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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

The Alternatives Analysis in Chapter 2 recommended four alternatives proceed forward for study: the three build alternatives, Southern Crescent Corridor Alternative, the I-85 Corridor Alternative, the Greenfield Corridor Alternative, and the No-Build Alternative. Each of the build alternatives will have sub-alternatives for the two Atlanta Approaches, one along the existing Norfolk Southern (NS) Railroad and the other following the existing CSX line. While GDOT is deferring selection of the Atlanta Approach to a Tier 2 analysis, presumably an Environmental Impact Statement (EIS), information on potential environmental impacts are presented in this Tier 1 EIS. Refer to Chapter 2 for additional information on the Corridor Alternatives moving forward for further study. As discussed in Chapter 2, the Tier 2 analysis may consider additional build alternatives..

In this chapter, the existing social, economic, and environmental conditions in the Study Area, as defined in Chapter 2, will be described. The potential for permanent and temporary (construction-related) impacts within the three Build Corridor Alternatives, including the two Atlanta Approach sub-alternatives, and the No-Build Alternative will be reviewed and considered. As discussed in Chapter 1, GDOT and the FRA are using a tiered process to complete the NEPA environmental review of the Project. GDOT and FRA are preparing a Tier 1 EIS to identify a Preferred Corridor Alternative (generalized area of travel). The assessment of impacts is primarily qualitative based on readily available data. This chapter will also present potential strategies to avoid, minimize, and mitigate the identified effects of the Project. In addition, a broad review and presentation of secondary and cumulative effects will be provided.

The No-Build Alternative is carried forward to serve as a baseline against which GDOT will measure the build alternatives. The two sub-alternative approach corridors into the City of Atlanta, along the existing NS Railroad and the existing CSX line, converge near Howell Junction, just north and west of downtown Atlanta. South of Howell Junction, both follow the same existing alignment to Hartsfield-Jackson Atlanta International Airport (H-JAIA). The existing rail lines along the approaches into Atlanta are located within a highly developed urban area and GDOT expects minimal impacts from use of either line. Exhibits 3.1-1 through 3.1-3 illustrate the three Corridor Alternatives with the two approach sub-alternatives into Atlanta.

Successful conclusion of the Tier 1 EIS and Record of Decision (ROD) should result in FRA selecting a Preferred Corridor Alternative for further analysis. After the Tier 1, GDOT could pursue additional Tier 2 analysis, should GDOT identify and secure additional funding. The Tier 2 analysis would presumably be an EIS, but it could be multiple Tier 2 documents. The Tier 2 analysis will further evaluate and develop the Preferred Corridor Alternative and select the sub-alternative approach into Atlanta. More in-depth studies and evaluations would be conducted, and specific mitigation commitments identified during a Tier 2 analysis as well.

Exhibit 3.1-1: Southern Crescent Corridor Alternative

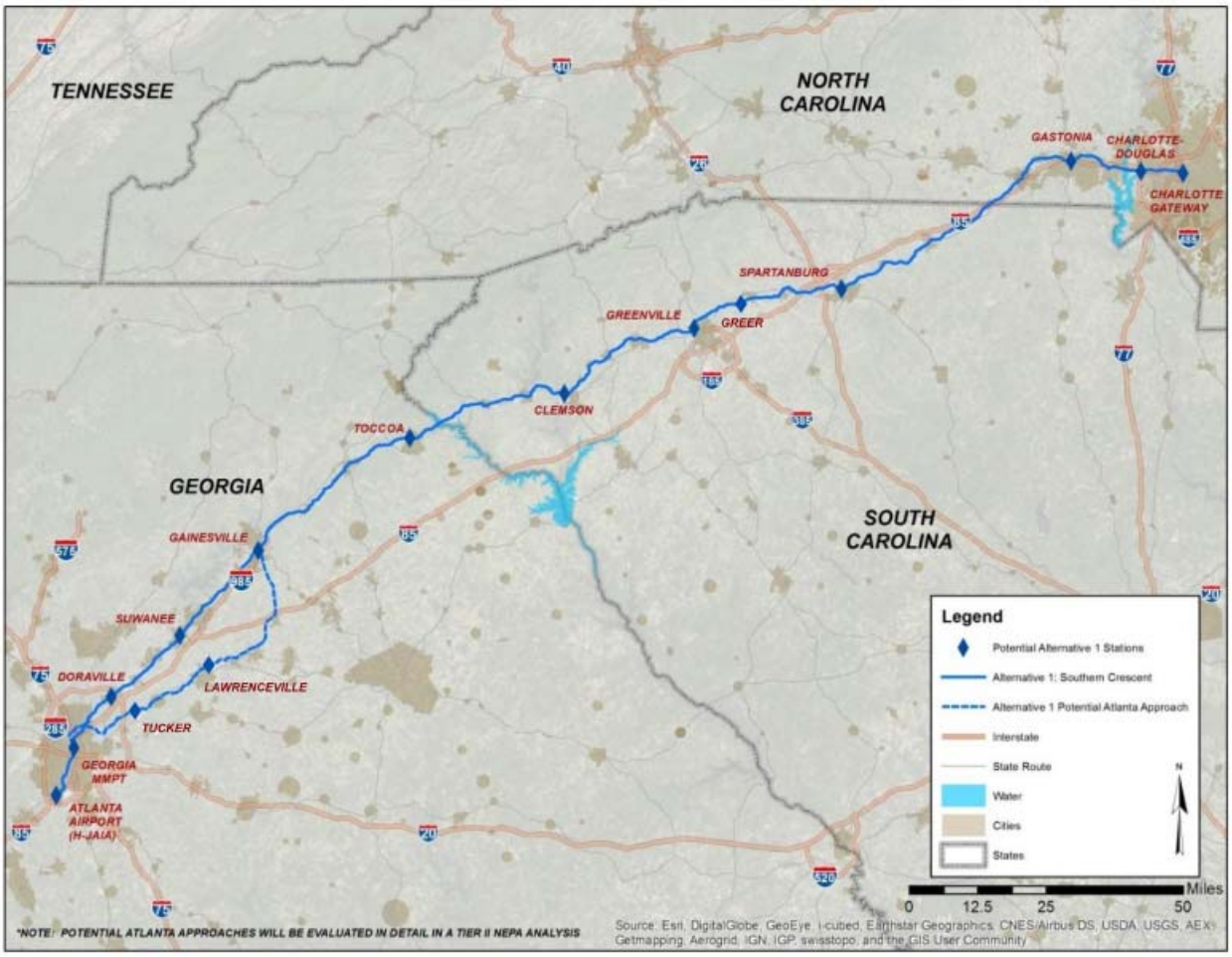


Exhibit 3.1-2: I-85 Corridor Alternative

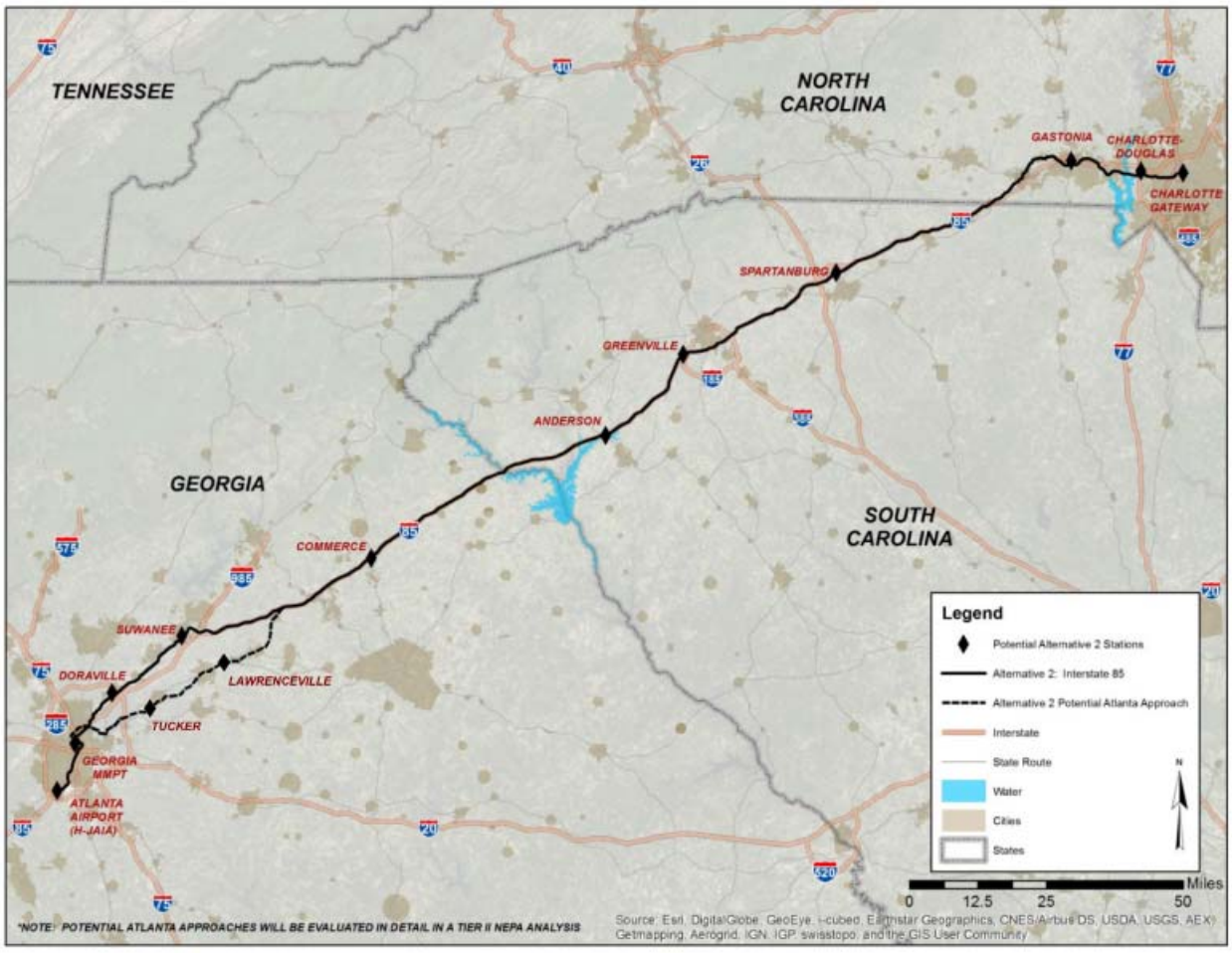
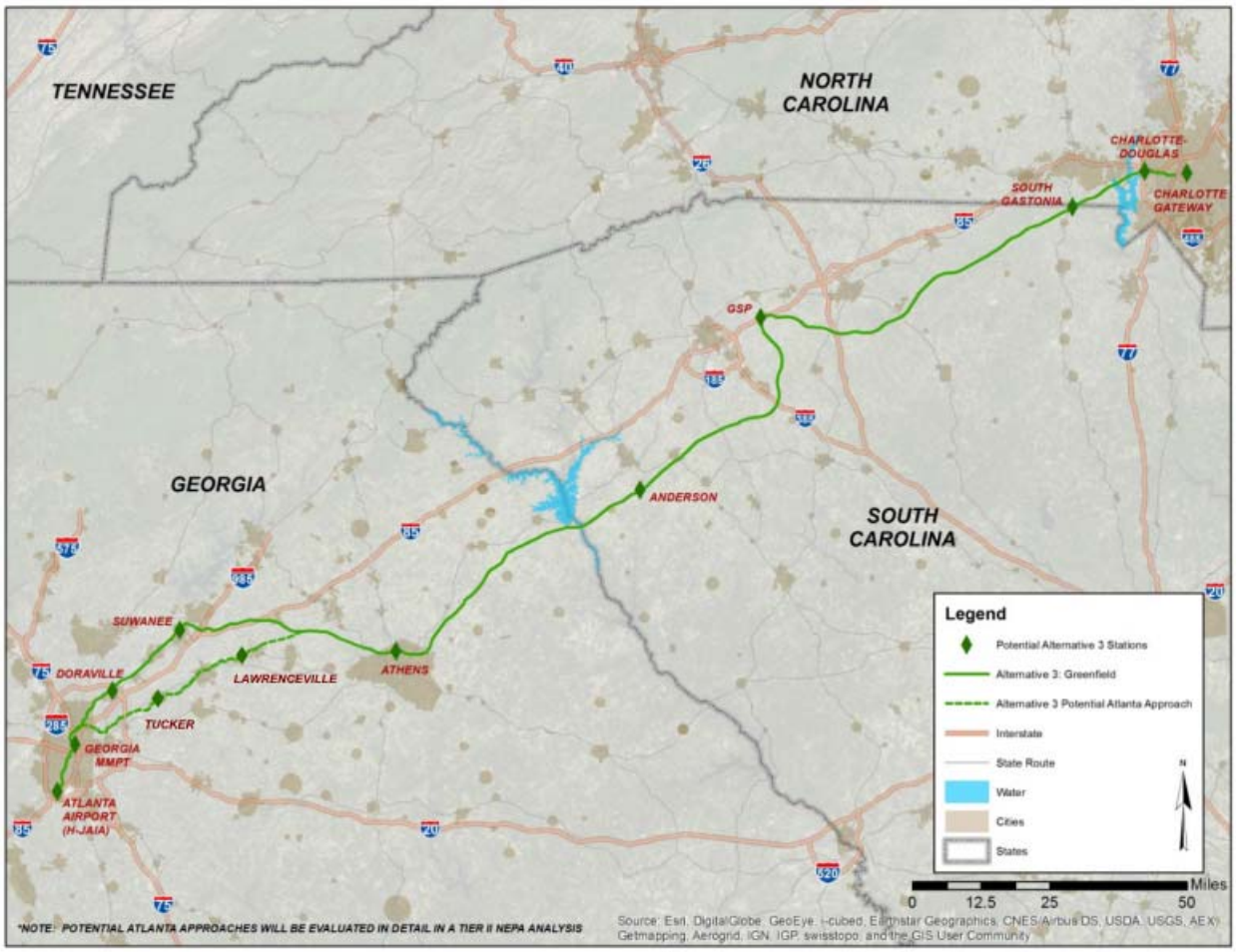


Exhibit 3.1-3: Greenfield Corridor Alternative



This Tier 1 EIS analysis typically considers 600-foot wide Corridor Alternatives. However, depending on the nature of each resource, GDOT chose to use wider screening areas and document potential impacts outside the 600-foot wide Corridor Alternative for some resources, as described in Exhibit 3.1-4. The term "environmental screening area" is used in this chapter to refer to the geographic areas GDOT evaluated for environmental resources. Subsequent Tier 2 analysis will further refine Corridor Alternatives to a more precise width of 100 to 250 feet, which will represent the specific alignment required to construct the Project.

Exhibit 3.1-4: Environmental Screening Areas

Resource	Environmental Screening Area Width (feet)	Rational if different from the 600-foot wide Corridor Alternative Width
Transportation	Entire Study Area	Unlike other topic areas, GDOT evaluated the project's impacts on various modes of transportation between Atlanta and Charlotte, covering the entire Study Area (defined in Chapter 1, Exhibit 1-4).
Noise	200-1,300'	FRA recommends specific screening distances depending on the existing noise environment and train speeds. Reduced screening distances are recommended where intervening buildings exist and may block noise.
Vibration	20-275'	FRA recommends specific screening distances depending on existing land uses, train speed and train frequency. Screening distances are wide enough to capture potential ground-borne vibration impacts.
Socioeconomics	1,000'	1,000-foot screening distance is intended to identify demographics, including minority and low-income populations that may be impacted by new rail infrastructure, ancillary facilities, and associated impacts, like traffic.
Parklands, Wildlife Refuges, and Recreational Areas	600' along Corridor Alternatives and 1,000' around stations	Due to the potential for additional activity and impacts near stations, GDOT evaluated a larger area than the standard 600-foot wide Corridor Alternative.
Historic Resources	1,000'	Due to the potential for direct effects to historic resources, such as visual effects or vibration, a 1,000-foot environmental screening area for historical resources was defined for each Corridor.
Archaeological Resources	600'	The 600-foot wide Corridor Alternative is adequate to identify potential archaeological impacts.
Water Resources	600' along Corridor Alternatives and 1,000' around stations	Due to the potential for additional activity and impacts near stations, GDOT evaluated a larger area than the standard 600-foot wide Corridor Alternative.
Biological Resources	600'	The 600-foot wide Corridor Alternative is adequate to identify potential biological impacts.
Note: Categories not evaluated in this Tier 1 EIS include: solid waste disposal, coastal zone management (not present in Study Area), production and consumption of energy, use of other natural resources, elderly and handicapped, public health, and safety. The broad scope of the Tier 1 EIS cannot provide a determination of impacts based on a corridor level evaluation.		

The methodology used in assessing the potential effects of the Corridor and No-Build Alternatives on the social, economic, and environmental resources reported in this Tier 1 EIS is in accordance with FRA procedures guidance. As explained above, the width of the Corridor Alternative environmental screening area is generally 600 feet wide throughout the analysis, except where noted otherwise for specific resources.

The resources listed below are the focus of this Tier 1 EIS. These resources were assessed for three reasons: 1) they occur in the proposed Corridor Alternative environmental screening area; 2) a determination of the effects on these resources can be made at the current program level (Tier 1) of evaluation; and 3) potential effects on these resources may vary among the Corridor Alternatives and will assist in the selection of the best build alternative to advance for further study if one is chosen.

- Transportation: assess impacts on other travel modes
- Air Quality: assess the consistency of the alternatives with Federal and state plans for the attainment and maintenance of air quality standards
- Water Resources, including wetlands, streams, and other waters of the U.S., floodplains, and water quality: assess the alternatives on the consistency with Federal and state standards and impacts on Waters of the U.S.
- Noise and Vibration: assess the effects of the alternatives based on Federal, state and local noise and vibration standards
- Socioeconomic and Environmental Justice: assess the effects of the alternatives on the number and industry of jobs, the potential for community disruption or cohesion, the possibility of demographic shifts, and local services and revenues, and on minority and low-income populations, and land use changes
- Recreational Areas and Opportunities: assess impacts on recreational activities, and their designated areas
- Natural Ecological Systems: assess the effects of the alternatives on wildlife and vegetation, including endangered species impacted by the alternatives, and the possible changes to the natural landscape
- Cultural Resources: assess the impacts of the alternatives on historical, architectural, archaeological, or cultural artifacts of significance

Because of the broad scope of a Tier 1 EIS, and because a determination of impacts cannot be evaluated from a corridor-level, or the category is not present in the Study Area, the following resources were not evaluated in this Tier 1 EIS: solid waste disposal, coastal zone management (not present in Study Area), production and consumption of energy, use of other natural resources, elderly and handicapped, public health, and safety.

Subsequent Tier 2 analysis of resources will require a site-specific design and more precise discussion of the direct and indirect effects within the selected Corridor Alternative, than is possible in this broad, Corridor-level assessment. If this Tier 1 process results in FRA selecting a Preferred Corridor Alternative, subsequent Tier 2 analysis will include site-specific research and fieldwork, effects analysis will be performed on all issues and resources in compliance with NEPA and FRA guidelines, and other relevant Federal and state laws. Should additional funding be identified and secured, GDOT and FRA will conduct additional and more extensive consultation with agencies and with the public as part of the Tier 2 analysis.

Each section in this chapter describes the affected environment and potential consequences of the Project. A "Subsequent Analysis" subsection is included to describe the next, specific analysis that will take place in Tier 2.

3.2 SUMMARY OF KEY FINDINGS

The Tier 1 analysis of environmental consequences described in this chapter determined that the Project, as well as the No-Build Alternative, have the potential to affect the human and natural environment.

3.2.1 No-Build Alternative

The extent to which the planned and funded projects in the No-Build Alternative would have impacts on the human and natural environment, and whether those impacts could be avoided or minimized, can only be determined through environmental analysis to be undertaken by the sponsors of those projects. See Exhibit 2-7 for a list of the planned and funded projects within the Study Area. Key findings of this Tier 1 EIS are that the No-Build Alternative:

- Could increase roadway capacity in selected portions of the Study Area's transportation network, but would not adequately enhance passenger mobility between the metropolitan areas and airports of Atlanta and Charlotte;
- Would not adequately address the transportation needs of projected population and employment growth in the Study Area, would not increase transportation options, would not increase airport and intermodal connections, would not fully address transportation limitations on economic growth, and would not provide faster and more reliable ground transportation as an alternative to highway, intercity bus and air travel;
- Would not reduce the quantity or the growth rate of mobile source emissions resulting from vehicle miles traveled on the highway network in the Study Area; and
- Could potentially have impacts on communities, parks, wildlife refuges and recreational areas, cultural resources, water resources, and biological resources resulting from other planned projects in localized areas.

3.2.2 Corridor Alternatives

Key findings from the Tier 1 EIS of the three Corridor Alternatives are that any of the build alternatives would improve passenger mobility and accessibility in the Study Area and specifically:

- Would address some of the transportation needs of projected population and employment growth in the Study Area, particularly increasing transportation options, increasing airport and intermodal connections, addressing transportation limitations on economic growth, providing faster and more reliable ground transportation as an alternative to highway, intercity bus and air travel;
- Could improve air quality by providing a transportation option that does not increase mobile source emissions resulting from vehicle miles traveled on the highway network in the Study Area; and
- Could potentially have impacts on communities, parks, wildlife refuges and recreational areas, cultural resources, water resources, and biological resources.

