87 Alt 4**	**Exit 87 Alt 5b**	**Exit 95 Alt 1**	**Exit 95 Alt 2**	**Exit 96 Alt 1**	**Exit 96 Alt 2**	**Exit 96 Alt 3**
Meets P&N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constructability*		VC	VC	VC	VC	D	VC	E	VC	D	D	D	VC	VC	VC	VC	VC
Cost (Millions)	$125.6	$13.5	$15.9	$24.9	$22.8	$25.2	$23.4	$32.7	$37.4	$38.4	$38.3	$38.4	$26.8	$27.3	$24.2	$23.7	$22.6
Wetlands (acres)	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.17	0.17	0.00	0.00	0.00	0.02	0.00	0.00
Streams (linear feet)	77	0	0	454	312	480	312	369	611	970	970	369	1,613	399	0	226	226
Ponds (acres)	0	0	0	0	0	0	0	0.54	0.91	0	0	0.84	0	0	0	0	0
Floodplains	2 Zone A Floodplains, Irene Creek & Broad River	No	No	No	No	No	No	No	No	No	No	No	2 Zone AE Floodplains, Providence Branch & Lake Whelchel	1 Zone AE Floodplain at Providence Branch	No	No	No
T and E Species	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**	No**
Historical Sites	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Archaeological Sites	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Section 4(f) Sites	De minimis	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Relocations																	
- Business	1	0	0	3	3	4	2	6	2	4	4	6	6	4	9	2	2
- Residential	3	1	1	1	3	5	2	6	5	4	3	2	9	5	1	0	0
- Vacant Commercial	1	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1
- Other***	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Noise Impacted Receptors	377			116	115	116	116	31	33	35	35	31	116	77	14	15	16
-Residential (NAC B)	178			17	16	17	17	21	22	24	24	21	91	73	14	15	16
-Schools & Churches (NAC C)	75			98	98	98	98	10	10	10	10	10	4	4	0	0	0
-Hotels (NAC E)	124			1	1	1	1	0	1	1	1	0	21	0	0	0	0
Hazardous Material Sites	2	0	0	3	2	2	2	0	0	0	0	0	3	3	1	1	1
Farmlands (acres)	209.3	12.2	11.2	13	10.2	14.4	8.9	22	34.4	34.1	35.8	28.4	8.5	10.2	13.4	12.7	12.1

*"Constructability" is defined as Very Constructible (VC), Difficult (D), and Extremely Difficult (E, Closure of entire interchange for extended period during construction).
**The Northern long-eared bat (NLEB) may occur in the study area. Avoidance and Minimization Measures will be implemented to avoid impacts to the NLEB.
***"Other" refers to utility facility.



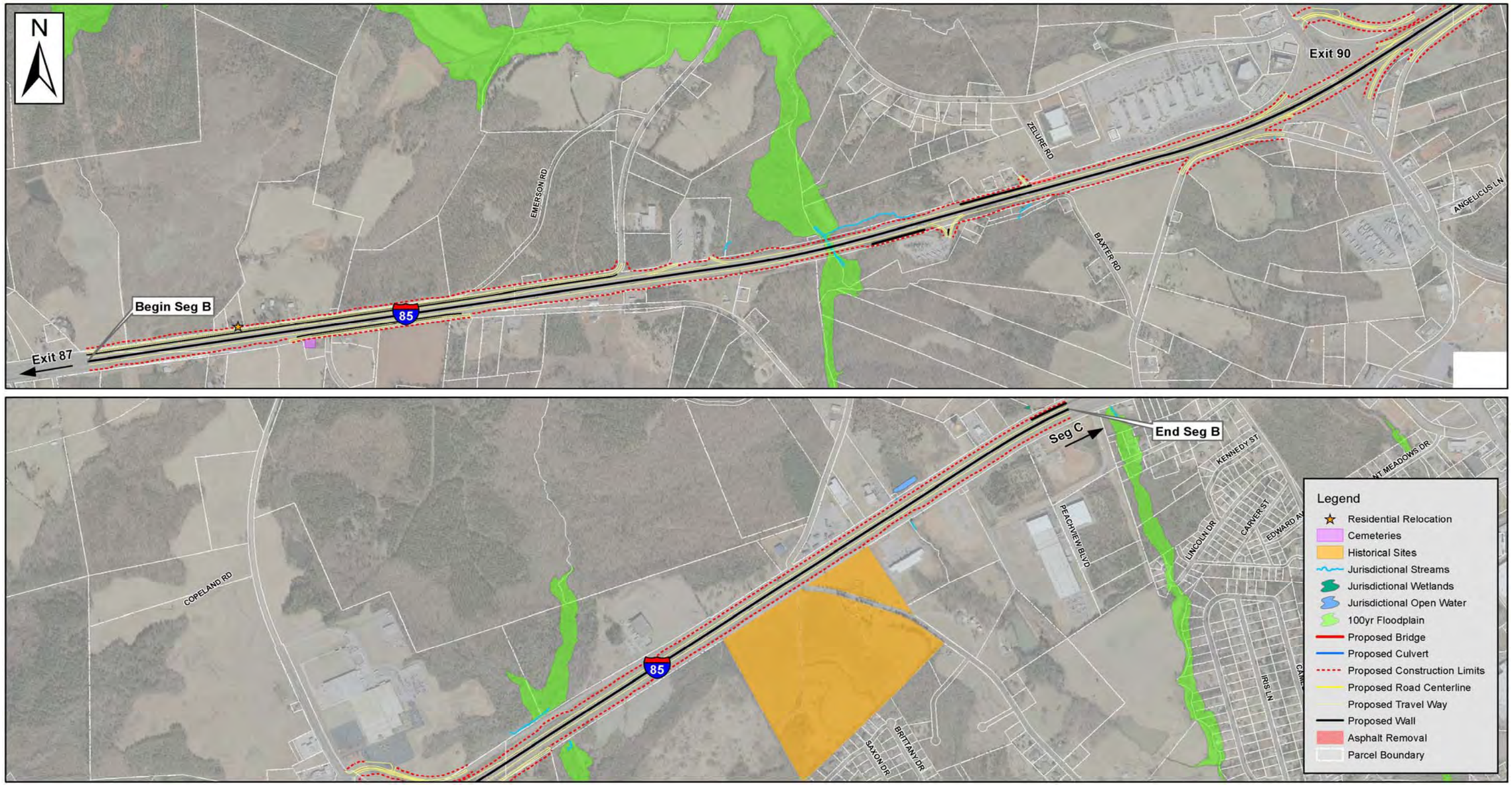
South Carolina Department of Transportation

1 inch = 1,500 feet

I-85 Widening MM 80-96 Environmental Assessment

Mainline - Seg A

Figure 2.1A



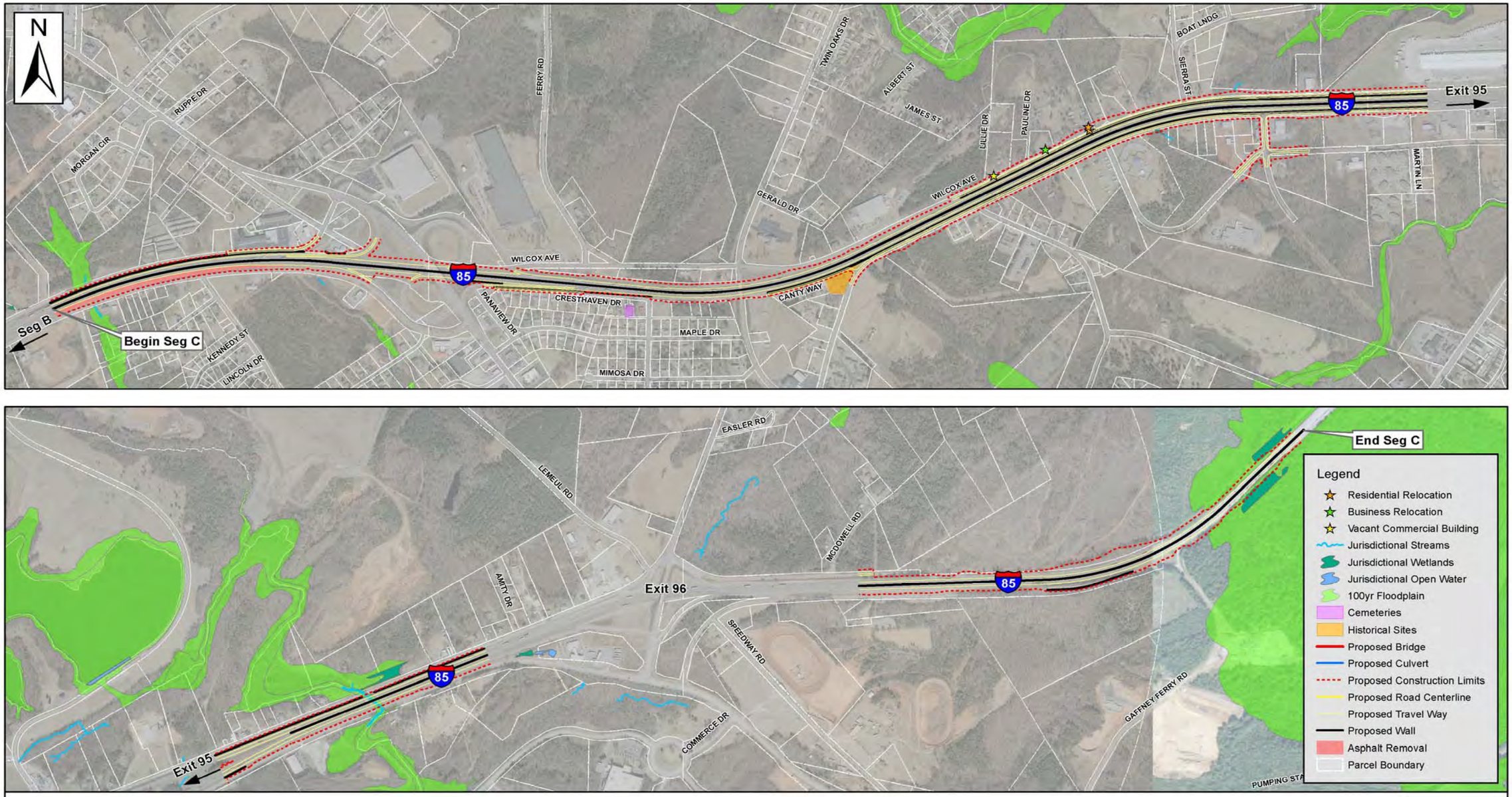
South Carolina Department of Transportation

1 inch = 1,000 feet

I-85 Widening MM 80-96 Environmental Assessment

Mainline - Seg B

Figure 2.1B



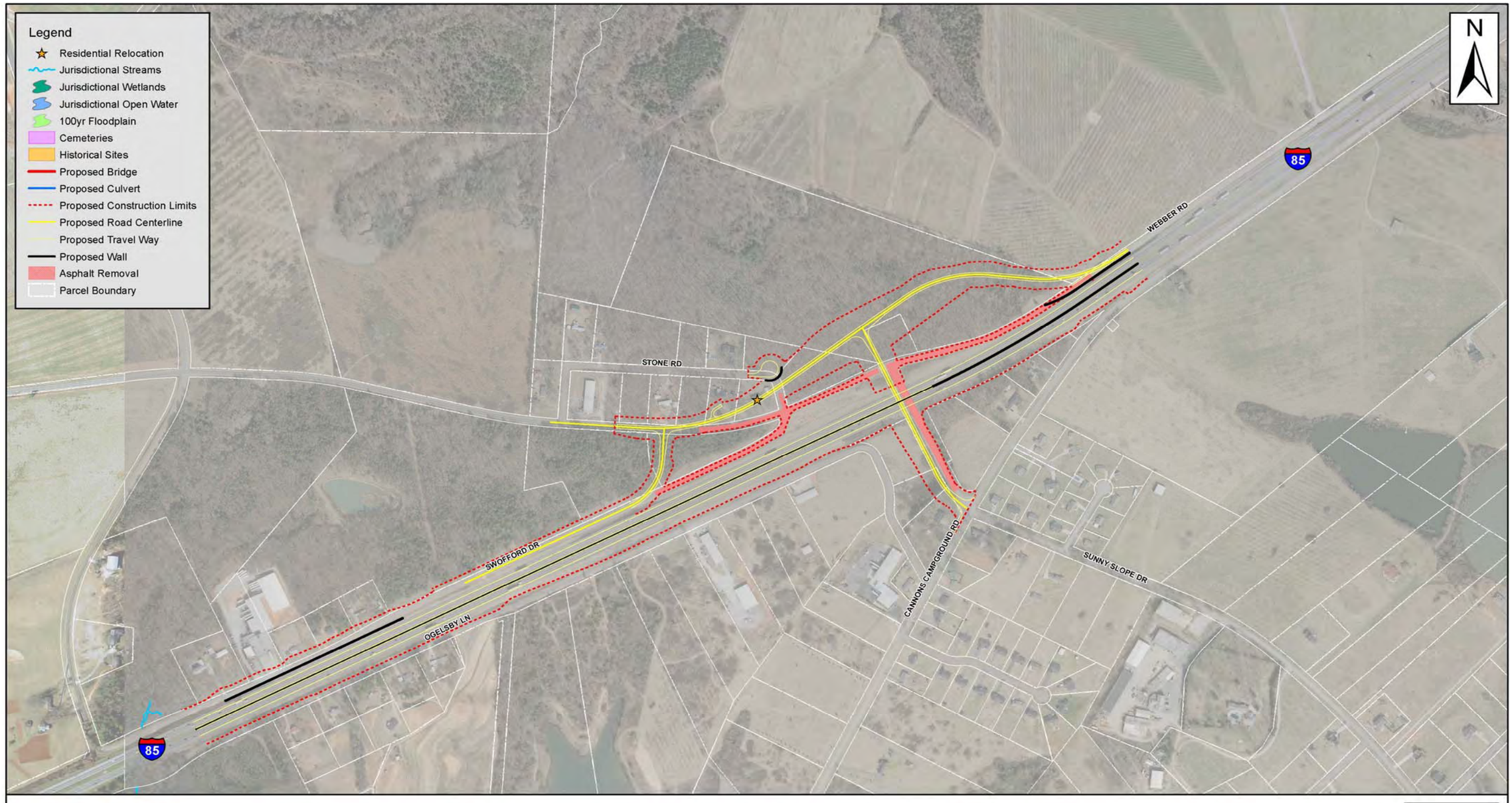
South Carolina Department of Transportation

1 inch = 1,000 feet

I-85 Widening MM 80-96 Environmental Assessment

Mainline - Seg C

Figure 2.1C



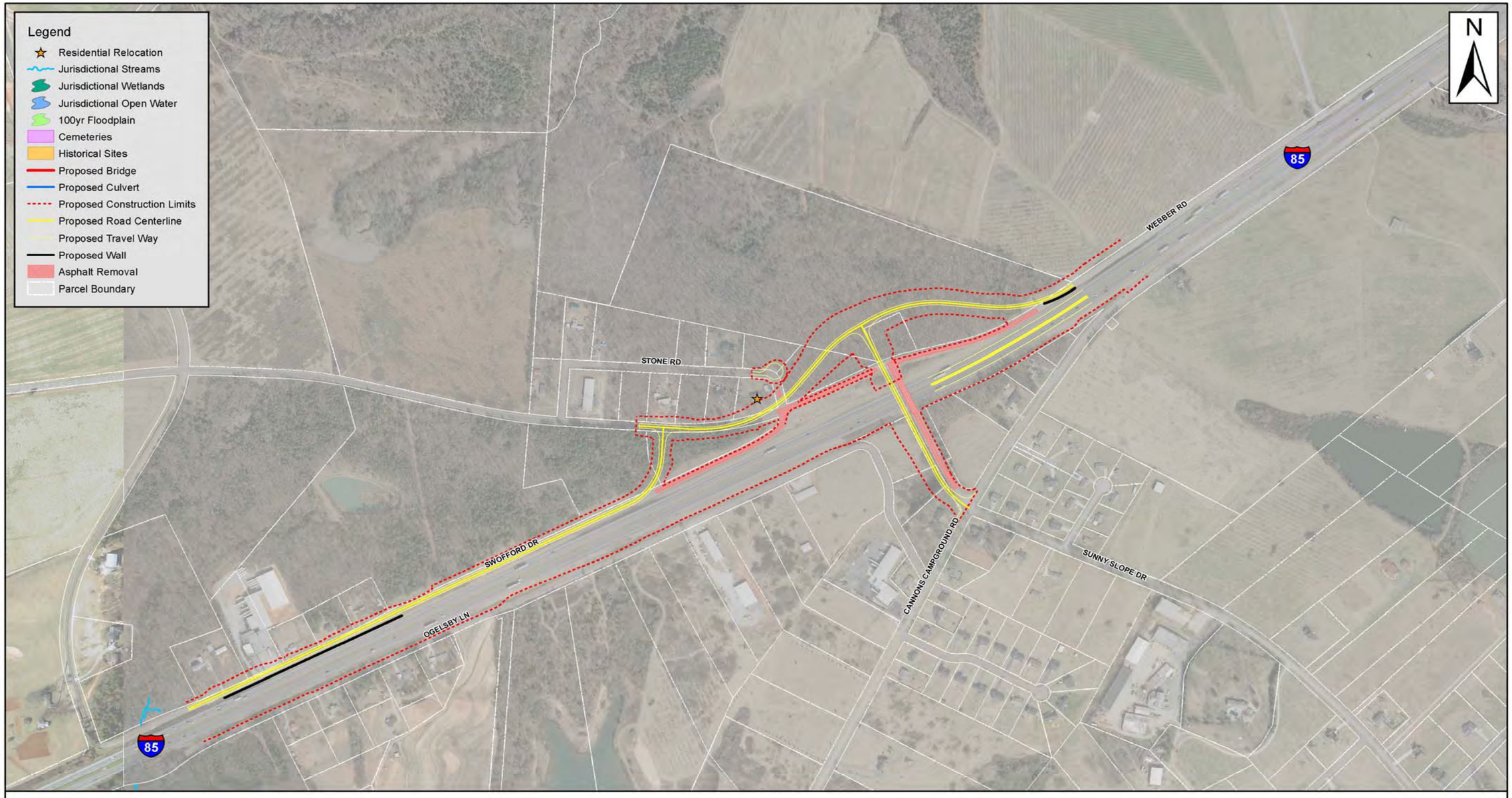
SCDOT
South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Sunny Slope - Alt 1

Figure 2.2



SCDOT
South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Sunny Slope - Alt 2

Figure 2.3

Mainline Alternative

The mainline widening alternative would widen the existing four lanes to six lanes from just north of Gossett Road (where the current six lanes end) to just short of the Broad River Bridge, approximately 17 miles in length. Other improvements made along the Mainline would also include:

- Construction of a mechanically stabilized earth wall to minimize impacts to the stream east of railroad bridge crossing I-85 near MM 81;
- Closure of the slip ramp onto Buds Drive, west of Battleground Road;
- Realignment of a portion of the Zelure Road loop intersection where the road fronts the interstate;
- Realignment of Lemmons Lane, the frontage road southwest of Exit 90;
- Realignment of Peachoid Road, the frontage road northeast of Exit 90;
- Realignment of Winslow Avenue, the frontage road southeast of Exit 90;
- Realignment of a portion of Cresthaven Drive, the frontage road southeast of Exit 92;
- Construction of a curb and gutter at Canty Way and Cresthaven to reduce impacts;
- Realignment of Canty Way with a modification to its intersection with Hampshire Drive;
- Closure of the slip ramp at Exit 95 onto Hampshire Drive and realignment of Hampshire Drive westward as it fronts the interstate;
- Realignment of Wilcox Avenue west of UPS Freight ending less than 200 yards from Lillie Drive;
- Realignment of Wilcox Avenue west of I-85 at Exit 96; and,
- Closure of the slip ramp onto I-85 North from Gaffney Ferry Road.

It was also determined during the development of the mainline alternative that walls would be used to separate the frontage road from the interstate in areas where the use of walls could limit the amount of right-of-way on the outside of the frontage wall that would be required. However, where these walls are to be constructed for a section with three travel lanes in one direction, it was determined that they should be located to accommodate a future fourth lane. This is to prevent, when in the future a fourth lane becomes necessary, the removal of the walls, acquisition of more right-of-way and reconstruction of new walls. While this will require some additional right-of-way now, it would allow SCDOT to widen the interstate in the future to four lanes in one direction without further encroachments into adjacent properties. It also would save, at that point in the future, cost of demolishing the wall and having to rebuild it.

Sunny Slope Drive

While there is one build alternative proposed for the mainline of I-85, there are two alternatives for the bridge replacement at Sunny Slope Drive (S-11-131) along the mainline. The existing bridge over the interstate was identified in the 2014 *I-85 Corridor Analysis Spartanburg and Cherokee Counties*[15] as being two feet too low in height to meet current FHWA standards. In

[15] SCDOT Office of Planning, *I-85 Corridor Analysis Spartanburg and Cherokee Counties*, January 10, 2014

order to raise the bridge, the distance needed to get Sunny Slope Drive back down to the existing grade will push the frontage roads farther to the north.

Alternative 1

Alternative 1 would be built to the west of the existing bridge. It is rated as Very Constructible and would result in no impacts to wetlands, streams, open water ponds, or potential hazardous material sites. Alternative 1 would impact 43.3 acres of farmlands, 0.3 acres more than Alternative 2. The cost to construct Alternative 1 is $13.5 million.

Alternative 1 would result in the realignment of Webber Road beginning near its intersection with Camp Road. One residence would be relocated with this realignment. Additionally, Alternative 1 would result in the realignment of Swofford Drive from where it currently intersects Webber Road to a new intersection constructed to access the frontage road.

Alternative 2

Alternative 2 also would be built west of the current bridge and is rated as Very Constructible. It would result in no impacts to wetlands, streams, open water ponds, or potential hazardous material sites. Alternative 2 would impact 43 acres of farmlands and would cost $15.9 million to construct.

Alternative 2 would result in relocation of the same single residence near the existing intersection of Webber and Stone Roads as Alternative 1. Like Alternative 1, Alternative 2 would result in realignment of Webber Road and modifications to its intersections with Swofford and Cannons Campground Roads. Since both the Alternatives at Sunny Slope Drive would have essentially the same impacts, Alternative 1 was designated as preferred because of its lower cost, more than $2 million less than Alternative 2.

The overall mainline widening (approximately 17 miles) would have no impacts to archaeological sites. It would impact 77 linear feet of streams, 0.247 acres of wetlands, and 209.3 acres of farmlands. It would cross two Zone A floodplains associated with Irene Creek and Broad River. No ponds along the mainline would be impacted. There would be 377 noise receptors impacted by the mainline widening.[16] The alternative would require right-of-way from two potential hazardous materials sites.

The two potential hazardous material sites (Auriga Polymer near MM 82 and the UPS Facility at Exit 95) would have right-of-way taken from them. The mainline widening would result in the conversion of 17.2 acres of farmland soils. The total cost of the mainline widening is $139.1 million, including the Sunny Slope Drive bridge.

The mainline alternative would result in four residential and one business relocation in Cherokee County; there would be no residential or business relocations in Spartanburg County. One residence that would be impacted is located on Webber Road, just east of Sunny Slope Drive. Another is on Old Post Road near Magg Road (less than one mile east of Exit 87). Two mobile

[16] Edwards-Pitman Environmental, Inc. *Preliminary Noise Analysis*, May 11, 2015

homes located on Wilcox Avenue between Pauline Drive and Sierra Street, one mile west of Exit 95, would be impacted. The business that the mainline alternative would impact is also located on Wilcox Avenue, adjacent to its intersection with Pauline Drive. Other businesses and residences may experience loss of right-of-way as a result of frontage road realignments and interchange reconfigurations.

One historical site (119 Canty Way) would have right-of-way taken from it as a result of the widening. However, this has been coordinated with the State Historic Preservation Office (SHPO), which concurred with a finding of no adverse effect to this site under Section 106 of the National Historic Preservation Act of 1966.[17] In addition, this would constitute a *de minimis* use under Section 4(f) of the US Department of Transportation Act of 1966.

119 Canty Way

2.2 What are the alternatives for Interchange Improvements?

These alternatives consist of the No-Build Alternative, Alternatives considered, but eliminated, and the Reasonable Alternatives. The alternatives for each interchange were compared against one another to determine which best met the purpose and need with the least impacts.

2.2.1 What are the No-Build Alternatives?

The No-Build Alternatives for the interchanges are the same as for the mainline; alternatives that represent the existing conditions and no changes to those conditions. Many of the impacts associated with the construction of the interchanges would not occur, but the interchanges would continue to be out of conformance with current state and federal design standards. This would not satisfy the purpose and need for the project.

While there would be none of the impacts associated with the construction of the Build or Reasonable Alternatives, the No-Build could have impacts. The short entrance and exit ramps would remain and traffic conflicts between frontage road and interstate ramp traffic would continue. Examples of these conditions are the short entrance ramps for southbound and northbound traffic at Exit 83, the "slip ramp" at Exit 83 northbound that intersects with frontage road traffic within 500 feet of entering the exit ramp, the intersecting frontage road and entrance ramp for southbound and northbound traffic at Exit 87, the two consecutive left turns (a virtual "U turn") for all vehicles moving from the northbound exit ramp at Exit 95 onto Pleasant School Road, the lack of a northbound entrance ramp at Exit 95, and the intermingling of traffic entering and exiting the southbound interstate with local frontage road traffic would persist. In addition, exit ramps with insufficient lengths can lead to traffic backing up onto the interstate during peak

[17] Letter from David Kelly (SCDOT) to Sarah Stephens (SCDAH), *Cultural Resource Survey*, July 22, 2015

times. As traffic in the area increased over time, the inherent safety problems of these situations would be anticipated to lead to more accidents.

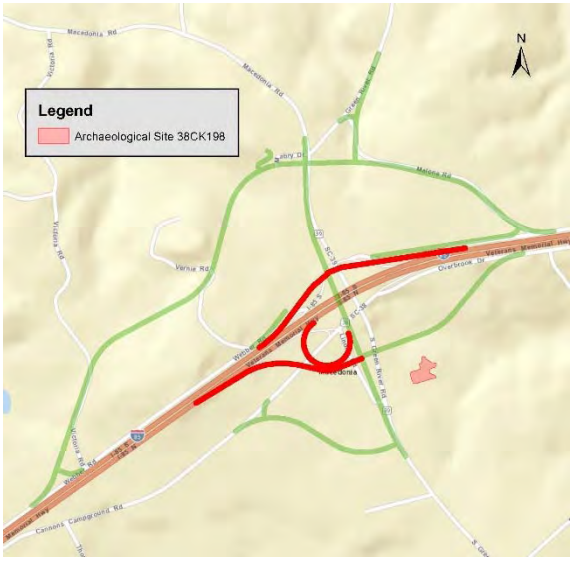
2.2.2 What alternatives were considered but eliminated, and why?

As mentioned in Section 2.0 Alternatives, page 17, there were several preliminary alternatives developed for each interchange. Many of the alternatives had the same interchange design, but with different frontage road alignments. 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 six preliminary alternatives initially developed for Exit 83, four for Exit 87, four for Exit 95 and four for Exit 96. Three of the six for Exit 83 were eliminated. One of these had a partial cloverleaf in the quadrant with Mt. View Baptist Church, which would have caused the relocation of the Church. One had a partial cloverleaf in the southeast quadrant and a diamond on the north side of I-85 and was eliminated because the other designs provided the same benefits to traffic movement as this alternative. One other alternative was similar to the second one, but had a roundabout at the intersection nearest the interchange. The traffic volumes did not warrant a roundabout, which would have a larger "footprint" than a conventional intersection.

At Exit 87 one diamond interchange was eliminated that had an "S" curve that extended through the interchange, which is less desirable from a design perspective. There were two alternatives eliminated at Exit 95 because the frontage road intersections were too close (less than the 750 feet preferred by SCDOT Traffic Engineering) to the interchange. Likewise at Exit 96, there was an alternative eliminated for the same reason.

After the Public Information Meetings, a fifth alternative, Alternative 5a for Exit 87 was developed to avoid an archaeological site (38CK198) that had been identified in the initial survey and was considered potentially eligible for listing on the National Register of Historic Places (NRHP). In order to avoid Site 38CK198, the frontage road (Overbrook Drive) that intersects with Green River Road was moved to the north, closer to the interstate. That relocated frontage road was adjacent to and overlapping with Stream #26 in the southeastern quadrant of this interchange. This caused this alternative to have the most stream impacts (1,957 linear feet) of any the proposed alternatives for Exit 87.



Exit 87 Alternative 5a - Eliminated

After more detailed archeological survey work determined that site 38CK198 was not eligible for listing on the NRHP there was no longer a need to avoid it. Since there were other alternatives that had less

stream impact (coupled with the substantial impacts this alternative had to Stream #26) and were similar in design to Alternative 5, this alternative was eliminated from further consideration.

2.2.3 What are the Reasonable Alternatives that were further evaluated?

After eliminating the alternatives described above from further evaluation, modifications were made to several of the Reasonable Alternatives in response to comments received during and after the Public Information Meetings. Changes to avoid relocations of businesses and homes and to minimize impacts to some of the small communities located adjacent to the interchanges were made. The specific changes made per interchange are summarized here:

Exit 83 –

- shifted the access road from Phillips Drive to Westar Travel Plaza farther to the east to avoid going between two homes and
- added a cul-de-sac on Edgefield Road for the CPC Livestock Nutrition facility.

Exit 87 –

- developed new frontage road options that did not bisect the Macedonia Baptist Church park and
- extended the frontage road in the northwest quadrant of the interchange farther to the west to connect with Victoria Road instead of splitting the residences along Webber Road.

Exit 95 –

- modified the design to move the frontage road intersection in the northeastern quadrant for one alternative off of the streams in that quadrant to minimize the stream impacts and
- shifted a frontage road south to reduce impacts to the employee parking area at UPS.

Exit 96 –

- moved the frontage road intersection on the south side of the interchange within the preferred 750-foot spacing (as approved by SCDOT Traffic Engineering) to avoid stream impacts and higher costs due to steep grade south of Shelby Highway.

There were also additional interchange alternatives developed for Exits 83 and 87 to respond to questions and concerns raised by commenters and in effort to minimize impacts. One additional Reasonable Alternative, Alternative 4, was developed for Exit 83. It was essentially a combination of Alternative 1 on the north side of the interstate (a diamond interchange) with Alternative 2 on the south side of the interchange (a partial cloverleaf).

Two more Reasonable Alternatives were developed for Exit 87. Alternative 4 was developed by moving the southern frontage road of Alternative 3 farther to the south, which avoided relocating a residence. In addition to the eliminated Alternative 5a for Exit 87, Alternative 5b was later developed, combining the design of Alternative 4 south of the interstate with a diamond

interchange north of I-85 and had a new frontage road alignment on the north side of the interchange to avoid and minimize impacts to residents and communities.

There were more changes to the alternatives made after more detailed evaluation of the potential benefits and impacts associated with the alternatives. These changes included adding bridges to avoid impacts to streams, using walls to avoid or minimize the placement of fill in streams, slight shifting of alignments to avoid stream impacts, and relocating proposed frontage roads to avoid businesses and residences. The specific changes made per interchange are summarized here:

Exit 83 –

- shifted the widening of Phillips Drive to the south to avoid impacts to a stream for Alternatives 1 and 4.

Exit 87 –

- relocated the frontage road in the northeast quadrant for Alternative 4 to avoid residences and wetland and stream impacts by reducing separation between interchange intersection and the frontage road intersection; and,
- added a bridge in the southeastern quadrant (for all alternatives) to avoid stream impacts.

Exit 95 –

- modified the design of Alternative 2 to move the frontage road intersection in the northeastern quadrant for one alternative off of the streams in that quadrant to minimize the stream impacts;
- added an intersection realignment to Alternative 2 since it closed Hampshire Drive, a frontage road on the south side of the interstate, thus making Mathew Drive the through street for frontage road traffic; and,
- refined the design of Alternative 2 to provide necessary sight distances, this led to the frontage road in the northwestern quadrant being moved closer to the UPS facility.

Exit 96 –

- added a flat slab bridge in the northeast quadrant for all alternatives to avoid stream impacts; and,
- added a connection road between SC 329 and Speedway Road to provide access to the businesses located on Gaffney Ferry Road.

Table 2.2, page 33, shows how stream impacts were avoided or minimized due to these design changes. The stream impact for Alternative 2 at Exit 83 increased due to the addition of rip-rap for bank stability that was not included in the initial design. The total for Alternative 3 at Exit 96 reflects the final number as reduced by design changes after a Preferred Alternative was designated. For the purposes of the alternatives analysis this was considered with 226 linear feet of stream impact, which is how it is reported in Table 2.1, page 21.

Table 2.2
Stream Impact Reduction Due to Design Refinements (linear feet)

		Exit 83			Exit 87					Exit 95		Exit 96		
	Mainline	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5b	Alt 1	Alt 2	Alt 1	Alt 2	Alt 3
Original Stream Impact	132	573	285	513	710	1,136	1,896	1,845	710	1,613	907	418	657	657
Revised Stream Impact	77	454	312	480	369	611	970	970	369	1,613	399	0	226	122
Stream Impact Reduction	-55	-119	27	-33	-341	-525	-926	-875	-341	0	-508	-418	-431	-535

2.2.3.1 What are the Reasonable Alternatives that were further evaluated for the Exit 83 Battleground Road/SC110 Interchange?

There are four Reasonable Alternatives developed for Exit 83 and they share many common features. They all would meet the purpose and need for the project by bringing the interchange into compliance with current state and federal design requirements. The safety at the interchange will be improved by providing on 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 slip ramp at Buds Drive, just west of the interchange, would be eliminated for all of the interchange alternatives. The slip ramps onto Bud Arthur Bridge Road for northbound traffic and Truck Stop Road for southbound traffic would also be eliminated for all the Reasonable Alternatives. Traffic would no longer use Edgefield Road to access I-85 northbound as this access point would be eliminated. No historical or archaeological sites, wetlands, or floodplains would be impacted by any of the alternatives at Exit 83. There is the potential for the Northern long-eared bat (NLEB) to be found in the study area. The noise impacts varied between 115 and 116 potentially impacted receptors. Alternative 2 had 115 all the others had 116. These numbers were considered effectively equal for purposes of comparing alternatives.