For human and natural environment impacts, the Tier 1 EIS revealed several differences among the Corridor Alternatives excluding the Atlanta Approach:

- Transportation Right-of-Way: The I-85 Corridor Alternative would use the greatest amount of existing highway transportation right-of- way (ROW) and the Southern Crescent Corridor Alternative would use a large amount of existing railroad ROW. The Greenfield Corridor Alternative would use the least amount of existing transportation ROW.

- Transportation Modes and Air Quality: The Greenfield has the greatest potential to divert trips from highway and air travel, followed closely by I-85, whereas the Southern Crescent Corridor, while more competitive with bus travel, only diverts a negligible amount of highway and air travel. GDOT expects that the Greenfield and I-85 Corridor Alternatives would have the greatest reduction in vehicular emissions, based on modal shift projections.
- Noise and Vibration: Using land use and property data, GDOT calculated the number of noise and vibration receptors that could potentially be impacted. The Southern Crescent Corridor Alternative has the greatest number of noise-receptor impacts, followed by the Greenfield, then the I-85 Corridor Alternative. The Greenfield Corridor Alternative has the greatest number of potential vibration-receptor impacts, followed by the Crescent, then the I-85 Corridor Alternative.
- Socioeconomic and Environmental Justice: GDOT evaluated the potential impacts to environmental justice (EJ) populations by reviewing 2010 Census data at the block-group level to identify where EJ populations are located. The Southern Crescent Corridor Alternative has the greatest percentage of block-groups meeting EJ criteria for both minority and low-income populations, followed closely by the I-85, then the Greenfield Corridor Alternative. Not all Corridor Alternatives serve the same proposed station locations or the same EJ populations. For example, only the Greenfield Corridor Alternative would serve the proposed Athens station area and only the Southern Crescent Corridor Alternative would have a station serving the Gainesville area. Therefore, depending on the Corridor Alternative, some EJ populations along each corridor would be served by a station and some would not.
- Parklands and Wildlife Refuges: Since the Southern Crescent and I-85 Corridor Alternatives mostly follow existing transportation facilities, impacts to parks and wildlife refuges are unlikely. However, the number of state and local parks within the screening areas are greater for these two Corridor Alternatives than for the Greenfield Corridor Alternative. In general, parks near station areas may experience more impacts than those near rail line, due to the more expansive footprints and active nature of station areas.
- Cultural and Historic Resources: The Southern Crescent Corridor Alternative has more than twice the number of known cultural and historic resources as the I-85 or the Greenfield Corridor Alternatives.
- Wetlands, Streams, and Floodplains: Since it follows less existing ROW, the Greenfield Corridor Alternative would potentially introduce more new or expanded stream and open water crossings than the other Corridor Alternatives. The I-85 and Greenfield Corridor Alternatives have similar impacts to wetlands, while the Southern Crescent Corridor Alternative has fewer potential impacts than the other two in all three areas.
- Threatened and Endangered Species Habitats: All three Corridor Alternatives are home to approximately the same number of threatened and endangered species. The Greenfield Corridor Alternative is the least developed of the three and contains the highest acreage of natural terrestrial habitat area, followed by the Southern Crescent, then the I-85 Corridor Alternative.

Exhibit 3.2-1 summarizes the data findings for the three Corridor Alternatives, including the two Atlanta Approaches; these data are discussed in the remaining sections of this chapter.

Exhibit 3.2-1: Summary Potential Environmental Impacts

Measures	Corridor Alternative					
	Southern Crescent with NS Atlanta Approach	Southern Crescent with CSX Atlanta Approach	I-85 with NS Atlanta Approach	I-85 with CSX Atlanta Approach	Greenfield with NS Atlanta Approach	Greenfield with CSX Atlanta Approach
Percentage of automobile trips diverted to rail (2050, rounded)	1%		3%		4%	
Percentage of air trips diverted to rail (2050, rounded)	n/a*		8%		10%	
Percentage of intercity bus rips diverted to rail (2050, rounded)	19%		19%		15%	
Number of potential noise receptor impacts	11,872	11,310	7,163	6,963	9,628	9,246
Number of potential vibration-receptor impacts	29	37	21	26	145	149
Percentage of Census Block Groups meeting EJ criteria for Minority Population	44.7%	43.2%	42.1%	41.8%	37.7%	37.2%
Percentage of Census Block Groups meeting EJ criteria for Low-Income Population	34.1%	30.11%	26.8%	23.7%	22.7%	19.02%
Parklands and Wildlife Refuges Sites (number)	28	33	21	26	17	22
Parklands and Wildlife Refuges (acres)	950.7	937.65	74.88	107.71	48.01	66.18
Known Historic Resources (number)	117	110	52	49	44	37

Measures	Corridor Alternative					
	Southern Crescent with NS Atlanta Approach	Southern Crescent with CSX Atlanta Approach	I-85 with NS Atlanta Approach	I-85 with CSX Atlanta Approach	Greenfield with NS Atlanta Approach	Greenfield with CSX Atlanta Approach
Community Facilities (number)	366	354	187	185	120	116
Wetlands (acres)	45	100	148	194	130	169
Waterbody Crossings (number)	169	270	462	525	566	629
Floodplains (acres)	494	918	762	1,181	738	1,129
Known Threatened and Endangered Species Habitats (number)	38	41	38	41	35	38
Natural Terrestrial Habitat (acres)	6,312	7,517	2,688	3,893	10,520	10,854

Note: Analysis of environmental resources is presented for each combination of Corridor Alternative and Atlanta Approach, except for transportation impact, since the two Atlanta Approaches have similar performance from an operational and ridership standpoint. The NS option is used as the representative Atlanta Approach for transportation impacts.

Sources and methodologies for each resource are discussed in the following sections of this chapter.

**As described in Appendix B, air travel diversion was modeled for the I-85 and Greenfield Corridor Alternatives, but not the Southern Crescent Corridor Alternative. GDOT determined that the level of service provided by the Southern Crescent would not be competitive with air travel, primarily due to the longer travel time.*

3.3 TRANSPORTATION

This section describes the existing roadway, transit, freight rail, passenger rail, and air transportation facilities and services within the Study Area. In addition, it discusses the potential network-wide effects of the Corridor Alternatives and the No-Build Alternative on existing transportation facilities within the Study Area, and identifies potential measures to avoid, minimize, or mitigate these effects. The potential effects include effects on ridership, travel time, level of service (LOS), connectivity, and operations.

3.3.1 Legal and Regulatory Context

The effects of the Corridor Alternatives on both passenger and freight transportation were broadly considered in this Tier 1 EIS using FRA's Environmental Procedures as guidance.[1]

3.3.2 Methodology

The methodology employed for this section is a mix of a qualitative discussion and quantitative assessment of existing conditions of the transportation network within the Study Area. Using this methodology, GDOT identified potential impacts on the transportation network within the Study Area resulting from the No-Build Alternative, and the Southern Crescent, I-85, and Greenfield Corridor Alternatives. In addition, GDOT evaluated the Study Area in its entirety from Atlanta to Charlotte, as opposed to the methodology used in evaluating other resource areas where the approaches to Atlanta were evaluated separately from the rest of the Alternatives.

GDOT coordinated with Project partners South Carolina (SCDOT) and North Carolina (NCDOT), as well as with Metropolitan Planning Organizations (MPOs) and other organizations, to obtain readily available transportation data and long-range transportation plans (LRTPs), including information related to existing and planned transportation facilities for each of the transportation modes along the Study Area. GDOT collected information regarding Levels of Service (LOS) and Average Daily Traffic (ADT) for major highways and interstates in the Study Area (Exhibit 3.3-1 below) primarily from MPOs and statewide travel demand models. The following MPOs and local or regional planning departments provided data for this section:

- Atlanta Regional Commission (ARC);
- Madison Athens-Clarke Oconee Regional Transportation Study (MACORTS);
- Gainesville-Hall Metropolitan Planning Organization (GHMPO);
- Augusta Planning and Development Department;
- Greenville-Pickens Area Transportation Study (GPATS);
- The Spartanburg Area Transportation Study (SPATS);
- Central Midlands Council of Governments (CMCOG); and
- Charlotte Regional Transportation Planning Organization (CRTPO).

In addition, GDOT collected information regarding intercity and regional bus and transit services, and existing freight and passenger rail services from the respective operators for these modes. GDOT

[1] *The FRA Procedures for Considering Environmental Impacts, 64 FR 28545 (May 26, 1999)* https://www.gpo.gov/fdsys/granule/FR-1999-05-26/99-13262 *(accessed 2/13/18)*

utilized airport and air travel information from the Bureau of Transportation Statistics.[2] In addition, airlines' websites and masterplans contain information on their services, including scheduled flight times, frequency of services, capacity, and fares.

GDOT will identify conceptual mitigation strategies for further consideration in the Tier 2 analysis. Additionally, the Tier 2 analysis will identify the need for further traffic and transportation assessments and the development of detailed mitigation strategies. Transportation topics recommended for more detailed analysis in a Tier 2 analysis include traffic studies, intersection improvements, local and regional transit connectivity, and more fully developed ingress and egress near the station sites.

3.3.3 Affected Environment

3.3.3.1 Automobile

Automobile travel is the most widely used mode connecting Atlanta and Charlotte, particularly via Interstate highways I-85, I-20, I-77, and I-26.[3] I-85 provides the most direct path for automobile travel between Atlanta and Charlotte (see Exhibit 3.3-1). As discussed in Chapter 1, projections show that automobile traffic volumes will increase and congestion will worsen for each of the metropolitan areas along the roadways within the Study Area, particularly on the Interstates. Furthermore, traffic projections indicate that automobile demand for I-85 will exceed capacity in the Atlanta, Greenville, and Charlotte metropolitan areas, causing significant delay for highway travelers throughout the Study Area.[4] GDOT collected highway capacity data analyses from MPOs and State DOTs to determine the current and projected Level of Service (LOS) and Average Daily Traffic (ADT) for the Study Area and illustrate current and projected driving patterns, particularly travel demand between Atlanta and Charlotte. As discussed in Chapter 1, travel by automobile provides competitive travel times compared to other modes, only second to air travel as shown in the exhibit below. However, the average air travel time only accounts for direct flight time and does not consider the additional time required for security, which increases travel time between Atlanta and Charlotte.

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[2] The Air Carrier Statistics database, also known as the T-100 data bank, contains domestic and international airline market and segment data. Certificated U.S. air carriers report monthly air carrier traffic information using Form T-100; The Airline Origin and Destination Survey (DB1B) is a 10% sample of airline tickets from reporting carriers collected by the Office of Airline Information of the Bureau of Transportation Statistics. Data includes origin, destination and other itinerary details of passengers transported. This database is used to determine air traffic patterns, air carrier market shares and passenger flows. More information on these data sources can be found at the Bureau for Transportation Statistics website: www.transtats.bts.gov (accessed 2/1/18)

[3] Atlanta to Charlotte PCRIP Alternatives Development Report. "Ridership and Revenue Methodology Technical Memorandum", May 2013

[4] Atlanta Regional Commission, http://atlantaregionsplan.org; Charlotte Regional Transportation Planning Organization http://www.crtpo.org/PDFs/MTP/2045/2045_MTP.pdf; Augusta Regional Transportation Study, https://www.augustaga.gov/2120/Transportation-Vision-2040; Greenville-Pickens Area Transportation Study, http://www.gpats.org/wp-content/uploads/2018/10/GPATS_Horizon2040_10_15_2018.pdf; Columbia Area Transportation Study Moving the Midlands 2040 Long Range Transportation Plan http:/centralmidlands.org/wp-content/uploads/2040-LONG-RANGE-TRANSPORTATION-PLAN-APPROVED-AUGUST-27-2015.pdf (accessed on 3/20/19)

Exhibit 3.3-1: Comparison of Existing Travel Modes and Proposed Corridor Alternatives

Travel Mode	Frequency of Trips (One-Way)	Average Travel Time between Atlanta and Charlotte
Automobile		
I-85	N/A	3 hours, 45 minutes[5]
I-20, I-77	N/A	4 hours, 43 minutes[6]
Intercity Bus	14	5 hours, 15 minutes , depending on carrier
Intercity Rail		
Amtrak Crescent	2	5 hours, 17 minutes[7]
Air	36	
American	18	1 hour 17 minutes (direct flight time only)[8]
Delta	18	1 hour, 10 minutes (direct flight time only)[9]
Sources: HNTB Revenue and Ridership Results, May 2013; Google maps		

VOLUMES OF AUTOMOBILES AND LEVELS OF SERVICE

Exhibits 3.3-2 and 3.3-3 display traffic volumes and LOS as reported in MPOs' LRTPs which presents the LOS and ADT at representative points on the roadway network between Atlanta and Charlotte. Each MPO LRTP reviewed by GDOT uses 2040 as its future horizon year, and either 2010, 2015, or 2016 for the current (or base) year. Some MPOs choose to report LOS as a range of values (ex. A-C or LOS E or Worse).

As described in Chapter 1, LOS is a measure used to describe operational conditions within a traffic stream. There are six levels identified by the letters A through F. LOS A represents free flow traffic where drivers are virtually unaffected by the presence of other vehicles, while LOS F represents operating conditions in which demand exceeds capacity. These projections highlight the increase in automobile congestion and the declining LOS expected through much of the Study Area.

[5] *Travel times reflect start/end points from city-centers of Charlotte and Atlanta Google Maps Driving Directions, assumes vehicles are driving the posted speed limits*
[6] *Travel times reflect start/end points from city-centers of Charlotte and Atlanta. Google Maps Driving Directions, assumes vehicles are driving the posted speed limits*
[7] *Amtrak, http://www.amtrak.com/home (accessed on 1/31/18)*
[8] *Estimate based on information provided by searching for weekday flights between Atlanta and Charlotte*
[9] *This number is dependent on which rail alternative is preferred. However, The Volpe Center in their "Evaluation of High-Speed Rail Options in the Macon-Atlanta-Greenville-Charlotte Rail Corridor." (2008) provides this estimate.*

Exhibit 3.3-2: ADT and LOS Trends on I-85 in the Project Study Area (2016 and 2040)

Metropolitan Area	I-85 Interstate Corridor Analysis Points	Number of Lanes	Current ADT (2016)*	Current LOS (2016)	Future AADT (2040)	Future LOS (2040)
Atlanta	I-85/75 north of I- 20 (Downtown Connector)	10	250,932	F	282,717	F
Atlanta	I-85/75 south of 14 St. Exit	14	362,234	F	401,743	F
Atlanta	I-85 north of I-75/I-85 Split at Armour Dr. NE	10	248,990	F	277,610	F
Atlanta	I-85/SR403 between I-285 & Chamblee Tucker Rd	14	224,469	E	258,915	E
Atlanta	I-85 north of Steve Reynolds Blvd to Pleasant Hill Rd approaching 316	12	267,480	F	345,827	F
Spartanburg	I-85 at I-29/Warren H Abernathy Hwy SC 290 to US-29	7	92,800	D	117,800	E**
Spartanburg	I-85 at I-26 SC 85 to I- 26	4	69,000	C	93,100	D
Spartanburg	I-85 at 221 SC 85 TO US 221	8	81,200	C	111,200	E
Greenville	I-85 N at 185/Southern Connector	6	32,800	D	46,400	F
Greenville	I-85 at US-276	6	41,500	C	52,700	D
Greenville	I-85 at I-385	6	60,500	C	76,100	D
Greenville	I-85 at Pelham Rd.	7	61,000	E	76,900	F
Greenville (Greenville Spartanburg Airport Corridor)	I-85 at Aviation Dr.	6	56,300	E	70,300	F
Charlotte	I-85 at I-485	8	144,200	LOS E or worse	178,200	LOS E or worse
Charlotte	I-85 at Moores Chapel Rd.	9	143,200	LOS E or worse	177,100	LOS E or worse
Charlotte	I-85 at Beatty Dr.	8	133,100	LOS E or worse	172,600	LOS E or worse

*Traffic data for Atlanta is from 2015
**There is a project to widen this portion of I-85 to 8 lanes with planned completion in 2030. When that is done the LOS is expected to be C.

Sources: Atlanta Regional Commission, Greenville County Department of Planning, Spartanburg Area Transportation Study MPO, SCDOT, NCDOT, Augusta Planning and Development Department

Exhibit 3.3-3: ADT and LOS Trends on I-20 and I-77 in the Project Study Area (2016 and 2040)

Metropolitan Area	I-20 Interstate Corridor Analysis Points	Number of Lanes	Current ADT (2016)*	Current LOS (2016)	Future AADT (2040)	Future LOS (2040)
Atlanta	I-20 east of I-75/85 & Capitol Ave @ Cherokee Ave.	9	212,309	F	258,336	F
Atlanta	I-20 west of I-285 near Columbia Dr	7	97,348	D	131,338	E
Atlanta	I-20 east of Panola Rd @ Fairington Rd	6	127,628	C-E	149,856	F
Atlanta	I-20 at GA 138	6	68,278	C	94,107	D
Augusta	I-20 at I-520	5	87,900	A-C	115,000	D
Augusta	I-20 at Washington Rd	7	75,800	A-C	105,000	D
Columbia	I-20 at Augusta Rd.	4	67,800	D	88,900	C
Columbia	I-20 at US-378	6	86,400	C	96,200	D
Columbia	I-20 at I-26	6	80,700	C	114,600	D
Columbia	I-20 at US-321	7	98,600	D	110,800	D
Columbia	I-20 at SC-277	6	83,500	C	92,300	C
Columbia	SC-277 at I-77	4	53,400	D	51,900	D
Charlotte	I-77 at NC-16	9	183,000	LOS E or worse	226,900	LOS E or worse
Charlotte	I-77 at US-74	8	147,700	LOS E or worse	178,500	LOS E or worse
Charlotte	I-77 at I-485	7	157,200	LOS E or worse	205,200	LOS E or worse
Charlotte	I-77 at Arrowood Rd.	8	160,600	LOS E or worse	210,200	LOS E or worse
Charlotte	I-77 at Westinghouse Blvd.	7	141,700	LOS E or worse	185,000	LOS E or worse

**Traffic data for Atlanta is from 2015 and LOS data for Augusta utilized a 2010 base year*

Sources: Atlanta Regional Commission, Greenville County Department of Planning, Spartanburg Area Transportation Study MPO, SCDOT, NCDOT, Augusta Planning and Development Department

In the year 2040, all I-85 segments analyzed between Atlanta and Charlotte operate at LOS D or worse in 2040 throughout the Study Area. Of the 16 segments analyzed along I-85, six experienced LOS F and all of the I-85 segments in the Charlotte area are projected to be LOS E or worse. The segments with LOS F are located in metropolitan Atlanta and Greenville, SC. There is a planned project in Spartanburg to widen a portion of I-85 to eight lanes with planned completion in 2030. When that is completed, SCDOT expects LOS C for the segment of I-85 at "I-29/Warren H Abernathy Hwy SC 290 to US-29". All segments on I-85 will see an increase in traffic volume from the Current Year (2016) to the Future Year (2040).