2.2.3.1.1 Exit 83 Alternative 1

Exit 83 Alternative 1 (refer to Figure 2.4, page 35) includes a diamond interchange, with frontage road intersections separated from the interchange intersections by a distance of at least 750 feet. This separation was mandated by SCDOT Traffic Engineering to prevent the operations at each intersection from interfering with one another. This alternative includes a westward shift in the alignment of Battleground Road (SC 110) and construction of a new bridge over I-85. The frontage road on the north side of I-85, Phillips Drive, would be shifted slightly northward, to meet the 750 foot separation requirement. A new road would be constructed south from Phillips Road to provide access to the existing truck stop and other properties in the northeast quadrant of the interchange. Access to Horry

An interchange intersection refers to the points where the entrance and exit ramps from the interstate intersect the crossing road.

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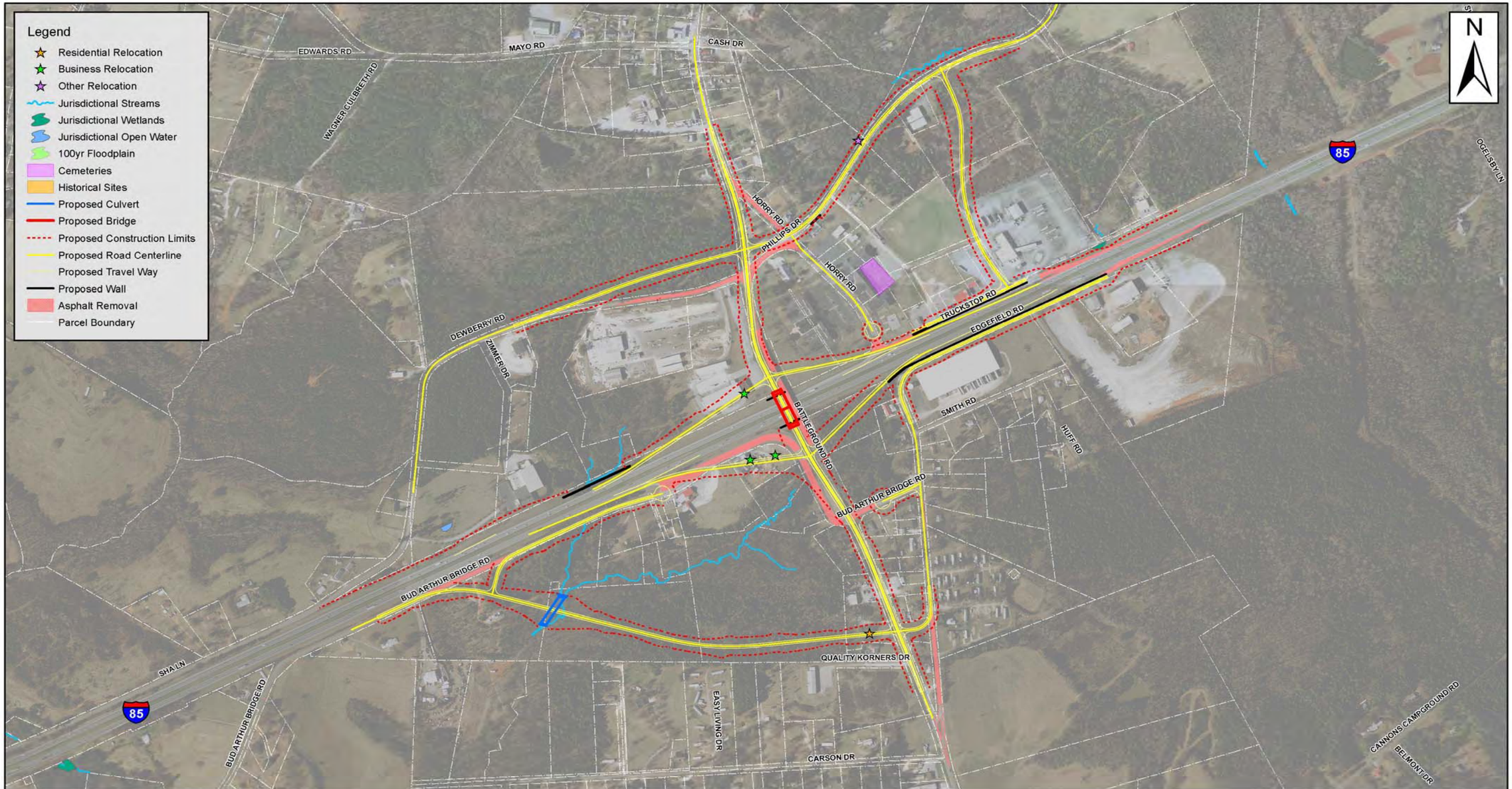

South Carolina Department of Transportation

1 inch = 600 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 83 - Alt 1

Figure 2.4

Road from Phillips Drive would be retained, but a cul-de-sac would be created on the south end of Horry Road that would eliminate through traffic. A segment of Dewberry Road would also be moved slightly north to connect with the realigned Phillips Drive. On the south side, Bud Arthur Bridge Road would be moved to a new location to intersect Battleground Road approximately 800 feet south of the existing intersection and a new connection to Edgefield Road would be constructed.

Alternative 1 is one of three alternatives determined to be Very Constructible (refer to Table 2.1, page 21). It would have the second highest impact to streams (454 linear feet), the second highest cost to construct ($24.9 million), the second highest impact to potential farmland (51 acres), and the highest number of potential hazardous materials sites (3).

Very Constructible means that closures during construction would not affect the entire interchange, only some specific movements, which would be closed for less than a month, typically less than a week. Difficult means that the new interchange would require closing a portion of the interchange for more than a month. Extremely Difficult refers to the entire interchange being closed for a minimum of a month.

Alternative 1 would have the one residential relocation, the lowest number of all Exit 83 alternatives. This residence is located south of the interstate and would be impacted by the realignment of Bud Arthur Bridge Road to intersect Battleground Road. Alternative 1 would also result in relocation of three business buildings. Poor Paul's Fireworks and S.A. Automotive, which are located within the same parcel south of the interstate, would be relocated. The maintenance and storage building at Builders FirstSource on the north side of the interstate would be within the road right-of-way and would also be taken, but it is not anticipated that this facility would relocate. The potential relocation listed as "Other" (Table 2.1, page 21) is an AT&T facility located on the north side of Phillips Drive that is within the project construction limits for all the alternatives. The design team will work on avoiding this facility as the design proceeds to final design.

According to the data provided by Environmental Data Resources, Inc. (EDR), there were leaking underground storage tanks associated with the former Truck Stop (now Westar Travel Plaza) site, the Poor Paul's Fireworks site, and the former I-85 Associates (now Builders FirstSource) site. However, all were listed by the S.C. Department of Health and Environmental Control (SCDHEC) as requiring No Further Action. In addition, a 25 gallon diesel fuel spill was reported at the Westar site in 2011.

The southbound exit ramp from I-85 would necessitate closing the existing intersection of Horry and Truck Stop Roads that would be within the ramp right-of-way. Horry Road would then end in a cul-de-sac. Consequently, through traffic currently passing along Horry Road between Mountain View Baptist Church and Mountain View Christian Academy would be eliminated.

Alternative 1 also provides access to Westar Travel Plaza, an Abbotts Farm Outlet, and Metro Drill, Inc. from a new road between Phillips Drive and Truck Stop Road. This road was relocated to the east to avoid going between two residences.

Westar Travel Plaza and Spencer Insulation, which are located south of the interstate, would both lose parking due to the changes of the interchange and frontage roads. This alternative would also acquire right-of-way from Mountain View Baptist Church, Abbott Farms Peaches, F.O Mertz, Spencer Insulation, CPC Livestock Nutrition, and several residences.

Modifications to the interchange and frontage roads would result in a less direct route than currently traveled to businesses and residences. Currently, southbound traffic exiting I-85 traveling to Westar Travel Plaza, Abbotts Farm Outlet, and Metro Drill, Inc., does not have to travel beyond the on and off/frontage road to exit the interstate, visit the businesses, and return to the interstate. However, the existing southbound entrance ramp is short and is identified as a "hot spot" in the *Accident Analysis Report.*[18] Alternative 1, like all of the proposed interchange alternatives, would result in a longer, less direct route to Westar Travel Plaza, Abbotts Farm Outlet, and Metro Drill, Inc., for southbound traffic exiting I-85. The route to these businesses for northbound traffic would be similar to the current route. North and southbound traffic would also have the longest, less direct route to Bud Arthur Bridge Road and to the businesses located there.

All of the proposed interchange alternatives would result in a longer, less direct route to the businesses on Truck Stop Road for southbound traffic exiting I-85.

2.2.3.1.2 Exit 83 Alternative 2

Alternative 2 consists of a partial cloverleaf interchange with ramps located in the northwest and southeast quadrants of the interchange (refer to Figure 2.5, page 39). The alternative includes a westward shift in the alignment of Battleground Road (SC 110) and construction of a new bridge over I-85. On the north side of I-85, Phillips Drive and Dewberry Road would be shifted northward to meet the 750 foot separation requirement. The north end of Horry Road would be realigned and continue to provide access to the existing Truck Stop Road businesses and other properties in the southeast quadrant of the interchange. On the south side of I-85, the frontage road in the southwest quadrant, Bud Arthur Bridge Road, would be realigned to intersect Battleground Road at the I-85 ramps and a new connection to Edgefield Road, in the southeast quadrant, would be provided.

Alternative 2 is one of three alternatives rated as Very Constructible. It would cost the least of all alternatives to construct ($22.8 million) and, like Alternative 4, would have the least impact to streams (312 linear feet). Alternative 2 would result in five total relocations, the second highest of the four alternatives. Alternative 2 would result in the highest potential impact to farmland (54.1 acres); however, like Alternatives 3 and 4, it would impact the least number of potential hazardous materials sites (2). According to the EDR report, the two hazardous material sites are the former I-85 Associates (Builders FirstSource) and the Poor Paul's Fireworks sites. Both were listed by SCDHEC as requiring No Further Action.

[18] Bihl Engineering, LLC, *Accident Analysis Report I-85 Widening Project MM 80 to MM 96 Spartanburg and Cherokee Counties, SC*, December 2014 (rev. March 2015)

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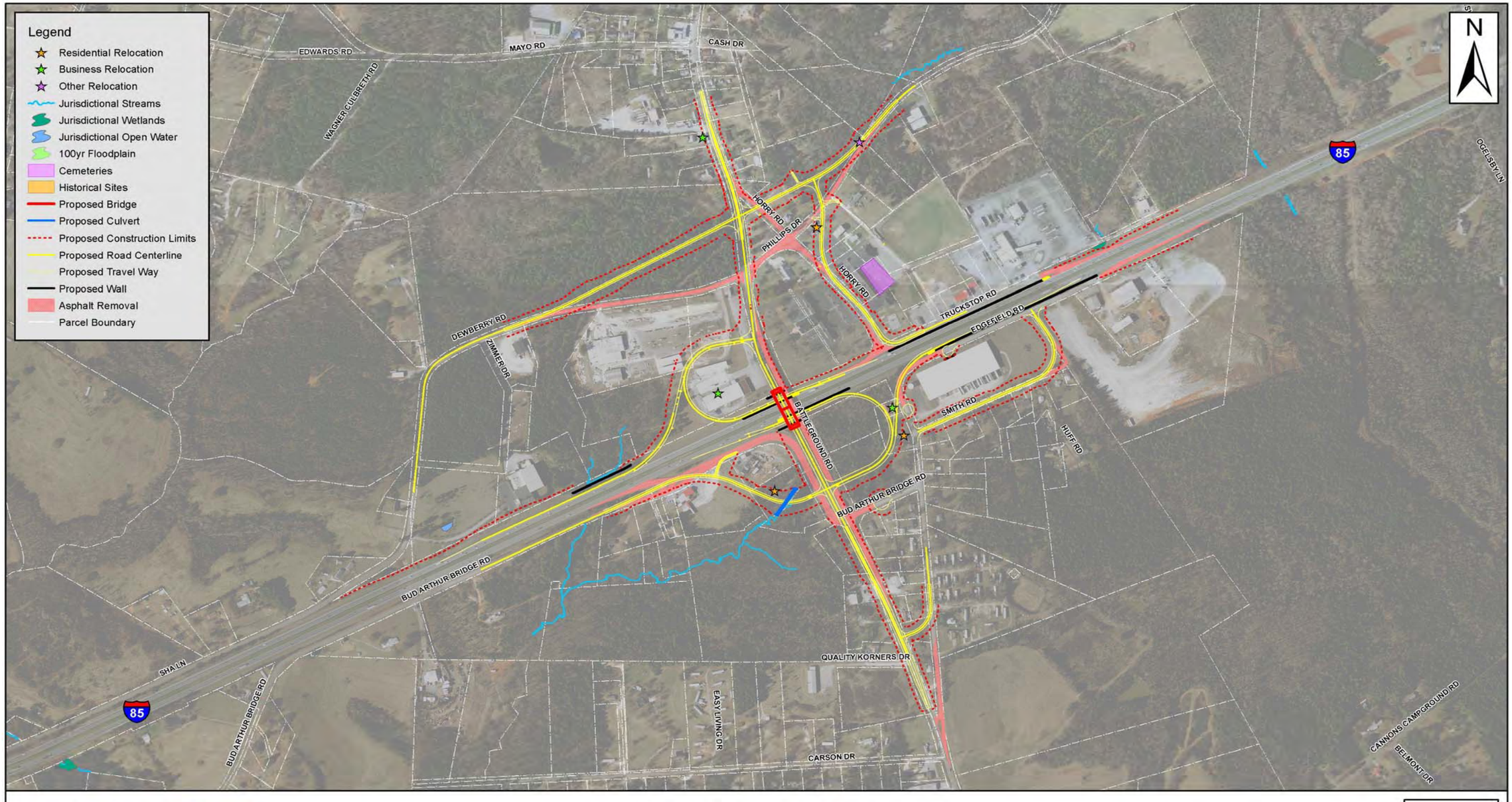


South Carolina Department of Transportation

1 inch = 600 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 83 - Alt 2

Figure 2.5

Three residences and three businesses would be relocated due to either realigned roads or the modified interchange. One residence on Edgefield Road would be impacted by the northbound on-ramp, one residence on Bud Arthur Bridge Road would be impacted by the realigned intersection of Battleground and Bud Arthur Bridge Roads, and one residence would be impacted by the northern shift of Phillips Drive and realignment of Horry Road.

One Ten Tan, a business located north of the interstate on Battleground Road, and Spencer Insulation on Edgefield Road would be relocated. Alternative 2 would result in removal of four buildings at the Builders FirstSource site. The maintenance and storage building, another storage building, and two open, raw material storage buildings would be displaced by the cloverleaf interchange. However, it is not anticipated that this facility would have to relocate. In addition, the realignment of Horry Road proposed in Alternatives 2 and 3 would eliminate some parking at Mountain View Baptist Church and Mountain View Christian Academy. The AT&T facility on the north side of Phillips Drive that was discussed for Alternative 1 and listed as "Other" in Table 2.1 (page 21) is also within the project construction limits for this alternative.

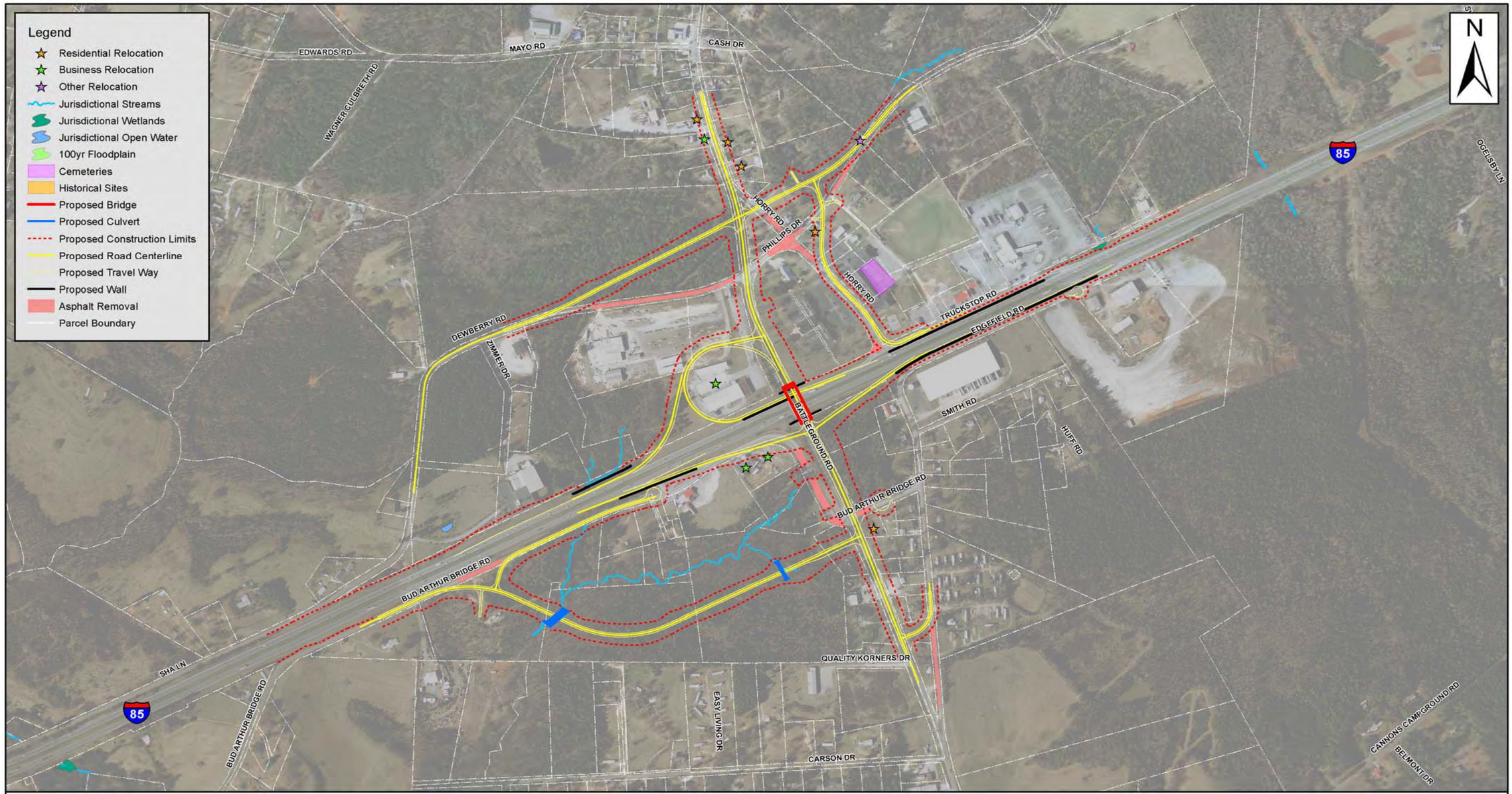
Currently, southbound traffic exiting I-85 traveling to Westar Travel Plaza uses the on and off/frontage road to exit and return to the interstate. Alternatives 2 and 3, each with a proposed partial cloverleaf exit from I-85 South onto Battleground Road, would result in a less direct route to the businesses along Truck Stop Road. Horry Road would continue to provide access to Truck Stop Road. However, the volume of truck and other traffic on Horry Road would increase since it would be the only way to access the businesses on Truck Stop Road.

Northbound vehicles on I-85 currently exit directly onto Bud Arthur Bridge Road in front of Sheila's Original Art and Abbott Farms Peaches. Alternative 2, with the partial cloverleaf exit and entrance for northbound traffic, would result in a less direct route to businesses and residences on Bud Arthur Bridge Road. However, it presents a more direct route than the diamond interchanges proposed in Alternatives 1 and 3.

2.2.3.1.3 Exit 83 Alternative 3

Alternative 3 is a partial cloverleaf and partial diamond interchange (refer to Figure 2.6, page 41). Exit and entrance ramps for southbound I-85 traffic are located in the northwest quadrant; diamond-style ramps are provided for northbound I-85. The alternative includes an eastward shift in the alignment of Battleground Road (SC 110) and construction of a new bridge over I-85. On the north side of I-85, the frontage road, Phillips Drive, would be shifted northward to meet the 750 foot separation requirement. Horry Road would be realigned and continue to provide access to the existing businesses on Truck Stop Road and other properties in the southeast quadrant of the interchange. On the south side of I-85, Bud Arthur Bridge Road in the southwest quadrant, would be realigned in accordance with the 750 foot separation requirement, and a new connection to Edgefield Road would be constructed.

Alternative 3 is rated as Difficult to construct, which means portions of the interchange would be closed for at least a month. It would have the greatest cost ($25.2 million) and would result in



South Carolina Department of Transportation

1 inch = 600 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 83 - Alt 3

Figure 2.6

the most impacts to streams (480 linear feet). Conversely, Alternative 3 would result in the least impacts to potential farmland (48.3 acres), and along with Alternatives 2 and 4, would impact the least number of potential hazardous materials sites (2).

The two hazardous material sites listed in the EDR report, are the same as for Alternative 2, the former I-85 Associates (Builders FirstSource) and the Poor Paul's Fireworks sites. Both were listed by SCDHEC as requiring No Further Action.

Alternative 3 would result in nine total relocations, five residences and four businesses, the highest of all the Reasonable Alternatives. This alternative would have the most residential relocations of all the alternatives. Four would be impacted by the realignment of Battleground Road, three of which are north of the interstate. One residence would be impacted by the northern shift of Phillips Drive and realignment of Horry Road. Alternative 3 would also result in a loss of parking at Mountain View Baptist Church and at Mountain View Christian Academy, the same as Alternative 2.

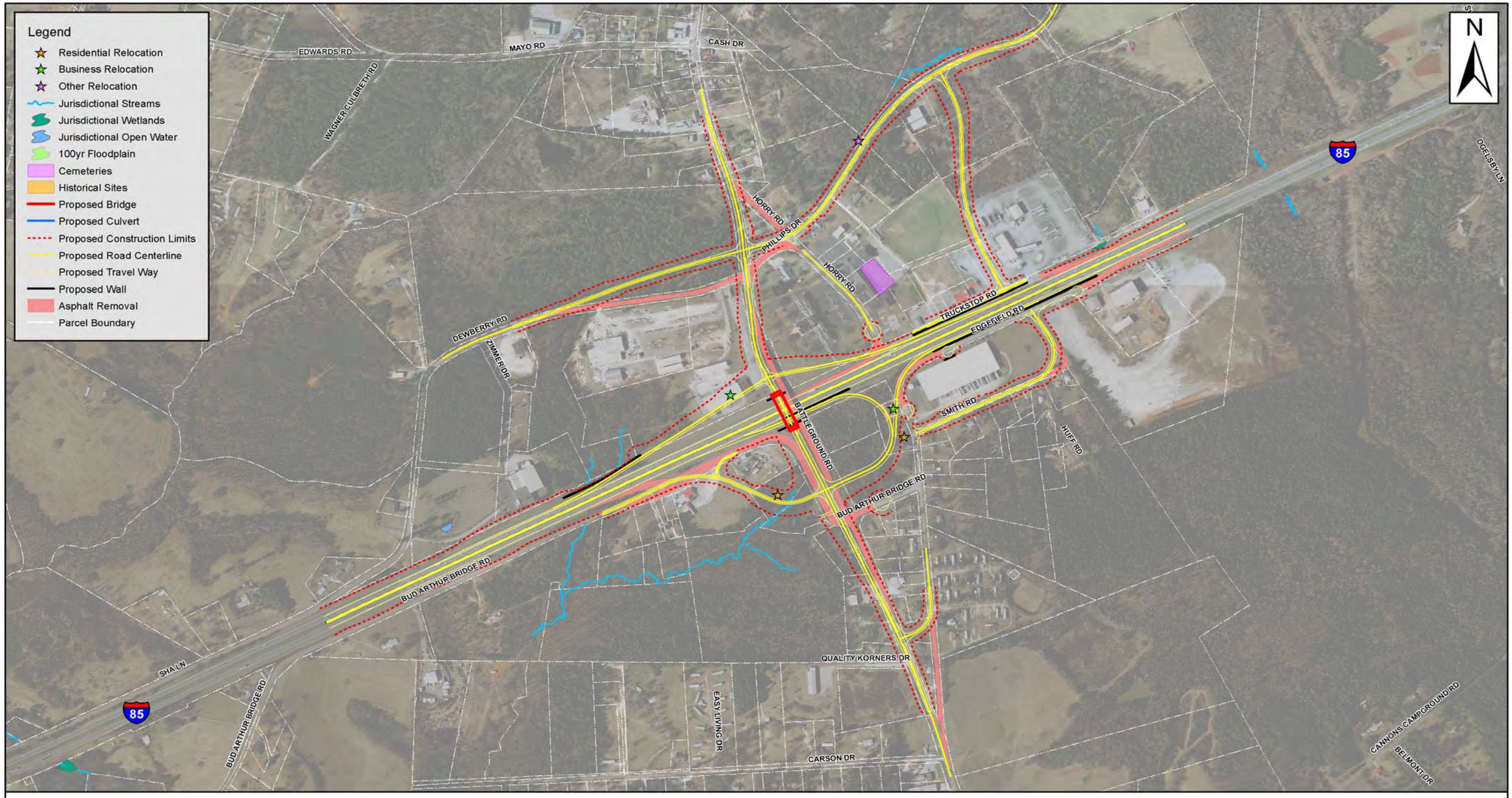
The four businesses relocations would be at One Ten Tan, Poor Paul's Fireworks, S.A. Automotive, and Builders FirstSource. One Ten Tan would be impacted by the relocation of Battleground Road and the other two businesses would be impacted by a diamond interchange exit from I-85 North onto Battleground Road. As described in Alternative 2, four buildings at Builders FirstSource would be taken by the proposed partial cloverleaf exit from I-85 South onto Battleground Road.

However, it is not anticipated that this facility would have to relocate. The AT&T facility on the north side of Phillips Drive that was discussed for Alternatives 1 and 2 ("Other" in Table 2.1, Page 21) is within the project construction limits for this alternative too.

The diamond interchange exit for I-85 northbound traffic would result in a less direct route between the interstate exit and Sheila's Original Art, Abbott Farms Peaches and residences on Bud Arthur Bridge Road. Alternative 3 would result in a less direct route for southbound traffic to businesses on Truck Stop Road. Northbound traffic would follow a similar route to Truck Stop Road as is currently used, taking Phillips Drive and Horry Road.

2.2.3.1.4 Exit 83 Alternative 4

Alternative 4 also consists of a partial cloverleaf and partial diamond interchange (refer to Figure 2.7, page 43). Cloverleaf exit and entrance ramps for northbound I-85 are located in the southeast quadrant; diamond-style ramps are provided for southbound I-85. The alternative includes a westward shift in the alignment of Battleground Road (SC 110) and construction of a new bridge over I-85. On the north side of I-85, the frontage road, Phillips Drive and Dewberry Road, would be shifted northward, to meet the 750 foot separation requirement. A new road would be constructed south from Phillips Drive to provide access to Truck Stop Road and the properties in the northeast quadrant of the interchange. Access to Horry Road (SR 9725) from Phillips Drive would be retained, but a cul-de-sac would be created on the south end of Horry Road eliminating through traffic. On the south side of I-85, Bud Arthur Bridge Road would be



South Carolina Department of Transportation

1 inch = 600 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 83 - Alt 4

Figure 2.7

realigned to intersect Battleground Road at the I-85 ramps; and a new connection to Edgefield Road would be provided.

Alternative 4, like Alternatives 1 and 2, is rated as Very Constructible. It would be the second least expensive to construct at a cost of $23.4 million. Alternative 4 is equal to Alternative 2 with the least stream impacts (312 linear feet). It would equal the least impacts to hazardous material sites (2). Additionally, it would impact the second lowest potential area of farmland (48.9 acres).

The two hazardous material sites listed in the EDR report, are the same as for Alternatives 2 and 3, the former I-85 Associates (Builders FirstSource) and the Poor Paul's Fireworks sites. Both were listed by SCDHEC as requiring No Further Action.

Alternative 4 would have four total relocations. It would relocate two residences and two businesses. One residence would be impacted by the realignment of Bud Arthur Bridge Road. The other residence would be impacted by the new cloverleaf in the southeastern quadrant. One business would be relocated, Spencer Insulation, located within the partial cloverleaf. Like Alternative 1, the proposed diamond interchange for traffic southbound on I-85 would impact the Builders FirstSource maintenance and storage building. The utility facility on the north side of Phillips Drive that was discussed for Alternatives 1, 2, and 3 and listed as "Other in Table 2.1, page 21, is also within the project construction limits for this alternative.

Westar Travel Plaza would lose parking due to the proposed new access road extending south from Phillips Road. This alternative would also acquire right-of-way from Mountain View Baptist Church, Abbott Farms Peaches, F.O Mertz, CPC Livestock Nutrition, and several residences. As described in Alternative 1, the access to businesses from the diamond interchange for I-85 southbound traffic would also occur in Alternative 4. This alternative includes elimination of through traffic on Horry Road resulting from the interchange southbound exit ramp. Like Alternative 2, the partial cloverleaf for I-85 northbound traffic would result in the most direct route to businesses and residences on Bud Arthur Bridge Road of the Reasonable Alternatives, albeit a less direct route than the existing access.

2.2.3.1.5 What is the Preferred Alternative for Exit 83?

Alternative 1 has a design that minimizes impacts on the north side of the interchange. It would have the second highest cost and the second highest stream impact. South of the interstate there are some issues which are avoided by other alternatives; for example, it would relocate Poor Paul's Fireworks and SA Automotive and make access to Abbott Farms Peaches and Sheila's Original Art less direct due to a long frontage road away from the interchange. However, it avoids the building at Spencer Insulation (but would impact the parking area by the realignment of Edgefield Road.

Alternative 2 has the lowest cost and would have the lowest stream impacts. On the south side it would have less impact to most existing businesses, but Spencer Insulation would be relocated. North of the interstate, it would have the most impact on the Builders FirstSource facilities, it would maintain through truck traffic on Horry Road between the interchange and the businesses

on Truck Stop Road, it would take parking from Mountain View Baptist Church and Christian Academy, and it would relocate one residence on Phillips Drive, north of the Academy.

Alternative 3 has the highest cost and would have the greatest impact to streams. It is rated as the most difficult of all these alternatives to construct. Alternative 3 would impact Builders FirstSource facilities the most, it impacts the Church and the Academy and it would increase the traffic volume on Horry Road. It would take two businesses in the southwestern quadrant and provide much longer access to the businesses that remained.

Alternative 4 is recommended as the Preferred Alternative for Exit 83. This alternative combines the best features of the other alternatives. The cost of Alternative 4 is slightly higher ($0.6 million) than Alternative 2, the lowest cost alternative. It would have the least amount of impact to streams.

Alternative 4 would have no direct impacts to Mountain View Baptist Church or Mountain View Christian Academy facilities. It would also remove through truck and other traffic from Horry Road in front of Mountain View Christian Academy. Alternative 4 would have the least impacts of any of the alternatives to the Builders FirstSource facility. It would relocate the fewest number of businesses. The businesses in the southeastern quadrant of the interchange, Abbott Farms Peaches, Sheila's Art, Poor Paul's Fireworks, and SA Automotive would not be relocated with Alternative 4 and would have the best access to and from the interstate of any of the build alternatives. Alternative 4 would have access to the businesses on Truck Stop Road that would be as good as any of the build alternatives.

2.2.3.2 What are the Reasonable Alternatives that were further evaluated for Exit 87 Green River Road/SC 39?

Five build alternatives for Exit 87 were developed and are described below. Table 2.1 on page 21 displays impacts to natural resources and community resources associated with the five build alternatives. As shown in Table 2.1, all five alternatives for Exit 87 meet the project purpose and need. None of the five alternatives would have impacts to historic resources, floodplains, or sites containing hazardous materials. There is the potential for the Northern long-eared bat (NLEB) to be found in the study area.

2.2.3.2.1 Exit 87 Alternative 1

Exit 87 Alternative 1 is a spread diamond interchange, with frontage road intersections separated from the interchange intersections by a distance of at least 750 feet (refer to Figure 2.8, page 47). The alternative includes a westward shift of Green River Road (SC 39) and construction of a new bridge over I-85. Webber Road on the north side of I-85 would be realigned to separate it from the interchange. Likewise, the frontage roads on the on the south side of I-85, Cannons Campground Road and Overbrook Drive, would be realigned to provide the required separation from the interchange. Lindley Road would be closed.