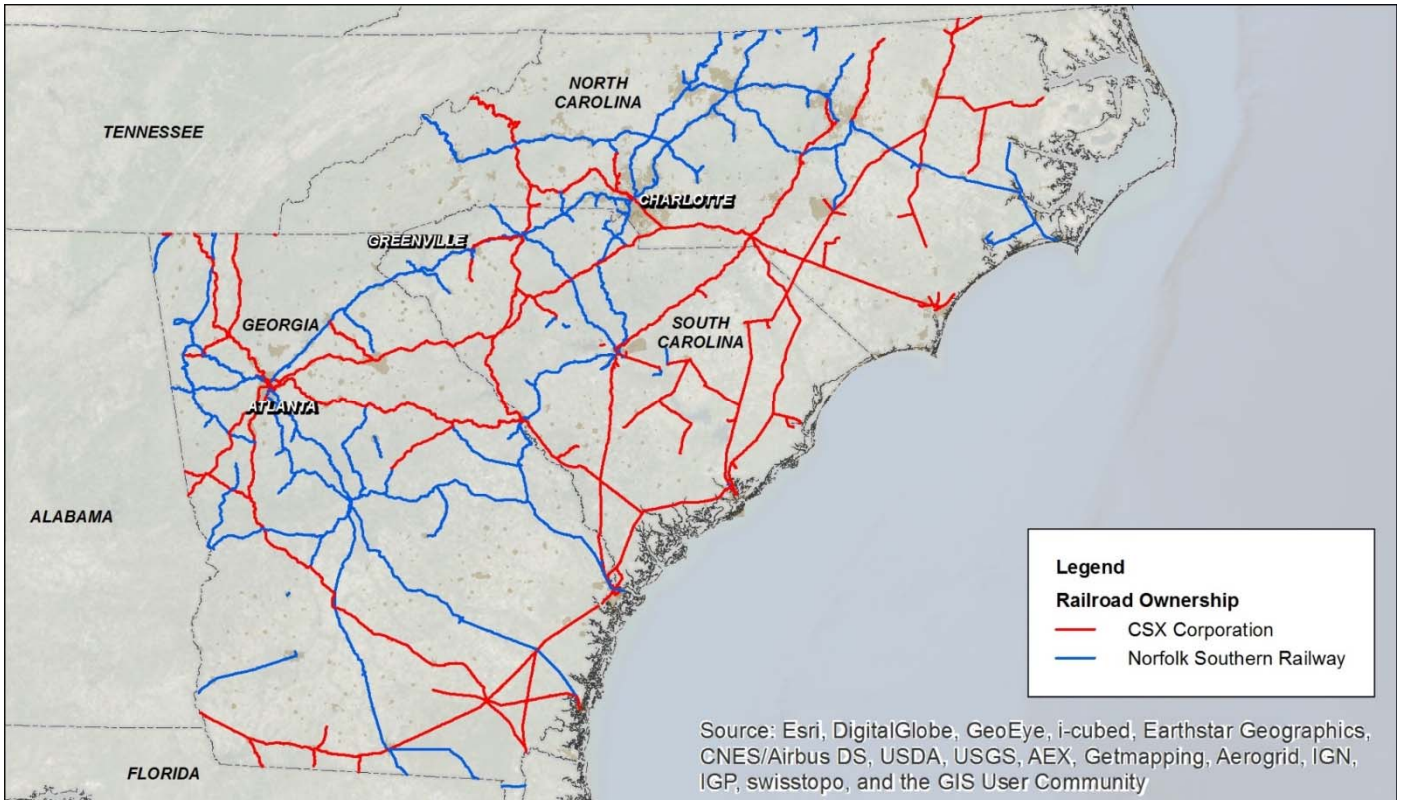
On the I-20 and I-77 corridors linking Atlanta to Charlotte, every road segment operates at LOS D or worse in 2040 except for two, I-20 at SC-277 and I-20 at Augusta Road in Columbia, SC. According to the SCDOT Office of Planning, I-20 at Augusta Road improves from LOS D to C between by 2040

due to a construction project that adds capacity to I-20 and I-77. Most roadway segments on I-20 and I-77 are projected to see an increase in traffic volume by 2040.

3.3.3.2 Freight Rail

The efficient movement of freight is a common goal for all three states, especially given that two of the top five ports for imported cars or container port tonnage – Savannah and Brunswick – are located in Georgia and served by the freight rail network. The freight rail network also serves the Port of Charleston in South Carolina. Multiple companies provide freight rail service in the Project Study Area. NS and CSX, both Class I railroads, are the two dominant rail companies providing service in the three states. Exhibit 3.3-4 provides a map of CSX and NS service rail lines in the three states. Exhibit 3.3-5 below illustrates daily train counts within the Project Study Area, based on data collection conducted in 2012.[10] The Southern Crescent Corridor is a key part of NS's intermodal network in the southeast.

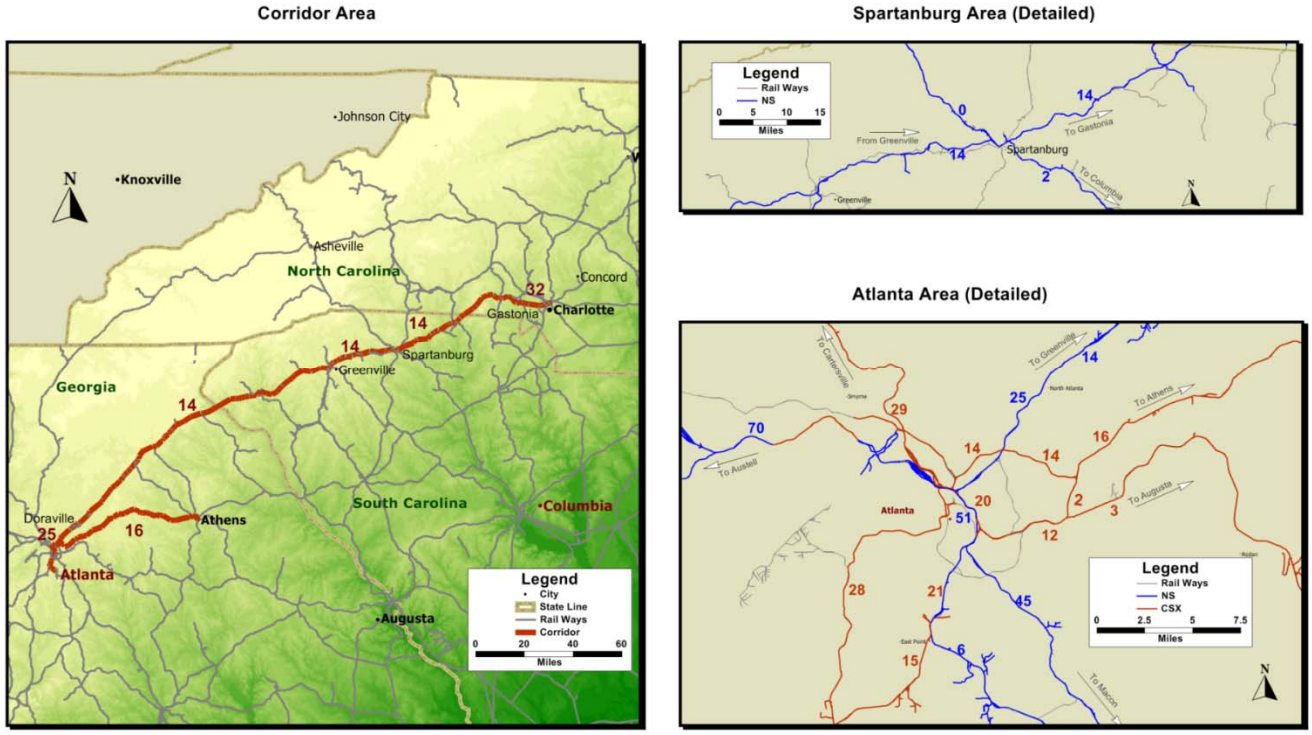
Exhibit 3.3-4: CSX and NS Rail Service in Georgia/South Carolina/North Carolina



Source: HNTB

[10] *RTC analysis done by TEMS, August 2012*

Exhibit 3.3-5: Trains per Day



Sources: HNTB

GEORGIA

Two Class I railroads and 29 Class III railroads (short line railroads, smaller local, switching, and terminal railroads) operate the Georgia freight rail system. The system consists of 4,643 total route miles.[11]

Class I carriers CSX and NS own 3,631 route miles, and both utilize Atlanta as their southeast rail hub. [12] Short line railroads and the State of Georgia own the remaining 1,012 route miles in the state. Georgia's Class I and Class III railroads provide vital connectivity to the Ports of Savannah and Brunswick. At the Port of Savannah's Garden City Terminal (the largest single container terminal in North America), CSX provides access to the Chatham Intermodal Container Transfer Facility (ICTF). NS also serves the Port of Savannah's Garden City Terminal, as well as the Ocean Terminal. [13]

Georgia's freight railroads carried over 189 million tons of freight or more than 3.9 million rail cars of various commodities that originated or terminated within Georgia, or traveled through the state in 2011. Forecasts indicate total rail freight flows in the state will increase through 2040 at a compound annual growth rate of 0.5 percent.[14] The Association of American Railroads estimates that 187.4

[11] *Georgia State Rail Plan (2015) http://www.dot.ga.gov/InvestSmart/Rail/Documents/StateRailPlan/2015GeorgiaStateRailPlan-1-26-16.pdf*
[12] *Georgia Statewide Freight and Logistics Study*
http://www.dot.ga.gov/AboutGeorgia/Board/Presentations/StatewideFreightandLogisticsPlan.pdf (accessed 12/22/17)
[13] *Georgia State Rail Plan (2015)*
[14] *Georgia State Rail Plan (2015)*

million tons of freight originated in, terminated in, or moved through Georgia by rail in 2014.[15] In the Project Study Area, the NS Greenville District Main Line runs between Atlanta and Greenville. The NS R-Line, also part of the Piedmont Division, connects Augusta, GA to Columbia, SC. From Columbia, the Piedmont Divisions' Columbia District connects Columbia to Charlotte.[16] Additionally, the CSX Abbeville and Georgia lines are within the Project Study Area.

SOUTH CAROLINA

Twelve rail carriers operate within the South Carolina rail network. Two are Class I carriers, CSX and NS, and the remainder are local carriers or switching and terminal companies. CSX owns 1,269 route miles, representing 56 percent of the statewide rail system of 2,258 miles. The NS, with 679 route miles, accounts for 30 percent of the state rail system. Palmetto Railways, a branch of the South Carolina Department of Commerce, operates three railroad subdivisions. In South Carolina, forecasted rail tonnage will increase from 70.3 million in 2011 to 101.4 million in 2040, a cumulative increase of 44.3 percent.

The Association of American Railroads estimates that 67.6 million tons of freight originated in, terminated in, or moved through South Carolina by rail in 2014.[17] As mentioned in the previous section, the NS Piedmont Divisions' Columbia District connects Columbia to Charlotte. Additionally, the NS Charlotte District of the Piedmont Division route connects Greenville to Charlotte and serves the Greer Inland Port. Spartanburg, SC connects to Columbia by the NS W line, also part of the Piedmont Division.[18] The CSX Spartanburg line of the Florence Division is within the Project Study Area.[19]

NORTH CAROLINA

Today there are over 3,200 miles of railroad in North Carolina, serving 86 of the state's 100 counties. Two Class I railroads – NS and CSX – and 20 short line railroads operate within the state of North Carolina. In addition, the North Carolina Railroad (NCRR) Company owns and manages a 317-mile corridor extending from the Port of Morehead City to Charlotte. NS operates along the corridor through an operating and maintenance agreement. Twenty Class III railroads operate in North Carolina ranging from three to 173 miles. Two federally-owned railroads are also located in North Carolina, providing access to Camp Lejeune and Military Ocean Terminal – Sunny Point.[20]

CSX operates approximately 1,111 miles of track in North Carolina. NS operates approximately 1,213 miles of track. NS' primary corridor parallels I-85 through the central part of the State connecting Charlotte and Greensboro with Atlanta, Georgia and the Northeast. The North Carolina State Rail Plan highlights that 58.3 tons originated and terminated in the state in 2012. The Association of American Railroads estimates that 85 million tons of freight originated in, terminated in, or moved through North Carolina by rail in 2014.[21] Charlotte connects to Spartanburg/Greenville and Columbia by the NS Charlotte District line and Columbia District lines respectively. Both of these lines are part

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[15] *Association of American Railroads, U.S. Freight Railroad Snapshot: Georgia; https://www.aar.org/data-center/railroads-states#state/GA (accessed 1/13/18)*
[16] *Norfolk Southern System Overview, http://www.nscorp.com/content/nscorp/en/system-overview.html (accessed 12/15/17)*
[17] *Association of American Railroads, U.S. Freight Railroad Snapshot: South Carolina, https://www.aar.org/data-center/railroads-states#state/SC (accessed 1/13/18)*
[18] *Norfolk Southern System Overview, http://www.nscorp.com/content/nscorp/en/system-overview.html (accessed 12/15/17)*
[19] *CSX System Map, https://www.csx.com/index.cfm/customers/maps/csx-system-map/ (accessed 2/15/17)*
[20] *North Carolina State Rail Plan (2015), https://www.ncdot.gov/divisions/rail/Pages/rail-plan.aspx (accessed 3/19/2019)*
[21] *Association of American Railroads, U.S. Freight Railroad Snapshot: North Carolina; https://www.aar.org/data-center/railroads-states#state/NC (accessed 1/13/18)*

of the NS Piedmont Division of rail lines.[22] CSX Charlotte Subdivision enters Charlotte through a connection to Monroe Subdivision rail line that travels through parts of South Carolina as part of the Florence Division of CSX rail lines.[23]

3.3.3.3 Passenger Rail

Amtrak passenger rail serves Georgia, South Carolina, and North Carolina.

GEORGIA

Four Amtrak long-distance intercity rail passenger routes operate within Georgia. Amtrak's *Crescent, Palmetto, Silver Meteor, and Silver Star* routes all originate in New York City with terminating points in New Orleans, Savannah, Orlando, and Miami, respectively. Amtrak's *Crescent* service is the only route located within the Project Study Area. There are five Amtrak stations in Georgia: Atlanta, Gainesville, Jesup, Savannah, and Toccoa.[24]

In FY17, the *Crescent* route in Georgia recorded approximately 86,651 passengers at the Atlanta, Gainesville, and Toccoa train stations, all of which are located in the Project's Study Area. Amtrak station usage in Georgia totaled to 153,479 passengers in FY17. The boarding and alighting at each Georgia station in FY17 were:

Crescent Route:

- Atlanta: 77,751
- Gainesville: 5,493
- Toccoa: 3,407

Silver Meteor/Silver Star/Palmetto Route*:*

- Jesup: 9,648
- Savannah: 57,180[25]

SOUTH CAROLINA

South Carolina is served by the same four long-distance routes that operate in Georgia – the *Crescent*, *Palmetto*, *Silver Meteor*, and *Silver Star* routes. South Carolina has eleven Amtrak stations: Camden, North Charleston, Clemson, Columbia, Denmark, Dillon, Florence, Greenville, Kingstree, Spartanburg, and Yemassee.[26]

In FY17, the *Crescent* route in South Carolina recorded a total of approximately 17,683 passengers at the Greenville and Spartanburg train stations, both of which are located in the Project Study Area. Clemson station was closed in FY 17 due to a highway project. Amtrak station usage in South Carolina totaled to 195,906 passengers in FY17. The boarding and alighting at each South Carolina station in FY17 were:

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[22] *Norfolk Southern System Overview, http://www.nscorp.com/content/nscorp/en/system-overview.html (accessed 12/15/17)*
[23] *CSX System Map, https://www.csx.com/index.cfm/customers/maps/csx-system-map/ (accessed 2/15/17)*
[24] *Rail Passengers Association, Fact Sheet: Amtrak in Georgia; https://www.narprail.org/site/assets/files/1183/ga.pdf (accessed 1/4/18)*

[25] *Amtrak Fact Sheet FY 17. https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/statefactsheets/GEORGIA17.pdf*
[26] *Rail Passengers Association, Fact Sheet: Amtrak in South Carolina; https://www.narprail.org/site/assets/files/1213/sc.pdf (accessed 1/4/18)*

Crescent Route:

- Greenville 14,135
- Spartanburg 3,548
- Clemson: (Closed in FY 17 for adjacent highway project; Ridership was 3,127 in FY 16)

Silver Meteor/Silver Star/Palmetto Route*:*

- Camden: 3,531
- Charleston: 66,759
- Columbia: 32,695
- Denmark: 3,604
- Dillon 6,692
- Florence 43,304
- Kingstree 11,187
- Yemassee 10,451[27]

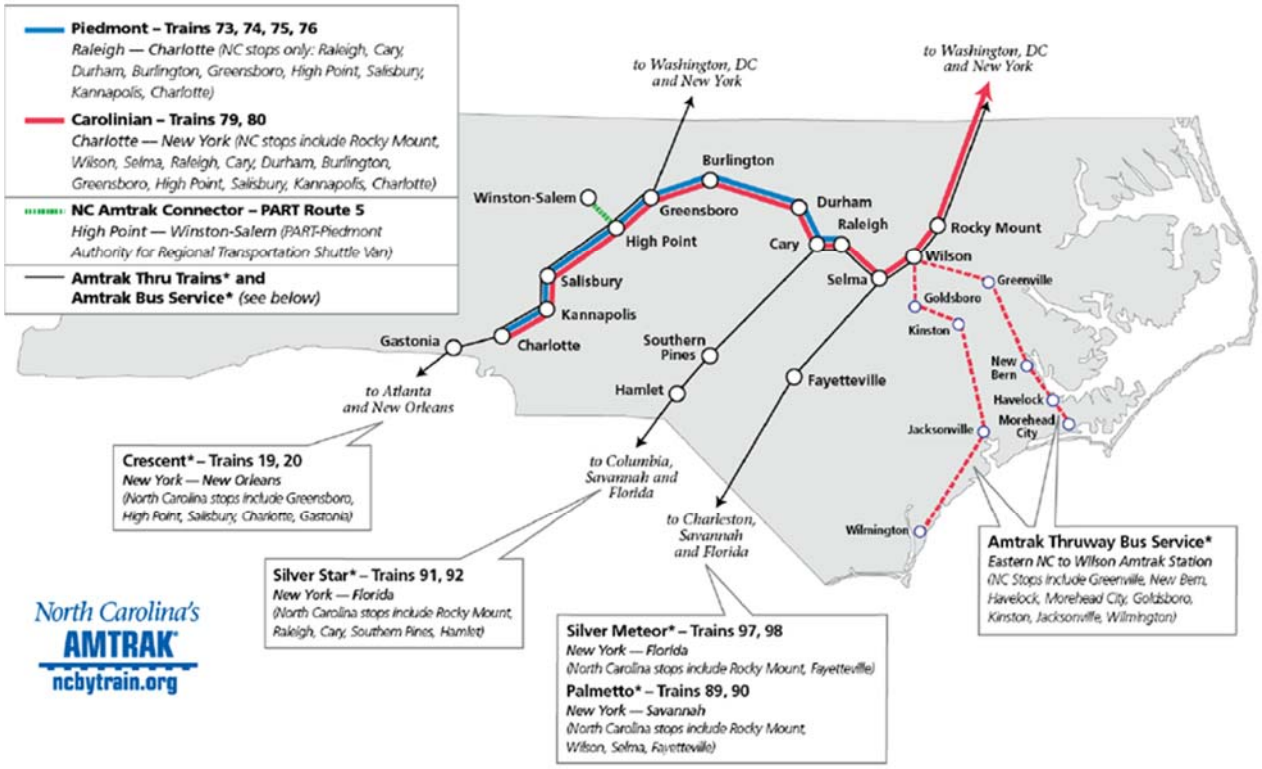
NORTH CAROLINA

As shown in Exhibit 3.3-6, North Carolina's passenger services include the state-supported *Piedmont* and *Carolinian*, which are regional trains serving the state's most heavily populated corridor, between Raleigh and Charlotte. The *Carolinian* service extends up the East Coast to New York City, while the Piedmont currently operates between Raleigh and Charlotte with plans to extend service to the Northeast Corridor in the future. Other long distance passenger rail services that travel through North Carolina include Amtrak's *Crescent*, *Silver Star*, *Silver Meteor* and *Palmetto*.[28]

[27] *Amtrak Fact Sheet FY17. https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/statefactsheets/SOUTHCAROLINA17.pdf*

[28] *Rail Passengers Association, Fact Sheet: Amtrak in North Carolina; https://www.narprail.org/site/assets/files/1206/nc.pdf (accessed 1/4/18)*

Exhibit 3.3-6 North Carolina Passenger Train Service



Source: NC State Rail Plan, 2014, pg. 2-13

North Carolina has eighteen Amtrak stations: Burlington, Cary, Charlotte, Durham, Fayetteville, Gastonia, Greensboro, Hamlet, High Point, Kannapolis, Lexington---BBQ Fest,[29] N.C. State Fair,[30] Raleigh, Rocky Mount, Salisbury, Selma—Smithfield, Southern Pines, and Wilson.

In FY17, the *Crescent* stations in North Carolina recorded approximately 333,642 passengers at the Charlotte, Gastonia, Greensboro, High Point, and Salisbury train stations, all of which are located in the Project Study Area. However, some of these boardings and alightings could be attributed to the Carolinian/Piedmont route. Amtrak station usage in North Carolina totaled to 860,680 passengers in FY17. The boarding and alighting at each North Carolina station in FY17 were:

Crescent Route:

- Charlotte: 168,144
- Gastonia: 1,345
- Greensboro: 111,187
- High Point: 30,818
- Salisbury: 22,148

Carolinian/Piedmont Route*:*

- Cary: 81,685

[29] *The Lexington, NC Amtrak station is a temporary station that is used once a year during the Lexington Barbeque Festival, which is one-day festival held every year in October.*

[30] *The NC State Fair Amtrak station is a temporary station that is used once a year during the North Carolina State Fair.*

- Charlotte: 168,144
- Durham: 71,924
- Greensboro: 111,187
- Burlington: 21,404
- High Point: 30,818
- Salisbury: 22,148
- Raleigh: 150,919
- Rocky Mount: 52,343
- Wilson: 55,579
- Selma-Smithfield: 13,724
- Kannapolis: 18,043

Silver Meteor/Silver Star/Palmetto Route*:*

- Rocky Mount: 52,343
- Wilson: 55,579
- Selma-Smithfield: 13,724
- Raleigh: 150,919
- Cary: 81,685
- Southern Pines: 7,065
- Hamlet: 4,376[31]

NCDOT has invested in the modernization of the state's railways through a series of railroad and highway construction projects and enhancements known as the Piedmont Improvement Program, or PIP. The PIP includes constructing rail-roadway grade separations, eliminating at-grade crossings, adding second main tracks and passing sidings, and easing curves, all of which have combined to significantly increase passenger and freight train speeds, shortening travel times in the Raleigh-Charlotte corridor. New or re-constructed stations and purchasing and rebuilding of trains were also part of the PIP. More information about the PIP can be found in Section 2.2.2.1.