Alternative 1 has the lowest construction cost compared to the other four alternatives for Exit 87, but was rated as Extremely Difficult to construct, which was the least favorable ranking in

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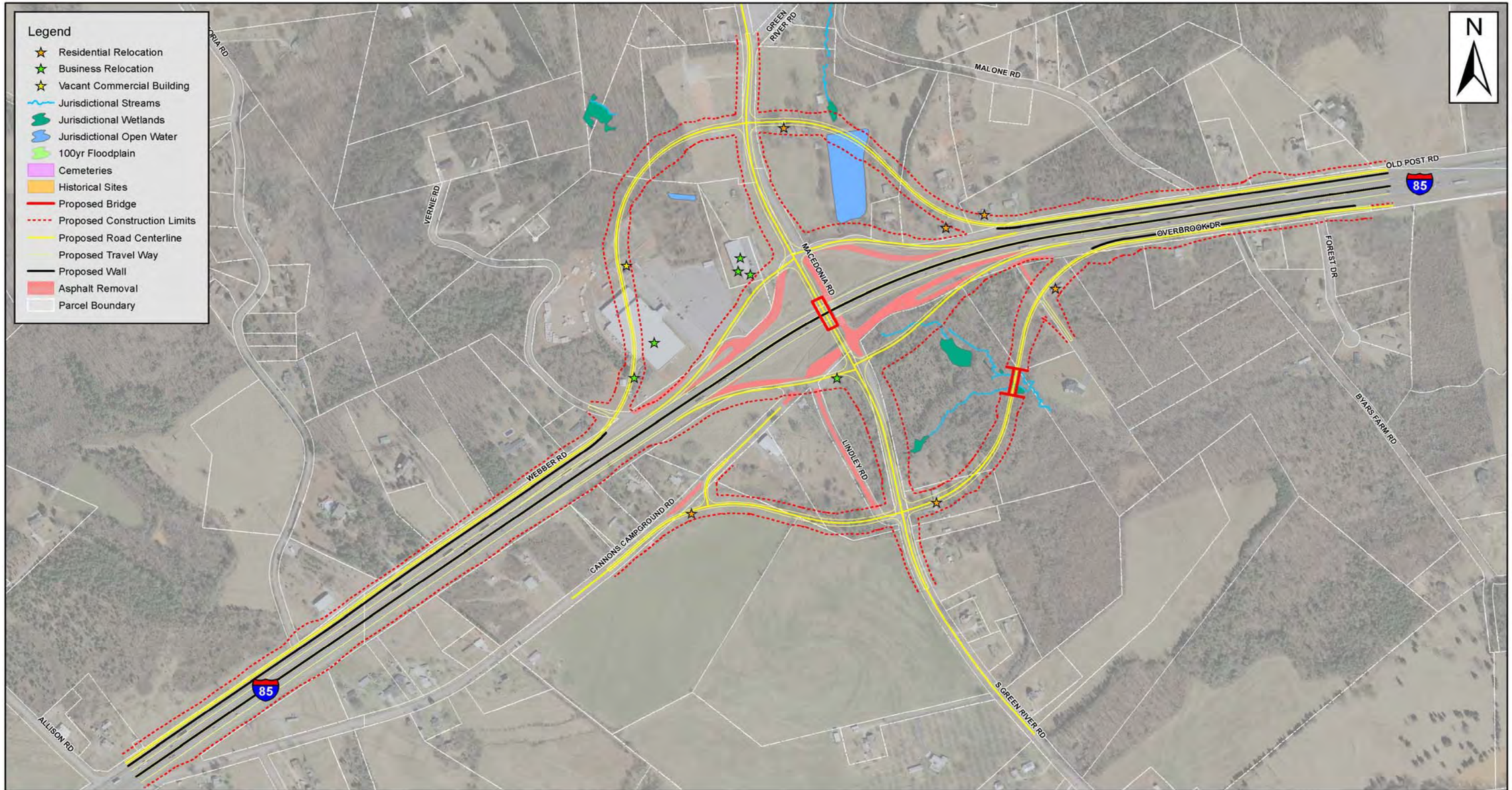

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I-85 Widening MM 80-96 Environmental Assessment

Exit 87 - Alt 1

Figure 2.8

terms of constructability. This means construction would require closure of the entire interchange for a month or more during the construction period. The low cost and the lower constructability ranking are both due to the fact that the new Green River Road Bridge would be constructed in close proximity to the old bridge, which would allow use of part of the existing fill material to lower costs, but it would be so close to the old bridge that the entire interchange would have to be closed for at least a month during construction.

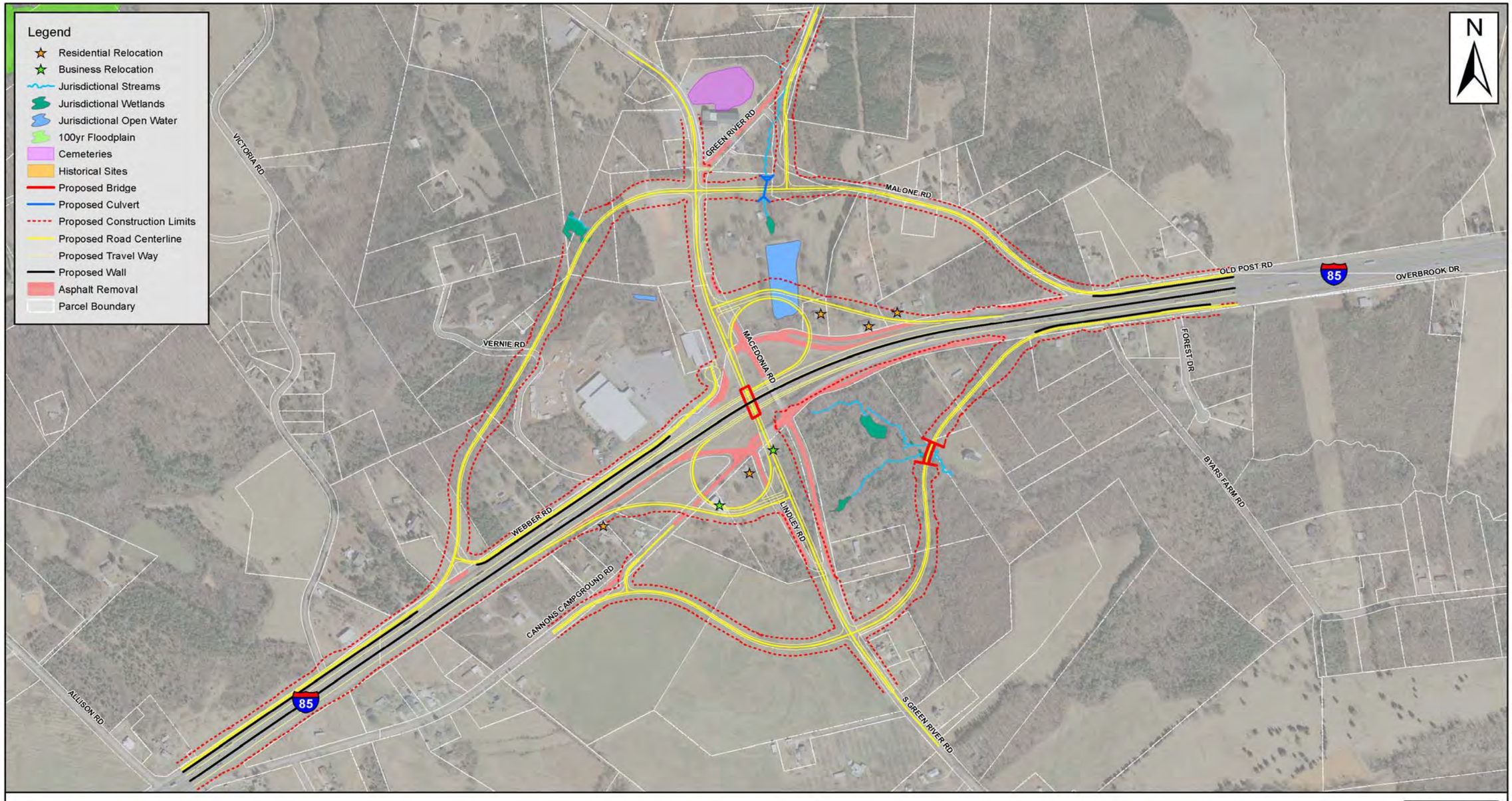
Alternative 1 would cross two streams and have 369 linear feet of stream impacts, which represents the lowest amount of stream impacts for the Exit 87 alternatives. Alternative 1 would have the second lowest level of impacts to wetlands (0.03 acres), and the third highest level of impacts to ponds (0.54 acres) when compared to the other alternatives. Alternative 1 would have the least impact to farmland compared to the other alternatives, with 72.3 acres of farmland impacted. Alternative 1 would have an impact on 31 noise receptors, the same number as Alternative 5, which represents the lowest amount of impacts compared to the other alternatives. It should be noted that the highest number of impacted receptors is 35.

Table 2.1 shows that Alternative 1 would have the highest number of total relocations compared to the other four alternatives: six residences, six businesses, and one vacant commercial building would be relocated (refer to Figure 2-X). Alternative 1 would impact the Old Post Road community by splitting the community and relocating three residences within the community. It would also relocate three residences south of the interchange. One is on Cannons Campground Road, another is on Green River Road, and the third is a mobile home on Overbrook Drive. In addition, this alternative would bisect the Macedonia Community Park, which is located in the northwest quadrant on church-owned property that they make available to the public.

Businesses that would be impacted include the building leased to the Spartanburg Herald Journal on the south side of I-85, Orchard Place, Ambustar, Lemmons Farm Peaches and Cream, Decorative Fabrics, and Diamond Child Development. The last three would not have access to the frontage road, which would, therefore, require their relocation. The currently vacant commercial property is located northeast of the Orchard Place building.

2.2.3.2.2 Exit 87 Alternative 2

Alternative 2 consists of a partial cloverleaf interchange with ramps located in the northeast and southwest quadrants of the interchange, with frontage road intersections separated from the interchange by a distance of at least 750 feet (refer to Figure 2.9, page 49). The alternative includes a westward shift of Green River Road (SC 39), and construction of a new bridge over I-85. On the north side of I-85, Old Post Road would be closed to through traffic and relocated slightly north and Malone Road would become the new frontage road. This would require a new intersection with Macedonia Road and a new connection to Green River Road. Webber Road would be realigned to the north to meet with Malone Road at a new intersection. On the south side of I-85, Cannons Campground Road and Overbrook Drive would be moved to new locations at least 750 feet south of the interchange intersection.



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Exit 87 - Alt 2

Figure 2.9

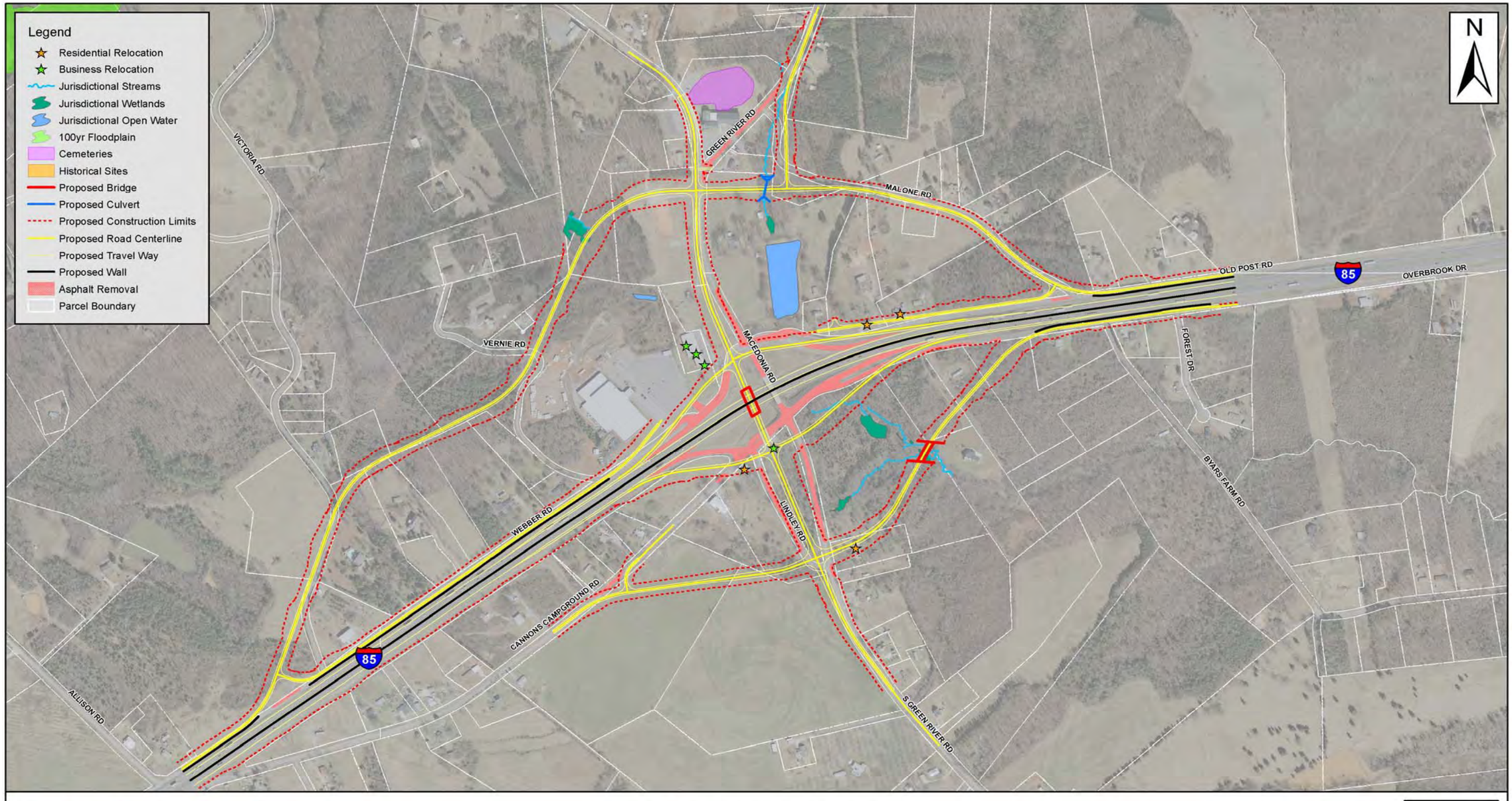
Alternative 2 has the most favorable ranking in terms of constructability, Very Constructible, and would have the second lowest cost. Alternative 2 would impact 0.17 acres of wetlands, which is the highest amount of wetlands impacted. Alternative 2 would cross three streams and have 611 linear feet of stream impacts, which is a greater impact compared to Alternatives 1 and 5, each with 369 linear feet of impacts, but less than Alternatives 3 and 4, each with 970 linear feet of impacts. Alternative 2 would impact 0.91 acres of a pond, the highest impact of all five alternatives. There would be 83.2 acres of farmland impacted, the second lowest level of impacts compared to the other four alternatives. Alternative 2 would impact 25 receptors, the second-fewest of all the alternatives.

Table 2.1 shows that Alternative 2 would require seven total relocations, the same number of total relocations associated with Alternative 4, which is the lowest number of expected total relocations. Alternative 2 would require two businesses to be relocated, Lemmons Packing House and a building leased to the Spartanburg Herald Journal, which is the fewest of all the alternatives. Five residences, would be relocated, which is the second highest number of residential relocations for all alternatives. Three of the residential relocations would occur along Old Post Road and two would occur along Cannons Campground Road. The realignment of Old Post Road in the northeast quadrant would impact that community by relocating three residences. In addition, the Webber Road community in the northwest quadrant would be split by the realignment of Webber Road on new location. Malone Road would become a frontage road.

This alternative maintains access to the Orchard Place and Ambustar businesses on Webber Road in the northwest quadrant; however, the access is less direct than their existing access. North of I-85, the realignment of Macedonia Road would come the closest to the Macedonia Church building compared to the other alternatives, and would have right-of-way impacts to the church parking lots that are located on both sides of Macedonia Road. The new alignment for Webber Road would cross the Macedonia Community Park at the north end, which would likely be less disruptive compared to Alternative 1.

2.2.3.2.3 Exit 87 Alternative 3

Alternative 3 consists of a spread diamond interchange, with frontage road intersections separated from the interchange by a distance of at least 750 feet (refer to Figure 2.10, page 51). The alternative includes a westward shift of Green River Road (SC 39) and construction of a new bridge over I-85. In the northeast quadrant, the design is similar to Alternative 2, closing Old Post Road to through traffic and relocating it slightly north and utilizing much of existing Malone Road for the new frontage road. It also would include a new intersection with Macedonia Road and a reconfiguration of the connection with Green River Road. In the northwest quadrant, Webber Road would be realigned to the north and extend to and extend to the west into Victoria Road before tying into the existing alignment of Webber Road. On the south side of I-85, Cannons Campground Road and Overbrook Drive would be moved to new locations at least 750 feet south of the interchange intersection.



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Exit 87 - Alt 3

Figure 2.10

The estimated construction cost for Alternative 3 would be essentially the same as what is anticipated for Alternative 4 and Alternative 5; all three are higher than Alternative 1 and Alternative 2. Alternative 3 is rated as Difficult, which is in the middle range of constructability. Alternative 3 would impact 0.17 acres of wetlands, the same level of impact as Alternative 2 and Alternative 4. Alternative 3 would cross three streams, and have 970 linear feet of impacts, the same as Alternative 4, which represents the highest amount of stream impacts for the Exit 87 alternatives. North of I-85, the design for Malone Road would be shifted farther north than Alternative 1, Alternative 2 and Alternative 5, which would eliminate pond impacts, but increase stream and wetland impacts. This alternative would have the highest impact on farmlands. There would be 35 noise receptors impacted, which is the highest number; however, this is only slightly higher than the low of 31.

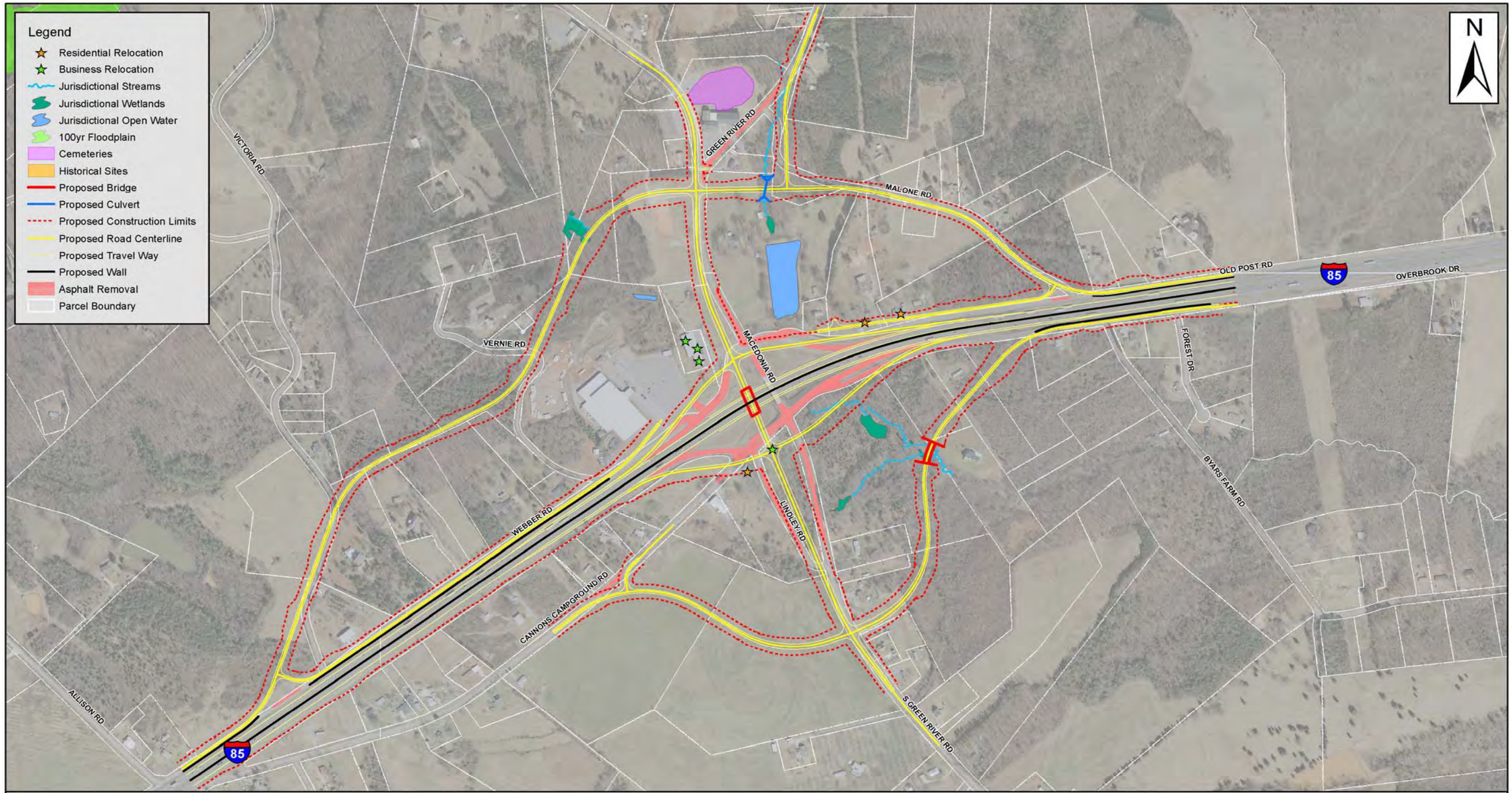
Table 2.1 shows that there would be eight total relocations. Four businesses, Lemmons Farm Peaches and Cream, Decorative Fabrics, Diamond Child Development, and a building leased to the Spartanburg Herald Journal would be relocated due to lack of access. Four residences would be relocated; two on Old Post Road, one near the intersection of Cannons Campground and Green River Roads, and one along Green River Road south of the interchange.

Under Alternative 3, Malone Road would be converted to a frontage road and the Webber Road realignment would tie in to Victoria Road farther to the west, which would lessen the impact to the Webber Road community compared to Alternative 2. The alternative would maintain access to the Orchard Place and Ambustar businesses on Webber Road in the northwest quadrant. The access to the businesses, however, is less direct than the access provided under Alternative 2. Alternative 3 would have right-of-way impacts to Macedonia Baptist Church parking lots that are located on both sides of Macedonia Road, north of I-85. The new alignment for Webber Road would cross the Macedonia Community Park at the north end, similar to Alternative 2, which would likely be less disruptive compared to Alternative 1.

2.2.3.2.4 Exit 87 Alternative 4

Exit 87 Alternative 4 consists of a spread diamond interchange, with frontage road intersections separated from the interchange by a distance of at least 750 feet (refer to Figure 2.11, page 53). This alternative is similar to Alternative 3, but with a different alignment for the frontage roads on the south side of I-85. The alternative includes a westward shift of Green River Road (S-39), and construction of a new bridge over I-85. In the northeast quadrant, the design utilizes much of the existing Malone Road alignment to reroute the frontage road. It also includes the relocation of Old Post Road slightly north of its current alignment and closing it to through traffic. In the northwest quadrant of the interchange, Webber Road would be extended primarily on new location extending north to Victoria Road. On the south side of I-85, Cannons Campground Road and Overbrook Drive would be moved to a new location, intersecting Green River Road farther south from the interchange compared to Alternative 3.

The estimated construction cost for Alternative 4 is similar to what is anticipated for Alternatives 3 and 5; all three are higher than Alternative 1 and Alternative 2. Alternative 4 is rated Difficult



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Exit 87 - Alt 4

Figure 2.11

in terms of constructability. Alternative 4 would impact 0.17 acres of wetlands, the same level of impact that would occur under Alternative 2 and Alternative 3. Alternative 4 would cross three streams and have 970 linear feet of impacts, the same as Alternative 3, which represents the highest level of stream impacts for the Exit 87 alternatives. North of I-85, the design for Malone Road compares to Alternative 3, which eliminates all impacts to ponds. There would be 35 noise receptors impacted, which is the highest number, but is only slightly higher than the low of 31.

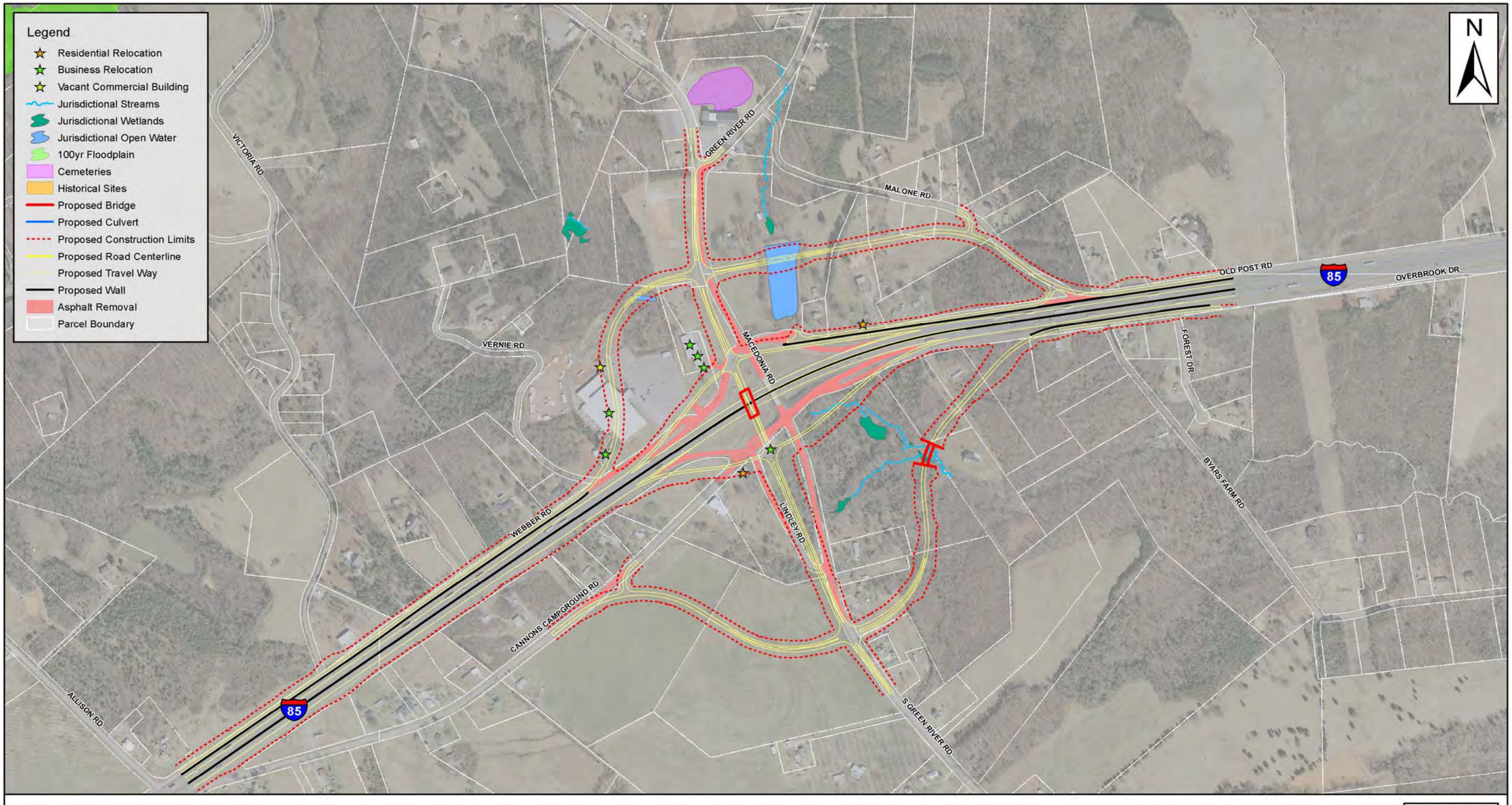
Table 2.1 shows that Alternative 4 would require seven total relocations, the same number of total relocations associated with Alternative 2, which is the lowest number of expected total relocations. Alternative 4 would require four businesses and three residences to be relocated. The three businesses would be Lemmons Farm Peaches and Cream, Decorative Fabrics, Diamond Child Development, and a building leased to the Spartanburg Herald Journal. Like Alternative 3, they would be relocated due to lack of access.

Two residences along Old Post Road would be relocated by the frontage road to provide access the two other residences on Old Post Road. This would impact the Old Post Road community, which consists of four residences. Because the realignment for Cannons Campground Road and Overbrook Drive is shifted farther south than what is proposed under Alternative 3, there would be only one residential relocation required at the intersection of Cannons Campground and Green River Roads.

North of I-85, Alternative 4 is the same as Alternative 3. The Webber Road realignment would tie in to Victoria Road farther to the west, which would lessen the impact to the Webber Road community, while still maintaining access to the businesses on Webber Road in the northwest quadrant. The access to the businesses, however, is less direct than the access provided under Alternative 2. Alternative 4 would have right-of-way impacts to Macedonia Baptist Church parking lots that are located on both sides of Macedonia Road, north of I-85. The new alignment for Webber Road would cross the Macedonia Community Park at the north end, similar to Alternatives 2 and 3, which would be less disruptive compared to Alternative 1.

2.2.3.2.5 Exit 87 Alternative 5b

Exit 87 Alternative 5b consists of a spread diamond interchange, with frontage road intersections separated from the interchange by a distance of 750 feet to the south and approximately 600 feet to the north, as approved by SCDOT Traffic Engineering (refer to Figure 2.12, page 55). The northern frontage road was moved closer to the interchange intersection than other alternatives in order to reduce impacts. The alternative includes a westward shift of Green River Road (SC 39), and construction of a new bridge over I-85. In the northeast quadrant, the design utilizes a portion of the existing Malone Road alignment to reroute the frontage road. It also includes the relocation of Old Post Road slightly north of its current alignment and closing it to through traffic. In the northwest quadrant of the interchange, Webber Road would be realigned to separate it from the interchange. It would extend on new location extending south from Green River Road to tie into existing Webber Road just south of the Ambustar facility. The frontage roads on the south side of I-85, Cannons Campground Road and Overbrook Drive, would be realigned. They



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Exit 87 - Alt 5b

Figure 2.12

would intersect Green River Road farther south, to provide the required separation from the interstate interchange, the same as Alternative 4.

The estimated construction cost for Alternative 5b is $38.4 million, essentially the same as for Alternatives 3 and 4, and the highest cost of all alternatives. Alternative 5 is rated Difficult in terms of constructability. Alternative 5b would have no impact to wetlands, the least of all alternatives. Alternative 5b would avoid the streams impacted by Alternatives 2, 3, and 4 in the northwest quadrant and would cross one stream with 369 linear feet of impacts, the same as Alternative 1. This represents the lowest amount of stream impacts for the Exit 87 alternatives. North of I-85, the realignment of the frontage road would impact 0.84 acres of a pond. There would be 31 noise receptors impacted, which along with Alternative 1 is the lowest amount of impacted receptors.

Table 2.1 shows that Alternative 5b would have eight total relocations; six businesses and two residences would be impacted. Orchard Place and Ambustar would be relocated because they would be within the right-of-way for the frontage road. Additionally, a building leased to the Spartanburg Herald Journal on the south side of the interstate at the Lindley Road/Cannons Campground Road intersection is located with the right-of-way needed for the interchange. The vacant commercial building immediately northeast of Orchard Place is located within the right-of-way needed for the frontage road right-of-way and would be relocated. Lemmons Farm Peaches and Cream, Decorative Fabrics and Diamond Child Development would no longer have access and, if access cannot be provided, would have to be relocated. Since the majority of the property in this area is owned by family members, the possibility exists that access can be provided from the relocated Webber Road, which would allow these businesses to remain. This possibility is much stronger for this alternative than for the other Reasonable Alternatives because of the close proximity of the relocated Webber Road to these businesses and because the relocated Webber Road would be south of the property owned by Macedonia Baptist Church.

Two residences would be impacted by Alternative 5b. One is on Old Post Road, north of the interchange, and the other is south of the interchange on Cannons Campground Road. A short portion of the existing Malone Road would be used for the frontage road. By only utilizing this short section at the southeastern end of Malone Road, current levels of through traffic should be maintained for the residents along Malone Road, which would minimize the impact to that community. Additionally, Malone and Webber Roads would intersect Macedonia Road south of where the other alternatives propose and would cross the Macedonia Community Park at its southern end instead of bisecting the parcel. The Webber Road realignment would tie in to the existing service road near Vernie Road, like Alternative 1, thereby avoiding the impact to the Webber Road Community. Cannons Campground Road and Overbrook Drive would be aligned as described in Alternative 4.

2.2.3.2.6 What is the Preferred Alternative for Exit 87?

Alternative 1 has the lowest estimated construction cost and would have the lowest stream impact. However, it is the only alternative on the project rated as Extremely Difficult to construct,

which means the entire interchange would be closed for a minimum of a month during construction. It would also have the most business and residential relocations, a total of 12. It would impact the Old Post Road community by relocating three residences and splitting the two that would remain with the relocated frontage road. It also bisects the Macedonia Community Park. There were numerous requests in the comments from the Public Information Meetings to avoid bisecting the park. Alternative 1 has over 200 linear feet of stream impacts more than Alternatives 1 and 5 and it would have the most impacts to wetlands (0.17 acres).

Alternative 2 is rated as the easiest to construct of the Exit 87 alternatives and would have the second lowest cost. It would also have the fewest business impacts. However, access to the businesses in the northwestern quadrant would be less direct than current access. It was not selected because it would have the most community impacts. It would impact the Old Post Road community by removing three of the residences. It would also split the Webber Road community at the west end of the Webber Road relocation. Finally, Alternative 2 would incorporate the entire length of Malone Road as part of the frontage road.

Alternative 3 would have the highest cost and the most wetland and stream impacts. The difference in the stream impacts alone is substantial enough to not select this alternative. Additionally, it also incorporated Malone Road into the frontage road. The access provided to Orchard Place and Ambustar is the least direct of any of the alternatives.

Alternative 4 is similar to Alternative 3, with the realignment of Cannons Campground Road and Overbrook Drive farther south to avoid relocating one residence. It would also have the most impacts to streams and wetlands (the same as Alternative 3 does), and a cost that is essentially equal to Alternatives 3 and 5. It also incorporated Malone Road into the frontage road and has the same indirect route to access Orchard Place and Ambustar.

Alternative 5b is the Preferred Alternative for several reasons. Although Alternative 5b has the highest cost, a distinction shared with Alternative 3, the costs of Alternatives 2, 3, 4, and 5 are within $1 million of each other. Alternative 1, while substantially less expensive, would be the most difficult to construct, closing the entire interchange for least a month during construction. In addition, the other alternatives, including Alternative 5b, have a better design because they straighten Green River Road. Alternative 5b also would have fewer residential relocations, be less disruptive to the Old Post Road Community, and would avoid splitting the Macedonia Community Park in half. While it would also have the most business relocations, there is the potential that these may be avoided during final design if it is possible to provide access from the realigned Webber Road. The alternatives that would not relocate Orchard Place and Ambustar (Alternatives 2, 3, and 4) provide access that is substantially less direct than the current condition.