3.3.3.4 Existing Transit Services

The following local and regional rail and bus transit systems operate in the Project Study Area:

GEORGIA

Atlanta Metropolitan Area

Metropolitan Atlanta Rapid Transit Authority (MARTA): During FY 2016, MARTA provided approximately 133 million passenger trips.[32] MARTA's rail system consists of 47.6 miles of operational double track and 38 fully functioning stations. The rail system has lines running in east-west and north-south directions with the main lines intersecting at the Five Points Station, located in

[31] *Amtrak FY17 Fact Sheet. https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/statefactsheets/NORTHCAROLINA17.pdf*

[32] *MARTA, Popular Annual Financial Report 2016; http://www.itsmarta.com/uploadedFiles/More/About_MARTA/2016%20Annual%20Report_web.pdf (accessed 12/18/17)*

Atlanta's Downtown Business District. MARTA's bus fleet and facilities consists of 569 diesel and compressed natural gas buses; a heavy maintenance facility and three operating garages; several park-and-ride lots and an extensive system of patron bus shelters and stops. MARTA operates 100 different bus routes providing approximately 25.2 million annual vehicle miles.[33] Rail service operates from 4:45 AM to 1:00 AM Monday through Friday, and weekends and holidays from 6:00 AM to 1:00 AM. Bus service operates from 5:00 AM to 1:00AM Monday through Friday and weekends from 5:00 AM to 12:30 AM.[34]

Georgia Regional Transportation Authority (GRTA)/Xpress: Xpress bus service, operated by the GRTA, offers 27 commuter bus routes and 27 park and ride lots in 12 metro Atlanta counties (Cherokee, Clayton, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale) and carries more than 1.8 million passenger trips annually. GRTA also contracts with Cobb Community Transit (CCT) to operate some Xpress routes to and from Cobb County. Xpress service operates Monday through Friday, generally between 5:30 a.m. and 9:00 a.m. for morning trips to Atlanta and 3:00 p.m. and 8:00 p.m. for afternoon trips to Cobb County. Xpress draws ridership from 44 counties and provides a connection between 3.4 million residents and 375,000 jobs. Additionally, GRTA estimates that Xpress bus service annually removes 55 million miles of congestion from the region's interstates.[35]

GRTA also offers a vanpool program and provides financial incentives to riders to maximize program participation and contracts with private sector vendors who supply the vans and place individual riders in vanpool groups. Vans range in capacity from 7-15 passengers.[36]

Gwinnet County Transit (GCT): GCT operates express commuter bus, local bus and paratransit service. Express bus service to/from Atlanta operates Monday through Friday and includes six routes using the High Occupancy Toll (HOT) lane on I-85.[37] Park and ride lots at I-985, Sugarloaf Mills and Indian Trail have been built or upgraded to provide free parking for bus riders. Local bus service operates five routes Monday through Saturday connecting neighborhoods and businesses to Gwinnett County locations. Paratransit service for qualifying persons with disabilities operates in conjunction with the local bus service.[38]

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[33] *MARTA, Comprehensive Annual Financial Report 2015&2016; http://www.itsmarta.com/uploadedFiles/More/About_MARTA/2016_CAFR_Web.pdf (accessed 12/18/17)*

[34] *MARTA, Train Stations and Schedules; http://www.itsmarta.com/train-stations-and-schedules.aspx; http://www.itsmarta.com/bus-schedules.aspx (accessed 12/18/17)*

[35] *Xpress FAQ and About; http://www.xpressga.com/faq/; http://www.xpressga.com/about/ (accessed 12/18/17)*

[36] *State Roadway and Tollway Authority, Vanpool; http://www.srta.ga.gov/vanpool/ (accessed 12/18/17)*

[37] *High Occupancy Toll (HOT) lanes allow registered transit, three or more person carpools, motorcycles, emergency vehicles, and Alternative Fuel Vehicles (AFV) with the proper AFV license plate (does not include hybrid vehicles) to use the Express Lanes toll-free. Vehicles with fewer than three occupants, including solo drivers, will be able to choose whether to use the general purpose lanes or pay for a more reliable trip in the Express Lanes. Vehicles with 2+ axles and/or 6+ wheels will not be allowed in the Express Lanes, as is the case in the HOV lanes. Georgia Department of Public Safety, I-85 Express Lanes (HOT Lanes); https://dps.georgia.gov/i-85-expres-lanes-hot-lanes (accessed 1/14/18)*

[38] *Gwinnett County, Gwinnett County Transit: About Us and Routes and Schedules; https://www.gwinnettcounty.com/portal/gwinnett/Departments/Transportation/GwinnettCountyTransit; https://www.gwinnettcounty.com/portal/gwinnett/Departments/Transportation/GwinnettCountyTransit/RoutesandSchedules (accessed 12/18/17)*

Athens-Clarke County

Athens Transit/The Bus: The Athens Transit local bus system (The Bus) is owned and operated by the Athens Clarke County Unified Government. The Bus operates Monday through Friday from 6:00 AM to 10:00 PM and Saturday and Sunday from 7:00 AM to 10:00 PM. The Bus offers fixed-route bus service on 19 routes with 28 handicap-accessible transit buses. In FY 2015, ridership on The Bus totaled approximately 1.5 million riders. Athens Transit also offers "The Lift", a curb-to-curb para transit service offered within one mile of the fix-route services, with three handicap-accessible vans.[39] [40]

University of Georgia Athens: The University of Georgia campus transit system provides transportation services to the University community through a variety of fixed-route, paratransit and custom services. UGA provides transit service focused on the central UGA campus and to campus facilities located in neighboring areas. UGA's 11 routes shuttle students, faculty and staff to and from various parts of campus. All fixed routes are fare-free and open to anyone including students, faculty, staff, and visitors. The service is funded primarily by a transportation fee paid by students each semester.[41] During FY 2010, the system served approximately 9.4 million passengers.[42]

Gainesville/Hall County

Hall Area Transit: Hall Area Transit is a public transportation system that has served the City of Gainesville and Hall County since 1983. The Gainesville Connection bus service provides fixed-route bus services throughout the City of Gainesville and parts of the City of Oakwood and unincorporated Hall County. The six routes are Routes 10, 20, 30, 40, 41, and 50 and encompass approximately 17 square miles.[43] Buses operate five days a week from 6:00 AM to 6:00 PM. Mobility Plus provides Americans with Disabilities Act (ADA) approved riders with the option to call and receive a ride directly to a Gainesville Connection bus stop or to their desired destination.[44] In addition, the Dial-A-Ride service provides riders with the option to call ahead 48+ hours to reserve van service that picks them up from their current location and takes them directly to their desired location.[45] Total ridership in 2015 was 149,594 passengers.[46]

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[39] Athens-Clarke County, About ATS; https://www.athensclarkecounty.com/1775/About-ATS (accessed 12/18/17)
[40] Athens-Clarke County, Athens Transit Feasibility Study; https://www.athensclarkecounty.com/DocumentCenter/View/35279 (accessed 12/18/17)
[41] Athens-Clarke County, Athens Transit Feasibility Study; https://www.athensclarkecounty.com/DocumentCenter/View/35279 (accessed 12/18/17)
[42] University System of Georgia, The University of Georgia Campus Transit System; http://www.usg.edu/assets/fiscal_affairs/documents/UGA_Transit_BOR0511.pdf (accessed 12/18/17)
[43] Gainesville Hall Metropolitan Planning Organization, Hall Area Transit Development Plan; http://www.ghmpo.org/DocumentCenter/Home/View/568 (accessed 2/4/2018)

[44] The Americans with Disabilities Act is a 1990 civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public. https://www.ada.gov/2010_regs.htm
[45] Gainesville, Georgia, Hall Area Transit Bus Services; https://www.gainesville.org/hall-area-transit (accessed 2/4/2018)
[46] Gainesville Hall Metropolitan Planning Organization, Hall Area Transit Development Plan; http://www.ghmpo.org/DocumentCenter/Home/View/568 (accessed 2/4/2018)

Augusta/Richmond County

Augusta Public Transit: Augusta Public Transit (APT) provides bus service throughout Richmond County. APT operates nine fixed routes of bus service. The hours vary by route but the buses run approximately between 6:00AM and 8:00PM. All routes have weekday and Saturday operations except for Routes 4 and 9. There is no Sunday bus service. In addition, APT offers paratransit and rural transit services. The Augusta-Richmond County Commission/Council and the Department of Transportation began operating the Richmond County Transit System in September of 1989. This service runs on reservations and appointments can be made up to a week in advance. APT services travel over 2,313 miles each weekday to more than 3,000 daily customers, or 1,095,000 riders per year.[47]

SOUTH CAROLINA

Greenville

GreenLink: GreenLink offers 11 fixed routes across Greenville County and is operated by the City of Greenville under contract to Greenville Transit Authority. All GreenLink buses are accessible for mobility devices and the GreenLink system also features a service called "GAP", an ADA paratransit service. In FY 2016, GreenLink provided approximately 1 million passenger trips.[48]

Clemson

Clemson Area Transit/CATBus: The CATBus service area includes Clemson University, the City of Clemson, the City of Seneca, and the Towns of Central and Pendleton. Clemson Area Transit provides fare-free fixed-route bus through federal, state, and local partnerships. The CATBus system currently offers nine routes.[49] The FY 2017 ridership for CATBus was 1,769,505.[50]

Clemson University/Tiger Transit: Clemson University operates Tiger Transit, which features on-campus shuttles and service to its Greenville campus. The Student Patrol, a student organization affiliated with the Clemson University Police Department (CUPD), operates tiger Transit under the direction of the Division of Student Affairs. Tiger Transit serves all Clemson University students, faculty, staff and visitors. Tiger Transit does not operate when Clemson University is not in session.[51]

Spartanburg

SPARTA (Spartanburg Area Regional Transit Agency): The SPARTA provides low-cost, convenient public bus service across Spartanburg, as well as some destinations outside the city limits. The SPARTA bus offers eight fixed routes that vary in service frequency and service hours by route.[52] The

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[47] *Augusta, Georgia, Public Transit; http://www.augustaga.gov/232/Public-Transit (accessed 2/4/2018)*
[48] *City of Greenville, GreenLink About and GreenLink Comprehensive Operations Analysis; https://www.greenvillesc.gov/152/About; https://www.greenvillesc.gov/DocumentCenter/Home/View/9759 (accessed 2/4/2018)*
[49] *CATBus; Clemson Reimagining Final Study; http://www.catbus.com/images/stories/clemson-reimaging-study-final-report-may-2017_protected.pdf (accessed 12/15/2017)*
[50] *Moody, Keith (General Manager of CATBus). "Re: Question about Clemson Area Transit Ridership." Message to Ashley Finch. E-Mail. (accessed 12/13/17)*
[51] *Clemson University, Tiger Transit; https://www.clemson.edu/cusafety/cupd/tiger-transit.html (accessed 12/15/2017)*
[52] *City of Spartanburg, SPARTA Routes; http://www.cityofspartanburg.org/sparta/routes (accessed 12/15/2017)*

FY 2017 yearly ridership total for SPARTA buses was 397,546.[53] Through the Spartanburg County Transportation Service Bureau, SPARTA offers a low-cost, door-to-door Paratransit van service to help meet the needs of mobility-impaired residents.[54]

Columbia

Central Midlands Regional Transit Authority (CMRTA)/The Comet: The Comet bus serves Richland and Lexington counties in the Columbia metropolitan area of South Carolina. Eighteen standard, all-day routes serve metropolitan Columbia, while eight peak hour routes and one weekend special route are also operated by CMRTA.[55] CMRTA also offers Dial-A-Ride Transit (DART) service, an origin-to-destination, advance reservation, shared-ride transportation service for riders with disabilities. Each bus is equipped with a wheelchair lift and can accommodate four wheelchairs.[56] In FY 2017, CMRTA total ridership was 2,496,462.[57]

University of South Carolina/Carolina Shuttle: The University of South Carolina (USC) offers six fixed campus shuttle routes to USC students. The Carolina Shuttle day service runs weekdays from 7:30 AM to 6:00 PM. An evening shuttle service runs on a fixed-route on weekdays from 6:00 PM to 12:20 AM.

NORTH CAROLINA

Gastonia

Gastonia Transit: The Gastonia Transit bus fleet consists of eight 35-foot transit buses, and three demand response vans. Gastonia Transit covers over 299,000 miles per year, providing service to over 282,000 passengers annually. The buses operate weekdays from 5:30 AM to 6:30 PM and on Saturdays from 8:00 AM to 6:00 PM. Gastonia Transit offers eight fixed routes.[58]

Charlotte

Charlotte Area Transit System (CATS): The Charlotte Area Transit System (CATS) is the public transit system in Charlotte, North Carolina. It operates bus and rail service around the Charlotte metropolitan area. In FY 2017, CATS total ridership was approximately 22.7 million.

CATS offers a bus rapid transit line called the Sprinter, local bus service, a light rail line called the LYNX Blue Line, and a streetcar line called CityLYNX Gold Line. The Sprinter provides a direct connection between Charlotte Douglas International Airport and Center City Charlotte. CATS operates 323 buses with 73 bus routes. More than 30 local bus routes provide stops within the city, with most operating from 4:49 AM to 2:00 AM, Monday through Saturday, and 5:25 AM to 2:00 AM on Sundays. Twelve express routes provide faster trips from the suburbs to the uptown area. In FY 2017, CATS fixed route buses carried 17,094,269 passengers.

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[53] *Gonzalez, Luis (General Manager of SPARTA). "Re: Question about SPARTA Ridership." Message to Ashley Finch. E-Mail. (accessed 12/12/17)*
[54] *City of Spartanburg, SPARTA Paratransit Service; http://www.cityofspartanburg.org/sparta/paratransit (accessed 12/15/2017)*
[55] *The Comet, About Us; http://catchthecomet.org/about-us/ (accessed 12/15/2017)*
[56] *The Comet, DART Service; http://catchthecomet.org/dart-service/ (accessed 12/15/2017)*

[57] *Federal Transit Administration, Central Midlands Transit:2017 Annual Agency Profile; https://www.transit.dot.gov/sites/fta.dot.gov/files/transit_agency_profile_doc/2017/40141.pdf (accessed 3/1/19)*
[58] *City of Gastonia, City Bus Service; https://www.cityofgastonia.com/city-bus-service.html (accessed 12/15/2017)*

The LYNX Blue Line is the Charlotte region's first light rail service. The line is 9.6 miles long and operates from I-485 at South Boulevard to Uptown Charlotte. The LYNX Blue Line contains 15 stations including seven park and ride locations. LYNX operates seven days a week, with weekday service operating from 5:26 AM to 1:26 AM. LYNX service is available every 10 minutes during weekday rush hour and every 15 minutes during non-peak hours. Weekend service operates every 20 minutes during the day and every 30 minutes during late night hours. In FY 2017, the LYNX Blue Line light rail system carried 4,762,081 passengers.[59] In March 2018, CATS opened its Blue Line light-rail extension. The 9.3-mile extension runs from the 7th Street Station in Charlotte's Center City to the University of North Carolina at Charlotte Campus.[60]

The CityLYNX Gold Line is a fare-free 10-mile streetcar system and provides a direct link to the heart of Uptown Charlotte with connectivity to bus and light rail service. The Gold Line operates seven days a week, running every 15 minutes during peak hours and every 20 minutes during non-peak hours. The Gold Line runs from 6:00 AM to 11:00 PM Monday through Thursday, 6:00 AM to 12:00 AM on Fridays, 8:00 AM to 12:00 AM on Saturdays, and 9:00 AM to 7:00 PM on Sundays. In FY 2017, the CityLYNX Gold Line streetcar system carried 445,176 passengers.[61]

CATS Special Transportation Service (STS) provides ADA paratransit service and is a pre-reservation, shared-ride, door to door service. In FY 2012, STS operated 84 vehicles and provided 227,996 rides. In FY 2017, Paratransit carried 271,158 passengers. [62]

INTERCITY BUS SERVICE

Two intercity bus services operate in the Project Study Area. One operates inter-city bus service between Atlanta and Charlotte, with six one-way departures daily, including weekends. The trip takes 4 hours and 15 minutes on an express trip bus, 6 hours and 5 minutes on a non-express bus, and 8 hours and 15 minutes on a bus with a transfer stop in Columbia, SC. The standard adult fare is approximately $33.00 one-way and $66.00 round trip (2017).

While at least one express bus provides non-stop service, others have various stops including: Duncan, SC, Norcross, GA, Gainesville, GA, Anderson, SC, Greenville, SC, and Spartanburg, SC.

Another service operates inter-city bus service between Atlanta and Charlotte, with two departures daily, including weekends. Each trip takes approximately 5 hours and 45 minutes. There is one stop in Athens, GA on the way to Charlotte from Atlanta. The standard adult fare ranges $5.00 to $27.00 each way with the lowest fares offered to riders who book early. Ridership figures are not available for either bus service.

3.3.3.5 Existing Air Transportation

Three air carrier airports are identified as potential station locations along the three Corridor Alternatives. The airports provide commercially significant regional and international links, as well

[59] *Kopf, Larry. "Re: Question about CATS Ridership." Message to Ashley Finch. E-Mail. (accessed 12/12/17)*
[60] *City of Charlotte, "Blue Line Extension;" http://charlottenc.gov/cats/transit-planning/blue-line-extension/Pages/default.aspx (accessed 12/20/17)*
[61] *Kopf, Larry. "Re: Question about CATS Ridership." Message to Ashley Finch. E-Mail. (accessed 12/12/17)*
[62] *Kopf, Larry. "Re: Question about CATS Ridership." Message to Ashley Finch. E-Mail. (accessed 12/12/17)*

as provide multimodal connectivity, as outlined as an evaluation criteria for the Corridor Alternatives in Chapter 2.

HARTSFIELD-JACKSON ATLANTA INTERNATIONAL AIRPORT (H-JAIA)

H-JAIA is located near Interstates 20, 75, 85, and 285. It is approximately 20 minutes south of downtown Atlanta during normal traffic. The airport is mostly in unincorporated areas in Fulton and Clayton counties. However, sections of the airport carry into the city limits of Atlanta, College Park, and Hapeville. MARTA's Red and Gold rail lines serve the H-JAIA domestic terminal. H-JAIA is owned and operated by the City of Atlanta.

- **Aviation Travel Demand:** Since 1998, H-JAIA has been ranked as the world's busiest airport.[63] H-JAIA currently ranks first in the world in passenger arrivals and departures, as well as for scheduled flights. ATL ranks 13th in air cargo volume. H-JAIA serves 150 U.S. destinations and more than 75 international destinations in 50 countries with 2,500 arrival and departures daily. The airport serves approximately 250,000 passengers a day, or about 91.3 million passengers per year.[64]
- **Airlines:** 22 airlines provide passenger service, 15 airlines provide international passenger service, and 17 airlines provide cargo service.[65]
- **Capacity:** There are 29,550 public parking spaces, including 13,566 covered spaces, 7,800 economy parking spaces, and 8,184 airport "park and ride" spaces.

GREENVILLE-SPARTANBURG INTERNATIONAL AIRPORT (GSP)

The Greenville-Spartanburg International Airport (GSP) is located in South Carolina on the county line separating Greenville and Spartanburg counties, approximately 15 miles southwest of downtown Spartanburg, 12 miles northeast of downtown Greenville, and two miles south of the City of Greer. The airport covers approximately 3,600 acres and features one runway, one passenger terminal, several general aviation facilities, two air cargo terminals, a cargo apron with a customs and immigration building, and numerous support facilities.[66] GSP is owned by the Greenville–Spartanburg Airport District and operated by the Greenville–Spartanburg Airport Commission.

- **Aviation Travel Demand:** GSP serves more than 2 million passengers each year and averages 50 non-stop daily departures with direct service to 14 major cities and 15 major airports across the U.S. Approximately 180,000 passengers arrive and depart from GSP monthly.[67]
- **Airlines:** There are five major passenger airlines that serve passengers at GSP. In addition to passenger flights, GSP is home to a 120,000 square-foot FedEx facility and handles flights from other cargo services. Nearly 30,000 tons are loaded on and off planes at GSP every year.

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[63] *Airports Council International, "ACI releases preliminary 2016 world airport traffic rankings;" http://www.aci.aero/News/Releases/Most-Recent/2017/04/19/ACI-releases-preliminary-2016-world-airport-traffic-rankingsRobust-gains-in-passenger-traffic-at-hub-airports-serving-transPacific-and-East-Asian-routes (accessed 12/13/17)*

[64] *Hartsfield-Jackson Atlanta International Airport, "ATL Fact Sheet;" http://www.atl.com/about-atl/atl-factsheet/ (accessed 1/10/18)*

[65] *Hartsfield-Jackson Atlanta International Airport, "ATL Fact Sheet;" http://www.atl.com/about-atl/atl-factsheet/ (accessed 1/10/18)*

[66] *GSP International Airport, "Existing Setting;" https://www.gspairport.com/site/user/files/39/MAS2.pdf (accessed 1/10/18)*

[67] *GSP International Airport, "Passenger Statistics;" https://www.gspairport.com/passenger-stats/ (accessed 1/10/18)*

- **Capacity:** There are two parking garages in the passenger terminal area, as well as surface parking. The parking garages are located within the terminal loop system and provide short-term parking as well as spaces for rental car pickup and drop-off. The large surface lots adjacent to the loop system provide short-term, daily, and long-term parking. There are 4,840 total parking spots available with 3,129 short-term spaces and 1,711 long-term spaces.

CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT (CLT)

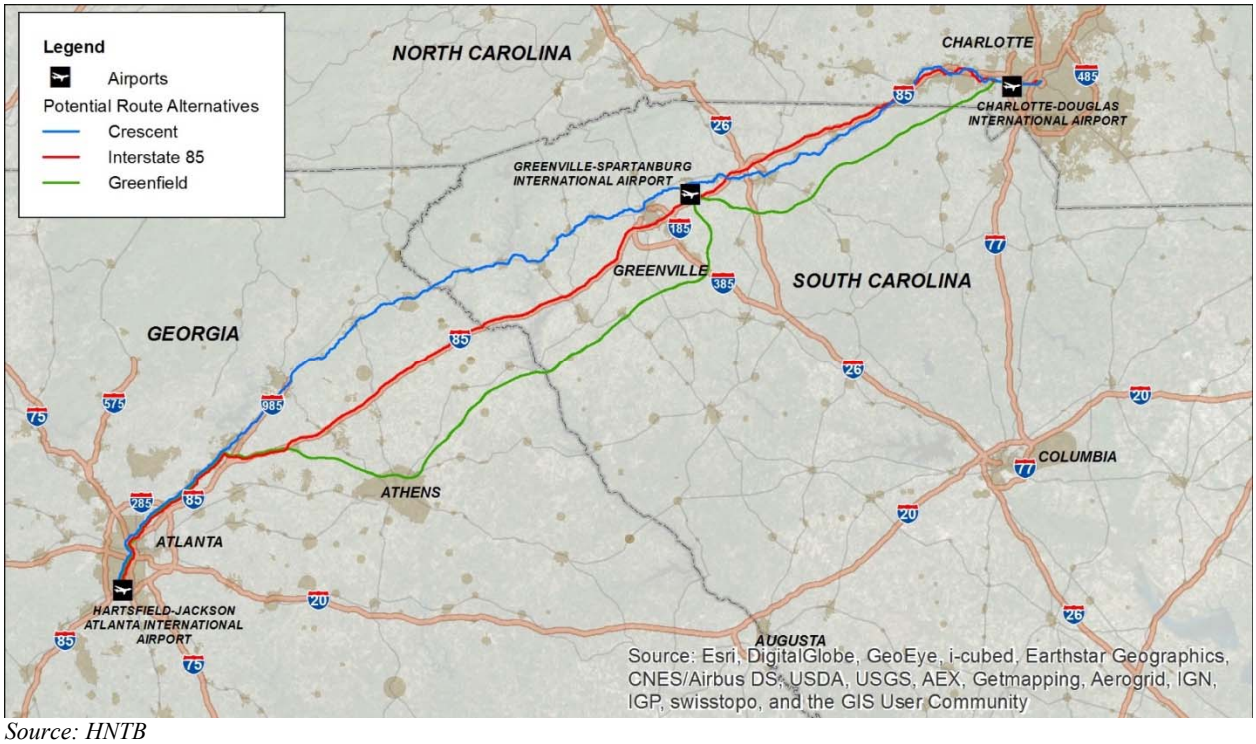
Charlotte Douglas International Airport (CLT) is located approximately seven miles from Charlotte's central business district. The airport occupies approximately 5,800 acres of land located within the City of Charlotte, and is accessible from I-85, I-77, I-485 and uptown Charlotte. The Airport ranks sixth nationwide and seventh worldwide in landings and departures, according to 2016 Airports Council International (ACI) preliminary rankings. For passenger traffic preliminary rankings, CLT ranks 11th nationwide and 32nd worldwide.[68] CLT is owned by the City of Charlotte and operated by the City of Charlotte Aviation Department.

- **Aviation Travel Demand:** CLT serves over 44 million passengers per year with approximately 3 million international passengers, 27 million air carrier passengers, and 13 million regional passengers. CLT has over 700 daily departures. CLT offers nonstop service to 170 destinations.[69]
- **Airlines:** Seven major domestic carriers serve passengers at CLT. In addition, the Airport is home to 16 regional carriers and three foreign flag carriers.[70] CLT moved 154,477 tons of cargo in 2016, boosting the Airport's cargo ranking to 28th nationwide.[71]
- **Capacity:** CLT has approximately 30,631 parking spaces, staging and parking for buses, taxis and limousine.[72]

Commercial air service gate-to-gate travel times between Atlanta and Charlotte is approximately 1 hour and 30 minutes. This does not include the time spent parking, entering and leaving the terminal, security screening, and walking to/from the gate. Additional delays can be experienced as a result of weather, air traffic control restrictions, or congestion on the airfield. The flight time between Atlanta and Greenville/Spartanburg is approximately 50 minutes and the flight time between Charlotte and Greenville/Spartanburg is approximately 45 minutes. The airports potentially served by the Corridor Alternatives are shown in Exhibit 3.3-7 below:

[68] *Charlotte Douglas International Airport, "Report of Achievement;" http://www.cltairport.com/News/Documents/ReportofAchievement/cltreportofachievement2016.pdf (accessed 1/6/18)*
[69] *Charlotte Douglas International Airport, "Fast Facts;" http://www.cltairport.com/AboutCLT/Pages/Fast%20Facts.aspx (accessed 1/6/18)*
[70] *Charlotte Douglas International Airport, "Fast Facts;" http://www.cltairport.com/AboutCLT/Pages/Fast%20Facts.aspx (accessed 1/6/18)*
[71] *Charlotte Douglas International Airport, "Report of Achievement;" http://www.cltairport.com/News/Documents/ReportofAchievement/cltreportofachievement2016.pdf (accessed 1/6/18)*
[72] *Charlotte Douglas International Airport, "Fast Facts;" http://www.cltairport.com/AboutCLT/Pages/Fast%20Facts.aspx (accessed 1/6/18)*

Exhibit 3.3-7: Airports Potentially Served by the Corridor Alternatives



Source: HNTB

3.3.4 Environmental Consequences

3.3.4.1 No-Build Alternative

The No-Build Alternative assumes a passenger rail system would not be built between Atlanta and Charlotte. Passenger service between the two cities would consist of existing bus and transit services, air travel, and continued automobile travel along I-85, I-20, I-77, and ancillary roadways. The No-Build Alternative projects currently planned would increase roadway capacity, expand transit service, and improve transportation operations in selected portions of the Study Area transportation network, but would not enhance regional passenger mobility throughout the Study Area or between metropolitan areas and the major commercial service airports. Chapter 2 highlighted committed projects in the Study Area, which is duplicated in Exhibit 3.3-8.

Exhibit 3.3-8: Committed Transportation Projects in the Study Area

Project Name	County	Description
Georgia		
Transit		
Amtrak Station Relocation	Fulton County	Relocate station from current location.
Georgia Multimodal Passenger Terminal (MMTP)	Fulton County	Construct new multimodal hub in downtown Atlanta
Revive 285 - I-285 North Corridor High Capacity Rail Service - Protective Right Of Way Acquisition	Fulton	ROW acquisition for high capacity transit along the northern segment of I-285 in the corridor between I-75 (Windy Hill Road) and I-85. This rail project would intersect the MARTA North Line at Perimeter Center.

Project Name	County	Description
Clifton Corridor Light Rail Transit - Phase 1	DeKalb County	Expand MARTA light rail transit from Lindbergh MARTA Station to North Decatur Station (Near Intersection of SR 155 (Clairmont Road) And North Decatur Road)
I-20 East Transit Initiative - Phase I Heavy Rail Transit Extension	Fulton/DeKalb County	Expand MARTA heavy rail transit from Indian Creek MARTA Station to Wesley Chapel Road and Bus Rapid Transit Service from Five Points Marta Station to Wesley Chapel Road
Clayton County High Capacity Transit Initiative - Phases 1 and 2	Clayton County	From East Point Marta Rail Station to Lovejoy via Jonesboro
GA 400 Transit Initiative - Phase 1		The Georgia 400 Corridor Transit Initiative to identify potential and feasible transit alternatives in the Georgia State Route 400 (GA 400) corridor.
Connect Cobb / Northwest Atlanta Transit Corridor Bus Rapid Transit	Cobb County	Expand mobility for all users along the Northwest Transit Corridor, a 25-mile stretch linking northern Cobb County to Midtown Atlanta
Automobile		
I-85 Widening	Jackson County	Widen I-85 from SR 53 to US 129/SR 11
I-85 Widening	Jackson/Barrow County	Widen I-85 from SR 211 to SR 53
I-85 Widening	Gwinnett/Barrow County	Widen I-85 from Hamilton Rd to SR 211
I-85 Managed Lanes	Gwinnett County	Construct managed lanes on I-85from Old Peachtree Rd to Hamilton Mill Rd
I-85 Managed Lanes (2)	Gwinnett County	Expand current managed lane system on I-85 by adding a second lane in each direction between I-285 and Old Peachtree Road
I-285 East Managed Lanes	DeKalb County	Construct two new managed lanes on I-285 between I-85 and I-20
I-20 East Managed Lanes	DeKalb County	Construct two new managed lanes on I-20 between I-285 and SR 124
I-85 New Interchange @ Gravel Springs Rd	Gwinnett County	Construct new interchange at Gravel Springs Rd at I-85
I-85 New Interchange @ McGinnis Ferry Rd	Gwinnett County	Construct new interchange at Gravel Springs Rd at McGinnis Ferry Rd
I-85 New Interchange @ SR 60	Hall County	Construct new interchange at SR 60
I-985 New Interchange @ Martin Road	Hall County	Construct new interchange at Martin Road, just north of SR 13
I-20 @ Hwy 138 Interchange Improvements	Rockdale County	Interchange improvements at Hwy 138
I-285/I-20 Interchange Improvements	DeKalb County	Construct capacity and operational improvements to general purpose interchange at I-285/I-20 in DeKalb (eastern wall)
I-285 @ I-20 Managed Lane Interchange	DeKalb County	Construct new managed lane ramps between managed lane systems on I-285 and I-20
I-285 @ Bouldercrest Rd Interchange Improvements	DeKalb County	Construct interchange improvements at I-285 @ Bouldercrest Rd
I-75 Northbound Collector/Distributor Lanes	Clayton/Fulton Counties	Construct northbound collector/distributor lanes from Forest Pkwy to I-285
SR 316 Grade Separation @ SR 11	Barrow County	Corridor operational and capacity improvements along SR 316 (a major metro Atlanta arterial)
SR 316 Grade Separation @ SR 81	Barrow County	Corridor operational and capacity improvements along SR 316 (a major metro Atlanta arterial)

Project Name	County	Description
SR 316 Grade Separation @ SR 53	Barrow County	Corridor operational and capacity improvements along SR 316 (a major metro Atlanta arterial)
US 78/SR 10 Widening	McDuffie County	Widening of US 78/SR 10 from SR 43 to Smith Mill Rd
SR 17/SR 10 Widening	McDuffie/Wilkes County	Widening of SR 17/SR 10 from Smith Mill Rd to Washington Bypass
SR 10 Passing Lanes	Oglethorpe County	Construct passing lanes throughout Oglethorpe and Wilkes County
SR 72 Widening	Madison/Elbert County	Widen SR 72 from Comer to Broad River
US 129/SR 11 Widening	Jackson/Hall County	Widen US 129/SR 11 from SR 332 to SR 323
US 129/Cleveland Hwy Widening	Hall County	Widen US 129/Cleveland Hwy from Limestone Pkwy to south of Nopone Rd
US 23/Buford Hwy Widening	Gwinnett/Hall County	Widening US 23/Buford Hwy from Sawnee Ave. to SR 347
Air		
H-JAIA Inbound Roadway Improvements	Fulton/Clayton	Upgrades to H-JAIA's internal roadway network.
H-JAIA New Cargo Warehouse	Fulton/Clayton	The new Cargo C building will complete the existing South Cargo Facility complex.
H-JAIA Concourse C Midpoint Expansion	Fulton/Clayton	The project will expand and renovate a total of approximately 52,000 square feet of space. The project will include two new escalators for passengers to connect from the Plane Train system up to the concourse level.
South Carolina		
Automobile		
I-85 Widening	Cherokee County	Widen I-85 from Gossett Rd (MM 80) to NC state line
I-20/I-26/I-77: Corridor Improvement	Lexington/Richland/Fairfield Counties	Corridor management plan (MM 34 TO MM 48)
I-26 @ US 1 (Augusta Rd)	Lexington County	Interchange improvements (HWY US21, MM119)
I-20 Widening	Lexington County	Interstate widening from US 278 to Long Pond Rd (MM 61 to MM 51)
I-26 Widening	Lexington/Richland County	Interstate widening from US 176 to St. Andrews Rd (MM 85 to MM 101)
I-26 Interstate Corridor Improvement	Newberry County	Pavement and general upgrades to I-26 in Newberry County (MM 60 to MM 75).
I-85 Widening	Greenville County	Widen I-85 from US 25 (MM 43) to SC 129 (MM 67)
I-385 @ I-85 Interchange Redesign	Greenville County	Redesign interchange at I-385 (MM 36) and I-85 (MM 51)
I-385 Widening	Greenville County	Widen I-385 from West Georgia Rd (MM 29)to I-85 (MM 36)

Project Name	County	Description
I-85 Widening	Greenville County	I-85 Widening from SC 153 (MM 40 to SC 85 (MM 69)
I-26 Widening	Spartanburg County	I-26 from US 176 (MM 15) to SC 296 (MM 22
I-85, SC 290 (MM 63) Improve Interchange	Spartanburg County	I-85 MM 63 SC 290 Improve Interchange (2 lane exit)
I-85 Widening	Spartanburg County	I-85 Widening SC 18 (MM 96) to near NC State Line (MM 106)
I-85 Widening SC 153 (MM 40) to SC 85 (MM 69)	Spartanburg County	I-85 Widening SC 153 to SC 85 (MM 40 to MM 69)
I-85 Widening from Gossett SC 57 (MM 80) to SC 18 (MM 96)	Spartanburg County	I-85 Widening SC 57 (MM 80) to SC 18 (MM 96)
I-85 Widening	Greenville County	Widen I-85 from US 25 (MM 43) to SC 129 (MM 67)
I-85 over Rocky Creek Bridge	Greenville County	Replace the culvert over the Rocky Creek with a bridge.
I-85 over Seneca River	Anderson County	Bridge Replacement - I-85 NB & SB over Seneca River
I-85 over Three & Twenty Creek	Anderson County	Bridge Replacement I-85 NB & SB over Three & Twenty Creek
I-85 Corridor Improvements	Anderson County	I-85 Corridor Improvements from GA State Line to Exit 20
I-77 Corridor Improvements	Chester, York Counties	I-77 Corridor Improvements from SC 9 (Exit 65) to US 21 (Exit 77)
I-20/I-26/I-77: Corridor Improvement	Lexington/Richland/Fairfield Counties	Corridor management plan (MM 34 TO MM 48)
I-20/I-26/I-126 - Corridor Improvements	Lexington/Richland Counties	Increase interstate capacity / mobility
I-26 @ US 1 (Augusta Rd)	Lexington County	Interchange improvements (HWY US21, MM119)
I-20 Widening	Lexington County	Interstate widening from US 378 to Longs Pond Rd (MM61 to MM 51)
I-20 & US 1	Lexington County	Bridge Replacement
I-26 Widening	Lexington/Richland County	Interstate widening from US 176 to SC 202 (MM 85 to MM 101)
I-126 Bridge Replacement over SCL Railroad	Richland County	Bridge Replacement
I-26 (Near MM 96 to near MM 101) - S-58 (Koon Road)	Richland County	Bridge Replacement
I-26 (Near MM 96 to near MM 101) - S-80 (Shady Grove)	Richland County	Bridge Replacement

Project Name	County	Description
SC 277 NB over I-77	Richland County	Bridge Replacement
I-77 (I-20 to Killian Road (Exit 22))	Richland County	Widening I-77 NB/SB (I-20 and Exit 22 Killian Road); Rehab of SB lanes from Killian Rd to Blythewood Rd; Widening of 10 mainline bridges.
North Carolina		
Transit and Passenger Rail		
Charlotte Gateway Station Project	Mecklenburg County	Construction of a new station in downtown Charlotte that will provide seamless integration of various rapid transit modes. The City of Charlotte and NCDOT began construction on the railroad infrastructure (bridges/tracks) for the new station in 2018, which will be completed in 2022. The City and NCDOT are also preparing engineering design for and pursuing funding to complete the station by 2025.
Piedmont Improvement Program	Multiple Counties	Corridor-wide railroad improvement program to increase capacity and expand intercity passenger rail service for up to five daily round-trip trains between Raleigh and Charlotte.
CATS West Corridor Transit Study	Mecklenburg and Gaston County	CATS is conducting a planning study to evaluate transit alternatives between the existing LYNX Gold Line and the CLT airport, including consideration of light rail within the NS ROW.
Freight Rail		
NS Bulk Transfer Facility	Mecklenburg County	New intermodal facility for transfer of freight between truck and rail, located near I-485 within Charlotte Douglas International Airport property.
Harrisburg to Charlotte Railroad Improvements	Mecklenburg and Cabarrus County	This project involves constructing about 12 miles of second track and realigning curves along the North Carolina Railroad (NCRR) corridor in Mecklenburg and Cabarrus Counties.
Charlotte Rail and Locomotive Maintenance Facility	Mecklenburg County	This project involves constructing a new facility to service state-supported Piedmont and Carolinian trains during layovers in Charlotte.
Automobile		
US 74 (Independence Blvd)	Mecklenburg County	Convert Bus Lanes to HOT Lanes. NC 27 to I-277. Lanes and jersey barriers are already in place. The scope of this project would include gantries, new striping and gates.
I-485	Mecklenburg County	Construct one express toll lane in each direction within the existing median. I-77 to US 74.
I-85 Interchange at Cox Rd	Gaston County	Construct new interchange at Cox Rd @ I-85
I-85 Widening	Gaston County	Widen I-85 to 8 lanes from US 321 to NC 273
Air		
CLT Airport Expansion	Mecklenburg County	Runway, terminal, and roadway improvements to increase airport capacity
Sources: State DOTs' STIPs and MPOs' TIPs		

The No-Build Alternative projects would not individually or collectively provide regional corridor-wide benefits for faster and more reliable ground transportation service to the traveling public as an alternative to highway, intercity bus, and air travel.

3.3.4.2 Corridor Alternatives

EFFECTS ON ROADWAYS

Travelers to destinations that would be served by a passenger rail system would have the option of using the passenger rail service as opposed to intercity bus or an automobile on the highway system. In general, GDOT anticipates that the Project will benefit the Study Area roadway network, as it would provide intercity travel capacity to supplement congested interstate highways in the Study Area. As previously discussed in Chapter 2, the varying travel times for each Corridor Alternative are reviewed in Exhibit 3.3-9 below.

Exhibit 3.3-9: Summary of Corridor Alternative Frequency, Travel Times, and Ridership

Alternative	Frequency (round trips)	End to End Travel Time (hrs:min)	2025 Ridership
Southern Crescent	4	4:35 – 5:34	0.81M – 1.01M
I-85	14	2:42 – 2:50	4.65M – 4.75M
Greenfield	16 – 22*	2:06 – 2:44	4.58M – 5.37M

Source: HNTB

**With high-speed technology, 22 round trips can be supported*

As a baseline comparison for the three Corridor Alternatives, Exhibit 3.3-10 below illustrates the potential number of intercity auto-trips diverted for the years 2025 and 2050 for scenarios without high-speed passenger rail (No Build) and scenarios with high-speed passenger rail service. Base-year trips (2012) are also displayed to represent existing No-Build conditions. For each Corridor Alternative, Exhibit 3.3-10 illustrates how the total annual auto-trips projected for the No-Build Alternative are impacted by introducing a passenger rail service into the Study Area. The 2025 No-Build annual auto-trip total is just over 108 million but with the Greenfield Corridor Alternative, that number reduces to just over 104 million, therefore demonstrating the Greenfield Alternative as diverting close to four million auto-trips. GDOT estimates that the Southern Crescent Corridor Alternative would result in the fewest automobile trip diversions (under one million in 2025 and 2050, a negligible number), which is attributed to its less frequent and relatively slower service compared to the other two Corridor Alternatives. The I-85 Corridor Alternative would divert around 2.4 million automobile trips in 2025 and 3.9 million in 2050.