Alternative 5b is the only alternative with no wetland impacts (although the wetland impacts for the worst alternatives are less than 0.2 acres) and equals Alternative 1 for the least amount of stream impacts. It would avoid an entire stream system that Alternatives 2, 3, and 4 each cross twice. It would also minimize the impacts to the Old Post Road and Webber Road communities,

while at the same time help preserve the character of the Malone Road community more than Alternatives 2, 3, and 4 by using only the southern portion of Malone Road as part of the frontage road.

2.2.3.3 What are the Reasonable Alternatives that were further evaluated for the Pleasant School Road, Exit 95 Interchange?

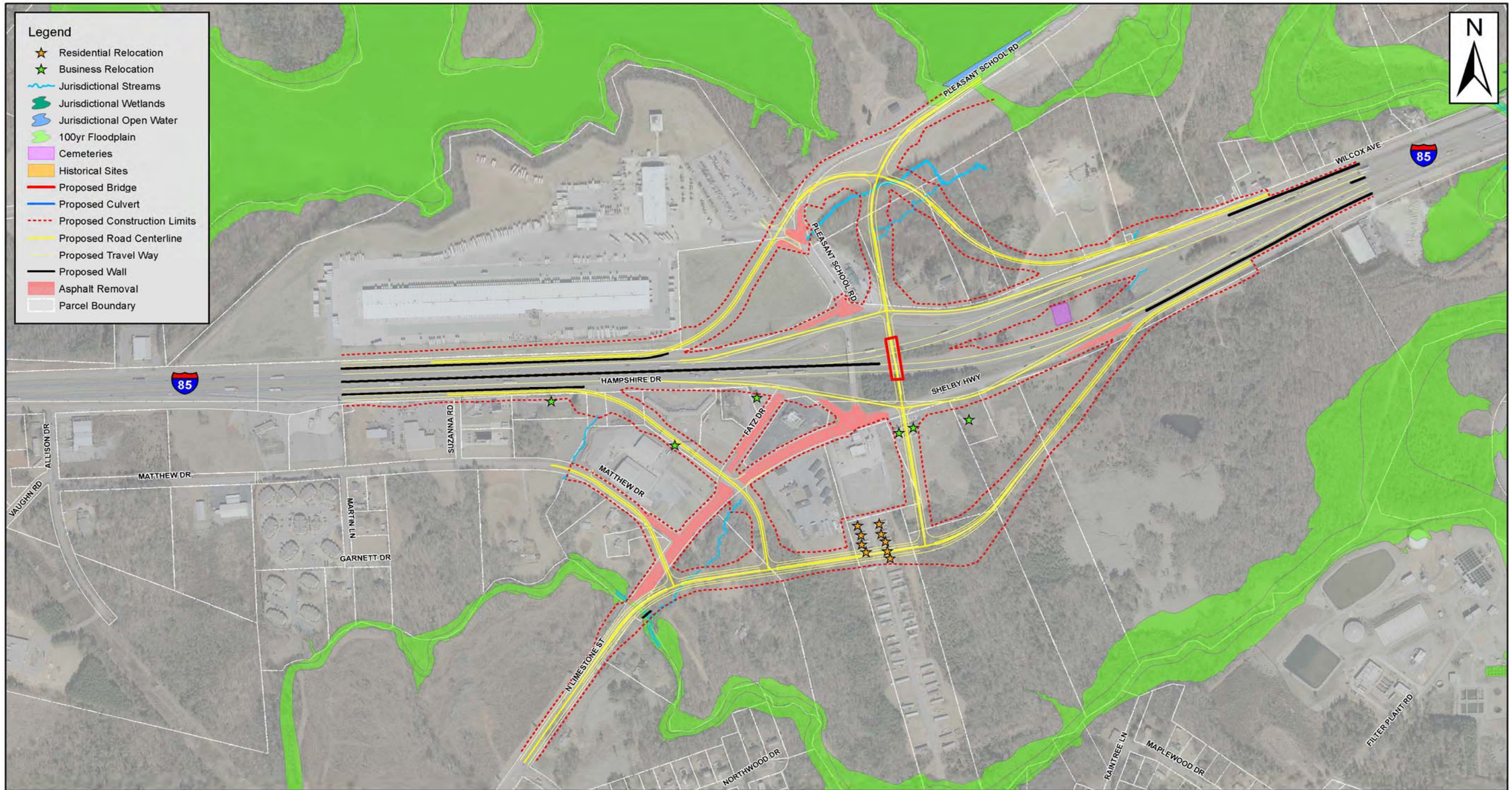
Two alternatives have been developed for Exit 95. Both alternatives would provide a northbound entrance ramp, which is not part of the existing interchange. This will be an important addition, especially given the location of the UPS freight facility at this interchange. The alternatives will also improve the existing route for northbound traffic exiting the interstate. Traffic that is heading north on Pleasant School Road will not have to make two consecutive left turns in the space of approximately 75 feet to get off the ramp and onto Pleasant School Road. Neither of the alternatives would impact wetlands, ponds, or historical or archaeological sites. There is the potential for the Northern long-eared bat (NLEB) to be found in the study area. The Lipscomb Cemetery, located in the median of I-85, would not be impacted by either of these proposed improvements.

2.2.3.3.1 Exit 95 Alternative 1

Alternative 1 consists of a diamond Interchange, with frontage roads relocated so that their intersections are separated from the interchange by a distance of at least 750 feet on both sides of I-85 (refer to Figure 2.13, page 59). The alternative includes shifting Pleasant School Road/S-82 to the east and construction of a new bridge over I-85. On the north side of I-85, Wilcox Avenue would be relocated to the north and a new intersection would be created with Pleasant School Road. On the south side of I-85, Limestone Street would be realigned to the south and provide traffic on Shelby Highway (SC 18) a through movement. Traffic going north on Limestone Street to the interchange or beyond would have to take a left turn off of Shelby Highway. The frontage road in the southwest quadrant, Hampshire Drive, and the parallel Matthew Drive, are shown as realigned and extended to tie into the realigned Shelby Highway with T-intersections. Fatz Drive would be removed.

Alternative 1 would cost $26.8 million to construct and is rated as Very Constructible. It would result in 1,613 linear feet of impacts to streams, which is more than 1,200 feet greater than Alternative 2). It would result in less impact to farmland (40.8 acres). This alternative would encroach into two Zone AE floodplains and two floodways associated with Providence Branch and Lake Whelchel.

Alternative 1 would impact three potential hazardous material sites, listed by SCDHEC at 129 Pleasant School Road (UPS Freight Facility), 100 Shelby Highway, and 708 Hampshire Drive. All three of the sites are listed due to leaking underground storage tanks (LUSTs) but No Further Action has been recommended by SCDHEC at each site. There does appear to be one LUST that is subject to an on-going recovery of free product at the UPS site. Alternative 1 would have impacts to 116 noise receptors.



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Exit 95 - Alt 1

Figure 2.13

Alternative 1 would result in the most relocations, 15 total, all of which are located south of the interchange. Six businesses and nine residences would be relocated due to either realigned roads or modified interchanges. Two businesses, the Gaffney Inn and the Shamrock Inn, would be impacted by the realignment of Hampshire Drive; two businesses, the Concealed Weapons Permit School and SC Wholesale, would be impacted by the diamond interchange; and two businesses, Arsenal Grill and Blackbeard's Fireworks, would be impacted by the realignment of Pleasant School Road (State Road S-11-82).

The nine residences to be impacted are located in Jimmy's Mobile Home Park, a mobile home development that would be impacted by the realignment of North Limestone Street. Based upon site visits, it appears that this mobile home park is primarily comprised of Hispanic residents (refer to Section 3.12.3.3, page 122).

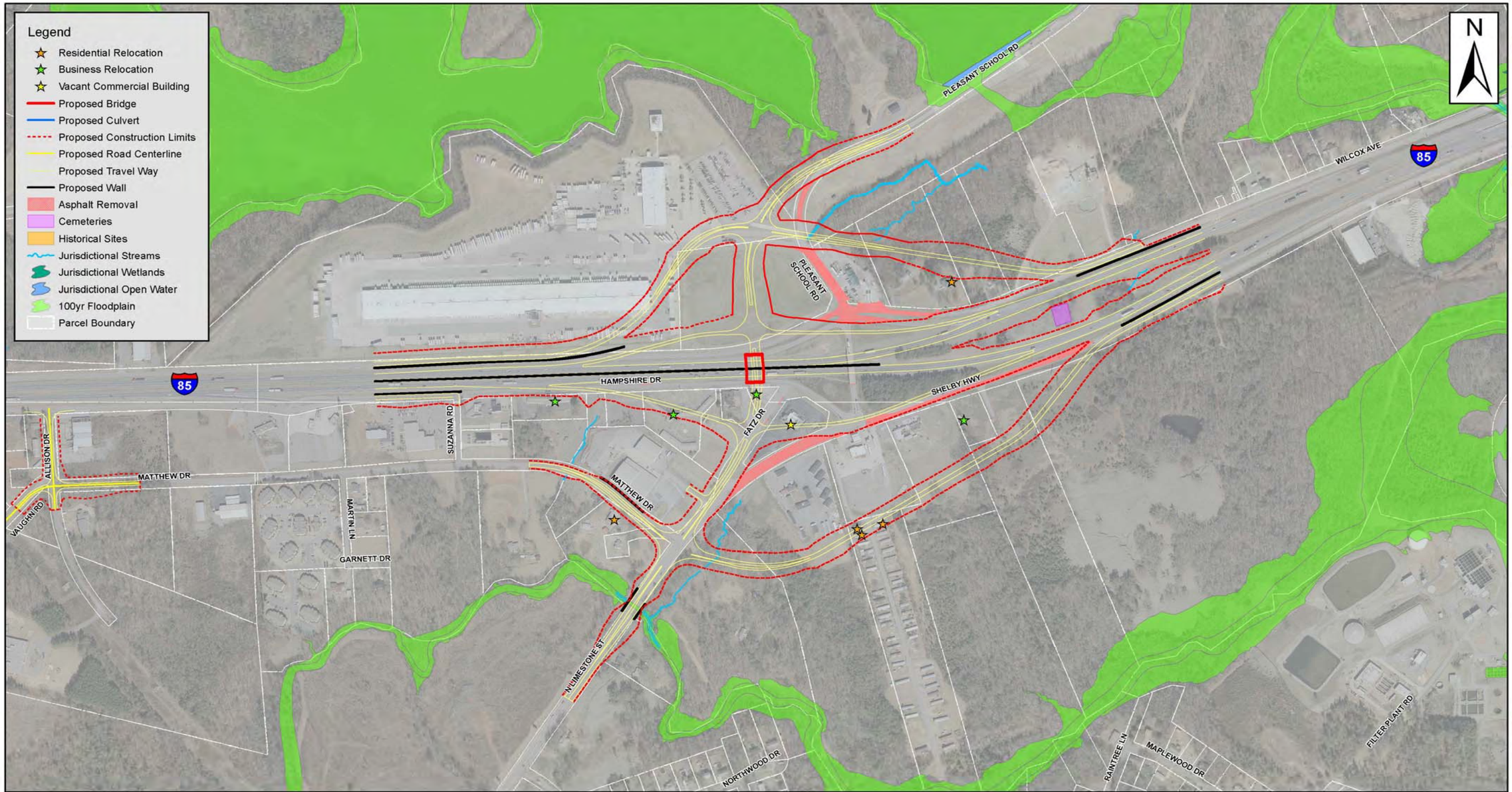
In addition, right-of-way would be acquired from the UPS facility, Norma's Truck Stop, Chapman Concrete Products, Encounter Church, Stephenson Homes, Inc., several businesses along Hampshire Drive, several undeveloped tracts and some residential areas. Access to the UPS Freight, located northwest of the interchange, would be impacted by the realignment of Wilcox Avenue. The accessibility at the interchange will be improved by ramps that connect directly to Pleasant School Road and by the addition of a northbound entrance ramp. All vehicles using the interchange would be positively impacted by these proposed improvements.

2.2.3.3.2 Exit 95 Alternative 2

Alternative 2 also consists of a diamond interchange (refer to Figure 2.14, page 61). The design calls for Pleasant School Road to be realigned and to tie directly to Limestone Street (SC 18) south of the new interchange; the new alignment crosses I-85 on a new bridge, west of the existing S-82 bridge. On the north side of I-85, the new frontage road intersects Pleasant School Road at a distance less than the 750 foot requirement. On the south side of I-85, Matthew Drive will be realigned and extended to function as the service road, intersecting Limestone Street (SC 18) approximately 770 feet south of the new interchange.

Alternative 2, like Alternative 1, is also rated as Very Constructible. Alternative 2 would have cost more to construct ($27.3 million, less than $0.5 million). It would have significantly less impact to streams (399 linear feet). It would have slightly higher impact to farmlands (44.2 acres). Alternative 2 would result in impacts to the same three potential hazardous material sites as described for Alternative 1 and would encroach into one Zone AE floodplain and floodway associated with Providence Branch. This alternative would impact 77 noise receptors, substantially less than the 116 impacted by Alternative 1.

Alternative 2 would result in less residential and business relocations than Alternative 1, nine total. Alternative 2 would result in relocation of four businesses, which are all located south of the interchange, and would impact to the UPS Operations building to the north. Two businesses, Gaffney Inn and Shamrock Inn, would be impacted by the diamond interchange exit from I-85 North; one business, the Concealed Weapons Permit School, would be impacted by the



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Exit 95 - Alt 2

Figure 2.14

realignment of Shelby Highway; and one business, SC Wholesale, would be impacted by the northbound ramp to I-85. The northbound side of the diamond interchange would result in impacts to one vacant commercial building. One building, the former Fatz Café situated at the intersection of Hampshire Drive and Fatz Road, would be impacted by the I-85 North entrance ramp. Alternative 2 would impact UPS Freight's Operations building, access around the operations building, and the employee parking area, as well as the grounds surrounding the operations building.

Five residences would be relocated. Four are located south of the interchange; three mobile homes in the Jimmy's Mobile Home Park would be impacted by the realignment of Shelby Highway; and one home would be impacted by the realignment of Matthew Drive. Additionally, one residence located north of the interchange would be relocated due to the frontage road. The realignment of Shelby Highway proposed in Alternative 2 would result in modifications to its intersection with Matthew Drive. Shelby Highway also would be realigned to the south to be opposite Matthew Drive, creating a new intersection with North Limestone Street. Access to Hampshire Drive from Fatz Drive and North Limestone would be closed. The businesses and residences on Hampshire Drive would use Matthew Drive to either Suzanna or Allison Drives to reach Hampshire Drive. Alternative 2 also proposes improvements to the three-way intersection of Matthew Drive, Allison Drive, and Vaughn Road.

2.2.3.3.3 What is the Preferred Alternative for Exit 95?

Alternative 2 is the Preferred Alternative for Exit 95. Although its cost is slightly higher than Alternative 1, they are rated equal for constructability. Alternative 2 would have less business and residential relocations than Alternative 1. It would however, impact the UPS Operations building. These two alternatives are the only alternatives in the entire project study area that have a substantial difference in noise impacts. Alternative 2 would have 39 fewer (77 versus 116) noise impacts. Another evaluation factor for Alternative 2 is the significant difference in stream impacts between the two alternatives, with over 1,200 linear feet less impact for Alternative 2. This lower stream impact gives this alternative preference when an application is made for a permit for the impacts to jurisdictional wetlands since selection of the "least environmentally damaging practicable alternative" is the goal of the U.S Army Corps of Engineers permitting requirements. Public comments were significantly in favor of Alternative 2, primarily because it provides a simpler, more direct access to the interstate.

2.2.3.4 What are the Reasonable Alternatives that were further evaluated for Exit 96, Shelby Highway/SC 18?

There are three Reasonable Alternatives for Exit 96. None of the three would impact floodplains, historical sites, or archaeological sites. There is the potential for the Northern long-eared bat (NLEB) to be found in the study area. All the alternatives would use the existing alignment of Shelby Highway south of the interchange, instead of moving Shelby Highway slightly south. This would avoid impacts to a stream south of Shelby Highway. There would be no impacts to ponds with any of the three alternatives. The noise impacts are similar in terms of the numbers of

receptors impacted. The biggest differences between these three interchanges is which roads on the south side provide the through movement to and from the interchange.

2.2.3.4.1 Exit 96 Alternative 1

Alternative 1 consists of a diamond interchange, and a frontage road on new location on the north side of I-85 to meet the required 750 foot separation between the interchange and the intersection (refer to Figure 2.15, page 65). The alternative includes a westward shift in the alignment of Shelby Highway/SC 18 and construction of a new bridge over I-85. South of I-85, the design calls for the new alignment of Shelby Highway/SC 18 to intersect the existing Limestone Street/SC 18 and Victory Trail Road/SC 329 alignment with a T-intersection.

Alternative 1 is rated as Very Constructible but would have the highest cost to construct ($24.2 million). Of the three alternatives, it is the only one that would impact wetlands (0.02 acres), but would not impact streams. It would impact one identified potential hazardous material site, a site at 1425 Wilcox Avenue with a LUST that has been determined to need No Further Action by SCDHEC. Alternative 1 would have the highest impact to potential farmland (39 acres). It would have impacts to 14 noise receptors.

Alternative 1 would result in the greatest number of relocations. There would be nine business relocations, all of which are north of the interstate. Six of the businesses that would be impacted operate from one commercial building: Littlejohn's Auto & Repair, Southern Pride Kart, RLH Construction, Palmetto Equipment, Roof Options, and Ellison's Machine Shop. These businesses would be impacted by the realignment of Wilcox Avenue. Cardenas Tires, Silver Dollar Private Club, and a convenience/open air mart also located on Wilcox Avenue, would be impacted by the southbound interchange ramp. Additionally, a vacant commercial building adjacent to Cardenas Tires on Wilcox Avenue would be impacted by the ramp onto I-85 South.

One residence, located north of the interstate on Wilcox Avenue just west of the six businesses, would be impacted by the realignment of Wilcox Avenue from the north on Shelby Highway. Right-of-way would be needed from several undeveloped parcels, as well as the Kangaroo service station on Shelby Highway and McEntire Concrete on Wilcox Avenue. There would be no through movement for vehicles traveling to the interchange from the south on Shelby Highway (SC 18). Traffic moving north to the interchange from both SC 18 and SC 39 would have to stop and turn either left or right, respectively, onto Shelby Highway and toward the interchange.

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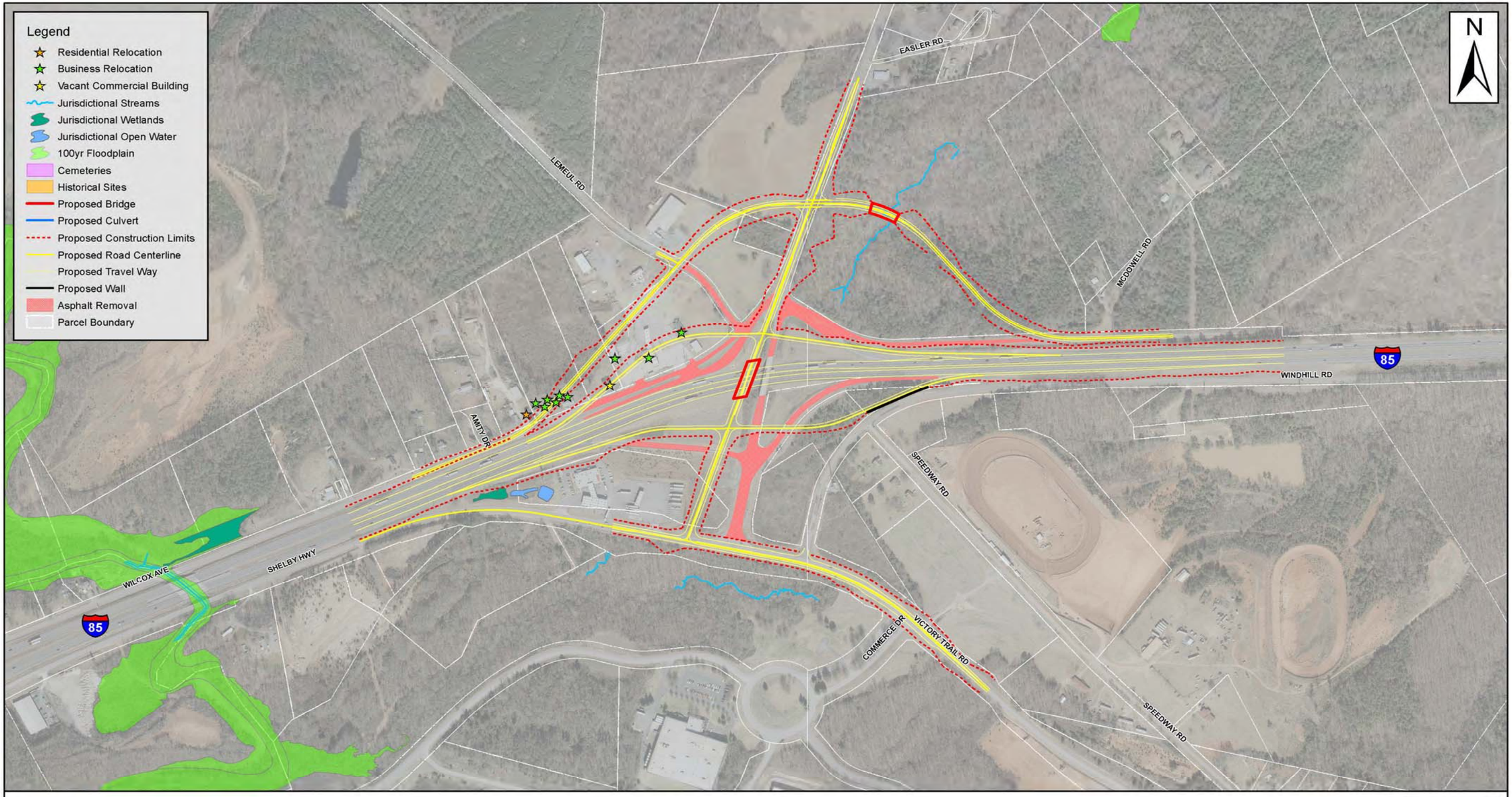


South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 96 - Alt 1

Figure 2.15

2.2.3.4.2 Exit 96 Alternative 2

Alternative 2 consists of a diamond interchange, and a service road on new location on the north side of I-85 to achieve the required 750 foot separation between the interchange and the intersection (refer to Figure 2.16, page 67). The alternative includes an eastward shift in the alignment of Shelby Highway/SC 18 and construction of a new bridge over I-85. South of I-85, the design would tie Shelby Highway/SC 18 directly to Limestone Street/SC 18 to create a free-flow for traffic, and create a stop-controlled T-intersection for Victory Trail Road/SC 329. In addition, a new connector road would be provided between Speedway Road and Victory Trail Road/SC 329.

Alternative 2, would be rated as Very Constructible and would cost $23.7 million to construct. It would impact the same potential hazardous material site as Alternative 1. It would also impact 226 linear feet of streams, but would not impact wetlands. Alternative 2 would have the lowest impact to potential farmland (35.3 acres). It would have impacts to 15 noise receptors.

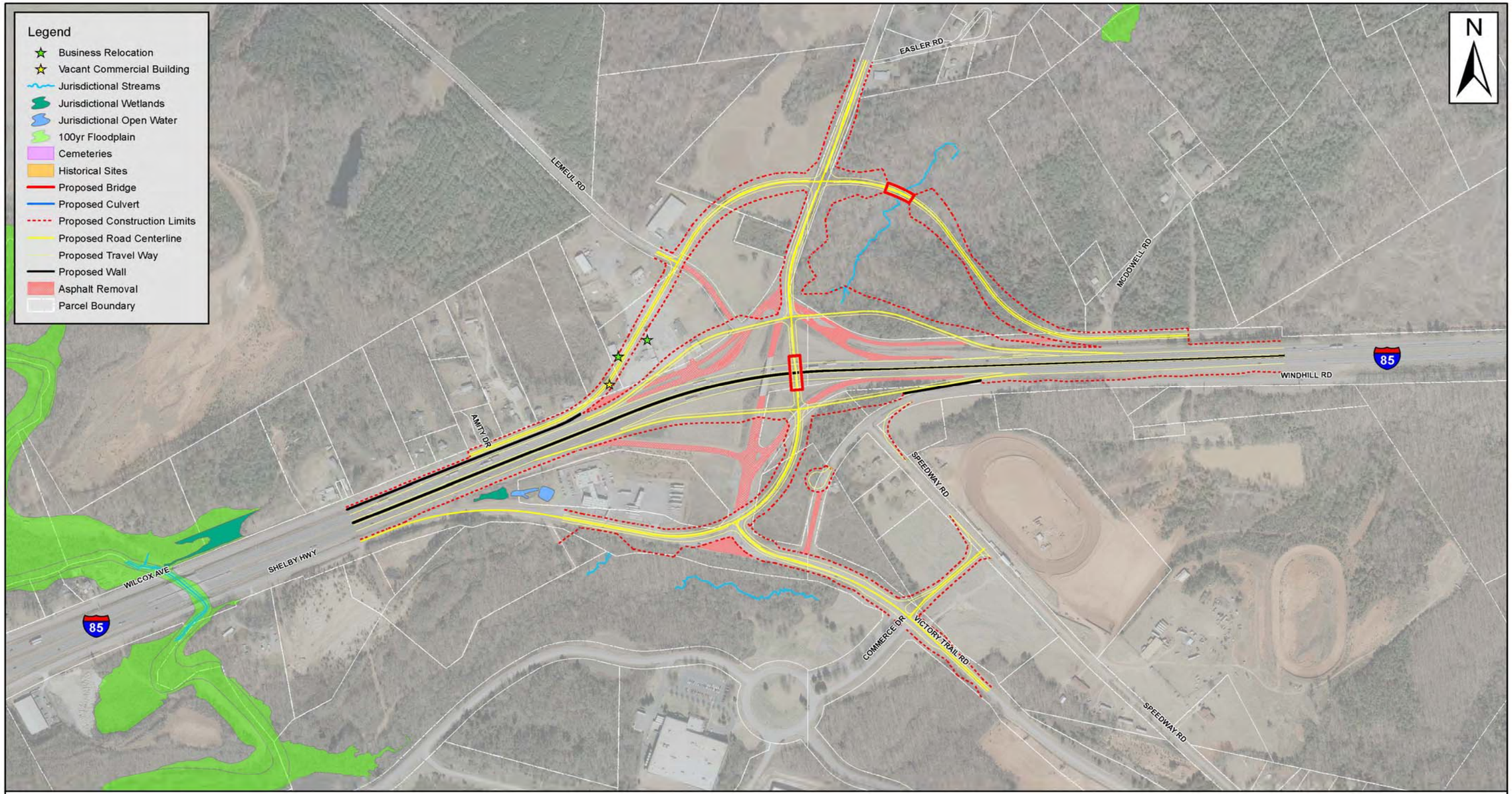
Alternative 2 would result in no relocations of residences, but would relocate two businesses. Cardenas Tires would be impacted by the realignment of Wilcox Avenue from the north on Shelby Highway. A convenience/open air mart would be impacted by both the realignment of Wilcox Avenue, as well as the diamond interchange ramp onto I-85 South. A vacant commercial building adjacent to Cardenas Tires would be impacted by the southbound ramp onto I-85.

The through movement for this interchange would be for vehicles traveling on Shelby Highway from either direction to the interchange and continuing on SC 18. Vehicles intending to travel south on SC 39 from SC 18 coming from either direction would have to stop and turn onto SC 39.

2.2.3.4.3 Exit 96 Alternative 3

Alternative 3 consists of a diamond interchange, and the frontage road would be moved farther north on new location on the north side of I-85 to meet the required 750 foot separation between the interchange and the intersection (refer to Figure 2.17, page 68). The alternative includes an eastward shift in the alignment of Shelby Highway/SC 18 and construction of a new bridge over I-85. South of I-85, the design ties Shelby Highway/SC 18 directly to Victory Trail Road/SC 329 to create a free-flow for traffic, and creates a stop-controlled tee intersection for Shelby Highway/SC 18. In addition, a new connector road is provided between Speedway Road and Victory Trail Road/SC 329. Alternative 3, like Alternatives 1 and 2, is rated as Very Constructible. It would cost $22.6 million to construct, the lowest cost of the three alternatives. Alternative 3 would impact the same potential hazardous material site as the other two alternatives. It would impact 226 linear feet of streams, but would not impact wetlands. This alternative would have the second highest impact to potential farmland (38.2 acres). It would have impacts to 16 noise receptors

Relocations resulting from Alternative 3 would be the same as Alternative 2. It would result in the relocation of two businesses: Cardenas Tires, impacted by the realignment of Wilcox Avenue



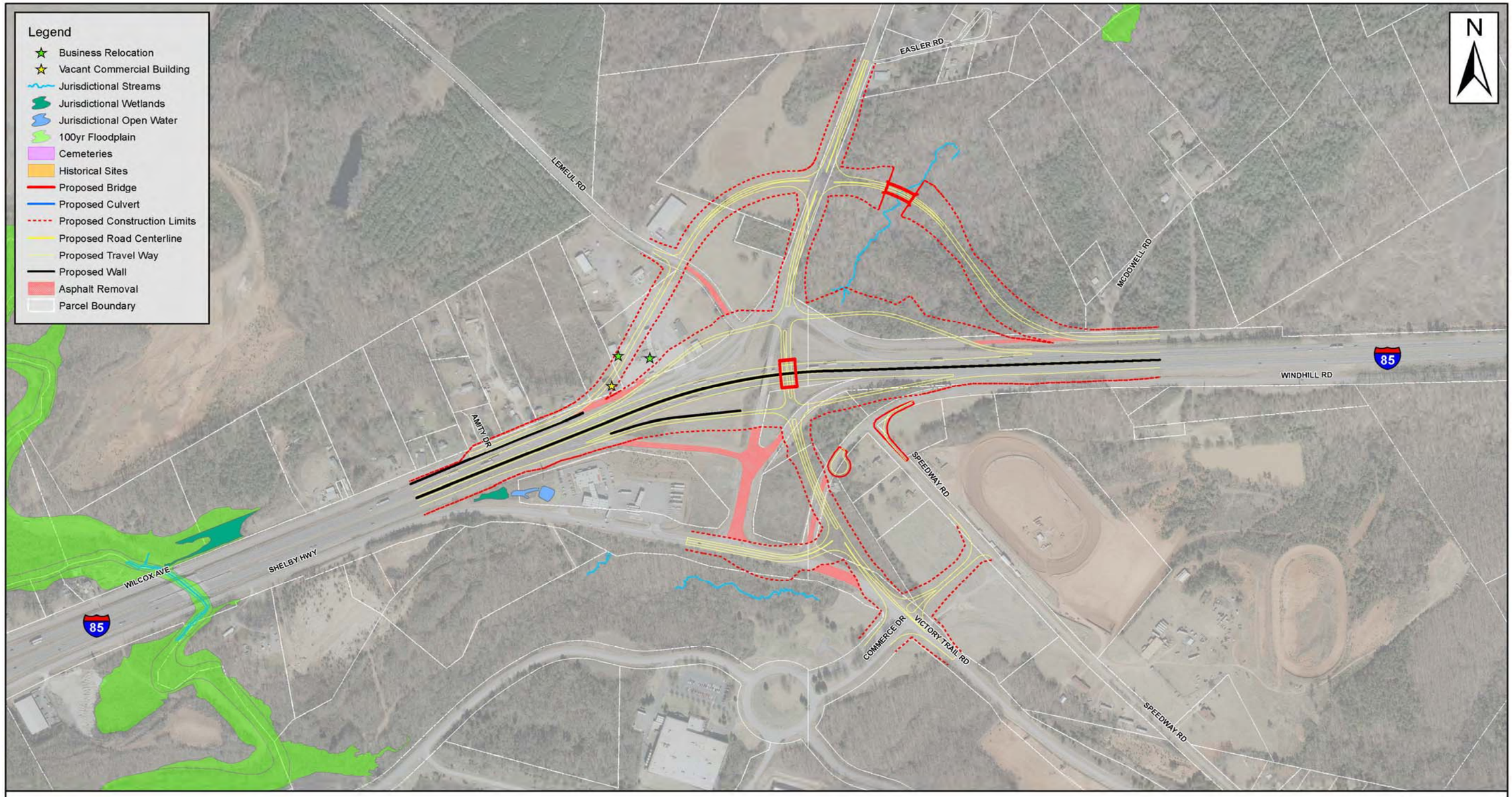
South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 96 - Alt 2

Figure 2.16



South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Exit 96 - Alt 3

Figure 2.17

from the north on Shelby Highway; and a convenience/open air mart, impacted by both the realignment of Wilcox Avenue, as well as the diamond interchange ramp onto I-85 South.

Additionally, a vacant commercial building adjacent to Cardenas Tires would be impacted by the ramp onto I-85 South. No residences would be relocated. The through movement for this interchange is for vehicles traveling north or south on SC 329. Northbound vehicles coming from SC 18 would have to stop to turn onto SC 329 either to proceed to the interchange or to go south on SC 329. Southbound vehicles on SC 18 would have to stop and make a right turn to continue on SC 18.

2.2.3.4.4 What is the Preferred Alternative for Exit 96?

Alternative 1 would have the least impact to streams of the three alternatives and a small impact to wetlands. However, it would have the highest cost and would relocate nine businesses and one residence; therefore, it was not considered as the preferred alternative. Alternatives 2 and 3 would have similar impacts to one another, with the difference that Alternative 3 would cost slightly less and provide a through movement to the south, along SC 329, instead of west along SC 18. With the existing Meadow Creek Industrial Park and the proposed Lee Nuclear Station proceeding with permitting for the facility, this movement would be the most beneficial. It would accommodate the traffic that would be expected at the industrial park and to be added during construction and operation of the Lee Nuclear Station. Therefore, Alternative 3 is the Preferred Alternative.