Exhibit 3.3-10: Number of Remaining Auto-trips (in millions) and Percent Diverted

	No-Build	Southern Crescent	Southern Crescent Trips Diverted	Southern Crescent Trips Diverted (Percent)	I-85	I-85 Trips Diverted	I-85 Trips Diverted (Percent)	Greenfield	Greenfield Trips Diverted	Greenfield Trips Diverted (Percent)
2012 Base Auto Trips	95.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2025 Forecast Auto Trips	108.7	107.86	0.84	0.7%	105.31	3.39	3.1%	104.88	3.82	3.5%
2050 Forecast Auto Trips	119	118.03	0.97	0.8%	115.11	3.89	3.3%	114.67	4.33	3.6%

Source: Revenue and Ridership Results, May 2013

Regionally, rider choice to use passenger rail service instead of the existing highways could impact traffic near potential station locations. The local and regional effect on roadways due to the Preferred Project Alternative would be analyzed in the Tier 2 analysis. In general, the change in driving patterns would potentially affect roadway LOS, particularly in places where roadways already experience some congested time periods. Using the highway LOS as a measure of regional traffic operations, many locations along I-85, I-20, and I-77 may experience changes in the projected LOS and AADT discussed earlier in this Chapter. GDOT projects that many segments observed on the highways connecting Atlanta and Charlotte will experience LOS D or worse throughout most of the corridor by 2040.

Locally, the Preferred Corridor Alternative would change travel patterns near proposed stations as people travel to and from the stations. Localized roadway improvements may be required to accommodate roadway impacts resulting from the Project. Such improvements would relate to managing circulation, accommodating added traffic volume, and considering safety of pedestrians and bicyclists. Stations have the potential to induce re-zoning and development in the area around stations. For example, transit-oriented development (TOD), which increases the density of residential and commercial land uses, can change vehicular, transit, pedestrian and bicycle travel patterns. In coordination with local and state planning officials, each proposed station location will be examined during the Tier 2 analysis. Necessary improvements will be identified and recommended as warranted and reasonably feasible.

A large portion of the I-85 Corridor Alternative would be within the existing highway ROW. Use of existing highway ROW will minimize the need to acquire additional ROW and lessen impacts to the natural and built environment. GDOT anticipates that the Preferred Corridor Alternative would not change the number of highway and travel lanes on the affected highways. Since high-speed rail requires extensive curve improvements and protection from the adjacent roadway traffic, the I-85 Corridor Alternative would include the reconstruction of highway medians and overpasses, and possibly the construction of 88 miles of elevated rail viaduct in segments where there is no space

available in the median or adjacent land for installation of tracks. The Tier 2 analysis will determine if roadway crossings are required and evaluate potential road closures and/or realignments. GDOT will coordinate with local governments to resolve rail- roadway design concerns. Roadway crossings would be guided by FRA's 2009 *Highway-Rail Grade Crossing Guidelines for High Speed Passenger Rail* which focuses on safety issues such as warning systems and traffic controls, train controls, barriers, and requires grade separations for high speed operation. Thus, the I-85 and Greenfield Corridor alternatives are not expected to have any at-grade crossings.

During construction, the Project has the potential to temporarily affect roadway operations due to construction staging, access requirements, and other activities. These impacts for each Corridor Alternative would be examined in the Tier 2 analysis.

EFFECTS ON EXISTING RAIL

The Southern Crescent Corridor Alternative and the Atlanta Approaches could have a direct effect on existing rail conditions and facilities. The Southern Crescent Corridor Alternative would utilize the NS track between Atlanta and Charlotte, with the potential to construct new sections of track within the ROW, depending on the selected operational speed. The existing freight rail ROW hosts the Amtrak Crescent service that travels from New York, N.Y., to New Orleans, LA. This Corridor Alternative follows the NS Piedmont Division mainline track from Charlotte in a southwest direction through Gastonia, N.C.; Spartanburg and Greenville, S.C.; Toccoa and Gainesville, GA.; before reaching Atlanta on the NS Georgia Division. On the proposed approach to the Georgia MMPT, which would be located in Atlanta's downtown business district, the route travels through Howell Junction before transitioning to the Class I CSX/NS corridor and then into the Georgia MMPT. The route continues south from the Georgia MMPT onto the NS Griffin line to East Point, GA, before transitioning to the CSX Atlanta and West Point A&WP mainline track to approach the H-JAIA area station.[73]

Because the Southern Crescent Alternative would utilize existing freight ROW, this Corridor Alternative has the potential to increase freight delays and congestion. Freight trains also may conflict with passenger service on shared use tracks.[74] From Charlotte Gateway Station to Howell Junction in Atlanta, the segment is a mixture of single (33 percent) and double (66 percent) track sections, with the number of daily freight trains ranging from 14 to 30 trains. From Howell Junction to the Georgia MMPT, the track geometry includes extensive curvature, which limits the ability to achieve desirable passenger speeds. This segment follows the representative alignment along the NS/CSX corridor. In addition, this entire segment is depressed and grade separated from all roadway crossings.

Operations at speeds up to 110 mph require an upgrade of the track class to FRA Class 6, along with supplemental improvements at grade crossings and an enhanced signal system. Heavy freight use will increase the maintenance costs associated with shared use tracks. To accommodate passenger trains, the existing NS corridor would need a substantial increase in capacity. Once constructed, these improvements must be maintained to FRA standards required for reliable and safe operations. Typically, the passenger operator would provide funding for maintaining any tracks that are added to the corridor either for its own use, or for mitigating delays to freight trains.

[73] *Appendix B (ADR) pg. 27*
[74] *"Shared use" refers to the sharing of track in an existing and active freight rail corridor*

Low- level platforms are permissible when the platform is accessed by tracks shared with freight traffic to avoid clearance conflicts. Use of a high-level platform would require construction of a separate, parallel track for passenger use only. Potential platform designs for the proposed stations should be evaluated to highlight the impacts on passenger and freight operations. While more costly, a high-level platform served by a dedicated passenger track can offer more fluidity to both freight and passenger train movements to help maintain the performance of both services.

Within the approaches to Atlanta and Charlotte, both the I-85 and Greenfield Corridor Alternatives would transition to dedicated passenger rail tracks in a shared-use freight corridor to access the stations including the Georgia MMPT, H-JAIA, CLT and Charlotte Gateway Station. GDOT anticipates that existing freight railroads will maintain the track and ROW that they own and the cost of track maintenance will be resolved through negotiations with the railroads.

EFFECTS ON EXISTING INTERCITY, REGIONAL, AND LOCAL TRANSIT

Trip diversion from intercity bus travel is larger than automobile trip diversion. All three Corridor Alternatives have similar numbers of diverted bus trips (between 40,000 and 50,000 trips) in 2025 and 2050. Base-year counts are also provided for comparison purposes.

Exhibit 3.3-11: Number of Inter-City Bus-Trips (in millions) and Trips Diverted

	Intercity Bus Trip Diversion Results		
Corridor Alternative	**2011**	**2025**	**2050**
No Build Bus Trips (Millions)	0.22	0.23	0.26
Southern Crescent Bus Trips (Millions)	n/a	0.18	0.21
Southern Crescent Bus Trips Diverted (Millions)	n/a	0.05	0.05
Southern Crescent Bus Trips Diverted (Percentage)	n/a	21.7%	19.2%
I-85 Bus Trips (Millions)	n/a	0.19	0.21
I-85 Bus Trips Diverted (Millions)	n/a	0.04	0.05
I-85 Bus Trips Diverted (Percentage)	n/a	17.4%	19.2%
Greenfield Bus Trips (Millions)	n/a	0.19	0.22
Greenfield Bus Trips Diverted (Millions)	n/a	0.04	0.04
Greenfield Bus Trips Diverted (Percentage)	n/a	17.4%	15.4%

**2011 was used as a base year for intercity bus trips.*
Source: HNTB Revenue and Ridership Results, May 2013

Existing intercity bus travel is expected to provide a viable travel option in future years but as illustrated in Exhibit 3.3-11, faster passenger rail service would divert some intercity bus travelers. As shown in Exhibit 3.3-12, the projected travel times for each Corridor Alternative would be competitive with intercity bus service. While the Southern Crescent Alternative would be comparable in travel time to inter-city bus service, the I-85 and Greenfield Alternatives would be significantly shorter than existing inter-city bus trip travel time. This chart below shows a comparison of the travel times between Atlanta and Charlotte for existing modes and proposed passenger rail.

Exhibit 3.3-12: Comparison of Existing Travel Modes and Proposed Corridor Alternatives

Travel Mode	Frequency of Trips (Round Trips)	Average Travel Time between Atlanta and Charlotte
Automobile		
I-85	N/A	3 hours, 45 minutes[75]
I-20, I-77	N/A	4 hours, 43 minutes[76]
Intercity Bus	14	5 hours, 14-16 minutes, depending on carrier
Intercity Rail		
Amtrak Crescent	1	5 hours, 17 minutes[77]
Air	36	
American	18	1 hour 17 minutes (direct flight time only)[78]
Delta	18	1 hour, 10 minutes (direct flight time only)[79]
Passenger Rail Proposed Corridor Alternatives		
Crescent	2	4 hours, 35 minutes to 5 hours, 34 minutes
I-85	7	2 hours, 42 minutes** to 2 hours, 50 minutes
Greenfield	8-11*	2 hours, 6 minutes** to 2 hours, 44 minutes

** With electric high-speed technology, 11 round trips can be supported*
*** Potential travel times for electric high-speed technologies*
Sources: HNTB Revenue and Ridership Results, May 2013; Websites of Greyhound, Megabus, and Amtrak; Google maps

As noted in Section 1.4, connectivity of the Project with existing transit services is an important need. Potential linkages will be studied during a Tier 2 analysis, including connections to Atlanta's MARTA heavy rail system and Charlotte's transit system. In addition, each Corridor Alternative may introduce new stations that could affect local and regional bus transit routes. Some bus routes may also change to accommodate changes in traffic patterns resulting from the locations of stations. During construction, surface transit operations on roadways within the construction area could experience delays which would affect existing bus service.

EFFECTS ON AIR TRANSPORTATION

The introduction of a high-speed rail service with one or more stations at hub airports can produce changes in levels and patterns of commercial air travel. Regarding airport choice modeling, air passengers typically choose an airport for a long-distance trip based on factors that include: access,

[75] *Travel times reflect start/end points from city-centers of Charlotte and Atlanta Google Maps Driving Directions, assumes vehicles are driving the posted speed limits*
[76] *Travel times reflect start/end points from city-centers of Charlotte and Atlanta. Google Maps Driving Directions, assumes vehicles are driving the posted speed limits*
[77] *Amtrak, http://www.amtrak.com/home (accessed on 1/31/18)*
[78] *Estimate based on information provided by searching for weekday flights between Atlanta and Charlotte*
[79] *This number is dependent on which rail alternative is preferred. However, The Volpe Center in their "Evaluation of High-Speed Rail Options in the Macon-Atlanta-Greenville-Charlotte Rail Corridor." (2008) provides this estimate*

distance from final destination and travel time; the range of destinations offered; and flight frequencies, times, and fares. Hub airports offer more choices and can be more attractive to passengers as they serve as gateways for passengers to connect to flights to numerous domestic and international destinations, as well as connection points for many longer-distance trips. As a result of H-JAIA and CLT being major hubs, there are two distinct types of air trips that are strong candidates for diversion to rail. With improved rail access between two major hub airports, passengers currently flying to H-JAIA and CLT from feeder airports like GSP, where passengers are likely making a connection at the hub airports, might divert from feeder air to rail to make those connections. In addition, passengers traveling between CLT and H-JAIA (in either direction) and then connecting to another flight could be presented with a new choice of whether to connect to one airport via high-speed rail rather than flying between CLT and H-JAIA.

Exhibit 3.3-13 provides the total number of trips, both for air and high-speed passenger rail service, occurring at the three primary airports in the Study Area. These trips are categorized by mode in order to illustrate the number of trips diverted from the air service to high-speed passenger rail service. The chart provides the potential diverted trips for each airport as well as for the entire corridor. For each of the Corridor Alternatives, the trip diversion was the greatest at the Greenville-Spartanburg Airport, averaging over 30 percent. As a result of a high-share of connecting air traffic and short travel distances (ATL to GSP is around 150 miles; CLT to GSP is around 100 miles), air trips may be diverted from GSP as travelers consider Atlanta or Charlotte as a possible alternate origin/destination of their air trips if high-speed rail offers competitive travel times to the hub airports.

At H-JAIA and CLT, the projection on average is 4 to 6 percent diversion of trips to a high-speed passenger rail service. GDOT expects this lower diversion due to higher volume of annual riders. As stated in Chapter 2, airport choice diversion was only modeled for I-85 and the Greenfield Corridor Alternatives, as GDOT determined that the level of service provided by the Southern Crescent would not be sufficient to constitute a viable option for air travelers due to the longer travel time.

Exhibit 3.3-13: Annually Diverted Trips from Air Service

Corridor Alternative	ATL	CLT	GSP	Corridor
I-85		2025		
Flights*	2,647,141	2,645,823	952,634	6,245,598
HSR	103,269	152,058	279,114	534,441
Total	2,750,410	2,797,881	1,231,748	6,780,039
Diversion Percentage	4%	6%	29%	9%
I-85		2050		
Flights*	3,529,521	3,797,745	1,190,792	8,518,058
HSR	137,692	218,260	348,892	704,844
Total	3,667,213	4,016,005	1,539,684	9,222,902
Diversion Percentage	4%	6%	29%	8%
Greenfield		2025		
Flights*	2,634,333	2,623,417	905,762	6,163,512
HSR	116,076	174,464	325,985	616,525
Total	2,750,409	2,797,881	1,231,747	6,780,037
Diversion Percentage	4%	7%	36%	10%

Corridor Alternative	ATL	CLT	GSP	Corridor
Greenfield		2050		
Flights*	3,512,444	3,765,585	1,132,203	8,410,232
HSR	154,768	250,421	407,482	812,670
Total	3,667,212	4,016,006	1,539,684	9,222,902
Diversion Percentage	4%	7%	36%	10%

HSR = High Speed Rail
Source: Revenue and Ridership Results, May 2013
Note: Southern Crescent Corridor not included due to having little to no effect on air service trip diversion
** Flights represents the number of travelers taking a connecting flight to/from a corridor airport to their destination (or from their origin) or air trips that are contained within the corridor.*

The Greenfield Corridor is projected to have a slightly larger number of diverted air trips than the I-85 Corridor, at 10 and 9 percent respectively. This is likely due to slightly faster projected rail travel times on the Greenfield Corridor than the I-85 Corridor. As illustrated in Exhibit 3.3-13, the number of diverted trips is projected to increase; this growth trajectory demonstrates how high-speed passenger rail could become a viable travel mode for intercity travel between Atlanta and Charlotte.

Effects on Local Parking
The need for vehicular parking at or near stations will be assessed during the Tier 2 EIS, based on the selected station locations, land use, and existing parking.

3.3.5 Potential Mitigation

3.3.5.1 Operations

If a Preferred Corridor Alternative is selected, GDOT will make an effort to avoid and minimize negative impacts on transportation facilities as the Preferred Corridor Alternative advances. GDOT will consider a number of strategies to mitigate impacts. Strategies that would mitigate the Project's impacts on highways, local roads, transit operations, and parking will vary depending on the nature of the impact. For example, near stations or where the Preferred Corridor Alternative crosses existing roadways, improvements may be required at intersections or roadway cross-sections to facilitate access and safe circulation. Improvements to at-grade roadway crossings may also be considered to mitigate traffic impacts. Mitigation strategies may also include improvements to accommodate existing and growing freight traffic on shared rail right-of-way, such as bypass routes, additional tracks, signalization, and coordination with the host railroad.

Station, parking, and maintenance facility designs could include operational and geometric improvements that maintain, wherever reasonably feasible, vehicle traffic conditions at acceptable levels of service. Mitigation could include the realignment of local traffic patterns and the creation of additional parking. Examples of roadway improvements to facilitate station access include turn lanes at intersections, local roadway capacity improvements, traffic control measures, coordination with local transit operations, and improvements in pedestrian and bicycle access. Landscape and streetscape enhancements could improve integration of stations with adjacent land uses.

3.3.5.2 Construction

The temporary construction effects to roadways and surface transit would be addressed by Best Management Practices during construction.

To the extent possible, work would be staged during night-time, weekends, or off-peak hours to minimize service outages and disruptions to the traveling public. Contract specifications would require road closures and detours to be coordinated so that drivers can take practical and short detour routes. Temporary closures and detours would be done in sequence as the Project progresses. During such closures and detours, the construction contractor would be required to post detours for traffic and implement other measures to ensure that traffic flow can be accommodated in an efficient manner as may be both practical and safe.

The Project sponsors would also coordinate with local agencies regarding hauling construction materials and debris on public streets to identify acceptable routes and times of operation. Traffic would be managed by detailed traffic control plans. The contractor, with the Project sponsors, would coordinate with potentially affected public services in planning traffic control measures. Construction activities that might substantially disrupt traffic would not likely be performed during peak travel periods to the maximum extent practicable. Access to all businesses and residences would be maintained.

Warning signs would be used as appropriate to provide notice of road hazards and other pertinent information to the traveling public. Signage and barricades would be used as part of the typical roadway construction traffic controls. Temporary traffic signal adjustments and/or temporary manual traffic control could be required when construction occurs at signalized intersections on adjacent arterials or roadways. The effectiveness of the traffic control measures would be monitored during construction and adjustments would be made, as necessary. The local news media would be notified in advance of road closures, detours, and other construction activities. Information would also be posted on the Project website.

3.3.6 Subsequent Analysis

The Tier 2 analysis will include more detailed planning and engineering to address connections to existing transportation systems, as well as potential effects on capacity requirements of transportation facilities affected by the project. For example, the Tier 2 analysis will examine any connections to the MARTA heavy rail system. The process will also include detailed planning and engineering to establish connections to local and regional bus systems since they are not fixed guideway modes and can be dynamically altered over time based upon shifting demands and trip-making behaviors. These inputs are harder to anticipate but easier to adjust once station locations are determined. The owners of the bus services could adjust the planning and development of local and regional bus routes and schedules after the Tier 2 process is completed.

The effects and mitigation measures that could be taken to address the capacity requirements of local roadway, transit, and pedestrian and bicycle networks generated by stations and TOD will be undertaken in the Tier 2 analysis. A more in-depth discussion of the effects to, and resulting from, land use changes will be addressed in that process. The need for vehicular parking will also be assessed during Tier 2, based on the selected station locations and the associated community planned land use and existing parking availability. All stations would be designed to comply with the ADA to accommodate the safety and accessibility for disabled patrons. For example, the passenger cars would provide allocated space and/or priority seating for individuals who use wheelchairs. Also,

stations would be designed to minimize physical barriers that prohibit or restrict access. A full range of necessary transportation-related mitigation commitments will be developed in Tier 2 EIS.

When a Preferred Corridor Alternative is selected, more detailed analyses would be performed to analyze travel demand, which would include the development of an optimized passenger rail operating timetable for the selected Corridor Alternative. The analysis would be an iterative process that would address optimal frequency and time of day requirements by market, while also considering the cost required to provide the service. The analysis would have implications on the Project's ridership, capital costs, and operating costs. The timetable optimization process would be coordinated with other rail corridor initiatives within the region. Depending on the amount of time that passes between completion of this Tier 1 EIS and additional analysis, updated travel market data, demographic data and forecasts may be required in the travel demand model. The update would include the latest Metropolitan Planning Organization (MPO) base year and future year highway networks; the latest MPO, statewide, and national socio-economic data and forecasts; and the latest air travel market data. The selected Corridor Alternative would be subjected to the plan development processes of review and approvals by the States of Georgia, South Carolina, and North Carolina, and the FRA.

3.4 AIR QUALITY

This section describes the existing air quality status of the Study Area and discusses qualitatively the potential impact of modal diversion on air pollution levels. At this broad-level Tier 1 EIS, there is no substantial difference in air quality impacts among the Corridor Alternatives, therefore this section will focus on the differences between the No-Build Alternative and the Project. In addition, some of the Corridor Alternatives under consideration use electric power; however, the source of the electric power is beyond the scope of a Tier 1 EIS and was not a consideration in the determination of potential air quality impacts.

3.4.1 Legal and Regulatory Context

The Federal agency that develops and enforces the regulations that help govern air quality is the U.S. Environmental Protection Agency (EPA). The Clean Air Act (CAA), as amended in 1990, led the EPA to establish National Ambient Air Quality Standards (NAAQS) for six criteria pollutants to protect the public from health hazards associated with air pollution. The six criteria air pollutants are: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$)[80], and lead (Pb). The sources of these pollutants, their effects on human health, and their concentrations in the atmosphere vary. Exhibit 3.4-1 shows the NAAQS for each criteria pollutant.

Exhibit 3.4-1: National Ambient Air Quality Standards (NAAQS) for Criteria Pollutant

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	Primary and Secondary	Rolling 3 month average	0.15 µg/m3	Not to be exceeded
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	Primary and Secondary	Annual	53 ppb	Annual Mean
Ozone	Primary and Secondary	8-hour	0.07 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years

[80] *The EPA classifies particulate matter in two size categories. PM_{10} refers to particles 10 micrometers in diameter and smaller. $PM_{2.5}$ refers to particles 2.5 micrometers in diameter and smaller.*

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
$PM_{2.5}$	Primary	Annual	12 µg/m_3	annual mean, averaged over 3 years
	Secondary	Annual	15 µg/m_3	annual mean, averaged over 3 years
	Primary and Secondary	24-hour	35 µg/m_3	98th percentile, averaged over 3 years
PM_{10}	Primary and Secondary	24-hour	150 µg/m_3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	Primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: EPA. National Ambient Air Quality Standards, https://www.epa.gov/criteria-air-pollutants/naaqs-table, last accessed 10/08/2018
Key: ppm = parts per million; µg/m3 = microgram per cubic meter; ppb = parts per billion;

The EPA designates areas that do not meet NAAQS as "nonattainment" and can designate areas that were previously in nonattainment to "maintenance" status. The EPA delegates authority to the states for monitoring and enforcing air quality regulations. The three states within the Study Area have State Implementation Plans (SIP), developed in accordance with the CAA and contain the major requirements with respect to air quality. Under the authority of the CAA, Federal entities are prohibited from taking actions in nonattainment or maintenance areas that do not conform to the SIP for the attainment and maintenance of the NAAQS. Conformity analyses ensure that Federal activities do not interfere with established emissions budgets in the SIPs, that Federal activities do not cause or contribute to new violations, and that States achieve overall attainment and maintenance of the NAAQS. FRA Actions are covered under the EPA General Conformity Regulations (58 CFR 63214).

A project conforms to the SIP if it is included in a conforming metropolitan transportation plan. This Project's three Corridor Alternatives overlap with several metropolitan planning organizations (MPO):

- Charlotte Regional Transportation Planning Organization (CRTPO),
- Spartanburg Area Transportation Study (SPATS),
- Greenville-Pickens Area Transportation Study (GPATS),
- Gainesville-Hall Metropolitan Planning Organization (GHMPO),
- Madison-Athens-Clark-Oconee MPO (MACORTS),
- Atlanta Regional Commission (ARC), and
- Central Midlands Council of Governments (CMCOG)

At this time, the MPOs have not identified funding for subsequent phases of the Project in their Long Range Plans or Transportation Improvement Programs (TIP).

3.4.2 Methodology

GDOT obtained data on existing air quality conditions from Georgia Department of Natural Resources-Environmental Protection Division, South Carolina Department of Health and Environmental Control, and North Carolina Environmental Quality. The Tier 2 analysis will include a conformity determination and hot spot analysis at the points in time and places where congestion is greatest or in areas of sensitive receptors.

3.4.3 Affected Environment

According to the EPA, seven counties in the Atlanta metropolitan area are designated as a nonattainment area for 8-hour ozone (O_3); four of those are within the Study Area: Gwinnett, DeKalb, Fulton, and Clayton. The Charlotte-Rock Hill, NC-SC- area is designated as maintenance for 2008 8-hour O_3 and 1997 O_3; this maintenance area includes Mecklenburg, Gaston, and York Counties. Mecklenburg County, NC is also in maintenance status for Carbon Monoxide (CO). All other counties within the Study Area are in attainment for all criteria pollutants. EPA reclassified Georgia's and ozone maintenance area from nonattainment in 2016. In 2017, EPA re-classified Georgia's and North Carolina's fine particulate matter (PM 2.5) non-attainment areas to attainment.

3.4.4 Environmental Consequences

3.4.4.1 No-Build Alternative

The No-Build alternative assumes passenger rail would not be built between Atlanta and Charlotte. Passenger service between the two cities would consist of existing bus services, air travel, and continued automobile use along I-85, I-20, and I-77. The air quality pollutant concentrations related to auto, bus, and air travel could worsen with the No-Build Alternative compared to the Corridor Alternatives, primarily due to emissions increases from heavier volumes of vehicular traffic in the future. Some emissions could be offset by increased use of more fuel-efficient automobiles. Any future, non-related construction projects within the Study Area could also have an impact on air quality. A list of committed projects in the Study Area that could have an impact on air quality in the future is located in Exhibit 3.3-7.

3.4.4.2 Corridor Alternatives

Criteria air quality pollutants can cause serious health effects. According to the EPA, exposure to pollutants could lead to a variety of health problems, including heart or lung disease, arrhythmia, asthma, decreased lung function, and other respiratory issues.[81] Regardless of the rail technology selected, it is not likely that any of the alternatives will cause or contribute an increase in criteria pollutants emissions. Any of the alternatives could result in net reduction of criteria pollutants within the Study Area and so, would have positive long-term health benefits for the region. Each of the alternatives has the potential to positively affect regional air quality by attracting riders to rail service from other modes of transportation, particularly the widely-used automobile.

Section 3 of this chapter discusses the impact of the Corridor Alternatives on existing transportation usage, including the projected modal diversion to rail, which may have positive benefit to air quality. The Greenfield Corridor Alternative has the greatest potential to attract riders from automobile use (4 percent), thereby reducing emissions within this area as compared to the No-Build alternative. See section 3.3.4.2 for more information the potential of each Corridor Alternative to divert trips to passenger rail from automobile, bus, and air. Reduced travel by single occupancy vehicles could directly reduce combustion engine emissions, thereby having a positive benefit on regional air quality. These air quality benefits could be further realized with the project's connection to local and regional transit service.

Temporary emissions from construction equipment to construct the Project are expected to be much less than the total emissions from other industrial and transportation sources in the region, and are not expected to cause a violation of the NAAQS. Fugitive dust emissions could occur during demolition, ground excavation, materials handling and storage, movement of equipment at the construction site, and transport of material to and from the construction site.

3.4.5 Potential Mitigation

3.4.5.1 Operations

Since GDOT anticipates that none of the Corridor Alternatives would cause or contribute to an increase in criteria pollutant emissions in Georgia, South Carolina or North Carolina, mitigation measures would not be required for operations.

3.4.5.2 Construction

GDOT anticipates minor, temporary construction impacts. The Project would adhere to the GDNR EPD 2010 Fugitive Dust regulation 391-3-1-02(2)(n) and the APC Regulation for Fugitive Dust (Chapter 1200-3-8).

Construction activities can result in short-term, localized effects on ambient air quality and generate a temporary increase in Mobile Source Air Toxics (MSAT) emissions. These potential effects include direct emissions from construction equipment and trucks, increased emissions from motor vehicles on the streets due to disruption of traffic flow, and fugitive dust emissions. Emissions from construction equipment and trucks are expected to be much less than the total emissions from other industrial and transportation sources in the region, and therefore, are not expected to cause a violation of the NAAQS. Fugitive dust emissions could occur during demolition, ground excavation, material

[81] https://www.epa.gov/air-research/research-health-and-environmental-effects-air-quality *(accessed 2/1/2018)*

handling and storage, movement of equipment at the site, and transport of material to and from the site.

Project-level assessments intended to develop construction emission mitigation measures would benefit from a number of technologies and operational practices that should help lower short-term MSATs. For instance, a number of diesel retrofit projects have been implemented using funding from the Congestion Mitigation and Air Quality Improvement (CMAQ) program. The EPA has listed a number of approved diesel retrofit technologies; many of which can be deployed as emissions mitigation measures for equipment used in construction. Best Management Practices would be implemented during construction and all required permits would be obtained prior to start of construction.

3.4.6 Subsequent Analysis

The Tier 2 analysis will include a detailed air quality assessment, including direct, indirect, and cumulative impacts, of the Preferred Alternative and the stations and maintenance facilities. The air quality analysis will consider existing conditions in the Study Area of the Preferred Alternative, as well as the potential impacts and benefits of the Project on regional air quality. The analysis will evaluate the Project's impact on motor vehicle emissions due to traffic to and from stations and of locomotives and other sources operating in rail yards. A Tier 2 analysis will also analyze specific construction impacts.

3.5 NOISE AND VIBRATION

This section provides an overview of the potential noise and vibration effects of the Project. It includes an inventory of land use types that are noise- and vibration-sensitive, and the number of potential noise- and vibration-sensitive receptors within the Corridor Alternatives. Noise/vibration-sensitive receptors are locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. Noise sensitive receptors include homes, schools, parks, religious structures, and other locations where noise could potentially be disruptive. Vibration-sensitive receptors are very similar to noise-sensitive receptors, but also include structures where vibrations may disrupt specialized equipment. This section also identifies the number of potential at-grade highway crossings, which may result in additional horn noise impacts, but defers detailed analysis of horn noise to Tier 2.

This Tier 1 EIS identifies potential receptors as a measure of potential impacts. This level of analysis does not indicate a negative noise or vibration impact, but the estimated number of possible noise and vibration receptors located within each Corridor Alternative. A Tier 2 analysis will conduct a detailed noise and vibration analysis of the Preferred Corridor Alternative, and explore noise and vibration impacts related to construction activities and station areas. The Tier 2 analysis will also identify mitigation strategies for the selected alignment, technology, and station areas.

3.5.1 Legal and Regulatory Context

Due to the range of speed and technologies under consideration during this Tier 1 EIS, GDOT has reviewed both FRA's and FTA's guidance for evaluating noise and vibration impacts resulting from rail projects. FRA's guidelines published in High-Speed Ground Transportation Noise and Vibration Impact Assessment[82] provide guidance for determining the potential noise and vibration effects associated with high-speed and conventional speed rail projects with speeds of 90 to 250 miles per hour.

The FTA provides guidance on assessing noise and vibration impacts of proposed mass transit projects in Transit Noise and Vibration Impact Assessment.[83] The purpose of this guidance is to assist with the preparation of NEPA documents. All types of bus and rail transit projects are covered. The guidance contains procedures for assessing impacts at different stages of project development, from early planning, before sponsors select mode and alignment, through preliminary engineering, and final design. The focus is on noise and vibration impacts during operations, but construction impacts are also covered. The FTA guidance describes a range of measures for controlling excessive noise and vibration.

Because this Tier 1 EIS includes a wide range of train speeds, GDOT applied both FRA and FTA methodology and impact criteria.

3.5.2 Methodology

Each Corridor Alternative under study has unique characteristics associated with existing noise and vibration levels. Urban areas generally experience higher noise levels from a variety of sources as compared to rural areas. Higher noise levels are also associated with frequently used rail and highway corridors. In these urban areas and transportation corridors, the introduction of new noise and

[82] https://www.fra.dot.gov/eLib/Details/L04090 *(accessed on 4/20/2018)*

[83] https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/fta-noise-and-vibration-impact-assessment *(accessed 4/20/2018)*

vibration sources is less detectable due to existing sources. GDOT applied FRA and FTA guidance to determine the number of noise and vibration receptors for each Corridor Alternative. Since the existing land uses, development conditions, and the proposed train speed of each Corridor Alternative differ, the specific screening distance for each varies, as explained in the following sections. GDOT collected land use data from county governments in the form of GIS maps and supplemented these maps with aerial imagery to identify noise and vibration receptors.

3.5.2.1 Noise

Due to the range of the three Corridor Alternatives' operating speeds, GDOT applied both FTA's and FRA's noise procedures to this analysis, as described in the previous section. For the Southern Crescent Corridor Alternative, the maximum operating speed ranges between 79 mph and 110 mph; therefore, FTA's procedures are applicable. The I-85 and Greenfield Corridor Alternatives have maximum operating speeds ranging from 125 to 220 mph; therefore, FRA's procedures are applicable for the electric option.

FTA's *Transit Noise and Vibration Impact Assessment* provides screening distances for train speeds less than 110 mph, which is 700 feet (on either side of the centerline) in unobstructed locations and 350 feet (on either side of the centerline) in areas with intervening buildings. GDOT applied this methodology to the Southern Crescent Corridor Alternative only.

For the I-85 and Greenfield Corridor Alternatives, GDOT conducted a preliminary noise evaluation according to the screening procedures outlined in the FRA manual. GDOT applied these procedures to identify locations with noise-sensitive land uses within FRA's recommended screening distances.

GDOT did not assess noise from ancillary sources, such as electrical substations, maintenance facilities, and increased roadway traffic near stations at this stage due to lack of detail and placement of the potential noise sources. GDOT will determine the extent and severity of impacts in a detailed noise assessment during the Tier 2 analysis, when specific alignments and associated infrastructure are known.

FRA recommends screening distances for potential noise impacts based on three variables: train speed, corridor type, and the existing noise environment. These screening distances are summarized here and detailed in Appendix D: Supporting Technical Documentation.

According to FRA guidance, high-speed trains (greater than 110 mph) generate a total wayside noise consisting of several individual noise-generating mechanisms depending on the speed. FRA categorizes these noise sources into three speed regimes:

- Regime I (125 mph or less): propulsion or machinery noise;
- Regime II (between 110 mph and 150 mph): mechanical noise resulting from wheel-rail interactions and/or guideway vibrations and;
- Regime III (greater than 150 mph): aerodynamic noise resulting from airflow moving past the train, including the pantograph.[84]

GDOT used Regime II screening distances for initial screening of noise-sensitive receptors where speeds could potentially exceed 110 mph (with a maximum speed of 150 mph). GDOT used Regime

[84] *Harris, Miller, Miller & Hanson, Inc., Parsons Transportation Group, United States, Office of Railroad Development, High-Speed Ground Transportation Noise and Vibration Impact Assessment (Washington, DC: U.S. Dept. of Transportation, Federal Railroad Administration, Office of Railroad Development, 2006).*

III screening distances in areas where speeds are anticipated to exceed 150 mph. Exhibit 3.5-1 provides a summary of the distances that were used for initial screening.

FRA defines two noise environments: Urban/Noisy Suburban and Quiet Suburban/Rural. FRA further categorizes Urban/Noisy Suburban as either being unobstructed or having intervening buildings. Noise environments relate to density of development and not specifically to land uses. GDOT selected screening distances for each Corridor Alternative based on the assumed speed regime and noise environment. Urban/Noisy Suburban noise environments are generally more densely populated areas, and for this analysis, GDOT relied on the defined Urbanized Area from the 2010 Census. All other areas were defined as Quiet Suburban/Rural. FRA guidance also uses a reduced screening distance where intervening buildings exist, and may block noise. FRA defines intervening buildings as rows of buildings located approximately 200, 400, 600, 800, and 1,000 feet away from the rail centerline. Exhibit 3.5-1 displays FRA's suggested screening distances for noise impacts based on corridor type, existing noise environment, and train speed.

Exhibit 3.5-1: FRA Screening Distances for Noise Assessments

Corridor Type	Existing Noise Environment	Screening Distance in Feet*	
		Regime II (110 mph to 150 mph)	Regime III (>150 mph)
Existing Railroad Corridor	Urban/Noisy Suburban - unobstructed	300 feet	700 feet
	Urban/Noisy Suburban - intervening buildings**	200 feet	300 feet
	Quiet Suburban/Rural	500 feet	1,200 feet
Existing Highway Corridor	Urban/Noisy Suburban - unobstructed	250 feet	600 feet
	Urban/Noisy Suburban - intervening buildings**	200 feet	350 feet
	Quiet Suburban/Rural	400 feet	1,100 feet
New Location	Urban/Noisy Suburban - unobstructed	350 feet	700 feet
	Urban/Noisy Suburban - intervening buildings**	250 feet	350 feet
	Quiet Suburban/Rural	600 feet	1,300 feet

** Measured from centerline of guideway or rail corridor.*

*** Rows of buildings assumed to be at 200, 400, 600, 800, and 1,000 feet parallel to guideway.*

Source: FRA. High-Speed Ground Transportation Noise and Vibration Impact Assessment. Table 4-1.

Once the appropriate screening distances were determined, GDOT identified noise-sensitive land uses within those areas along each Corridor Alternative. The types of land uses that are sensitive to noise impacts, according to FRA, are listed in Exhibit 3.5-2.

Exhibit 3.5-2: FRA Land-Use Categories Sensitive to High-Speed Train Noise

Land Use Category	Description of Land Use Category
1	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, and museums can also be considered to be in this category. Certain historical sites, parks, campgrounds, and recreational facilities are also included.

Source: FRA. High-Speed Ground Transportation Noise and Vibration Impact Assessment. Table 3-2.

3.5.2.2 Vibration

As with the noise analysis, GDOT used FRA's guidance to identify vibration-sensitive land uses close enough to the Corridor Alternative for potential ground-borne vibration impacts to be possible. FRA recommends screening distances based on the proposed train speed, frequency, and land use type, displayed in Exhibit 3.5-3.

Exhibit 3.5-3: Screening Distances for Vibration Assessments

Land Use	Train Frequency*	Screening Distance (feet) By Train Speed		
		Train Speeds < 100 mph	Train Speeds 100 to 200 mph	Train Speeds 200 to 300 mph
Category 1: High-Sensitivity Buildings	Frequent to Occasional	100	160	220
	Infrequent	20	70	100
Category 2: Residential	Frequent or Occasional	120	220	275
	Infrequent	60	100	140
Category 3: Institutional	Frequent or Occasional	100	160	220
	Infrequent	20	70	100

**Frequent or Occasional = greater than 70 pass-bys per day. Infrequent = less than 70 pass-bys per day.*

Source: FRA. High-Speed Ground Transportation Noise and Vibration Impact Assessment. Table 8-1.

FRA guidance outlines three categories of land use. The first category addresses high-sensitivity buildings where vibration will interfere with operations within the building, such as vibration-sensitive electronic research and manufacturing equipment, hospitals with vibration-sensitive equipment, and university research operations. In this application, "residential" land uses include any buildings where people sleep including hotels and hospitals. "Institutional" land uses include schools, places of worship, and other institutions that contain quiet office spaces and do not have vibration-sensitive equipment. FRA's guidance describes "frequent or occasional" operations as 70 or more train pass-bys per day; the frequencies proposed for this Project are fewer than 70 per day, so GDOT applied the "infrequent" screening distances.

3.5.3 Affected Environment

3.5.3.1 Southern Crescent Corridor Alternative

NOISE

The Southern Crescent Corridor Alternative will utilize either diesel trains on shared tracks (maximum speed of 79 mph) or diesel trains on a combination of shared and dedicated tracks (maximum speed of 110 mph). Accordingly, GDOT applied the FTA screening distances for train speeds less than 110 mph, which is 700 feet (on either side of the centerline) in unobstructed locations and 350 feet (on either side of the centerline) where intervening buildings exist. Since FTA recommends using the same screening distance for all speeds less than 110 mph, GDOT's analysis of potential noise-sensitive receptors is the same for both Southern Crescent speed options. Exhibit 3.5-4 shows that 7,544 potential noise receptor impacts could occur within the Southern Crescent Corridor Alternative, exclusive of the Atlanta Approach.

The large number of potential noise receptor impacts is mainly because the Southern Crescent Corridor travels through more urbanized areas with greater development density compared to the other Corridor Alternatives. Most of these urbanized areas have residential neighborhoods, schools, parks, and other noise-sensitive land uses within close proximity to the existing rail corridor. Some older communities located along the Southern Crescent Corridor consist of residences and other structures built especially close to the rail line.

The Southern Crescent is the only Corridor Alternative following an existing rail corridor and including at-grade crossings, which would result in horn noise from approaching trains. The Tier 2 analysis will quantify the number of noise-receptors impacted by horn noise for the Preferred Corridor Alternative, if applicable. The Southern Crescent Corridor currently has 230 at-grade crossings and carries between 14 and 30 freight trains per day, which are generally louder than passenger trains, in addition to two daily Amtrak passenger trains. Train horn noise at the 230 crossings are a common existing condition due to the existing 14 to 30 daily freight trains and two daily Amtrak trains; therefore GDOT anticipates that the additional horn noise from four new daily high-speed passenger trains at these crossings would be minimal.

VIBRATION

For the Southern Crescent Corridor Alternative with diesel trains using shared tracks (maximum speed of 79 mph), GDOT utilized a 20-foot screening distances for institutional and high-sensitivity buildings and a 60-foot screening distance for residential land use. Exhibit 3.5-4 shows that twenty-one potential vibration-receptor impacts could occur with the shared track option.

For the Southern Crescent with diesel trains using a combination of shared and dedicated tracks (maximum speed of 110 mph), GDOT utilized a 20-foot screening distance for institutional land use and high-sensitivity buildings, in areas where train travel speeds are estimated to be below 100 mph. For the same categories, GDOT used a screening distance of and 70 feet where trains speeds are greater than 100 mph. For residential land uses, GDOT used a 60-foot screening distance where train speeds are below 100 mph and 100 feet where speeds are greater than 100 mph. In this Corridor Alternative, GDOT estimates only a few short sections will allow for train speeds greater than 100 mph, topping at 110 mph. Most of these locations are in rural areas with less adjacent development. Even though the screening distance is wider in these areas, there are very few potential vibration receptors. As shown in Exhibit 3.5-4, the shared-dedicated track option generates one additional vibration-sensitive receptor.

Exhibit 3.5-4: Noise- and Vibration-Sensitive Receptors with the Southern Crescent Corridor Alternative

	Noise Receptors		Vibration Receptors	
	Shared Tracks (up to 79 mph)	Shared & Dedicated Tracks (up to 110 mph)	Shared Tracks (up to 79 mph)	Shared & Dedicated Tracks (up to 110 mph)
Georgia*	2,397	2,397	21	22
South Carolina	3,816	3,816	4	4
North Carolina	1,331	1,331	0	0
Total	**7,544**	**7,544**	**25**	**26**

**Excludes Atlanta Approach*
Source: HNTB

3.5.3.2 I-85 Corridor Alternative

NOISE

Compared to the other Corridor Alternatives, I-85 travels through fewer urbanized areas and noise-sensitive land uses are generally further set back from the interstate freeway than they are from longer-established freight railroads. No at-grade crossings are proposed.