2.3 What is the Project Preferred Alternative?

A Preferred Alternative has been designated for the mainline improvements as well as for each interchange. The mainline with the Sunny Slope 1 Alternative, along with Alternative 4 at Exit 83, Alternative 5b at Exit 87, Alternative 2 at Exit 95, and Alternative 3 at Exit 96 comprise the Preferred Alternative for the project. These segments will continue to have the designs improved in order to further reduce potential impacts to the human and natural environment. Chapter 3, Existing Conditions and Environmental Consequences, describes the specific impacts to be anticipated and what measures to mitigate those impacts will be implemented.

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CHAPTER 3 EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

Existing conditions refers to the current state of the human environment in the project study area. This is used as a baseline to measure the potential impacts associated with each of the alternatives. The No-Build Alternative is a continuation of the existing conditions 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 alternatives. What is described in this section are the impacts resulting from the Preferred Alternative compared with 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.

3.1 What are waters of the US?

Waters of the U.S. are defined by 33 CFR 328.3(b) and protected by Section 404 of the Clean Water Act (33 U.S.C. 1344), which is administered and enforced in South Carolina by the U.S. Army Corps of Engineers (USACE), Charleston District. The term "waters of the U.S." is defined in 33 CFR Part 328 as:

For this project, Waters of the U.S. refers to wetlands, streams, rivers, and lakes and ponds.

1. 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;
2. All interstate waters including interstate wetlands;
3. 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, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
   - Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
   - From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   - Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs 1 – 4 above;
6. The territorial seas; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in 1 – 6 above.

Wetlands are defined 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 soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands are defined in the field as areas that display positive evidence of three environmental parameters including dominance of hydrophytic vegetation, wetland hydrology, and hydric soils.

Streams, or tributaries, are defined as seasonal or perennial. Seasonal tributaries flow at least three (3) months a year, but do not have constant flow. Perennial tributaries flow year-round.

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

The boundaries of waters of the U.S. were delineated between October 3 and November 23, 2014, and April 7 and June 20, 2015. Wetlands in the project area were determined using the Routine On-Site Determination Method as defined in the Corps of Engineers Wetland Delineation Manual[19] and the Eastern Mountains and Piedmont Region Supplement to the Manual.[20] The boundaries of delineated waters within the project area were flagged (delineated) in the field at that time. Furthermore, delineated waters were located using a handheld Global Positioning System (GPS) unit.

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

3.1.2 What types of wetlands and streams were identified in the study area?

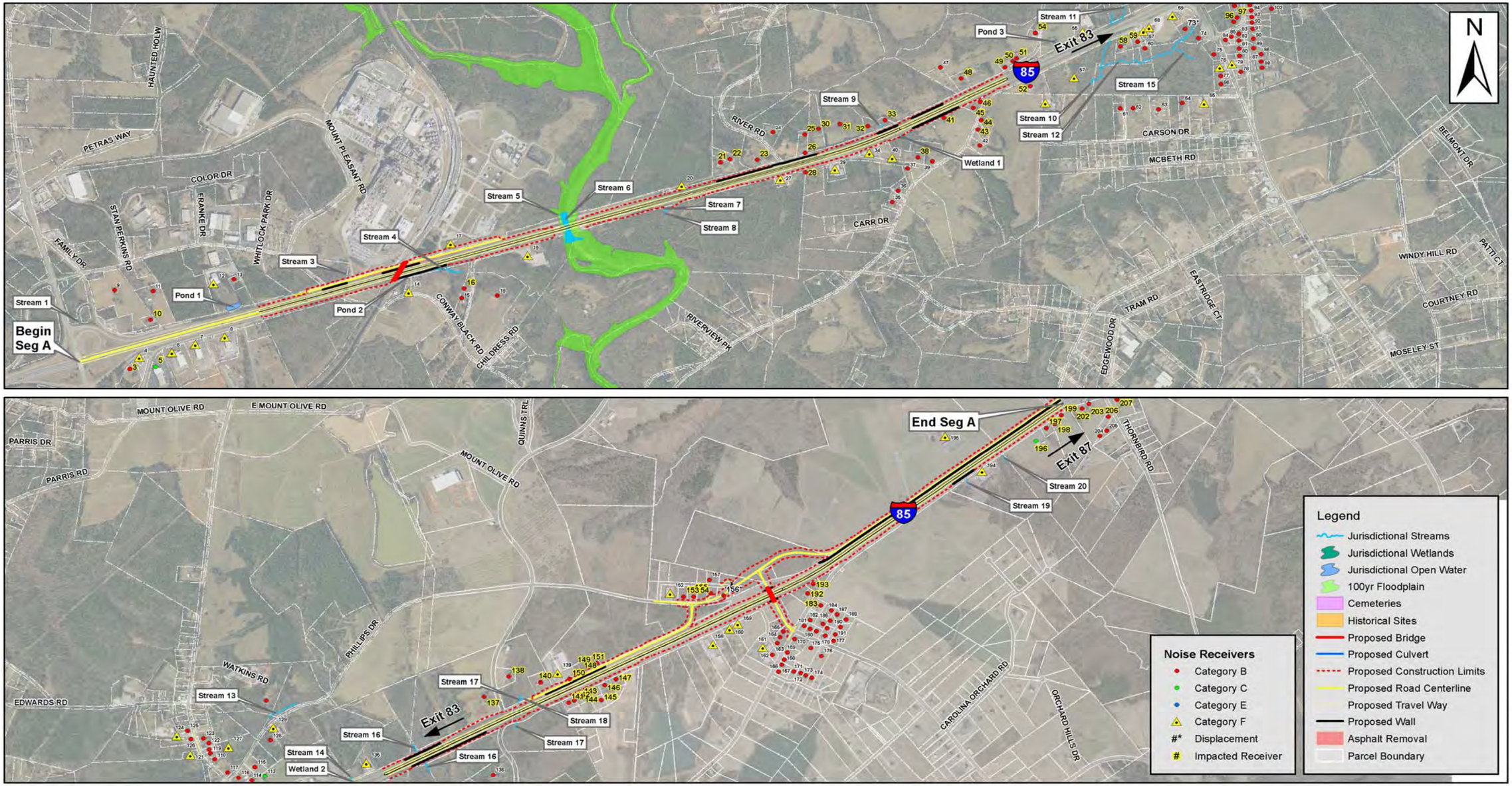
A total of 16 wetland communities, 54 streams, and 9 ponds/waters were identified within the project area during site reviews. More detailed information about the wetlands is in the Natural Resources Technical Memorandum in Appendix C. Their locations are shown in Figures 3.1A-G, pages 73 to 79.

Wetlands delineated within the project area included four (4) emergent, one (1) shrub-scrub, one (1) forested/shrub-scrub, two (2) emergent/seep, five (5) forested wetlands, and three (3) forested/emergent wetlands as shown in Table 3.1, page 80, along with the acreage within the study area.

As shown in Table 3.1, most of the wetlands are small. Only wetlands 3, 12, 14, and 16 extend beyond the study area boundary. Wetland 16 is part of a large forested wetland associated with the Broad River, which is east of the project study area. The portion of it adjacent to I-85 includes a shrub-scrub community.

[19] U.S. Army Corps of Engineers, *Corps of Engineers Wetlands Delineation Manual*, January 1987

[20] U.S. Army Corps of Engineers, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (ver. 2.0), April 2012



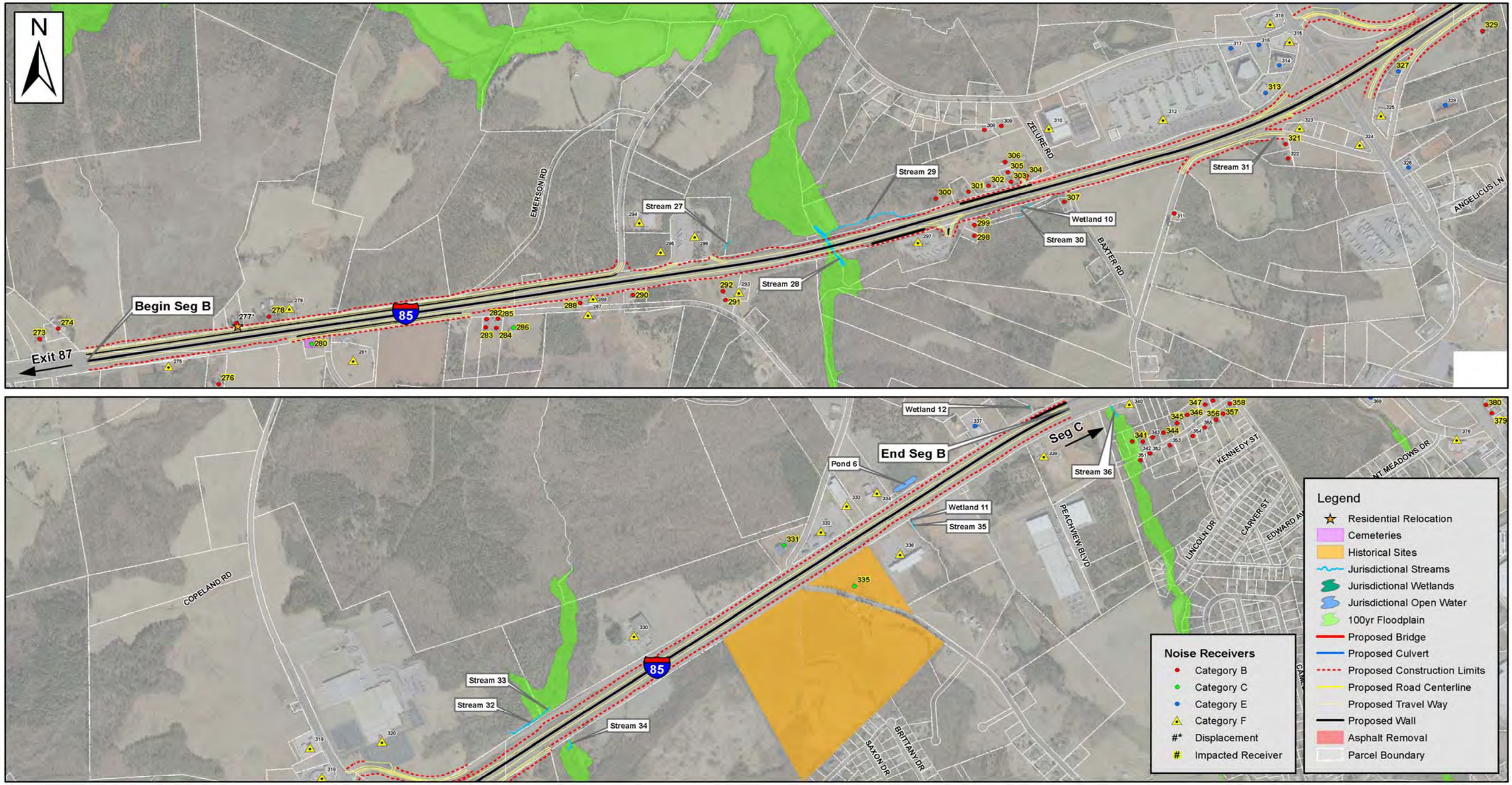
South Carolina Department of Transportation

1 inch = 1,500 feet

I-85 Widening MM 80-96 Environmental Assessment

Mainline - Seg A

Figure 3.1A



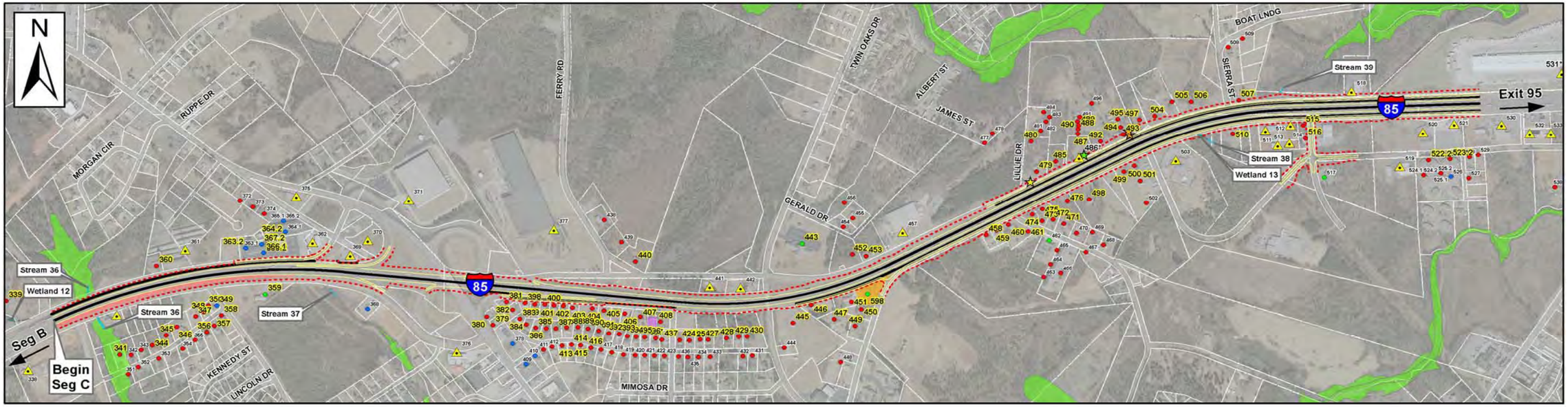
South Carolina Department of Transportation

1 inch = 1,000 feet

I-85 Widening MM 80-96 Environmental Assessment

Mainline - Seg B

Figure 3.1B



South Carolina Department of Transportation

1 inch = 1,000 feet

I-85 Widening MM 80-96 Environmental Assessment

Mainline - Seg C

Figure 3.1C

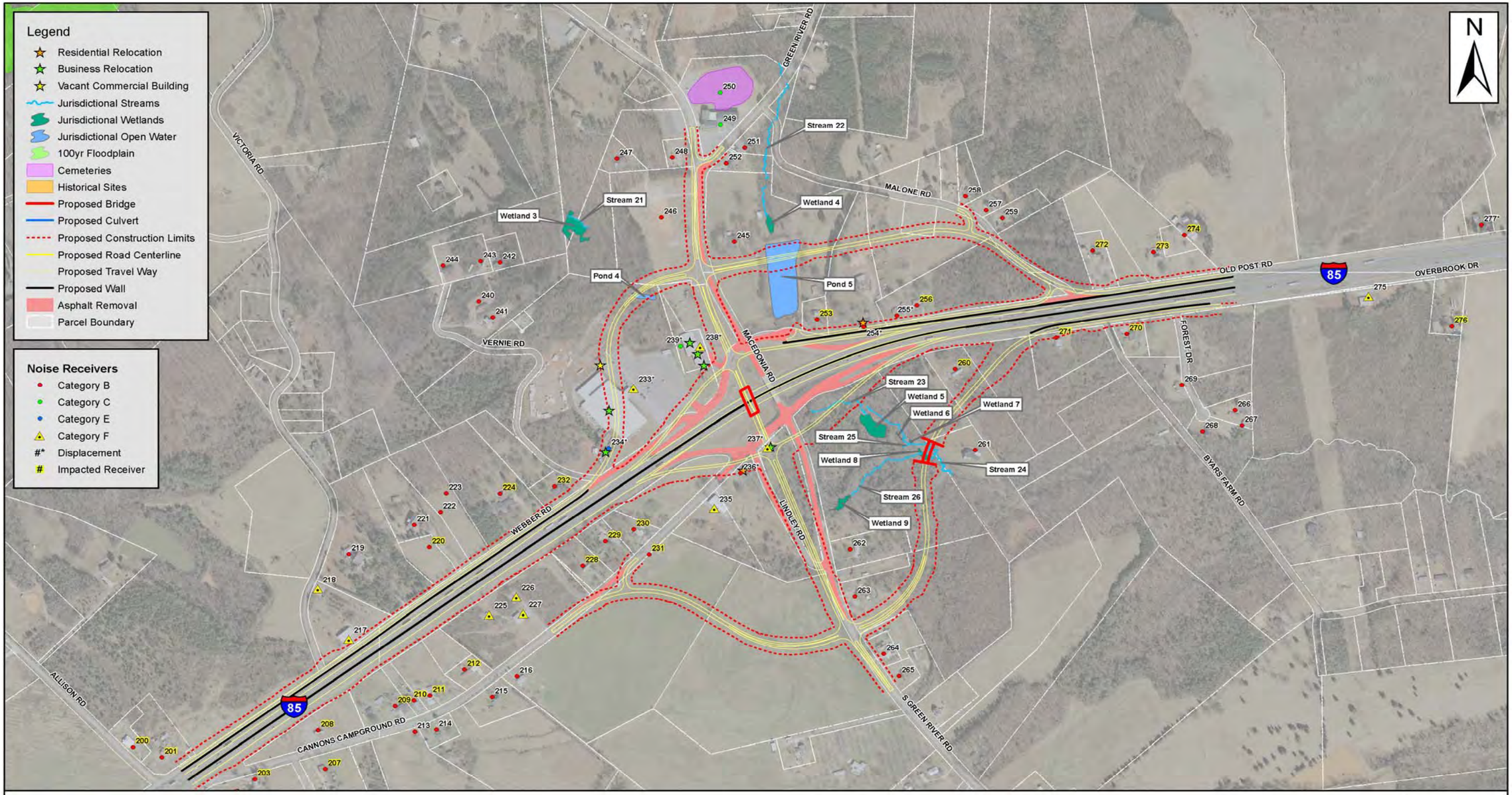
SCDOT
South Carolina Department of Transportation

1 inch = 600 feet

I-85 Widening MM 80-96 Environmental Assessment

Preferred Alternative Exit 83

Figure 3.1D



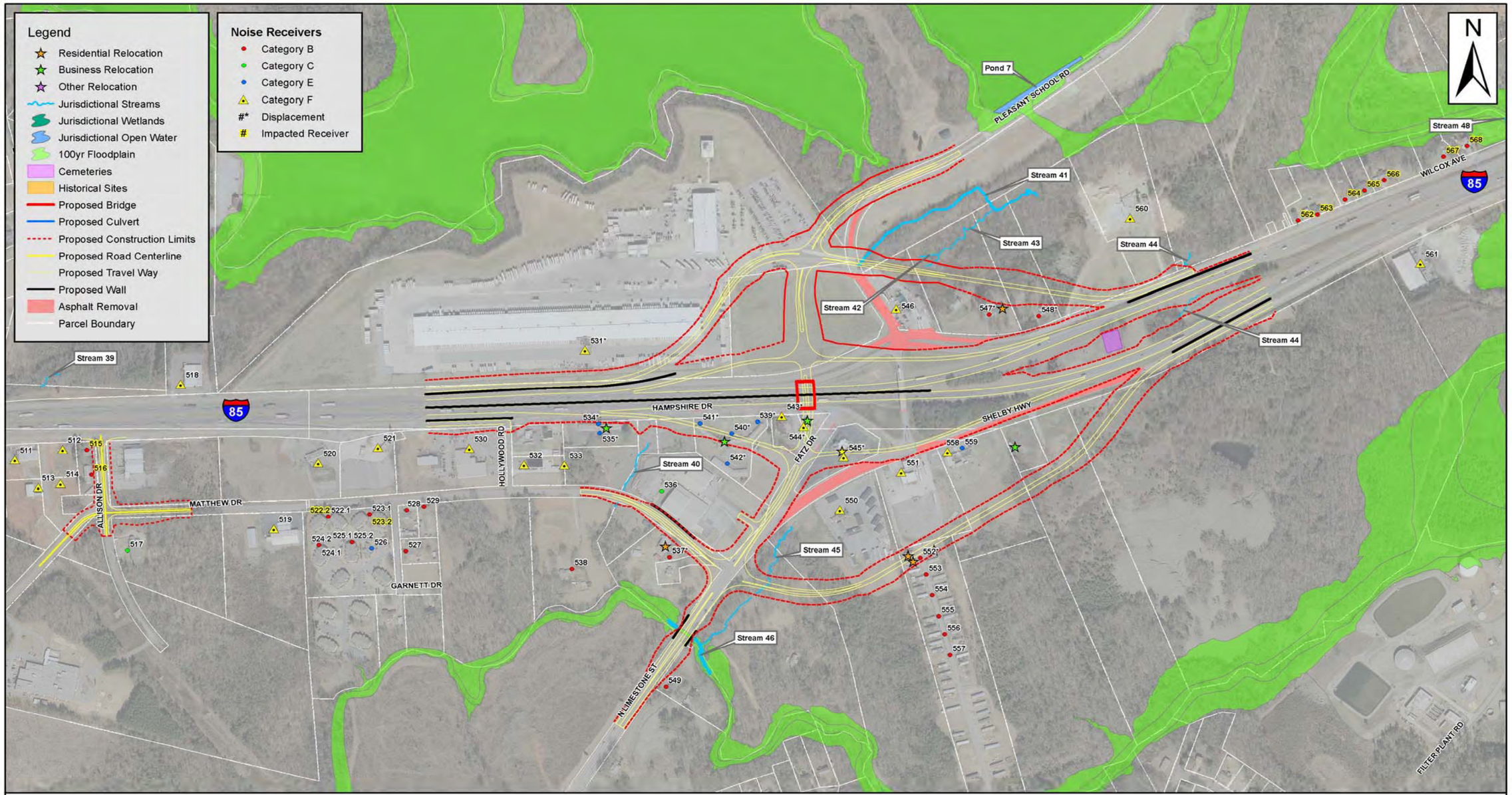
SCDOT
South Carolina Department of Transportation

1 inch = 600 feet

I-85 Widening MM 80-96 Environmental Assessment

Preferred Alternative Exit 87

Figure 3.1E



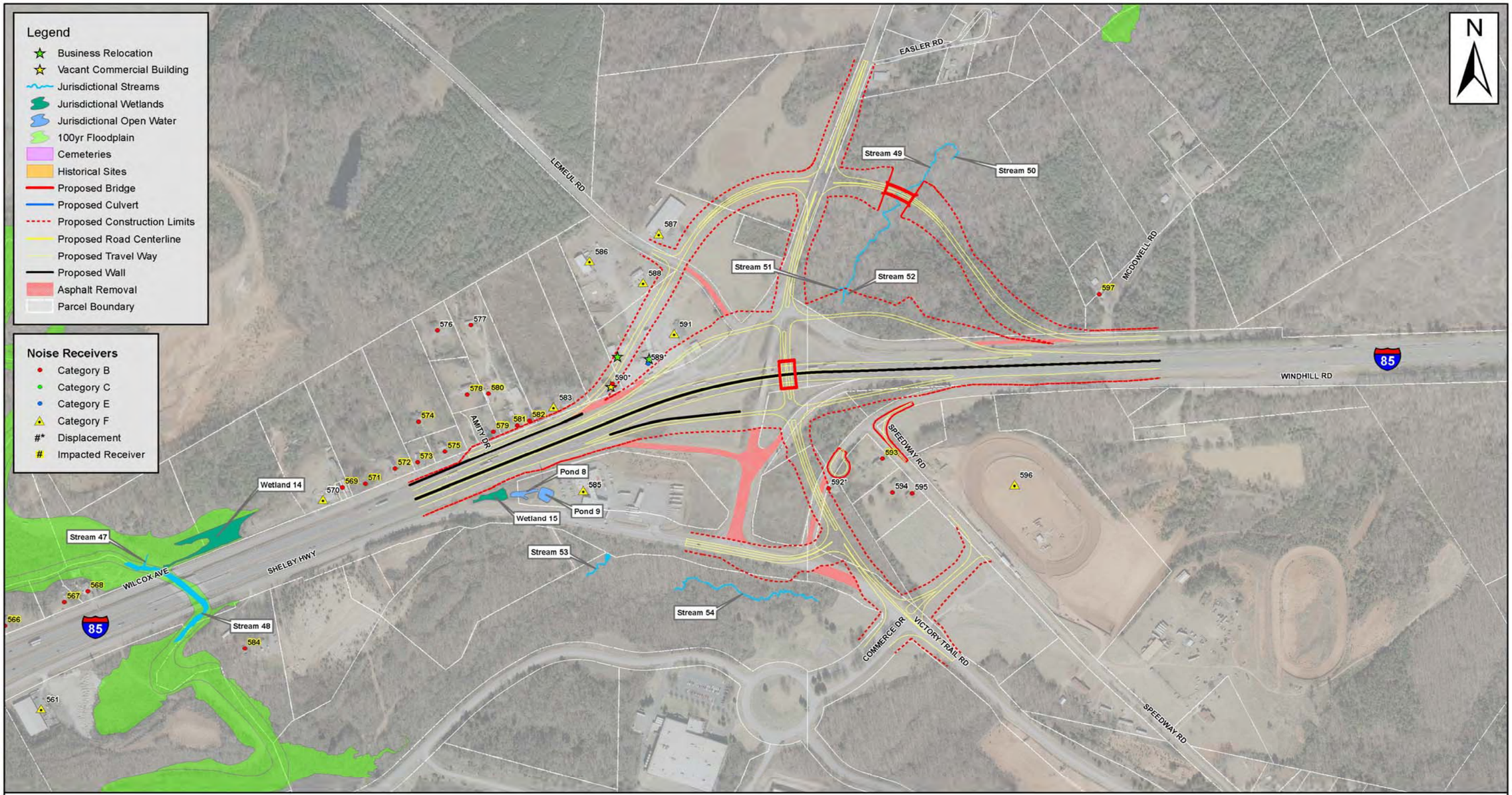
South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Preferred Alternative Exit 95

Figure 3.1F



SCDOT
South Carolina Department of Transportation

1 inch = 500 feet

I-85 Widening MM 80-96 Environmental Assessment

Preferred Alternative Exit 96

Figure 3.1G

Table 3.1
Wetlands Within the Project Study Area

Wetland	Wetland Type	Area (ac.)
Wetland 1	Forested/Emergent	0.126
Wetland 2	Emergent	0.046
Wetland 3	Forested	0.346
Wetland 4	Shrub-Scrub	0.094
Wetland 5	Emergent	0.352
Wetland 6	Emergent/Seep	0.005
Wetland 7	Forested	0.009
Wetland 8	Forested	0.059
Wetland 9	Forested	0.094
Wetland 10	Emergent/Seep	0.006
Wetland 11	Emergent	0.011
Wetland 12	Forested/Emergent	0.047
Wetland 13	Emergent	0.053
Wetland 14	Forested/Emergent	0.673
Wetland 15	Forested	0.155
Wetland 16	Forested/ Shrub-Scrub t	2.297

Source: Mead and Hunt, *Natural Resources Technical Memorandum, Proposed Interstate 85 Widening and Improvements Project*, 2015

A total of 54 streams, consisting of 46 unnamed tributaries and eight (8) named streams, were delineated within the project area. The locations of the streams are shown in Figures 3.1A-G, pages 73 to 79. Larger, named streams and rivers identified include:

- Pole Bridge Branch (Tributary 2)
- Pacolet River (Tributary 6)
- Little Thicketty Creek (Tributary 16)
- Thicketty Creek (Tributary 28)
- Cole Creek (Tributary 34)
- Irene Creek (Tributary 36)
- Providence Branch (Tributary 46)
- Cherokee Creek (Tributary 48)

Pole Bridge Branch is west of the proposed improvement and would not be impacted by the Preferred Alternative. The Pacolet River, Thicketty Creek, and Cherokee Creek crossings would be on the existing bridges and no changes would occur at those locations. The Little Thicketty

Creek, Cole Creek, Irene Creek, and Providence Branch crossings would be done without making any changes at those crossings.

A total of nine ponds, and other open waters, were identified within the project during site reviews, refer to Table 3.2. These waters included Lake Whelchel and eight unnamed ponds. Five of the ponds (2, 4, 5, 8, and 9) are contained entirely within the study area. Four ponds, (1, 3, 6, and 7) extend beyond the study area. Lake Whelchel is an approximately 150 acre lake that is the primary drinking water source for the City of Gaffney.[21] It would not be directly impacted by this project.

Table 3.2
Ponds Within the Project Study Area

Ponds/Open Waters	Area (ac.)
Pond 1	0.430
Pond 2	0.019
Pond 3	0.056
Pond 4	0.098
Pond 5	2.058
Pond 6	0.348
Open Water 7, Lake Whelchel	0.330
Pond 8	0.082
Pond 9	0.113

Source: Mead and Hunt, *Natural Resources Technical Memorandum, Proposed Interstate 85 Widening and Improvements Project*, 2015

3.1.3 What are potential impacts to wetlands and streams as a result of the proposed project?

Mainline

The mainline widening of I-85 (including the Sunny Slope Drive bridge replacement) would impact a total of three tributaries, comprising 77-linear feet (lf) of impact. These include a portion of perennial Tributaries 4 and 9, and a portion of seasonal Tributary 31. Widening of the mainline would also impact 0.004 acre of Wetland 1, 0.044 acre of Wetland 13, and 0.199 acre of Wetland 16.

The Preferred Alternative would impact approximately 1,279-linear feet (lf) of streams or tributaries, 0.25 acre of wetlands, and 0.84 acre of ponds.

[21] Gaffney, South Carolina Board of Public Works, *2014 Water Quality Report*, http://www.gbpw.com/files/2014-water-report.pdf

Interchange Alternatives

The Preferred Alternative for the Exit 83 interchange would impact approximately 312-lf of streams, 112-lf of the seasonal reach of Tributary 12, and an additional 200 feet of the perennial reach of Tributary 12. Neither wetlands nor ponds would be impacted by the project at Exit 83.

The Preferred Alternative for the Exit 87 interchange would impact approximately 369-lf of streams, 114-lf of the seasonal reach of Tributary 23, and an additional 255 feet of the perennial reach of Tributary 23. Approximately 0.073 acre of Pond 4 and 0.77 acre of Pond 5 would also be impacted. Wetlands would not be impacted by the project at Exit 87.

The Preferred Alternative for the Exit 95 interchange would impact five seasonal tributaries, comprising 399-lf of impact. These include a portion of Tributaries 40, 41, 43, 44 and 45. Neither wetlands nor ponds would be impacted by the project in the vicinity of Exit 95.

The Preferred Alternative for the Exit 96 interchange would impact two tributaries, comprising 122-lf of impact. These include seasonal Tributary 52, and 88-lf of the seasonal reach of Tributary 49. Neither wetlands nor ponds would be impacted by the project in the vicinity of Exit 96.

3.1.4 How would the proposed impacts be mitigated?

Compensatory mitigation is normally required to offset unavoidable losses of waters of the U.S. The Council on Environmental Quality (CEQ) has defined mitigation in 40 CFR Part 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 and the addition of bridges to avoid wetland impacts. Impacts have been minimized by increasing headwall heights, thus reducing the lengths of culverts and pipes used within streams. Compensatory mitigation consists usually 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 (i.e., on-site compensatory mitigation). The USACE typically requires compensatory mitigation for any wetland impacts for which a Section 404 permit application is submitted.

It is anticipated that compensatory mitigation for permanent project impacts will be attained through purchase of mitigation credits from a USACE-approved mitigation bank. Specific mitigation requirements will be established during the Section 404/401 permitting process.

3.1.5 What permits are required?

A Clean Water Act Section 404 permit is required for impacts to waters of the U.S., including wetlands. Section 404 is administered by the U.S. Army Corps of Engineers (USACE). Depending on the type and extent of waters of the U.S., including wetlands, to be impacted, Section 404 permitting requirements can range from activities that are considered exempt or preauthorized to those requiring pre-construction notification (PCN) for a Nationwide Permit (NWP) or Individual Permit (IP) from the USACE. For South Carolina Department of Transportation (SCDOT)

projects, USACE General Permit (GP) 2010-01346 may be applicable if impacts do not exceed 3.0 acres of freshwater wetlands, 0.5 acre of tidal wetlands, and/or 300-f of stream.

Based on the potential impacts exceeding the thresholds to Waters of the U.S. of the SCDOT GP, it is anticipated that an IP will be required for this project. This involves a more rigorous, time-consuming review process. It is not uncommon for the regulatory processing of an IP application to take close to a year.

In addition to the Section 404 permit, the South Carolina Department of Health and Environmental Control (SCDHEC) must grant, deny, or waive a Water Quality Certification (WQC), in accordance with Section 401 of the Clean Water Act. 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 (ORW), Shellfish Harvesting Waters (SFH), trout waters, areas draining to waters included on the 303(d) list of impaired waters, and areas draining to waters with an approved Total Maximum Daily Load (TMDL).

3.2 What are protected species and how might they be impacted?

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, is the federal regulatory tool that serves to administer permits, implement recovery plans, and monitor protected species. The United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA-NMFS) administer the ESA and establish a list of projected species. Species with the federal classification of Endangered (E) or Threatened (T), or Threatened due to Similarity of Appearance (T [S/A]) are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). In addition to federal regulations, animal species that are on the South Carolina state protected species list receive protection under the South Carolina Nongame and Endangered Species Conservation Act.

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 a federal actions are involved, including federal permits. Because of the federal nexus of the proposed project, consultation with USFWS and/or NOAA-NMFS would be required under Section 7 of the ESA, as amended (16 U.S.C. 1531-1534) for actions that “may affect” federally-classified endangered and threatened species.

A search of the USFWS database, updated April 29, 2015, provided existing information concerning the potential occurrence of federally threatened or endangered species within Spartanburg and Cherokee Counties. The database identifies two federally threatened species known to occur or to have formerly occurred in these counties, as listed in Table 3.3, page 84.

Table 3.3
Listed Species in Cherokee and Spartanburg Counties

Common Name	Scientific Name	County of Listing	Federal Status	State Status
Northern long-eared bat	*Myotis septentrionalis*	Spartanburg & Cherokee	T	-
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Spartanburg & Cherokee	T	-
T = Threatened				

The South Carolina Department of Natural Resources (SCDNR) Rare, Threatened and Endangered Species Inventory[22] database for Spartanburg and Cherokee Counties, updated June 11, 2014, was also reviewed for information regarding species with state endangered or threatened status.

A detailed discussion of the Federally protected species is provided in the Natural Resources Technical Memorandum. They are briefly described below:

Northern long-eared bat (*Myotis septentrionalis*) – The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. During the summer, northern long-eared bats roost underneath bark, in cavities, or in crevices of both live trees and dead trees. Individuals of the species have also been found rarely roosting in structures, like barns and sheds.

Northern long-eared bat
Source: NCDOT

Dwarf-flowered heartleaf (*Hexastylis naniflora*) – Dwarf-flowered heartleaf is a low-growing spicy-smelling, evergreen perennial herb that spreads via rhizomes. Leaves are heart-shaped, alternate, leathery, lacking teeth, and 1.6 to 2.4 inches in length and width. Flowering occurs from mid-March to early June; fruiting begins in late May. The dwarf-flowered heartleaf is typically found along bluffs and north-facing slopes, boggy areas along streams, and adjacent hillsides and ravines with acidic, sandy loam soils in deciduous forests. This species is also commonly associated with mountain laurel (*Kalmia latifolia*).

Although it is not a listed species for Spartanburg and Cherokee Counties, an aquatic survey also was conducted to determine whether or not the federally Endangered Carolina heelsplitter (*Lasmigona decorata*) is present in the study area. The Carolina heelsplitter is a medium-sized mussel with a maximum length of 11.8 centimeters (4.7 inches). The Carolina heelsplitter is

[22] S.C. Department of Natural Resources, *SC Rare, Threatened & Endangered Species Inventory*, http://www.dnr.sc.gov/species/index.html

found in large rivers and streams, but is restricted to cool, clean, shallow, heavily shaded streams with moderate gradient. The Carolina heelsplitter requires stable stream banks and channels, with clean well oxygenated water and little or no fine sediment.[23]

Environmental scientists performed literature and field reviews to determine the likelihood of federally protected species within the project study area and potential project-related impacts. The list of state and/or federally protected species known to occur in the Counties of Spartanburg and Cherokee was reviewed, and field surveys were conducted within the project study area in October 2014 and May and August 2015 (refer to I-85 Widening Biological Assessment, Appendix D). Areas that matched the descriptions of preferred habitat for dwarf-flowered heartleaf were classified as protected species habitat and were surveyed for the presence of protected species.

The SCDNR South Carolina Heritage Trust (SCHT) Geographic Database of Rare and Endangered Species was also reviewed to determine the presence of known populations of protected species within the vicinity of the project. Information obtained from the SCDNR-SCHT database indicates that there are no state-listed threatened or endangered species known to be present within the project study area as of January 17, 2006. Furthermore, according to the database, no state-listed threatened or endangered species are located within a one mile radius of the project.

Potential habitat for dwarf-flowered heartleaf was identified in multiple locations within the project study area, including north-facing hillsides and ravines with acidic, sandy loam soils in deciduous forests. Pedestrian transects were conducted within areas of potential habitat and individuals of the genus Hexastylis were denoted. A variety of Hexastylis species were observed within the project study area; however, no dwarf-flowered heartleaf plants were identified during the field reviews. Additionally, populations of the associated species *Kalmia latifolia* were not found within the project study area.

Potential habitat for the Northern long-eared bat exists throughout the project study area. Existing bridges and culverts, which measure a minimum of five feet in diameter and 200 feet in length, were surveyed in August 2015. No evidence of bats were found during this field survey, however the generic nature of the summer habitat of the bat means that it could be found through most of the study area. The findings were provided to the USFWS in a Biological Assessment (refer to Appendix D), along with a Project Submittal Form for informal consultation with the USFWS (refer to Appendix D). This form lists the avoidance and minimization measures that SCDOT will implement to avoid impacts to the Northern long-eared bat.[24] SCDOT committed to performing acoustic or mist netting surveys for the Northern long-eared bat during the survey window (May 15 through August 15) prior to construction or to only perform clearing of trees greater than 3 inches in diameter between November 15 and March 31. If a survey is completed,

[23] Edwards-Pitman Environmental, Inc., *Protected Aquatic Species Survey Report Cherokee and Spartanburg Counties Interstate 85 Widening from Mile Marker 80 to 96*, June 2015

[24] Federal Highway Administration and Federal Railroad Administration, *Range-wide Programmatic Informal Consultation for Indiana and Northern Long-eared Bat Project Submittal Form*, June 23, 2015

SCDOT will consult with USFWS on the results of this survey and will follow any USFWS regulations/requirements resulting from that consultation.

Potential habitat for Carolina Heelsplitter was identified within 12 tributaries. A freshwater mussel survey was conducted by Edwards-Pitman Environmental, Inc. in October 2014. An associated report entitled *Protected Aquatic Species Survey Report; Cherokee and Spartanburg Counties; Interstate 85 Widening from Mile Marker 80 to 96*[25] was completed in June 2015 (Appendix D). The report documented that neither the Carolina Heelsplitter nor suitable habitat was observed within the 12 streams surveyed. Additionally, there has been no recent or historical documentation of the Carolina Heelsplitter within the Broad River basin.

Based on the literature and field reviews, it is determined that the project will have a biological conclusion of 'no effect' on Carolina Heelsplitter and dwarf-flowered heartleaf. Based upon implementation of the avoidance and minimization measures, USFWS has confirmed a conclusion of "may affect, but not likely to adversely affect" for the northern long-eared bat[26] (refer to Appendix D).

3.3 What impacts to wildlife could result from this project?

There is a wide variety of wildlife species found in the project study area. Bird species observed in the project study area included cardinal (*Cardinalis cardinalis*), Carolina wren (*Thryothorus ludovicianus*), mockingbird (*Mimus polyglottos*), American crow (*Corvus brachyrhynchos*), and mourning dove (*Zenaida macroura*). Other bird species that may occur within the project study area include red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*B. jamaicensis*), black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), red-bellied woodpecker (*Melanerpes carolinus*), downy woodpecker (*Picoides pubescens*), blue jay (*Cyanocitta cristata*), eastern towhee (*Pipilo erythrophthalmus*), American robin (*Turdus migratorius*), Carolina chickadee (*Parus carolinensis*), common grackle (*Quiscalus quiscula*), tufted titmouse (*Baeolophus bicolor*), starling (*Sturnus vulgaris*), and brown-headed nuthatch (*Sitta pusilla*).

No reptile or amphibian species were observed within the project study area during the field reviews. However, various terrestrial reptile and amphibian species may occur within the project study area and may include southern toad (*Bufo terrestris*), black rat snake (*Elaphe obsoleta obsoleta*), eastern kingsnake (*Lampropeltis getula getula*), eastern box turtle (*Terrapene carolina carolina)*, northern water snake (*Nerodia sipedon*), rough green snake (*Opheodrys aestivus*), brown snake (*Storeria dekayi*), redbelly snake (*S. occipitomaculata*), eastern garter snake (*Thamnophis sirtalis*), copperhead (*Agkistrodon contortix*) and various salamanders (*Ambystoma* spp.).

No mammals were directly observed within the project study area during the field reviews. Terrestrial mammals that may occur in the project study area include raccoon (*Procyon lotor*),

[25] Edwards-Pitman Environmental, Inc., *Protected Aquatic Species Survey Report Cherokee and Spartanburg Counties Interstate 85 Widening from Mile Marker 80 to 96*, June 2015

[26] Email from Morgan Wolf, USFWS to Siobhan Gordon, SCDOT, dated September 8, 2015

opossum (*Didelphis virginiana*), eastern gray squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), eastern chipmunk (*Tamias striatus*), and eastern cottontail rabbit (*Sylvilagus floridanus*).

Aquatic Wildlife

Aquatic invertebrates observed in the project study area include crayfish and various macroinvertebrate insect species located within numerous tributaries. A freshwater mussel survey was also conducted within perennial tributaries that found Eastern creekshells (*Villosa delumbis*) and Asiatic clams (*Corbicula fluminea*)

No aquatic mammals were directly observed in the project study area. Beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*) may be expected to occur in the project study area. Fish species that may occur within the streams, creeks, and rivers located within the project study area include mosquito fish (*Gambusia* spp.), sunfish (*Lepomis* spp.), brown bullhead (*Ameiurus nebulosus*), chubs (*Hybopsis* spp.), and various species of shiners (*Notropis* spp.).

Impacts from the mainline widening are anticipated to be minimal. The widening will be primarily in the existing median, which is generally poor habitat for most species found in the project study area. The relocated frontage roads near the interchanges, by virtue of being moved farther away from the interchanges, will divide the habitat adjacent to the interstate.

At Exit 83 the improvements to the interchange occur adjacent to existing roads, with the exception of the partial cloverleaf for northbound traffic entering and exiting the interstate. This approximately 6.5 acre wooded area would be converted to ramps and area within the interchange right-of-way.

Exit 87 would result in about 20 acres of wooded area being divided by the relocated Overbrook Road, a frontage road in the southeastern quadrant of the interchange. However, a bridge over the stream in this quadrant would provide a means of ingress and egress for terrestrial and aquatic animals. Another small (~2 acre) area in the northwest quadrant would be isolated by the conversion of a portion of this area to frontage road.

The improvements at Exit 95 would occur almost entirely within the "footprint" of development that already exists at this interchange, with minimal conversion (2 acres) of wooded habitat in the northeast quadrant of the interchange.

The relocated frontage road in the northeast quadrant of Exit 96 would impact about 19 acres of wooded habitat. However, like at Exit 87, a bridge along the frontage road that crosses a stream there would provide an ingress and egress for terrestrial and aquatic species.

3.4 How could water quality be affected by this project?

3.4.1 What watersheds may be impacted?

The proposed project is located in the Broad River Basin, as defined by SCDHEC. The Broad River basin extends across the Piedmont region of North Carolina and South Carolina. Within South Carolina, the Broad River Basin is subdivided into three major sub-basins, including the Enoree

River Basin, the Tyger River Basin, and the Broad River Basin. Of these, the proposed project is located within the Broad River Sub-Basin (which includes USGS Hydrologic Unit Codes [HUC] 03050105 and 03050106).

The Broad River Sub-Basin is located in Cherokee, Spartanburg, York, Union, Chester, Fairfield, Newberry, and Richland Counties, and encompasses approximately 2,500 square miles within South Carolina. Of the approximately 1.5 million acres, there are approximately 2,798.6 stream miles and 14,603.0 acres of lake waters. The Broad River Sub-Basin is further divided into 17 watersheds. A watershed is an area of land in which all of the surface water drains to the same point.

The project spans three watersheds, including the Pacolet River Watershed (HUC 03050105-15), the Thicketty Creek Watershed (HUC 03050105-10), and the Broad River Watershed (HUC 03050105-16).

3.4.2 Are there any existing water quality impairments in the project area?

SCDHEC works with the U.S. Environmental Protection Agency (EPA) to create and revise water quality standards across the state of South Carolina. Water quality standards are established to protect and improve the quality of the surface waters for use as drinking water, wildlife habitat, and recreation uses. To monitor the quality of surface waters, SCDHEC implements and monitors over 1,000 water-quality monitoring stations across the state. Surface water within the limits of the proposed project drains to six water-quality monitoring stations, as listed in Table 3.4.

Table 3.4
Water Quality Monitoring Stations

Station	Location	303(d) listed	Within TMDL
Station B-331	Pacolet River at S-59 (Beacon Light Road)	No	Yes (FC)
Station RS-04376	Little Thicketty Creek at S-307 (Love Springs Road)	Yes (Bio)	Yes (FC)
Station B-062	Thicketty Creek at SC 211 (Hickory Grove Road)	No	Yes (FC)
Station RL-01029	Lake Whelchel	Yes (CHLA)	Yes (FC)
Station B-056	Cherokee Creek at US 29 (Cherokee Avenue)	No	Yes (FC)
Station B-044	Broad River at SC 211 (Hickory Grove Road)	No	Yes (FC)

Source: Mead and Hunt, *Natural Resources Technical Memorandum, Proposed Interstate 85 Widening and Improvements Project*, 2015

In accordance with Section 303(d) of the 1972 Federal Clean Water Act (CWA), SCDHEC evaluates water bodies identified as impaired for appropriate inclusion on the Section 303(d) list. The 303(d) list is a State list of waters that are not meeting water quality standards or have impaired uses. The 303(d) list targets water bodies that do not meet water quality standards set for the state for water quality management, as well as identifying the cause(s) of the impairment and the designated classifications.

According to SCDHEC's 2014 Section 303(d) List of Impaired Waters,[27] Station RS-04376 is impaired for all uses based on macroinvertebrate community data (Bio). Station RL-01029 is impaired due not meeting chlorophyll-A (CHLA) standards. Stations B-311, B-062, B-056, and B-044 are not currently listed as impaired.

Once a waterbody is included on the 303(d) list of impaired waters, a Total Maximum Daily Load (TMDL) must be developed within two to thirteen years of initial listing. A TMDL is the amount of a single pollutant (e.g., bacteria, nutrients, metals) that can enter a waterbody on a daily basis and still meet water quality standards set forth by the State. .

According to the SCDHEC *Total Maximum Daily Load Development for the Upper Broad River Basin*,[28] a TMDL has been developed by SCDHEC in 2004 and approved by the EPA for the Broad River Basin (HUC 03050105) to determine the maximum amount of fecal coliform it can receive from nonpoint sources and still meet water quality standards. The primary sources of fecal coliform to the stream were determined to be wildlife; land application of poultry litter (fertilizers); livestock manure; and malfunctioning septic systems. The TMDL will require reduction in fecal coliform loading from nonpoint sources at a rate ranging from 49% to 86% to meet standards (SCDHEC, 2004). The proposed project is located within HUC 03050105; therefore, the TMDL for fecal coliform applies to all waters within the project limits.

3.4.3 Would the project directly impact water quality?

Increased pavement would result in an increase in run-off to the surface waters adjacent to the project. This run-off would contain sediments and contaminants that resulted from the operation of motor vehicles. During construction activities, temporary siltation may occur in adjacent waters and erosion will 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 (HUC 03050105).

3.4.4 How would these impacts be mitigated?

SCDOT will follow the guidance contained in Engineering Directive Memorandum (Number 23), dated March 10, 2009, regarding procedures to be followed in order to ensure compliance with S.C. Code of 72-400, Standards for Stormwater Management and Sediment Reduction. It is

[27] S.C. Department of Health and Environmental Control, *State of South Carolina Integrated Report for 2014 Part I: Section 303(d) List of Impaired Waters*, May 1, 2014

[28] S.C. Department of Health and Environmental Control, *Total Maximum Daily Load Development for the Upper Broad River Watershed (Hydrological Unit Code: 03050105)*, September 29, 2004

recommended that the contractor minimize construction impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and S.C. Code of Regulations 72-400. Exposed areas may be stabilized by following SCDOT's Supplemental Technical Specification for Seeding (SCDOT Designation SC-M-810 (11-08). 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.

3.5 What are 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 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.

3.5.1 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.

3.5.2 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 3.5, page 91. The project study area is designated as in attainment/unclassified.

3.5.3 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 (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3) and sulfur dioxide (SO_2).

Table 3.5 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 mobile source air toxics (MSATs). Due to their association with roadway transportation sources, O_3, CO, $PM_{2.5}$, and MSATs are typically reviewed for potential effects on nearby receptors with respect to roadway projects

3.5.4 How would the I-85 widening project affect air quality?

3.5.4.1 Ozone (O_3)

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 the York NAA and, therefore, is considered to be in attainment for O_3.

3.5.4.2 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.

3.5.4.3 Particulate Matter (PM_{10} 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 PM_{10} [40 CFR Part 93]. This rule requires that $PM_{2.5}$ and/or PM_{10} hotspot analysis be performed for transportation projects with significant diesel traffic in areas not meeting $PM_{2.5}$ and/or PM_{10} air quality standards. The project area is classified as an attainment area for both PM_{10} and $PM_{2.5}$. As such, a hotspot analysis was not required for particulate matter.

3.5.4.4 Mobile Source Air Toxics (MSATs)

In December of 2012, the FHWA issued an interim guidance update regarding MSAT in a NEPA analysis to include the EPA Motor Vehicle Emissions Simulator (MOVES) emission model along with updated research on air toxic emissions from mobile sources. The guidance includes three categories and criteria for analyzing MSATs in a NEPA documents:

1. No meaningful MSAT effects,
2. Low potential MSAT effects, and

3. High potential MSAT effects.

A qualitative analysis is recommended for projects that meet the low potential MSAT effects criteria while a quantitative analysis is recommended for projects with a higher potential for MSAT effects criteria.

Based on traffic projections associated with the project, the estimated AADT for the year 2040 will not exceed 88,000 (87,600 AADT on Segment 1: I-85 Exit 80 to 83). 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.

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 Average Annual Daily Traffic (AADT) by the project length. To calculate VMT for this project, the length of I-85 was used.

The AADT for the project was averaged from the AADT for each of the segments depicted in Figure 1.3 on page 9. Also the AADT is projected to be the same in both the Build and No-Build alternatives. Therefore the VMT in the design year for both the Build and No-Build alternatives would be the same, 75,900. Because the estimated VMT under each of the Alternatives are the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. However, any emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases.

Regardless of the alternative chosen, emissions will likely be lower than present levels in the Build year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, growth rates, and local control measures. However, the magnitude of the EPA projected reductions is so great (even after accounting for growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The proposed project will have the effect of moving some traffic closer to nearby homes and businesses; therefore, under the Build Alternative there may be localized areas where ambient concentrations of MSATs could be higher than the No Build Alternative. However, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, for a widening project that includes interchange improvements, the localized level of MSAT emissions for the Build 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 result in lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled

with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

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.

The EPA 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 CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects."[29] 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.

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.[30] As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare

[29] U.S. Environmental Protection Agency, *Integrated Risk Information System*, http://www.epa.gov/iris

[30] The Health Effects Institute, *Mobile-Source Air Toxics: A critical review of the literature on exposure and health effects*, http://pubs.healtheffects.org/getfile.php?u=395, November 2007

for MSAT compounds, and in particular for diesel PM. EPA[31] and HEI[32] have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA 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 EPA 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 one 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 one 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 EPA'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.

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.

3.5.4.5 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

[31] U.S. Environmental Protection Agency, *Basic Information – Risk Assessment Portal*, http://www.epa.gov/risk/basicinformation.htm#g, July 31, 2012

[32] The Health Effects Institute, *Mobile-Source Air Toxics: A critical review of the literature on exposure and health effects*, http://pubs.healtheffects.org/getfile.php?u=395, November 2007

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.

In order to minimize the amount of construction dust generated, current state best management practices (BMPs), 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; many of these can be deployed as emissions mitigation measures for equipment used in construction.

3.5.4.6 Summary

This project was evaluated for its consistency with state and federal air quality goals, including ozone, CO, and PM2.5, 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 project is in an area that is in compliance with air quality standards and would not change the area's air quality status. It has no appreciable impact on the regional MSAT levels. It may result in increased local exposure to MSATS at certain locations.

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.

3.6 Would this project affect any floodplains?

Floodplains are defined by the Federal Emergency Management Agency (FEMA) as, "Any land area susceptible to being inundated by floodwaters from any source."[33] 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 the Federal Emergency Management Agency (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 differentiates them by Zone.

A Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. (FEMA, 2015)

Zone A floodplains are areas subject to inundation by the 1-percent-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 subject to inundation by the 100 year flood event and have been determined by detailed methods. BFEs are available for Zone AE floodplains and are provided on FIRMs.

3.6.1 What floodplains are located within the project study area?

Based upon a review of the floodplain mapping and a GIS analysis of the project study area, the proposed project crosses or encroaches on eight FEMA-regulated floodplains. Table 3.6, page 97, lists these floodplains by their associated waterbody. The extents of each floodplain are illustrated in Figures 3.1A-G, pages 73 to 79.

[33] Federal Emergency Management Agency, *Definitions*, http://www.fema.gov/national-flood-insurance-program/definitions

Table 3.6
FEMA-Regulated Floodplains Within the Project Study Area

Floodplain	FIRM Map ID	Existing Crossing	FEMA Zone
Pacolet River	45083C0186D	Bridge	Zone AE
Thicketty Creek	45021C0155D	Bridge	Zone A
Cole Creek	45021C0155D	Box Culvert	Zone A
Irene Creek	45021C0156D	Box Culvert	Zone A
Lake Whelchel	45021C0180D	Dam / Spillway	Zone AE / Floodway
Providence Branch	45021C0157D	Box Culvert	Zone AE / Floodway
Cherokee Creek	45021C0180D	Bridge	Zone AE / Floodway
Broad River	45021C0180D	Causeway / Bridge	Zone A

Source: Mead and Hunt, *Natural Resources Technical Memorandum, Proposed Interstate 85 Widening and Improvements Project*, 2015

3.6.2 What direct impacts would there be to floodplains?

The project does not propose the replacement of the existing structures spanning the Pacolet River, Thicketty Creek, Cole Creek, or Cherokee Creek. Furthermore, the project would not modify the existing dam and spillway of Lake Whelchel; therefore, encroachment into their associated floodplains is not anticipated.

The Preferred Alternative would cross the Floodway and Zone AE Floodplains of Providence Branch. This encroachment is located south of I-85, within the project limits of the Exit 95 interchange. This floodplain is mapped as extending across North Limestone Street (refer to Figure 3.1F, page 78). The existing SC 18 (Shelby Highway) roadway currently crosses Providence Branch at this location with a double box culvert. The preliminary design of the project proposes to extend the existing headwalls of the culvert vertically to minimize impacts to these FEMA-regulated areas; however, the project would encroach on the FEMA-regulated areas to accommodate the roadway improvements within the interchange.

The Preferred Alternative would also encroach on two Zone A floodplains, including Irene Creek and the Broad River. I-85 currently crosses Irene creek with a single box culvert and traverses the floodplains of the Broad River with an earthen causeway and bridge. This floodplain is mapped as crossing Peachoid Road and extending into the area between this frontage road and I-85 (refer to Figure 3.1C, page 75). The project would require fill to be placed within the limits of these floodplains to accommodate the widened I-85 roadway.

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 E). In order to meet the requirements of a “No-Rise” condition, FEMA requires projects which would encroach on Regulated Floodways and Zone AE floodplains to

result in a change no greater than 0.1 feet from the established 100-year flood elevations. Furthermore, SCDOT requires all Zone A crossings to be analyzed for the 100-year flood to insure that the floodplain encroachment does not cause one (1) foot or more of backwater when compared to unrestricted or natural conditions.

These encroachment 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 will be performed for each encroachment of a FEMA-regulated floodplain during final design.

3.7 How could farmlands be impacted by this project?

3.7.1 Why is farmland protected?

Agriculture and farming have been the base of South Carolina's economy since the settlement of the American colonies. The state has about 25,000 farms, which produce crops and livestock valued at over $3 billion annually.[34] Together, Spartanburg and Cherokee Counties account for more than $30 million of the state's annual agriculture production. The main crops grown in the two counties are fruits in orchards, wheat for grain, soybeans, vegetables, and corn for grain.[35]

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. These soils may or may not be presently used as cropland.

3.7.2 What methodology was used to determine impacts to farmland?

In accordance with the *FPPA*, the NRCS was formally consulted for the proposed project. Farmland Impact Conversion Rating Forms for Corridor Type Projects (NRCS-CPA-106) were completed for the Preferred Alternative. The NRCS requires that a separate form be submitted for each county, since each county provides unique farmland characteristics. 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 determined using the Farmland Impact Conversion Rating Forms, including the relative value and the corridor assessment value. The relative value assessment is the relative value of farmland to be converted by the Preferred Alternative, on a scale of zero to 100 points. The 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.

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[34] *Ibid*.

[35] U.S. Department of Agriculture, *2012 Census of Agriculture*, http://www.agcensus.usda.gov/Publications/2012/Full_Report/Census_by_State/South_Carolina, June 14, 2010

The project study area is comprised of approximately 1,760 acres of land within Cherokee and Spartanburg Counties. Of these acres, 808 acres are prime farmland and 373 acres are farmland of statewide importance. Together, they account for 67 percent of land within the project study area. No unique farmland soil types exist within the project study area. Table 3.7 lists the number of soil types and amount of acreages of prime farmland and farmland of statewide importance in the project study area, by county.

Table 3.7
Summary of Farmland Soils in the Project Area

	Prime Farmland	Farmland of Statewide Importance
Cherokee County		
Number of Soil Types	9	9
Acreage	580	335
Spartanburg County		
Number of Soil Types	4	3
Acreage	228	38

Source: Mead & Hunt, 2015

3.7.3 How would the Preferred Alternative directly impact farmlands?

Construction of the Preferred Alternative would result in the direct conversion of a total of 89.1 acres of farmland soils. Of these acres, the mainline widening of I-85 would account for 17.3 acres of farmland conversion, including 0.1 acre in Spartanburg County and 17.2 acres in Cherokee County. The interchange improvements would account for a total of 71.8 acres of farmland conversion, as listed by interchange in Table 3.8, page 100.

The Preferred Alternative would require the conversion of 7.5 percent of the total farmland soils within the project study area, which is not anticipated to negatively impact farming activities in the project area.

The corridor assessment value for the Preferred Alternative scored 29 and 52 points on the Farmland Impact Conversion Rating Forms for Spartanburg and Cherokee Counties, respectively. By totaling the relative value and the corridor assessment value, it was determined that the total threshold, 160 points overall, set by NRCS, was not exceeded by the Preferred Alternative in either Spartanburg or Cherokee County. Since the 160-point threshold was not exceeded for the Preferred Alternative, neither alternative sites nor additional studies are required under the FPPA. The Farmland Impact Conversion Rating Forms can be found in Appendix F.

Table 3.8
Conversion of Farmland Soils by Interchange

Location	Acres
Exit 83 (Battleground Road)	8.9
Sunny Slope Drive Overpass	12.2
Exit 87 (Green River Road)	28.4
Exit 95 (Shelby Highway/Pleasant School Road)	10.2
Exit 96 (Shelby Highway)	12.1
Total	**71.8**

Source: Mead and Hunt, 2015

3.8 How could land use be affected by the proposed improvements?

Spartanburg and Cherokee counties have historically been rural and based on agriculture until highway retail began to develop near the interstates and major highways in the counties. In 1994, the BMW Plant in Spartanburg opened; the campus sits on over 1,000 acres adjacent to I-85 and has helped transformed the region. "Traditionally a textile producing region, the transition into automotive production began in the early 1970s. Since 1994, BMW has been the hub of this growing industrial cluster."[36] The Spartanburg County Comprehensive Plan points out that the "pull of I-85 has created an elongated east-west development pattern through the center of the County. As a consequence, most major streets and roads in the area have become high intensity use corridors." Due to these types of development demands, land uses have been converted from agricultural and open lands to commercial and industrial uses throughout both counties in recent years.

According to the 2010 Census, Cherokee County has approximately 55,000 residents and Spartanburg County has approximately 284,000. The counties have seen a steady increase in population since the 1950's. Between 2000 and 2010, Cherokee and Spartanburg counties saw five and 12 percent increases in population, respectively.

According to the South Carolina Revenue and Fiscal Affairs Office, Cherokee County is expected to continue to see gradual population growth between 2010 and 2030,[37] while Spartanburg County is expected to see more significant population growth by 2030. Table 3.9, page 101, presents population growth and projections for the two counties.

[36] University of South Carolina, *BMW's Impact in South Carolina: Two Decades of Economic Development*, https://www.bmwusfactory.com/wp-content/uploads/2012/11/BMW-SC-Economic-Impact-2014.pdf
[37] S.C. Revenue and Fiscal Affairs Office, *County Population Projections 2000-2030*, http://www.sccommunityprofiles.org/census/proj_c2010.html

Table 3.9 Population Growth					
County	**2000 Population**	**2010 Population**	**2030 Population**	**2000 – 2010 % Growth**	**2010 – 2030 % Growth**
Cherokee	52,537	55,342	57,300	5.3%	3.5%
Spartanburg	253,791	284,307	331,200	12.0%	16.5%

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

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

The project corridor is located primarily within unincorporated areas of Spartanburg and Cherokee counties, but includes small portions of the City of Gaffney. Existing land uses are primarily rural residential and open land with areas of industrial and commercial. The closest incorporated municipalities are the City of Gaffney (to the southeast of the corridor) and the Town of Cowpens (to the south of the corridor).

Along the mainline of I-85, land uses consist mainly of agricultural and open lands, with low density residential and pockets of industrial and highway retail. Three industrial parks are located in surrounding areas along the interstate; these include Sunny Slope Corporate Park, Upstate Corporate Park and Meadow Creek Industrial Park. Sunny Slope Corporate Park and Upstate Corporate Park are both zoned industrial/warehousing/office and are located north if I-85 between Exits 83 and 87. Meadow Creek Industrial Park is located south of Exit 96. Water and sewer services are available at Exits 83, 95, and 96.[38] Water service is available at Exit 87.

The project interchanges within the corridor contain higher concentrations of commercial and industrial, as described below:

Exit 83 – Battleground Road

Land uses surrounding this interchange consist of low-density residential, commercial, light industrial, institutional and open/wooded land. Builders FirstSource is located to the west. Mountain View Baptist Church, Mountain View Christian Academy, Westar Travel Plaza, Spencer Insulation, and F.O. Mertz & Co. are located east of the interchange. Smaller businesses and open/wooded land are located to the south and southwest of the interchange.

Exit 87 – Green River Road

This interchange contains mainly open/wooded land with commercial uses and several small businesses located northwest and southwest of the interchange. Low-density residential uses are located to the east and south. Macedonia Baptist Church is located north of the interchange.

[38] Personal Communications, September 9, 2015, Gaffney Board of Public Works, September 9, 2015, Mr. Phillip Sarratt, Grassy Pond Water Co., and, September 10, 2015, Ms. Amanda Hall, Spartanburg Water.

There are several areas of open/wooded land at this interchange, namely in the southeast quadrant and north of the existing Orchard Place building in the northwest.

Exit 95 – Pleasant School Road

There are more commercial, institutional, and light industrial land uses surrounding this interchange than the other interchanges. Immediately west of the interchange the land use is comprised of light industrial (UPS freight facility) and commercial, with motels, restaurants and other businesses. There are pockets of open/wooded land east of the interchange. Commercial (small businesses), residential (a small mobile home park) and institutional (Encounter Church) land uses are located south of the interchange. Farther southwest are high density residential areas (Iveywood Park), an elementary school and a community learning facility.

Exit 96 – Shelby Highway

This interchange contains mainly open/wooded land with pockets of light industrial and commercial. West of the interchange is commercial/industrial with several small businesses and McIntire Concrete. Undeveloped land is to the northeast. The Cherokee Speedway race track is located southeast of the interchange and the Meadow Creek Industrial Park is located south of the interchange. Associated Hardwoods sawmill is located on Gaffney Ferry Road, southeast of Exit 96.

3.8.2 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 project study area are listed and described below:

Spartanburg County Comprehensive Plan (1998)

The Spartanburg County Comprehensive Plan is the currently adopted plan to guide the development of land, infrastructure, and community facilities as well as preserve natural and cultural resources. The Land Use element of the Plan presents goals and trends and addresses where development should occur. The first four miles of the project are located in Spartanburg County's Planning Area Three, according to the *Spartanburg County Comprehensive Plan* (1998). According to the plan, Planning Area Three "may be described as urban and developing. [It is] highly industrialized and commercialized, as evident from strip development patterns along most major corridors radiating from Spartanburg and traversing the county." Sewer service is available for much of the area and is essential to urban development. Planning Area Three is also described as being developed virtually unplanned and is projected to accommodate most future development. Open/undeveloped space along the corridor is zoned for residential and agricultural uses. The county's future land use map has the project corridor located in a "High Intensity Corridor" designation, which will "accommodate the highest and best use of property fronting on and/or accessible to such designated roads."[39]

[39] Spartanburg County South Carolina, *Spartanburg County Comprehensive Plan 1998-2015*, http://www.co.spartanburg.sc.us/govt/depts/pln/compplan/part7.pdf

Cherokee County Comprehensive Plan (2004)

The Cherokee County Comprehensive Plan was produced to provide the county with the critical planning data necessary to shape the county's future, by examining current growth and development trends. This document provides Cherokee County with a foundation for future land use decisions. One of the plan's land use and growth issues is the type of residential development occurring on previously agricultural areas. The proposed project is located between two planning areas; the northwest sector and the central sector. Commercial and industrial uses in the northwest sector are generally clustered in nodes created by the I-85 interchanges. The plan states that a fairly large portion of the land directly north and adjacent to I-85 is "undeveloped and may be compatible for either commercial or industrial development." The central sector, though highly urbanized in some locations, is still rural, and contains large tracts of agricultural land. The County's future land use plan has the I-85 corridor designated as commercial, with agricultural and low-density residential land uses to the north and industrial land uses to the south.

Cherokee County Land Development Regulations (2013)

The Cherokee County Land Development Regulations ordinance includes development standards for specific land uses including multi-family housing, commercial and office uses, industrial uses and mobile home parks.

Spartanburg Area Transportation Study (SPATS) Long Range Transportation Plan (LRTP) 2035

The SPATS LRTP is a document that outlines transportation priorities and proposed projects to the year 2035 for Spartanburg County and a portion of Cherokee County. Project priorities are based upon growth patterns, land uses, population and employment projections, and a transportation model that forecasts traffic and transportation needs to the year 2035. The SPATS LRTP identified transportation problems and proposes improvements that are needed to accommodate the increasing demands that may be placed on the roadway network and identifies transportation corridors where growth is anticipated. As such, SPATS identified improvements to I-85 from Gossett Road to Shelby Highway as an essential project in the region.

Appalachian Council of Governments (ACOG) Comprehensive Economic Development Strategy (CEDS) (Update 2014)

The ACOG's CEDS is a document that presents economic development strategies and provides economic profiles of the region. It promotes transportation and land use planning as a way to support the region's growing population and increasing traffic challenges.

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

With anticipated population growth and the corridor's proximity to both Charlotte and Spartanburg, residential, commercial and industrial development are expected to continue within the project study area, for the No-Build and the Preferred Alternative. While I-85 provides a key element of the infrastructure to support development, the availability of water and sewer service is also necessary for denser development to occur. Water and sewer are available at Exits 83, 95, and 96. Water service is available at Exit 87. The lack of sewer at this exit would impact

the magnitude of types of development that can occur at this interchange. Potential impacts to land use are described below.

Mainline

Along the mainline of I-85 in the project study area, the land use consists of mainly of open/agricultural land, with areas of low-density residential, industrial and commercial uses. The proposed widening of the mainline from four to six lanes is not expected to change land uses along the mainline of the interstate.

Interchanges

The proposed project also provides improvements to four interchanges on along I-85, as well as realignment of a portion of the frontage roads at Exit 90. The frontage road realignment at Exit 90 would have little impact on land uses. It would result in the loss of parking spaces at the Hamrick's. There would be potential for increased development at the project interchanges. This would be due to either the potential for redevelopment of existing commercial properties and/or the presence of developable land at each interchange. The interchange improvements would provide interstate access consistent with current design standards that could be attractive for future development.

Exit 83 – Battleground Road

Improvements at the interchange would require right-of-way from Mountain View Baptist Church, Builders' FirstSource, and several other businesses and undeveloped parcels located at this interchange. Westar Travel Plaza, and undeveloped parcels north of it and north of Builders' FirstSource, would be converted to road right-of-way by new access roads and realignment of the existing frontage road.

The improvements at the interchange may attract development to areas of open/wooded lands in the surrounding areas, specifically areas north of the realigned frontage road at Builders' First Source in the northwest quadrant, as well as the wooded area in the southeast quadrant of the interchange. It is anticipated that improved access created by the updated interchange could encourage the conversion of any undeveloped areas at this interchange to highway commercial uses. This interchange also provides access to the Upstate Corporate Park, a multi-county park with available lots, located on Mt. Olive Road, north of the interchange. Improvements at the interchange may help attract industrial uses to the corporate park by improving the access to the park from I-85. However, growth at the Upstate Corporate Park would not result in a change in land use as the land in the park is planned for industrial uses.

Exit 87 – Green River Road

This interchange improvement would directly result in the conversion of primarily residential land to road right-of-way at the interchange. The frontage road relocation would impact commercial land use in the northwest quadrant (Orchard Place and Ambustar) and would cross the southern end of the Macedonia Baptist Church Community Park. Portions of residential parcels would be converted to frontage road in the northeastern quadrant and undeveloped land and residential land would be taken for the frontage road in the southeastern quadrant.

Farmland would be the dominant land use directly converted to roadway in the southwestern quadrant of the interchange.

The interchange is surrounded mainly by low-density residential, farmland, and wooded lands, with a pocket of commercial. It is anticipated that enhanced access resulting from the improved interchange could encourage the conversion of any undeveloped areas at this interchange to commercial and industrial uses. With the proposed improvements, the northeast quadrant of the interchange may be viewed as more attractive for development as the new location on-ramp would be surrounded by open land, currently containing rural residential uses. Undeveloped open/wooded land is located in the northwestern and southern quadrants of this interchange. This interchange provides access to the Sunny Slope Corporate Park, located to the west, off Webber Road and Allison Road. It is anticipated that improvements at this interchange could attract growth at both the surrounding areas of the interchange and the corporate park. However, as previously noted, the lack of sewer service at this interchange would affect the type of development that could occur.

Exit 95 – Pleasant School Road

Existing land uses expected to be directly impacted by proposed improvements of this interchange are primarily light industrial and commercial. The UPS Freight Facility, located in the northwestern quadrant, would see land converted to right-of-way by the interchange and the relocated frontage road. The frontage road would impact residential and undeveloped land in the northeastern quadrant. Residential and commercial land uses in the southeastern quadrant would be impacted by the interchange and the frontage road relocation. Commercial land uses would be impacted in the southwestern quadrant, primarily by the interchange ramp.

The land outside of the new right-of-way is expected to remain in the same type of land uses; nevertheless, improvements at the interchange may attract redevelopment of current commercial sites or development of the open/wooded lands surrounding this interchange.

Exit 96 – Shelby Highway

This interchange would impact commercial property and undeveloped land with the interchange improvements. The frontage roads also would impact commercial and undeveloped land. The interchange is surrounded mainly by open/wooded lands, with areas of industrial and commercial, including Cherokee Speedway. It is anticipated that improved access created by the interchange modifications could encourage the conversion of any undeveloped areas to commercial or industrial uses. Undeveloped open/wooded land is located at all quadrants of this interchange.

Exit 96 provides access to the Meadow Creek Industrial Park and Cherokee Speedway, both located to the south of Exit 96, off Victory Trail Road. The proposed Lee Nuclear Station is also located off of Exit 96. It is anticipated that improvements at this interchange would attract growth at both the area surrounding the interchange and the industrial park.

The project is in accordance with local plans and is expected to positively impact land use in the area by providing efficient access for motorists to reach industrial, commercial and residential establishments. Due to proposed improvements at the interchanges, there is potential for development to occur at surrounding undeveloped land, assuming other necessary infrastructure is available. If parcels change land use categories, it is anticipated that the overall land use would be consistent due to the counties' well-defined comprehensive plans.

3.9 What are cultural resources and how might they be impacted?

Cultural resources refers to archaeological sites or historical buildings or structures. 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. 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 NHRP 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.

3.9.1 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 project study area 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 October and November 2014, with follow-up in April 2015, 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 project study area.

The archaeological survey was completed in accordance with the *South Carolina Standards and Guidelines for Archaeological Investigations* (SCSGAI),[40] (COSCAPA 2013).[41] The archaeological field survey was accomplished by coverage of the study area for the widening of I-85 and the improvement of the interchanges. All material collected in the field was returned to the EPEI laboratory in Columbia for processing and analysis. The results of the artifact analysis are located in Appendix A of the *Phase I Cultural Resource Survey for Proposed Widening of Interstate 85* (refer to Appendix G.[42])

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 project study area. Field survey methods complied with federal and state requirements and guidelines. The architectural resources survey area generally corresponded to the project study area, but was expanded, where necessary, to include architectural resources located outside the project study area, but within the viewshed of the proposed project.

The integrity of a historic architectural resource is a primary consideration for inclusion in the SCSS, as well as on the NRHP. While in the field, the project historian evaluated the integrity of each identified historic architectural resource. Some resources exhibiting exceptionally poor integrity were not recorded. All historic architectural resources located within or adjacent to the project study area that retained sufficient integrity to be included in the SCSS were recorded. The location of each historic architectural resource was recorded on USGS topographic maps and a SCSS Intensive Survey site form was prepared for each historic architectural resource.

3.9.2 What archaeological resources were found during the survey?

As a result of the survey, three previously recorded sites; 38CK81, 38CK82, and 38CK83, were revisited; three new archaeological sites, 38SP410, 38CK197, and 38CK198, were recorded; and two isolated artifacts, IF 1 and IF 2, were documented. None of these sites were recommended eligible for listing on the NRHP.

3.9.3 What historical resources were found during the survey?

No previously identified architectural resources were known to be within the proposed project study area in Spartanburg County. Eight bridge structures 50 years old or older were identified within the study area in Spartanburg and Cherokee counties. The three bridge structures located in Spartanburg County and the five bridge structures located in Cherokee County were

[40] The Council of SC Professional Archaeologists, *South Carolina Standards and Guidelines for Archaeological Investigations*, http://shpo.sc.gov/programs/Documents/Standards_Guidelines2005-13.pdf
[41] The Council of SC Professional Archaeologists, http://www.coscapa.org/
[42] Edwards-Pitman Environmental, Inc., *Phase I Cultural Resource Survey for Proposed Widening of Interstate 85 From Mile Marker 80 to 96, Cherokee and Spartanburg Counties, South Carolina*, July 2015

determined not eligible for inclusion on the NRHP in the South Carolina Historic Bridge Survey.[43] Twenty-eight newly identified architectural resources (113-1056 through 113-1075 and 113-1077 through 113-1084) were identified within the study area in Spartanburg County. Seventy-three newly identified architectural resources (113-0174 through 113-0188; 113-0235 through 113-0241; 186-0189 through 186-0217; 186-0242; 040-0218 through 040-0234; and 040-0243 through 040-0246) were identified within the project study area in Cherokee County.[44]

No architectural resources identified within the study area in Spartanburg County were recommended eligible for inclusion on the NRHP. Two architectural resources identified within the study area in Cherokee County were recommended eligible for inclusion on the NRHP. These two resources are: 186-0198, the Blanton Farm Complex, a late nineteenth century farm complex located at 1820 West Rutledge Avenue; and 186-0207 a Usonian-style Ranch house located at 119 Canty Way. The Blanton Farm Complex is comprised of a main residence, three associated outbuildings, and associated landscape features. It was recommended eligible for NRHP listing under Criteria A (significance in agricultural history) and C (significance in architecture) and a NRHP boundary was established for the resource (Adair and Sipe 2015). The Canty Way property was considered eligible for NRHP listing under Criterion C (architecture).

3.9.4 What would be the potential impacts to cultural resources?

3.9.4.1 Mainline

The two architectural resources that were determined to be eligible for NRHP listing are along the mainline. The Blanton Farm Complex, Resource 186-0198, and 119 Canty Way, Resource 186-0207 (refer to Figures 2.1B and 2.1C in Chapter 2 – Alternatives Analysis). Proposed project improvements will not intrude into the eligible boundary area of Resource 186-0198 (the Blanton Farm Complex) and will not result in a noticeable change to the view to or from the site. The proposed undertaking will thus have No Effect on this eligible resource.

Project improvements will require acquisition of a minor amount of right-of-way (ROW) from the eligible boundary of the 119 Canty Way resource. A small section of ROW will be taken from the parcel on the side between the house and the interstate frontage road (Canty Way). Additionally, a section of the parcel at the northeast corner is proposed to be taken to realign the intersection of Canty Way and Hampshire Drive. Coordination with the SHPO occurred to evaluate this resource and to consider ways to minimize impacts to the site. SCDOT has committed to limit the amount of right-of-way that would be needed by using curb and gutter along this parcel and require the protection of several mature trees crucial to the character of the property during construction. As for the realignment of the Canty Way and Hampshire Drive, proposed changes in this northeastern portion of the parcel would not alter the character of the parcel's core, which contains the attributes that make this resource NRHP eligible. Additionally, changes in this northeastern corner would not alter the view to or from the eligible resource in a significant way.

[43] Edwards-Pitman Environmental, Inc., *Phase I Cultural Resource Survey for Proposed Widening of Interstate 85 From Mile Marker 80 to 96, Cherokee and Spartanburg Counties, South Carolina*, July 2015
[44] *Ibid*.

Therefore, due to the proposed project's minimal ROW acquisition at 119 Canty Way and the lack of character-changing effects generated by the ROW acquisition, it is the opinion of SCDOT and FHWA that the proposed project will have no adverse effect to Resource 186-0207 (Appendix G). This opinion was provided to the SC SHPO, the Catawba Indian Nation Tribal Historic Preservation Officer (THPO), the Eastern Band Cherokee THPO, and the SC Institute of Archaeology and Anthropology. The SC SHPO, along with the Catawba Indian Nation THPO, provided their concurrence with the determination (Appendix G).

3.9.4.2 Interchange Alternatives

No eligible cultural resources that could be considered eligible for NRHP listing were identified during the archaeological and historic resource surveys of the interchange alternatives. As a result, the proposed interchange improvements will have No Effect on cultural resources.

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

3.10.1 What is Section 4(f)?

Section 4(f) of the US DOT 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 National Register of Historic Places (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 (NPS). Replacement lands of equal fair market value, location and usefulness must be provided to the facility if land is converted.

3.10.1.1 What are the existing Section 4(f) resources located in the study area?

No publicly-owned parks, recreations lands or wildlife and waterfowl refuges are located within the project study area. Historic properties are considered a Section 4(f) resource if they are eligible for or listed on the National Register of Historic Places (NRHP). Two historic architectural resources identified within the project study area in Cherokee County are recommended eligible for inclusion in the NRHP. These two resources are the Blanton Farm, a late nineteenth-century farm complex located at 1820 West Rutledge Avenue (Resource 186-0198), and a Usonian-style Ranch house located at 119 Canty Way (Resource 186-0207). The Blanton Farm is recommended Eligible for listing on the NRHP under Criteria A and C (agriculture and architecture). The 119 Canty Way ranch house is recommended eligible for the NRHP under Criterion C (architecture).

3.10.1.2 Would any of these resources be impacted by the proposed project?

The Blanton Farm would not be impacted by the proposed project. A small section of ROW would be taken from the 119 Canty Way parcel on the side between the house and the interstate and frontage road (Canty Way). Additionally, a section of the parcel at the northeast corner is proposed to be taken to realign the intersection of Canty Way and Hampshire Drive; a total of approximately 0.1 acres of ROW is estimated to be taken.

Each Section 4(f) resource is evaluated for how a transportation project may impact it. The FHWA takes into account any avoidance or minimization of impacts along with any mitigation or enhancement measures to determine the extent of the impact to the resource. If the FHWA determines that a transportation project will have a *de minimis* (minimal) impact on a Section 4(f) resource, the Section 4(f) evaluation process is complete. The managing agency for the resource would need to state, in writing, that the project is not likely to "adversely affect the activities, features and attributes" of the Section 4(f) resource. The State Historic Preservation Office (SHPO) is the managing agency for historic resources.

In order to preserve as much of the 119 Canty Way parcel as possible, SCDOT would plan on limiting the impact by allowing for the mature trees to be retained. The section of the parcel impacted by the Canty Way and Hampshire Drive intersection realignment is very open and appears to be somewhat isolated from the section containing the house, which is enveloped in trees and other plantings and is on a slight rise above the open northeastern corner. Proposed changes to the parcel should not alter the character of the parcel's core, the house, which contains the attributes that make this resource NRHP eligible. Additionally, changes in this northeastern corner would not alter the view to or from the eligible resource in a significant way.

Due to the proposed project's minimal ROW acquisition, the lack of character-changing effects generated by the ROW acquisition, and the SCDOT efforts to minimize impacts (using curb and gutter along this parcel and protecting the trees during construction) the proposed project was determined to have no adverse effect on the 119 Canty Way site. The SHPO provided written concurrence with this finding. The project was therefore determined by the FHWA to have a *de minimis* impact (See Appendix G for FHWA *de minimis* and SHPO coordination).

3.10.2 What is Section 6(f)?

Section 6(f) resources are places such as public parks, trails, courts, and other recreational areas that were purchased in part through grants from the LWCF Act of 1965 and are protected from conversion to non-public recreational uses.

3.10.2.1 What Section 6(f) resources are located in the study area and would they be impacted by the proposed project?

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

3.11 What is noise and how could noise impact people?

Noise is typically defined as unwanted or undesirable sound. The basic parameters of noise that affect humans are:

- intensity or level
- frequency content
- variation with time.

Intensity is determined by the level of sound, which is expressed in units of decibels (dB). On a relative basis, a 3-dB change in sound level generally represents a barely perceptible change in a common outdoor setting, to someone with average hearing. A 5-dB positive change presents a "noticeable" change, and a 10-dB 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), the Federal Highway Administration (FHWA) established guidelines (23 CFR Part 772) for the assessment of highway traffic-generated noise. The noise assessment for the widening of I-85 was prepared in accordance with 23 CFR Part 772 and SCDOT Noise Abatement Policy (September 1, 2014). The I-85 Noise Impact Assessment is in Appendix H 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.

3.11.1 How are noise impacts estimated?

Noise for this project was modeled using the Federal Highway Administration'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 with 3 decibels (dB) of the measurement collected in the field, the model is considered valid to calculate noise levels for the project. For the I-85 widening project all of the field measurements were within 3 dB of the modeled results.

3.11.2 What are the anticipated noise impacts for the Alternatives?

Pursuant to 23 CFR Part 772 and 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 3.10). For the I-85 widening project noise sensitive receivers were assigned NAC category B, C, D, E, or F. For the purpose of this noise study, approach means within one dBA of the noise abatement criterion.

Table 3.10
Noise Abatement Criteria [Hourly A-Weighted Sound Level Decibels, dB(A)]

Activity Category	Activity Leq(h)	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67	Exterior	Residential
C	67	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	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	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F
F	-	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	-	-	Undeveloped lands that are not permitted

Source: FHWA, 23 CFR Part 772

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 343 receptors would be impacted by noise. For the design year (2040) No-Build Alternative 442 receptors would be impacted. For the design year (2040) Build (Preferred) Alternative, 388 receptors would be impacted by noise from the proposed project (refer to Figures 3.1A-G, pages 73 to 79). In all conditions modeled, the impacts are as a result of approaching or exceeding the NAC for the category shown in Table 3.10 (refer to Appendix A in the Noise Impact Assessment, Appendix H). None of the impacts were a result of a substantial increase, as defined in the SCDOT Noise Policy. Table 3.11 compares impacts between the Preferred Alternative and the No-Build Alternative, for the mainline and improved interchanges.

Table 3.11
Comparison of Build and No Build Noise Impacts

	Mainline	Exit 83	Exit 87	Exit 95	Exit 96	Total
Preferred Alternative	324	113	18	39	15	509
2040 No Build Alternative	322	111	34	90	17	574

Source: Noise Impact Analysis, August 2015

3.11.3 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

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.

Alteration of Horizontal and Vertical Alignments

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.

Acquisition of Property Rights for Construction of 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.

Acquisition of Real Property to Create a Buffer Zone to Preempt Development

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.

Noise Barriers

The use of structural barriers (earth berms and freestanding walls) was considered for impacted receivers. There are feasibility and reasonableness criteria that must be met for construction of noise walls. Noise walls are assessed under the feasibility criteria first, and if all conditions are met are then considered for reasonableness. There are two feasibility criteria. Per SCDOT policy acoustic feasibility means that a noise reduction of at least 5 dBA must be achieved for 75% of impacted receivers. There are also seven engineering and design considerations that must be achieved to meet the engineering feasibility criteria. These considerations include topography, safety, drainage, utilities, maintenance, access, and wall height.

Based on the location and concentration of impacted receivers in the build condition, 43 locations within the project area were considered for noise walls and assessed for adherence to feasibility criteria. Of these 43 noise walls, 42 met both the acoustic and engineering feasibility requirements and were assessed for reasonableness.

As with feasibility, there are several reasonableness criteria that must be met. These include:

1. Noise Reduction Design Goal - It is SCDOT's policy that a noise reduction of at least 8 dBA must be achieved for 80% of those receivers determined to be in the first two building rows and considered benefited.
2. Cost Effectiveness - The allowable cost of the abatement is based on $35.00 per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost will be divided by the number of benefited receptors. If the cost per benefited receptor is less than $30,000 then the barrier is determined to be cost effective.
3. Property Owners and Residents - SCDOT will solicit the viewpoints of all of the benefited receivers and document a decision on either desiring or not desiring the noise abatement measure. A noise wall will only be constructed if at a minimum 50 percent plus one of

the respondents vote in favor of noise abatement. This third criterion is only considered if the noise wall meets the first two criteria.

Of the 42 walls assessed under the reasonableness criteria, 17 could be designed to achieve the noise reduction design goal of 8 dBA reduction at 80% of receivers within the first two rows. The location of noise walls considered for abatement is shown on the Noise Impacts Map in Appendix H. None of those 17 walls met the cost effectiveness criteria for reasonableness, the construction cost exceeded the benefitted cost for the receivers. Therefore, no measures considered were either feasible or reasonable to abate noise impacts to receivers within the project corridor resulting from the proposed project.

There were no proposed noise walls found to be feasible and reasonable; therefore, no noise walls would be constructed as part of this project.

3.11.4 Will there be noise during construction?

The SCDOT recognizes that minimizing construction noise is important. In South Carolina, contractors on all highway construction projects are required to adhere to SCDOT Standard Specification Section 107.1 – Laws to Be Observed, which states in part that the contractor shall "Keep fully informed of, and at all times observe and comply with, all federal, state, and local laws, ordinances, regulations, and all orders and decrees of bodies or tribunal having any jurisdiction or authority…"[45] unless the necessary variance is obtained.

The impact of construction noise does not appear to be serious in most instances. Nevertheless, low-cost, easy-to-implement measures may be incorporated into project plans and specifications, where applicable. Such measures may include work-hour limits, equipment muffler requirements, locations of haul roads, elimination of "tail gate banging," ambient sensitive back-up alarms, community rapport, and complaint mechanisms.

3.12 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.[46] 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.

[45] SCDOT, *Standard Specifications for Highway Construction*, http://www.scdot.org/doing/doingpdfs/2000_full_specbook.pdf

[46] Federal Highway Administration, *Community Impact Assessment: A Quick Reference for Transportation*, September 1996

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

As a result of the project, 15 businesses and 13 residences may be required to relocate. Table 3.12 highlights the number of potential relocations associated with the Preferred Alternative described in Chapter 2. During final design, further measures to avoid and minimize displacements will occur; this may lower the numbers ultimately displaced.

Table 3.12
Relocations

Location	Businesses	Residences
Mainline	1	3
Sunny Slope Drive	0	1
Exit 83	2	2
Exit 87	6	2
Exit 95	4	5
Exit 96	2	0
TOTAL	**15**	**13**

The business and residential relocations listed below are described in Chapter 2 – Alternatives and shown in Figure 3.1.

Mainline: The Lighting Company and two residences located on Wilcox Avenue in Gaffney; one residence on Webber Road one residence located on Old Post Road in Gaffney

Exit 83: Spencer Insulation and one residence on Edgefield Road; Builders FirstSource on Dewberry Road; one residence on Bud Arthur Bridge Road

Exit 87: Lemmons Farm Peaches and Cream, Decorative Fabrics, Diamond Child Development, Orchard Place, and Ambustar on Webber Road; a building leased to the Spartanburg Herald Journal and one residence on Cannons Campground Road; and one residence on Old Post Road

Exit 95: Gaffney Inn, Shamrock Inn, the Concealed Weapons Permit School, and the former Fatz Café on Hampshire Drive; three residences on Shelby Highway; one residence on Matthew Drive, one residence on Wilcox Avenue

Exit 96: Cardenas Tires and a convenience/open air mart on Wilcox Road

The SCDOT will acquire all new right-of-way and process any relocations in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S. C. 4601 *et seq*.). The purpose of these regulations is to ensure that owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owner, to minimize

litigation and relieve congestion in the courts, and to promote public confidence in Federal and federally-assisted land acquisition programs.

3.12.2 What are the Population Demographics for the Project Area?

The United States Census Bureau's decennial data for 2000 and 2010 were used to determine the demographic composition of the State, the two Counties, and the 14 Census tract block groups that fall within the study area. Table 3.13 presents race, age, poverty, and growth percentages for South Carolina and Spartanburg and Cherokee Counties. Comparisons of the data indicate the percentage minority population in both Spartanburg County (29.9%) and Cherokee County (26.0%) is below the reported State percentage (35.9%). The population age 65 and older is nearly the same when comparing the two counties (13.4%) to South Carolina as a whole (13.7%). The percent of the population with an income below the poverty level is slightly lower for both Spartanburg County (12.3%) and Cherokee County (13.9%) compared to South Carolina (14.1%). Although both counties experienced population growth between 2000 and 2010, growth in the two counties was less than the 15.3% growth experienced by South Carolina as a whole; Spartanburg experienced 12.0% growth, while the population in Cherokee County grew by 5.3%.

Table 3.13
Population Demographics

	South Carolina	Spartanburg County	Cherokee County
Percent that is white	64.1%	70.1%	74.0%
Percent that is minority	35.9%	29.9%	26.0%
Percent age 65 and over	13.7%	13.4%	13.4%
*Percent income below poverty level	14.1%	12.3%	13.9%
Percent change in population (2000-2010)	15.3%	12.0%	5.3%

Source: Census.gov (2010 data); *Decennial Census 2000 data

Figure 3.2, page 119, displays the boundaries of the 14 Census Block Groups included in this study area, 4 of which are in Spartanburg County and 10 in Cherokee County. Tables 3.14 and 3.15, pages 118 and 120, provide demographic information for each County's Block Groups. The categories include: minority populations; populations with incomes below the 2000 poverty level; and, persons age 65 and over.

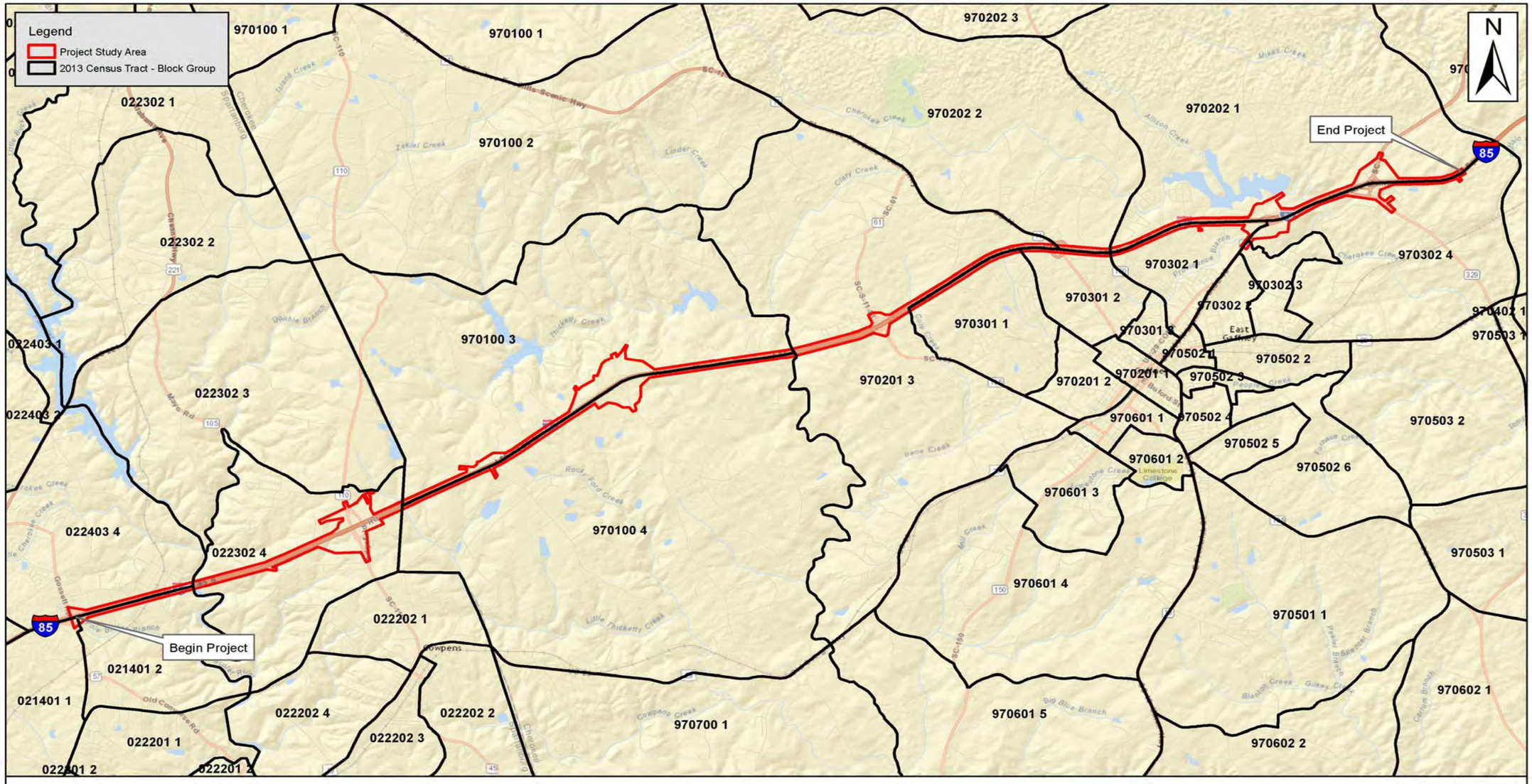
Of the four Census Block Groups in Spartanburg County, none exceeded Spartanburg County's minority rate of 29.9%. However, the minority populations in 6 of the 10 Block Groups located in Cherokee County are greater than the County's total rate of 26.0%. In 2000, the Census Bureau reported the poverty rates for Spartanburg and Cherokee Counties as 12.3% and 13.9%,

respectively. Four Block Groups, one in Spartanburg County and three in Cherokee County, exceed both the State's and their respective County's poverty threshold.

Table 3.14
Spartanburg County
Population Demographics by
Census Tract (Tract) and Block Group (BG)

	Tract 214.01 BG 1	**Tract 214.01 BG 2**	**Tract 223.02 BG 4**	**Tract 224.03 BG 4**
Minority	29.5%	8.5%	18%	23.2%
Poverty*	7.7%	6.0%	22.2%	11.4%
Age 65 & over	54.5%	31.0%	22.1%	24.3%

*2000 data
Source: Census.gov (2010 data)



South Carolina Department of Transportation

1 inch = 6,000 feet

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Census Tracts and Block Groups in the Study Area

Figure 3.2

Table 3.15
Cherokee County
Population Demographics by
Census Tract (Tract) and Block Group (BG)

	Tract 9701.00 BG 3	Tract 9701.00 BG 4	Tract 9702.01 BG 3	Tract 9702.02 BG 1	Tract 9702.02 BG 2	Tract 9703.01 BG 1	Tract 9703.01 BG 2	Tract 9703.02 BG 1	Tract 9703.02 BG 3	Tract 9703.02 BG 4
Minority	13.9%	13.2%	18.7	44.8%	20.1	58.4%	48.4%	76.5%	32.3%	33.5%
Poverty*	15.2%	7.5%	10.8%	0.7%	3.3%	8.1%	13.6%	19.6%	10.7%	29.6%
Age 65 & over	25.1%	23.0%	20.0%	20.4%	22.1%	25.1%	38.7%	16.3%	23.5%	19.4%

*2000 data
Source: Census.gov (2010 data)

3.12.3 Would the project disproportionately impact Environmental Justice communities?

3.12.3.1 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.[47]

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 have a disproportionate impact to low-income or minority populations.

3.12.3.2 How were environmental justice communities identified?

USEPA 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.[48] The guidelines for low-income communities, those living in "poverty" as defined by the Department of Health and Human Services,[49] are updated annually.

U.S. Census Data was analyzed to determine the presence of minority and low-income communities within the project area. The 2000 and 2010 Decennial Census for South Carolina as well as the Census Block Groups within the project area are shown in Tables 3.14 and 3.15, pages 118 and 120. 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 one block group in Spartanburg County and seven block groups in Cherokee County, eight total:

- Spartanburg County, Census Tract 223.02 BG 4: based on poverty (22.2% vs. 12.3% for Spartanburg County);
- Cherokee County, Census Tract 9701.00 BG 3: based on poverty (15.2% v. 13.9% for Cherokee County);
- Cherokee County, Census Tract 9702.02 BG 1: based on minority population (44.8% vs. 26.0% for Cherokee County);
- Cherokee County, Census Tract 9703.01 BG 1: based on minority population (58.4%);
- Cherokee County Census Tract 9703.01 BG 2: based on minority population (48.4% vs. 26.0% for Cherokee County);
- Cherokee County, Census Tract 9703.02 BG 1: based on minority population (76.5%), and on poverty (19.6% vs. 13.9% for Cherokee County);

[47] U.S. Environmental Protection Agency, *Environmental Justice*, http://www.epa.gov/environmentaljustice
[48] *Ibid*
[49] Federal Highway Administration, *Guidance on Environmental Justice and NEPA*, December 16, 2011

- Cherokee County, Census Tract 9703.02 BG 3: based on minority population (32.3% v. 26.0% for Cherokee County); and,
- Cherokee County, Census Tract 9703.02 BG 4: based on minority population (33.5% v. 26.0% for Cherokee County), and on poverty (29.6% v. 13.9% for Cherokee County).

3.12.3.3 What impacts would occur to environmental justice communities?

The Preferred Alternative at Exit 95 will impact Jimmy's Mobile Home Park, located in Cherokee County, in Census Tract 9703.02 Block Group 4. As mentioned in Chapter 2, this community was observed to be primarily comprised of Hispanic residents. This Census Block Group meets the threshold for an Environmental Justice community based on its minority population (33.5%) and poverty level (29.6%). Three of the nearly 50 lots onsite in that community would be relocated by the Preferred Alternative (less than the nine for the other alternative), their displacement would not result in a disproportionate impact on that community.

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.

3.13 What economic impacts could the project have?

The region's location along the I-85 corridor has been referred to as the "Boom Belt" as it places the region directly between the largest business centers in the southeast, Atlanta and Charlotte.[50] The economic characteristics of Cherokee and Spartanburg 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 in pockets throughout the corridor.

3.13.1 Existing Conditions

The historic development of the region was largely based on agriculture until 1900, when textiles took over as the region's most rapidly growing industry. For the past 25 years, the region's economy has diversified, though textiles remain a significant presence. Influential investments, from companies like BMW, which established its North American headquarters in Spartanburg County, have driven regional economic development.[51]

Table 3.16, page 123, presents recent past and current economic conditions for Cherokee and Spartanburg counties. Cherokee County's top sources of employment are textiles and manufacturing Educational/Healthcare/ Social Services, Retail Trade, Arts and Recreation,

[50] Appalachian Council of Governments, *Comprehensive Economic Development Strategy Update 2014*, http://www.scacog.org/Portals/9/2014%20SCACOG%20CEDS%20UPDATE.pdf

[51] *Ibid*

Table 3.16 Economic Conditions for Cherokee and Spartanburg Counties			
	Cherokee County	**Spartanburg County**	**South Carolina**
Population			
2000	52,537	253,791	4,012,012
2010	55,800	283,530	4,549,150
Percent change	6.2%	11.7%	13.4%
Median Household Income			
2000	33,787	37,579	37,082
2010	34,202	42,919	44,779
Percent change	1.2%	14.2%	20.8%
Unemployment Rate			
2000	3.8%	3.5%	3.6%
2010	8.8%	6.8%	6.9%

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

Hospitality and Food Services, and Transportation/ Warehousing/Utilities. Cherokee County's top five employers include Nestle USA, Hamrick Mills, The Timken Company, Freightliner Custom Chassis Corp and Suminoe Textile America,[52] all of which are textile and manufacturing industries.

The median income for Spartanburg County has also risen by 14.2 percent. The county's top five employers include BMW Manufacturing Corporation, Michelin North America, Inc., Milliken & Company, Sealed Air Corp, and Draexlmaier Automotive of America, Inc. Spartanburg County possesses over 100 international companies from 15 different countries. The New York Times stated that Spartanburg County had the highest per capita international investment in the country.[53]

ACOG's Comprehensive Economic Development Strategy (CEDS) explains that the "presence of many state and federal highways, plus a variety of public and private utilities, represent a regional strength upon which there are opportunities to develop economically. Compared to more rural and isolated areas of the country, Upstate South Carolina is a physically well-connected and well-integrated region that can compete with most metropolitan areas."[54]

3.13.2 Potential Economic Impacts

Providing improved interstate capacity and improved access to the interchanges could help boost economic opportunities and encourage commercial and industrial businesses to locate in the

[52] Upstate SC Alliance, *Regional Fact Sheets*, http://www.upstatescalliance.com/about-upstate/regional-fact-sheets

[53] *Ibid*

[54] Appalachian Council of Governments, *Comprehensive Economic Development Strategy Update 2014*, http://www.scacog.org/Portals/9/2014%20SCACOG%20CEDS%20UPDATE.pdf

area. The project is not being proposed to initiate any economic development plans, nor to serve any particular development. Increased capacity for I-85 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.[55]

As a result of the proposed I-85 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-85 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-85 due to improved accessibility and connection.

As a result of the project, fifteen businesses would be directly impacted. Table 3.17, page 125, quantifies the business impacts noted in Chapter 2 – *Alternatives Analysis* for the Mainline, at Sunny Slope Drive, and at the interchanges. Not all of these businesses would relocate. Although a building at Builders FirstSource would be impacted by the interchange at Exit 83, the business is not likely to relocate. The potential exists for three businesses at Exit 87 to resolve access issues that would allow them to remain where they are. Some businesses would benefit from improved access to and from the interstate. Other would be negatively impacted by less direct access resulting from these changes.

The specific relocations are described in Sections 2.1 and 2.2 of this document. SCDOT will acquire all new right-of-way and process any relocations in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

[55] Regional Economic Models, Inc., *Transportation Research*, http://www.remi.com/the-remi-model/topic-areas/transportation/transportation-research

Table 3.17 Business Relocations	
Location	**Businesses**
Mainline	1
Sunny Slope Drive	0
Exit 83	2
Exit 87	6
Exit 95	4
Exit 96	2
TOTAL	15

ACOG's Comprehensive Economic Development Strategy (CEDS) lists the proposed I-85 widening project as having a "major regional impact". Local planning officials with the Appalachian Council of Governments believe that economic development capacity for investment and job creation would be greatly enhanced by this DOT project.[56] Potential economic impacts along the project corridor are described for the mainline and the interchanges for the Preferred Alternative.

Mainline

With anticipated population growth and the corridor's proximity to both Charlotte and Greenville/Spartanburg, residential, commercial and industrial development is expected to continue to grow along the project mainline, with or without the project. There are a few areas along the mainline that are likely to see accelerated growth due to interchange improvements. These areas include Sunny Slope Corporate Park, near Exit 87 (Green River Road), Upstate Corporate Park, located off Exit 83 (Battleground Road) and Meadow Creek Industrial Park off of Victory Trail Road near Exit 96. Improvements at the interchanges may help attract industrial businesses to these corporate parks.

Interchanges

Exit 83 – Battleground Road

Improvements at the Exit 83 interchange may attract development to open land in the surrounding areas, specifically areas north of the Builders FirstSource location in the northwest quadrant, as well as the undeveloped, wooded area in the southeast quadrant of the interchange. With the proposed interchange improvements removing direct on/off access to ramps, the Westar Travel Plaza Truck stop and a fireworks store, located in the northeastern quadrant, would have less direct access on and off the interstate for southbound traffic. A new I-85 northbound off-ramp is proposed in the southeast quadrant, which could increase interest in development of the surrounding, undeveloped land near that intersection. The new location southbound on-ramp would also be surrounded by undeveloped property and could attract new

[56] David Shellhorse, SC Appalachian COG (email communication, April 29, 2015.)

commercial and/or industrial developers, due to the ease of access on and off the interstate, as well as the close proximity to Builders FirstSource to the north.

Two businesses at this interchange would be impacted due to the proposed improvements; Spencer Insulation, Inc., located in the southeast quadrant, would need to be relocated and one of Builders FirstSource buildings, in the northwest quadrant, would be acquired. Other businesses and establishments located at this interchange include a fireworks and gas stop, Abbott Fruit Market, and Mountain View Baptist Church. Access to Upstate Corporate Park is provided by this interchange and the proposed improvements are predicted to increase interest in development within the corporate park.

In July 2015, it was announced that Dollar Tree would invest $104.4 million into a distribution center in Upstate Corporate Park. Dollar Tree purchased a 24 acre site to build a 1.5 million-square-foot distribution center which will employ about 400 people over the next five years. It was said that the "state's plans to widen I-85 and upgrade interchanges, along with the park's proximity to the S.C. Inland Port, helped attract the retailer."[57]

Exit 87 – Green River Road

This interchange is surrounded mainly by low-density residential and undeveloped, wooded lands, with a pocket of commercial businesses in the northwest quadrant. With the proposed improvements, the northeast, northwest and southeast quadrants may become more desirable for development as the current, irregular interchange design and frontage road design would be upgraded with new location on- and off-ramps, eliminating atypical frontage road access. This new interchange design would be surrounded by undeveloped land and could be viewed as more attractive to commercial and highway retail developers.

There are five businesses located in the northwestern quadrant that would be impacted by the proposed roadway improvements; a fabric store, a daycare, a fruit stand, a private ambulance facility, the Orchard Place facility, and a building leased to the Spartanburg Herald Journal would all need to be relocated. The Orchard Place property would be divided into two parcels after business relocation; each of these parcels would be visible from the interstate and have access to the frontage road, characteristics that may attract commercial developers. Access to the realigned frontage road for the fabric store, daycare facility and the fruit stand may be able to be developed and therefore they may not have to move.

This interchange provides access to the Sunny Slope Corporate Park, located to the west, off Webber Road and Allison Road. It is anticipated that improvements at this interchange would attract growth at both the surrounding areas of the interchange and the corporate park.

Exit 95 – Pleasant School Road

There are more commercial, institutional, and light industrial establishments surrounding this interchange than the other interchanges. The area immediately northwest of the interchange is

[57] GSA Business, *Dollar Tree pays $4.28M for distribution center site*, http://gsabusiness.com/news/55094-dollar-tree-pays-4-28m-for-distribution-center-site

dominated by the UPS freight facility and the southwest quadrant includes motels, restaurants and other commercial businesses. There are pockets of undeveloped, wooded land east of the interchange. A few small businesses, a small mobile home park and Encounter Church are located south of the interchange.

Interchange design improvements to this interchange consist of implementing a more direct I-85 northbound off-ramp to Pleasant School Road. It also includes a new I-85 northbound on-ramp; the interchange currently does not include an I-85 northbound on-ramp. The more direct connections on and off the interstate could be attractive to businesses and developers and could encourage redevelopment of existing commercial properties.

Three businesses would be impacted due to the proposed interchange improvements. Two motels and the Concealed Weapons Permit Training Center would need to be relocated due to the proposed improvements.

Exit 96 – Shelby Highway

This interchange contains mainly undeveloped areas with pockets of light industrial and commercial businesses. The area southwest of the interchange contains a gas station and truck stop. McIntire Concrete is located in the northwest quadrant of the interchange. The Cherokee Speedway race track is located southeast of the interchange and is considered a big tourism draw for the area. The Meadow Creek Industrial Park is located south of the interchange and is home to several industrial businesses, with room to grow. Associated Hardwoods sawmill is accessible from Exit 96 and is located on Gaffney Ferry Road, southeast of Exit 96.

There are two businesses located in the northwestern quadrant that would be impacted by the proposed interchange improvements; a gas station and a tire shop would need to be relocated. These interchange improvements, along with Highway 18/Shelby Highway being a heavily traveled road, could make the surrounding, undeveloped areas more attractive for commercial and industrial development.

3.14 What are hazardous material 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 (SARA). 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 list search was completed for the proposed project in October 2014. The purpose of this search was to identify potentially contaminated sites, including possible sites involving the presence and/or past presence of LUSTs, above ground storage tanks (ASTs), and/or other hazardous materials in or adjacent to the proposed project. A report was compiled using federal and state environmental database information from the regulatory records of the U.S. Environmental Protection Agency (EPA) and the State of South Carolina[58]. This report included environmental sites and activities within a radius of proposed project property. The report, including detailed descriptions of the databases and acronyms used below, is included in Appendix I.

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

The report identified two (2) sites that were included in multiple federal and state environmental databases. These sites are known to store hazardous waste, and are considered sites of environmental concern. Table 3.18, page 129, provides details regarding these sites and the databases in which each is included. Additional information on these two sites was provided in reports on the Auriga and UPS facilities. SCDHEC provided a report regarding the groundwater status at the UPS facility.[59] Another report, describing groundwater conditions at the Auriga facility was also obtained.[60] Both of these reports (refer to Appendix I) indicated ongoing investigations regarding groundwater and/or soil contamination that may affect the project.

The report also identified 23 LUST sites within a one-half mile radius of the proposed project, including the UPS facility.

Five (5) LUST sites included on the report have been demolished, due to recent commercial development and/or roadway improvements. These include:

- Gaffney Express: 107 Wilcox Avenue, Gaffney, SC 29341
- Dicks Talleys Shell: I 85 & SC Highway 11, Gaffney, SC 29341
- Ramseys Chevron: 1801 Floyd Baker Blvd, Gaffney, SC 29341
- Fast & Fresh 2: Floyd Baker Boulevard, Gaffney, SC 29341
- Hoechst Celanese Corp: I 85 & Gossett Road, Spartanburg, SC 29307

[58] Environmental Data Resources, Inc., *I-85 Widening MM 80-MM 96 Spartanburg/Cherokee,* 2014
[59] ARCADIS, *Groundwater Monitoring Report: UPS Freight – Gaffney Terminal*, July 2013
[60] F&ME Consultants, Inc., *Limited Phase II Environmental Site Assessment Report: I-85 Rehabilitation Project MM 77.0 to MM 84.0 Spartanburg and Cherokee Counties, South Carolina*, August 5, 2015

Table 3.18
Potential Sites of Environmental Concern

Site	Database Listed	Description of Database
UPS Facility* 129 Pleasant School Rd Gaffney, SC 29341	RCRA-LQG	Sites which generate, transport, store, treat and/or dispose of hazardous waste
	ERNS (3 listings)	Reported releases of oil and hazardous substances
	HMIRS (560 listings)	Hazardous material spill incidents reported to the Department of Transportation
	SC GWCI	Sites that has groundwater contamination over a federal Maximum Contaminant Level
	SC LUST	Reported leaking underground storage tank (LUST) incidents
	SC UST	Registered Underground Storage Tanks (USTs)
	PA MANIFEST	Sites that maintain hazardous waste manifest information.
	SC SPILLS	Known spills
	SC RGA LUST	LUST incidents derived from historical databases and includes many records that no longer appear in current government lists.
Auriga Polymers, Inc.** 1550 Dewberry Rd Spartanburg, SC 29307	RCRA-LQG	Sites which generate, transport, store, treat and/or dispose of hazardous waste
	RCRA-LQG	Sites which generate, transport, store, treat and/or dispose of hazardous waste
	ERNS (12listings)	Reported releases of oil and hazardous substances
	PADS	Sites which generator, transports, commercial stores and/or brokers and disposes of Polychlorinated Biphenyl (PCBs)
	SC UIC	Sites with underground injection wells the place fluids underground for storage or disposal
	SC NPDES	Waste water treatment facility locations
	SC SPILLS	Known spills

Source: EDR Data Map Area Study for I-85 Widening MM 80-MM 96 Spartanburg/Cherokee (October 2014)
* The UPS facility is listed as three separate site names in the EDR report.
** The Auriga Polymers facility is listed with two separate addresses in the EDR report.

Six (6) LUST sites are not expected to affect the proposed project, due to their distance from the project area. These include:

- Blacksburg I-85 Mobile: I 85 & N. Mountain Street, Blacksburg, SC 29702
- Hamricks KWIK Shop: 2175 Boiling Springs Highway, Gaffney, SC 29341
- Burns Chevrolet: 1733 North Limestone Street, Gaffney, SC 29341
- Timken Company Gaffney Bearing: 100 Timken Road, Gaffney, SC 29340
- Air Liquide Industrial US LP: 1540 Dewberry Road, Spartanburg, SC 29307
- Converse School Bus Shop: 537 Burns Road, Spartanburg, SC 29307

Table 3.19, page 131, identifies the twelve (12) LUST sites located within close proximity to the project, and includes details regarding the LUST at each site. Five (5) of these sites were also included in the SW 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).

Each 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.

3.14.2 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 I and Phase II Environmental Site Assessments, in accordance with ASTM E1527-13. Direct impacts to potentially contaminated sites are included in Table 3.20, page 132.

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 Alternative.

Table 3.19
Leaking Underground Storage Tanks in the Project Area

Site	Database	Status	Decision Date
UPS Facility 129 Pleasant School Rd Gaffney, SC 29341	LUST/GWCI	No Further Action	1/05/09
Poppin Jack 708 Hampshire Drive Gaffney, SC 29341	LUST/GWCI	No Further Action	3/13/12
96 Fuel Center 1425 Wilcox Avenue Gaffney, SC 29341	LUST	No Further Action	2/18/03
Pantry 3406 DBA Mini Mart 100 Shelby Hwy Gaffney, SC 29341	LUST	No Further Action	3/07/01
HWY 11 Food Mart 322 Chesnee Highway Gaffney, SC 29341	LUST	No Further Action	2/26/91
Gaffney Redi Mart 110 Chesnee Highway Gaffney, SC 29341	LUST/GWCI	No Further Action	3/07/11
Pantry 3961 DBA Petro 1103 Hyatt Street Gaffney, SC 29341	LUST/GWCI	No Further Action	6/01/11
Express Behelers Gro 841 Battleground Road Gaffney, SC 29341	LUST/GWCI	No Further Action	6/01/11
Westar Travel Plaza 175 Truck Stop Road Cowpens, SC 29330	LUST	No Further Action	9/23/02
I-85 Associates 151 Dewberry Road Cowpens, SC 29307	LUST	No Further Action	9/09/99
Poor Paul's Fireworks 275 Bud Arthur Bridge Road Cowpens, SC 29307	LUST	No Further Action	8/08/07
Stowe Woodward Company 140 Conway Black Road Spartanburg, SC 29307	LUST	No Further Action	5/10/93

Table 3.20
Impact to Potentially Contaminated Sites (acres)

Site	Mainline	Exit 83	Exit 87	Exit 95	Exit 96
UPS Facility* 129 Pleasant School Rd Gaffney, SC 29341	0.50		-	7.86	
Auriga Polymers, Inc.** 1550 Dewberry Rd Spartanburg, SC 29307	0.25		-		
Poppin Jack 708 Hampshire Drive Gaffney, SC 29341				0.01	
96 Fuel Center 1425 Wilcox Avenue Gaffney, SC 29341					2.57
Pantry 3406 DBA Mini Mart 100 Shelby Hwy Gaffney, SC 29341			-	0.40	
Westar Travel Plaza 175 Truck Stop Road Cowpens, SC 29330		1.35	-		
Poor Paul's Fireworks 275 Bud Arthur Bridge Road Cowpens, SC 29307		0.14	-		

3.15 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 Council

on Environmental Quality (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-85 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 3.21 provides a summary of the distinction between direct, indirect and cumulative impacts.

Table 3.21
Direct, Indirect and Cumulative Effects

Type of Effect	Direct	Indirect	Cumulative
Nature of Effect	Typical/Inevitable/ Predictable	Reasonably Foreseeable/ Probable	Reasonably Foreseeable/ Probable
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 than direct effect	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.

3.15.1 What study area is used for this 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 project study area boundaries are shown in Figure 1.1, page 2. The study area for the land use analysis was broader, it included the unincorporated areas of Spartanburg and Cherokee counties and the City of Gaffney. For the stream and water quality analysis, since the project is located in the Broad River Basin and the project spans across three watersheds within this basin, the Pacolet River Watershed, the Thicketty Creek Watershed, and the Broad River, these three watersheds were used for the water quality and stream impact study area.

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-85 in 1959. 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.

3.15.2 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 *Spartanburg Comprehensive Plan (1998)* documents long-term growth trends in the area and identifies the development that can be expected to occur within the area. The Spartanburg County portion of the project corridor is described as urban and developing. Within these urban and developing areas, Spartanburg County proposes to ensure that new development is sensitive to and compatible with existing land uses and environmental conditions.

The Spartanburg Area Transportation Study (SPATS) 2035 Long Range Transportation Plan (LRTP) proposes transportation improvements that are needed to accommodate increasing demands on roadway networks and identifies key corridors where growth is projected. SPATS identifies the I-85 Improvement project as an essential component of their transportation plans.

The *Cherokee County Land Development Regulations* ordinance contains information on developing within Cherokee County based on adjacent land uses and presents requirements for land development projects within the unincorporated areas of the county. The *Cherokee County Comprehensive Plan (2004)* was also reviewed for community trends and goals and provides

growth and development objectives for the county. Within Cherokee County, the project corridor is located in rural areas with nodes of commercial and industrial.

Future development was forecast based upon projects in the planning or permitting stages with the Counties or the City, combined with estimates of continued growth in the project area due to expansion from the Greenville/Spartanburg area to the south and Charlotte to the north.

The Basinwide Watershed Water Quality Assessment Report for the Broad River Basin (SCDHEC, 2007) and the S.C. List of 303(d) Impaired Waters (SCDHEC, 2014) were reviewed for information pertaining to water resources and water quality. According to SCDHEC's 2014 List of Impaired Waters, there are locations impaired for all uses based on macroinvertebrate community data and impaired for chlorophyll-A excursions. According to the SCDHEC *Total Maximum Daily Load Development for the Upper Broad River Basin,* a TMDL has been developed by SCDHEC in 2004 and approved by the EPA for the Broad River Basin (HUC 03050105) to determine the maximum amount of fecal coliform it can receive from nonpoint sources and still meet water quality standards.

3.15.3 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 3: Existing Conditions and Environmental Consequences, Section 3.8 Land Use
- *Natural Resources Technical Memorandum – Proposed Interstate 85 Widening & Interchange Improvement Project from MM 80 to MM 96 Natural Resources Technical Memorandum*
- Chapter 3: Existing Conditions and Environmental Consequences, Section 3.4 Water Resources and Water Quality

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.

3.15.4 What is the context of the affected resources?

Land Use

The project corridor is located within unincorporated areas of Spartanburg and Cherokee counties and the City of Gaffney. Existing land uses are primarily rural residential and open land with areas of industrial and commercial. The closest incorporated municipalities are the City of Gaffney (to the southeast of the corridor) and the Town of Cowpens (to the south of the corridor).

Mainline

Along the mainline of I-85, land uses consist mainly of agricultural and open lands, with low density residential and pockets of industrial and highway retail. Three corporate parks are

located in surrounding areas along the interstate; these include, Sunny Slope Corporate Park, Upstate Corporate Park and Meadow Creek Industrial Park. The project interchanges within the corridor contain higher concentrations of commercial and industrial, as described below.

Exit 83 – Battleground Road

Land uses surrounding this interchange consist of low-density residential, commercial, light industrial, institutional and open/wooded land. Mountain View Baptist Church and Christian Academy are located north of the interchange and Builders FirstSource is located in the northwestern quadrant. Some businesses are located along Truck Stop Road are in the northeast quadrant and are currently accessible by direct driveway access on and off the interstate. Southeast of the interchange are two businesses and residential development. In the southwest quadrant, there are some commercial uses currently located on the frontage road, which has direct access on and off the interstate. Farmland and wooded land is located to the north and south of the interchange. Water and sewer services are available here.

Exit 87 – Green River Road

This interchange contains mainly open/wooded land with commercial and low-density residential uses. There are several areas of open/wooded land at this interchange. Macedonia Baptist Church is located north of the interchange. A few commercial establishments, are located in the northwestern quadrant of the interchange; these businesses currently have direct access to the frontage road and interstate. Water services are available here.

Exit 95 – Pleasant School Road

Land uses surrounding this interchange consist of commercial, low-density residential and light industrial (UPS Freight facility). There are pockets of open/wooded land in the northern quadrants of the interchange, and Lake Whelchel, the primary drinking water source for Gaffney is north of the interchange. A small manufactured housing development is located south of the interchange as are the Gaffney and Shamrock Inns, some commercial uses and Encounter Church. Water and sewer services are available here.

Exit 96 – Shelby Highway

This interchange contains mainly open/wooded land with pockets of light industrial and commercial. Meadow Creek Industrial Park is located south of the interchange as well as the Cherokee Speedway race track, located southeast of the interchange. Associated Hardwoods sawmill is located on Gaffney Ferry Road, southeast of exit 96. Water and sewer services are available here.

Streams/Water Quality

The project is located in the Broad River Basin, as defined by the SC Department of Health and Environmental Control (SCDHEC). A total of 54 streams, or tributaries, were identified within the project study area during site reviews. The streams are listed in Section 3.1.2, page 72.

3.15.5 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-85 have the potential to accelerate 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 and improved access 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.

3.15.6 What are the potential indirect impacts?

Land Use

The study area is comprised of residential, commercial, industrial, agricultural and open land uses. There would be potential for increased development at the project interchanges, primarily resulting from growth in the project area due to its proximity to Charlotte and Greenville/Spartanburg and the benefits of a location on the I-85 corridor. 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-85 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-85 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.

There would be potential for increased development at the project interchanges, due to the presence of undeveloped land. Refer to Section 3.8.3 for additional information on potential development and land use impacts at each interchange.

3.15.6.1 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;
- Spartanburg County Comprehensive Plan; and
- Cherokee 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 in both Spartanburg and Cherokee Counties; see Section 3.8.2 for a list and description of the local plans.

3.15.7 What are the cumulative impacts?

Past actions that have affected the area have been the creation of I-85 which facilitated conversion of agricultural lands into commercial, residential and industrial uses near the interchanges, and the rise of new industries in the Spartanburg/Greenville area. Based on the existing land use in the area and land use plans and goals for growth, the project has a potential to accelerate growth in specific areas at the interchanges. As the area is a growing part of Cherokee and Spartanburg County, development is expected to continue. 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 widening of I-85 from mile marker 96 to mile marker 106 at the South Carolina/North Carolina state line that is within the study area for indirect and cumulative impacts. I-85 has several other improvement projects that are geared to improving the capacity and efficiency of moving traffic through the area. The I-85/I-385 interchange improvements, the widening from SC 25 to I-385 and the widening from Pelham Road to SC 101 are either underway or in development. While the transportation improvements, with the exception of the widening of I-85 from 96 to 106, are beyond the study area of the indirect and cumulative impacts, the nature of the improved transportation resulting from these projects would facilitate additional development in this area.

There are three corporate parks adjacent to the study area that contain developable land and available lots; Upstate Corporate Park, located at Exit 83, Sunny Slope Corporate Park at Exit 87 and Meadow Creek Industrial Park at Exit 96 are all expected to add tenants. Recently Dollar Tree, Inc. announced that it will build a 1.5 million square foot distribution center in Upstate Corporate Park. The proposed Lee Nuclear Station, which is in the process of obtaining permits is located off of Exit 96.

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 surfaces that 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.

3.15.8 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 industrial, commercial and residential establishments. In Spartanburg County, many agricultural areas with potential for development are currently designated as a Developing Residential or Business/Industrial use in the Spartanburg County Comprehensive Plan's Plan Map, which presents future land uses. Cherokee County's future land use plan has the project corridor located in the commercial use designation, while being surrounding to the north by agricultural and low-density residential land uses and industrial land uses to the south. Conversion of land uses is regulated by Spartanburg and Cherokee Counties and/or the City of Gaffney through local planning and zoning ordinances.

Water quality Impact would be mitigated by stormwater control measures, both during construction and post-construction, which are required for new development projects in both Counties[61] [62] and the City. 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.

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 U.S. Army Corps of Engineers (USACE). The USACE typically requires compensatory mitigation for any impacts to jurisdictional areas for which a permit application is submitted. Compensatory mitigation is normally required to offset unavoidable losses of waters of the U.S. and is only undertaken after avoidance and minimization actions are exhausted.

3.16 USACE - What are the Public Interest Review Factors and how were they used to evaluate alternatives?

According to U.S. Army Corps of Engineers regulations (33CFR Part 320.4 (a)(1):

> The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its

[61] Spartanburg County, South Carolina, *Storm Water Management Design Manual*, http://www.spartanburgcounty.org/govt/depts/pubwrks/docs/StormWater/DesignManual.pdf, March 16, 2009
[62] Cherokee County, South Carolina, *Cherokee County Land Development Regulations*, http://cherokeecountysc.gov/assets/docs/uniform-land-development-regulations.PDF, January 1, 2013

> intended use on the public interest. Evaluation of the probable impact which the proposed activity may have on the public interest requires a careful weighing of all those factors which become relevant in each particular case.

and

> All factors which may be relevant to the proposal must be considered including the cumulative effects thereof: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

The public interest review factors pertinent to this project have been considered in the development and selection of the Preferred Alternative. The Alternatives Analysis Matrix (Table 2.1, page 21) quantifies impacts to many of these categories that were considered during the evaluation of the alternatives, including wetlands, ponds, jurisdictional streams, protected species, historic properties, floodplains, business and residential relocations, noise, farmlands, and hazardous material sites. The potential impacts of these features to land use, community impacts, impacts to publicly-owned parks and recreation areas (even consideration for a privately-owned, but available to the public park at Exit 87), economic impacts, wildlife impacts, and general environmental concerns, such as impacts to hazardous material sites and air quality impacts were considered for all Reasonable Alternatives.

3.17 What are the Section 404(b)(1) guidelines and how were they considered during the alternatives evaluation?

The Section 404(b)(1) guidelines are U.S. Environmental Protection Agency regulations (40 CFR Part 230) that regulate the deposition of dredge or fill material in wetlands. They are essential during consideration for the issuance or denial of a permit to fill or alter jurisdictional waters of the United States. A permit for the wetland, stream, and pond impacts from this project will be needed, therefore these guidelines should be followed in the development of a Preferred Alternative. USACE regulations (33 CFR Part 320(a)(1) state:

> … For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(1) guidelines.

The USEPA regulations (40 CFR 230.10(a)) require that:

> …no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have, so long as the alternative does not have other significant adverse environmental consequences.

This “practicable alternatives” is known as the “least environmentally damaging practicable alternative” (LEDPA). It must be demonstrated that avoidance and minimization steps have been taken to reduce the unavoidable impacts associated with the project and that there is no other alternative with “less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.”

The consideration of the impacts to aquatic systems during the alternatives analysis has been documented in Chapter 2, Section 2.2.3 and is illustrated in Table 2.2, page 33. The Preferred Alternative is the LEDPA, based upon the amount of streams and wetlands impacted when compared with the other alternatives. The mainline has only 0.25 acres of wetland impacts and 77 linear feet of stream impacts. All four of the interchanges have no wetland impacts and three of the four interchange alternatives had the lowest stream impacts. The only interchange alternative for the Preferred Alternative that did not have the least amount of stream impact was at Exit 96. However, the alternative with less stream impacts at this interchange would have impacted seven more businesses and a residence and is the only alternative that provides for the dominant traffic movement to be to Victory Trail Road. These impacts to businesses and the residence are considered “other significant adverse environmental consequences”. In addition, Alternative 1, the alternative with lower stream impacts, has an estimated cost of right-of-way and for relocations of $2.3 million dollars while Alternative 3 has an estimated cost of $1.2 million. This difference of over a million dollars for the right-of-way and relocations between these two interchanges is well above the estimated $91,500 cost of stream mitigation.

The effort to reduce impacts to jurisdictional waters of the United States continued through the refinement of the design of the Preferred Alternative and is illustrated by the reduction of stream impacts from 226 linear feet to 122 linear feet at Exit 96 after the Preferred Alternative had been designated. The compensatory mitigation for unavoidable impacts from the project is described in Chapter 3, Section 3.1.4, page 82.

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CHAPTER 4 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.

4.1 How was the public engaged in the project?

SCDOT hosted informal, drop-in style Public Information Meetings on November 18, 2014 and March 24, 2015 at Gaffney High School – Cherokee County, and on November 20, 2014 and March 26, 2015 at Cowpens Middle School – Spartanburg County. Notice of the meetings was advertised in The Spartanburg Herald Journal, The Gaffney Ledger, and on SCDOT's website. Attendees were provided a copy of the advertisement, a 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 initial meetings in November 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, as alternatives were developed during the design and environmental evaluation process. A total of 166 people attended the meetings. Two additional meetings were held in March to present the proposed conceptual designs for the improvements to the interchanges and receive comment on those designs from the public. Several stations were set up with graphics showing proposed concepts for the existing interchanges. Various representatives of SCDOT were available for discussion.

Members of the public, especially diverse communities that might be affected by the proposed project, were encouraged to attend the second public information meetings. SCDOT sent outreach letters to four African American churches in the vicinity of the I-85 project encouraging the pastors to share the Public Information Meeting advertisement with their congregation and neighboring community. Two of the churches are located within Gaffney's city limits, and the others are located north of I-85. The Cherokee County Chamber of Commerce's Diversity Committee Chairperson was also included in the outreach efforts.

4.2 How were local governments involved?

Invitations to attend the public meetings were sent to members of the General Assembly, City, and County Councils representing Spartanburg and Cherokee Counties as well as State Agencies, Commissioners and Liaisons of SCDOT, and the South Carolina Appalachian Council of Governments. The Spartanburg Area and Cherokee County Chambers of Commerce provided

notice of the Public Information Meetings to their members on their website calendars and through electronic mail.

4.3 How were the project stakeholders involved?

During early project development, SCDOT met with stakeholders to provide an overview of the project and to obtain feedback on specific interchange improvements. On October 8, 2014, SCDOT met with United Parcel Service Freight (UPS) to discuss provide an explanation of the project and to obtain feedback regarding the improvements to Exit 95. Also on October 8, 2014, SCDOT met with the Pastor and representatives of Mountain View Baptist Church and Mountain View Christian Academy to discuss improvements to Exit 83.

4.4 What agencies were contacted on this project?

On September 8, 2014, SCDOT sent a Letter of Intent (LOI, refer to Appendix J) to representatives of the following federal, state and local agencies as well as non-governmental organizations:

Federal Agencies
United States Army Corps of Engineers
United States Coast Guard
United States Department of Transportation – Federal Highway Administration
United States Environmental Protection Agency
United States Fish and Wildlife Service
United States Housing and Urban Development

State Agencies
South Carolina Budget and Control Board
South Carolina Department of Agriculture
South Carolina Department of Archives and History
South Carolina Department of Commerce
South Carolina Department of Health and Environmental Control
South Carolina Department of Natural Resources
South Carolina Department of Parks, Recreation & Tourism
South Carolina Forestry Commission
South Carolina Human Affairs Commission
South Carolina Institute of Archaeology and Anthropology

Special Interest Organizations
The National Wild Turkey Federation
The Nature Conservancy
Ridge Heritage Association
The Sierra Club
South Carolina National Heritage Corridor
South Carolina Wildlife Federation

Tribal Historic Preservation Program:

Catawba Indian Nation
Eastern Band of Cherokee Indians
United Keetoowah Band of Cherokee

Informal consultation was performed with USFWS regarding the Northern long-eared bat. A biological assessment was provided to USFWS who concurred with the findings of "may affect but not likely to adversely affect."

The LOI included a description of the project, a location map, and contact information for SCDOT's Project Manager along with a request for information related to beneficial or adverse impacts the project may have relevant to the agency/organization. A copy of the LOI and responses are included in Appendix J.

4.5 What input did the agencies provide?

Responses to the LOI were received from the following Bureaus within the Office of Environmental Quality Control at the South Carolina Department of Health and Environmental Control:

Bureau of Air Quality
Bureau of Water
Bureau of Land and Waste Management

4.6 Public Hearing

A public hearing will be held in the fall of 2015 to present the development of the project and obtain input from concerned citizens.

Appendix A
Interstate 85 Widening Traffic Analysis and I-85 Accident Analysis Reports

Appendix B
Public Information Meeting Summary Reports

Appendix C
Natural Resources Technical Memorandum and Appendices

Appendix D

I-85 Widening (MM 80 to 96) Biological Assessment, I-85 Project Submittal Form for NLEB, Protected Aquatic Species Survey Report; Cherokee and Spartanburg Counties; Interstate 85 Widening from Mile Marker 80 to 96, and FWS Correspondence regarding I-85 Project Submittal Form for NLEB

Appendix E
SCDOT Floodplains Checklist

Appendix F
Farmland Impact Conversion Rating Forms

Appendix G

Phase I Cultural Resource Survey of the Proposed Widening of Interstate 85 from Mile Marker 80 to 96, Cherokee and Spartanburg Counties, SHPO/THPO Concurrence, and FHWA Section 4(f) de minimis Concurrence

Appendix H

I-85 Preliminary Noise Analysis, Noise Impact Assessment: I-85 Widening Between Exits 80 and 96 Spartanburg and Cherokee Counties, South Carolina, Noise Impact Maps, and Noise Assessment Memorandum

Appendix I
Environmental Data Resources Report, EDR Map, Arcadis Groundwater Monitoring Report for UPS Site, S&ME Limited Phase II Environmental Site Assessment Report: I-85 Rehabilitation Project, and SCDHEC Correspondence

Appendix J
Letter of Intent and Agency Responses