For the I-85 Corridor Alternative diesel option (maximum speed of 125 mph), GDOT utilized FRA's Regime II screening criteria to identify 2,906 potential noise receptors. For the I-85 Corridor Alternative using electric rail technology (maximum speed of 180 mph), GDOT utilized FRA's Regime III screening criteria and identified 3,223 potential noise receptors. The geometry along I-85, however, limits the locations where Regime III-level speeds are possible.

Exhibit 3.5-5 summarizes the number of potential noise receptors within the I-85 screening distance. The higher speed associated with the electric option results in a greater number of noise-sensitive receptors than the diesel option, due to the wider screening distance applied to greater speeds.

VIBRATION

GDOT applied the appropriate screening criteria outlined in Exhibit 3.3-4 for speeds less than 100 mph and speeds between 100 and 200 mph. GDOT identified twenty-one vibration-sensitive receptors along the I-85 Corridor Alternative for both speed options, as displayed in Exhibit 3.5-5.

Exhibit 3.5-5: Noise- and Vibration-Sensitive Receptors with the I-85 Corridor Alternative

	Noise Receptors		Vibration Receptors	
	Diesel Option (up to 125 mph)	Electric Option (up to 180 mph)	Diesel Option (up to 125 mph)	Electric Option (up to 180 mph)
Georgia*	1,701	1,773	21	21
South Carolina	376	621	0	0
North Carolina	829	829	0	0
Total	**2,906**	**3,223**	**21**	**21**

**Excludes Atlanta Approach*
Source: HNTB

3.5.3.3 Greenfield Corridor Alternative

NOISE

For the Greenfield Corridor Alternative with diesel technology (maximum speed of 125 mph), GDOT utilized Regime II screening criteria to identify 3,176 noise receptors. For the electric rail technology option (maximum speed of 220 mph), GDOT utilized Regime III screening criteria and identified 5,511 noise receptors. Because of the higher train travel speeds resulting in wider screening distances, this corridor and rail technology combination has the second largest number of noise-sensitive receptors within the specified screening distances, as compared to the other Corridor Alternatives. No at-grade crossings are proposed.

VIBRATION

Under the Greenfield Corridor Alternative with diesel technology (maximum speed of 125 mph), GDOT used a 70-foot screening distance for institutional land use and high-sensitivity buildings, where speeds are between 100 and 200 mph. The screening distance for the same technology and building categories is 20 feet where speeds are below 100 mph. GDOT used a 100-foot screening distance for residential land use where speeds are between 100 and 200 mph, and 60 feet where speeds are below 100 mph. As shown in Exhibit 3.5-6, GDOT identified eighty-two vibration-sensitive receptors under the diesel option.

Under the Greenfield Corridor Alternative electric technology option (maximum speed of 220), GDOT increased the screening distances to 100 feet for institutional and high-sensitivity buildings and 140 feet for residential land use, where speeds are greater than 200 mph. As shown in Exhibit 3.5-6, in the electric technology option with wider screening distances captures more vibration-sensitive receptors than the diesel option.

Exhibit 3.5-6: Noise- and Vibration-Sensitive Receptors within the Greenfield Corridor Alternative

	Noise Receptors		Vibration Receptors	
	Diesel Option (up to 125 mph)	Electric Option (up to 220 mph)	Diesel Option (up to 125 mph)	Electric Option (up to 220 mph)
Georgia*	2,044	2,592	35	51
South Carolina	989	2,390	47	86
North Carolina	143	529	0	1
Total	**3,176**	**5,511**	**82**	**138**

**Excludes Atlanta Approach*
Source: HNTB

3.5.3.4 Atlanta Approaches

Since the selection of an Atlanta approach is deferred to the Tier 2 EIS, GDOT identified and tabulated the potential noise and vibration receptors in each approach separate from the three Corridor Alternatives. To identify noise receptors, GDOT applied FTA's screening criteria for train speeds less than 110 mph since the two options both follow existing freight rail. To identify vibration receptors, GDOT applied screening distances for speeds less than 100 mph and between 100 and 200 mph, where appropriate.

NS APPROACH

Exhibit 3.5-7 summarizes the total number of noise and vibration receptors impacts by each of the three Corridor Alternatives including the NS Atlanta approach.

Exhibit 3.5-7: Noise- and Vibration-Sensitive Receptors within the NS Atlanta Approach

	Noise Receptors		Vibration Receptors	
	Train Speeds up to 79 mph	Train Speeds up to 110 mph	Train Speeds up to 79 mph	Train Speeds up to 110 mph
Southern Crescent	4,328	4,328	0	3
	Diesel Option	**Electric Option**	**Diesel Option**	**Electric Option**
I-85	3,940	3,940	0	0
Greenfield	4,027	4,117	2	7

Source: HNTB

Note: number of receptors reflects only the Atlanta approach portion of each Corridor Alternative

CSX APPROACH

Exhibit 3.5-8 summarizes the total number of noise and vibration receptors impacts by each of the three Corridor Alternatives including the CSX Atlanta approach.

Exhibit 3.5-8: Noise- and Vibration-Sensitive Receptors within the CSX Atlanta Approach

	Noise Receptors		Vibration Receptors	
	Train Speeds up to 79 mph	Train Speeds up to 110 mph	Train Speeds up to 79 mph	Train Speeds up to 110 mph
Southern Crescent with CSX Approach	3,766	3,766	4	11
	Diesel Option	**Electric Option**	**Diesel Option**	**Electric Option**
I-85 with CSX Approach	3,540	3,740	2	5
Greenfield with CSX Approach	3,535	3,735	2	11

Source: HNTB
Note: number of receptors reflects only the Atlanta approach portion of each Corridor Alternative

3.5.3.5 Summary of Corridor Alternatives

Exhibit 3.5-9 shows the numbers of noise and vibration receptors within the applied screening distance for each of the Corridor Alternatives and Atlanta approaches. Unlike the other environmental resources evaluated in this chapter, noise and vibration impacts are highly dependent on train speed; therefore, GDOT evaluated both speed options for each Corridor Alternative. GDOT followed FTA and FRA guidelines for screening distances based on speed and land use characteristics. In all three Corridor Alternatives, the higher speed option generated a greater number of potential impacts.

Exhibit 3.5-9: Noise- and Vibration-Sensitive Receptors Summary

	Noise Receptors		Vibration Receptors	
Corridor Alternative	**Train Speeds up to 79 mph**	**Train Speeds up to 110 mph**	**Train Speeds up to 79 mph**	**Train Speeds up to 110 mph**
Southern Crescent with NS Atlanta Approach	11,872	11,872	25	29
Southern Crescent with CSX Atlanta Approach	11,310	11,310	29	37
	Noise Receptors		**Vibration Receptors**	
Corridor Alternative	**Diesel Option (up to 125 mph)**	**Electric Option (up to 220 mph)**	**Diesel Option (up to 125 mph)**	**Electric Option (up to 220 mph)**
I-85 with NS Atlanta Approach	6,846	7,163	21	21
I-85 with CSX Atlanta Approach	6,446	6,963	23	26
Greenfield with NS Atlanta Approach	7,203	9,628	84	145
Greenfield with CSX Atlanta Approach	6,711	9,246	84	149
Source: HNTB				

3.5.4 Environmental Consequences

3.5.4.1 No-Build Alternative

The No-Build Alternative assumes no new passenger rail between Atlanta and Charlotte. Passenger service between the two cities would consist of existing rail and bus service, air travel, and continued automobile use along the highway system. The No-Build Alternative would not increase rail capacity or expand rail service. The No-build Alternative would not meet the Purpose and Need for the Project. In general, the noise and vibration levels along the major highway corridors are likely to increase in the future, primarily due to heavier volumes of vehicular traffic in the No-Build Alternative. As the geographic scope and nature of any No-Build Alternative projects would be limited, the potential effects of the projects are likely to be contained to the vicinity of the individual construction projects.

3.5.4.2 Corridor Alternatives

All three Corridor Alternatives have noise- and vibration-sensitive land uses that could be affected by new passenger rail operations. The Southern Crescent Corridor Alternative has the most noise receptors, while the I-85 Corridor Alternative has the least. This could be because development along I-85 consists of land uses more compatible with highway operations and associated noise. The I-85 Corridor Alternative also has the fewest vibration receptors within the screening distance, while the Greenfield has the most. Due to the Greenfield's rural setting, however, there are fewer high-sensitivity buildings than in other Corridor Alternatives. Residential development constitutes the majority of vibration receptors in the Greenfield Corridor Alternative.

Following FRA's and FTA's guidance, GDOT used wider screening distances where higher speeds are possible, resulting in a greater number of impacts. For the Greenfield, which is the only Corridor Alternative that operates at speeds greater than 200 mph, this means 145 or 149 potential vibration receptors, substantially greater than the other Corridor Alternatives, which were evaluated using much smaller screening distances.

The Southern Crescent is the only Corridor Alternative with at-grade roadway crossings, resulting in potential horn noise impacts. GDOT identified 230 potential at-grade crossings, which are all existing

crossings used by freight trains today. The Tier 2 analysis will further explore these potential impacts of horn noise, if relevant to the selected Corridor Alternative. The detailed analysis for noise and vibration performed during the Tier 2 EIS would also quantify the differences in impact between diesel and electric technologies.

3.5.4.3 Construction

Typical construction activities may include, but are not limited to, track-laying and relocation, station construction, and construction of parking facilities. Noise and vibration levels from construction activities for the Corridor Alternatives would be temporary. The potential for exposure to construction-related noise and vibration levels varies depending on the types of construction and the types of equipment used for each stage of work. This topic will be explored during a Tier 2 EIS.

3.5.5 Potential Mitigation

3.5.5.1 Potential Noise Mitigation Strategies

The Tier 2 analysis will include a detailed noise analysis, including quantifying potential noise effects. In the Tier 2 analysis, GDOT will also examine specific strategies to avoid and minimize noise effects for feasibility and incorporate them as necessary into the Project as design progresses. The Tier 1 EIS identifies the following noise control and mitigation strategies that could apply to a high-speed passenger rail project:

- Install noise barriers – depending on the height and location relative to the tracks, noise barriers can achieve between 5 and 15 dB (decibel) on noise reduction. The primary requirements for an effective noise barrier are that the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver, be of an impervious material with a minimum surface density of 4 pounds per square foot, and not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for the construction of noise barriers. Depending on the situation, noise barriers can become visually intrusive, which the Tier 2 analysis would take into consideration. Coordination with affected communities and property owners will be required to determine the appropriateness of noise barriers.
- Building sound insulation – sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a potential mitigation measure. Although this approach has no effect on noise in exterior areas, it can provide noise reduction for residential/institutional interiors, which can be especially important where noise barriers are not feasible or desirable for buildings where indoor sensitivity is of serious concern. The Tier 2 analysis will further evaluate sound insulation based on noise impact analysis of the refined alignment and train technology, and in accordance with applicable GDOT, SCDOT, NCDOT, and FRA policies on noise abatement.
- Source Treatments – source treatments include measures to reduce noise through the train vehicles and rails, due to materials and quality of construction of wheels, the vehicle body type, propulsion and ventilation systems used, and materials and quality of construction of the vehicle guideway support. For instance, the use of continuously welded rail may produce less wayside noise than jointed rail. In the procurement of a high-speed passenger rail vehicle, the Project can set performance limits for noise levels in order to reduce community noise effects throughout the corridor. The types of technology available and cost considerations will inform the potential to

reduce the noise throughout the corridor through various vehicle and guideway design considerations. Specific potential source treatments will be determined in Tier 2.

- Quiet Zones – provided sufficient infrastructure is in place, local governments and public agencies can apply to FRA to create Quiet Zones to reduce horn-sounding noise in local communities, in accordance with 49 CFR Part 222, known as the Train Horn Rule. Quiet Zones can eliminate the use of horns at certain crossings or restrict horns during certain times of day. Additional advance warning signage may be required along roadways approaching grade crossings in Quiet Zones. The use of pole-mounted warning horns, or wayside horns, at grade crossings are also possible mitigation efforts. Pole-mounted horns are activated by an approaching train and make sound until the train reaches said crossing, thereby reducing the extent and duration of the noise impact.
- Grade Separations - the Southern Crescent includes 230 potential at-grade roadway crossings. Grade separating crossings can mitigate the need for horn noise.
- Routine Maintenance: conducting routine maintenance on rails and wheels, including wheel truing, can reduce wayside noise.

3.5.5.2 Potential Vibration Mitigation Strategies

Resilient track design can help control ground-borne vibration that exceeds the FRA effect criteria. Depending on the track design, there are different methods to control vibration. For steel-wheel slab track, resilient direct fixation fasteners are an option for mitigation. For ballast and tie track, shredded tire aggregate or rubber ballast mats are appropriate mitigation. Specific mitigation for the selected Corridor Alternative and technology selected will be determined in the Tier 2 analysis.

3.5.6 Subsequent Analysis

The Tier 2 analysis will include a detailed noise and vibration evaluation for the selected Corridor Alternative. In the Tier 2 analysis, GDOT will recommend an alignment within the Preferred Corridor Alternative, along with the preferred technology, exact station and maintenance facility locations, and the necessary infrastructure to support these facilities. The analysis will identify the noise and vibration levels from the new high-speed rail service, including the proposed number of locomotives necessary for efficient operations, proposed efficient speeds, and proposed hours of operations. The Tier 2 analysis will evaluate the effects of the related electrical substations, the passenger stations, and maintenance facility operations. If the selected Corridor Alternative has at-grade roadway crossings, the Tier 2 analysis will evaluate potential horn noise impacts and mitigation. It will also quantify specific noise and vibration effects, identify strategies for avoidance and mitigation of those effects, and make final recommendations. Noise and vibration control measures will comply with all applicable Federal, state, and local construction regulations.

3.6 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section broadly describes the socioeconomic conditions and environmental justice (EJ) populations within the 1,000-foot wide screening area for each of the three Corridor Alternatives. It also presents the potential effects of the Project on these conditions and populations. As the proposed station locations vary among the Corridor Alternatives, distinguishing factors potentially include the specific populations, employment areas, and EJ populations in proximity to proposed station locations. The ratio of EJ populations to non-EJ populations in each Corridor Alternative varies. This section also broadly describes the potential effects to population, employment, demographic characteristics, neighborhoods, community resources, community disruption or cohesion, and commerce. The detailed impacts such as property acquisitions or displacements, and effects on children, per Executive Order 13045-Protection of Children from Environmental Health and Safety Risks, would be further evaluated in the Tier 2 analysis.

3.6.1 Legal and Regulatory Context

Council on Environmental Quality (CEQ) Regulations Implementing NEPA (40 CFR Section 1500 et. seq.): Section 1502.1 states that the Federal government must fully and fairly discuss significant environmental impacts and the reasonable alternatives that avoid or minimize those effects on the human environment. Section 1508.27 requires Federal agencies to consider the significance of the impacts from a proposed action by considering the intensity and context of the impacts.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629, February 11, 1994): Requires Federal agencies to provide public involvement for low-income or minority populations. This includes demographic analysis identifying and addressing potential action impacts on low-income or minority populations that may experience a disproportionately high and adverse effect.

U.S. Department of Transportation (DOT) Order 5610.2(a), Environmental Justice in Minority and Low-Income Populations, published April 15, 1997: Outlines the DOT's commitment to the principles of environmental justice and presents a program for department-wide implementation.

Environmental Justice: Guidance Under the National Environmental Policy Act, published December 10, 1997: Presents CEQ's guidance on addressing environmental justice issues under the National Environmental Policy Act of 1969, as amended (NEPA).

Final Guidance for Consideration of Environmental Justice in Clean Air Act 309 Reviews, published July 1999: Provides EPA guidance and answers often-asked questions about environmental justice[85].

3.6.2 Methodology

3.6.2.1 Socioeconomics

GDOT analyzed historic and projected population and employment data for each of the counties containing one or more of the three Corridor Alternatives, as displayed in Exhibit 3.6-1. The purpose of this analysis is to document shifting population and employment concentrations over time and to provide a high-level estimation of each Corridor Alternative's ability to serve areas of greater population and employment concentrations. GDOT collected historic population data from the U.S.

[85] https://www.epa.gov/sites/production/files/2014-08/documents/enviro_justice_309review.pdf

Census Bureau and historic employment data from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) for the years 1970 through 2010. The employment data presented here represents the number of full- and part-time jobs by place of work. Woods and Poole Economics projected population, employment, median age, income, and household size at the county level for the year 2040 using historic data from the Census and BEA. To account for inflation, income projections are presented in 2005 dollars.

Exhibit 3.6-1: Listing of Counties within Corridor Alternatives

County	State	Southern Crescent with NS Approach	Southern Crescent with CSX Approach	I-85 with NS Approach	I-85 with CSX Approach	Greenfield with NS Approach	Greenfield with CSX Approach
Banks	GA	x	x	x	x		
Barrow	GA		x	x	x	x	x
Clarke	GA					x	x
Clayton	GA	x	x	x	x	x	x
DeKalb	GA	x	x	x	x	x	x
Elbert	GA					x	x
Franklin	GA			x	x		
Fulton	GA	x	x	x	x	x	x
Gwinnett	GA	x	x	x	x	x	x
Habersham	GA	x	x				
Hall	GA	x	x			x	x
Hart	GA			x	x		
Jackson	GA		x	x	x	x	x
Madison	GA					x	x
Stephens	GA	x	x				
Cleveland	NC	x	x	x	x		
Gaston	NC	x	x	x	x	x	x
Mecklenburg	NC	x	x	x	x	x	x
Anderson	SC			x	x	x	x
Cherokee	SC	x	x	x	x	x	x
Greenville	SC	x	x	x	x	x	x
Laurens	SC					x	x
Oconee	SC	x	x				
Pickens	SC	x	x				
Spartanburg	SC	x	x	x	x	x	x
York	SC					x	x

3.6.2.2 Environmental Justice

The EJ analysis identifies the presence of minority and low-income populations within the 1,000-foot wide screening areas for each of the three Corridor Alternatives. Minority populations include persons who are American Indian or Alaska Native, black or African American, Hispanic or Latino, and

Native Hawaiian or other Pacific Islander. Low-income populations are defined as persons whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines. The 1,000-foot width is intended to encompass and account for the improvements that would be associated with each of the alternatives, including infrastructure improvements (such as embankments, aerial structures, and track improvements), ancillary facilities (such as stations, substations, yards, and parking structures), or service changes.

GDOT identified minority populations using U.S. Census Bureau Census 2010 block group-level data for race and ethnicity, collected from the American Community Survey (ACS) 5-year Estimate. Similarly, GDOT identified low-income populations using ACS 5-year Estimates 2010 block group-level data for persons living below the poverty level. The classification of census block groups was based on criteria provided in the CEQ's 1997 guidance on environmental justice analysis in NEPA documents. Based on this guidance, a block group contains a high concentration of either minority or low-income population if:

- At least 50 percent of the population in the census tract is minority or low-income; or,
- The minority or low-income population in the tract is "meaningfully greater" than the average of the minority or low-income population in the county in which the tract is located. For this Tier 1 EIS, a census tract meets the "meaningfully greater" threshold if the percentage of minority or low-income residents is 50 percent, or higher than the percentage in the corresponding county.

3.6.3 Affected Environment

3.6.3.1 Socioeconomics

The socioeconomic factors included in this section include population, employment, age, income, household size, community facilities, and environmental justice, which includes minority and low-income populations.

POPULATION

Exhibit 3.6-2 shows the populations and population growth for each county within one or more of the three Corridor Alternatives, between 1970 and 2010. There are 26 counties included in the Study Area evaluation. Of the 26, there are five counties whose 2010 populations are approaching or have exceeded 500,000. In the south end of the Study Area, the counties with the largest populations are DeKalb, Fulton, and Gwinnett Counties in the Atlanta metropolitan area. In the north end, Mecklenburg County, NC is home to nearly one million people and Greenville County, SC is nearly 500,000 people. For each decade evaluated, the total population of the 26 counties included generally grew by about 21 percent. Some of the counties with the greatest growth rates over the 1970-2010 time period were in the northeastern Atlanta suburbs, like Gwinnett (998%), Barrow (311%), and Hall (201%). Counties with the lowest average growth rates tend to be more rural, like Elbert (17%), Stephens (28%), Laurens (34%), Cleveland (34%), and Gaston (39%).

Exhibit 3.6-2: Historic and Existing Population by County, 1970 - 2010

County	State	1970	1980	1990	2000	2010
Banks	GA	6,833	8,714	10,379	14,544	18,415
Barrow	GA	16,986	21,477	30,106	46,520	69,731
Clarke	GA	65,557	75,023	88,058	102,401	116,668
Clayton	GA	99,857	151,298	182,769	238,079	259,623
DeKalb	GA	420,318	483,875	549,655	668,271	692,902
Elbert	GA	17,235	18,791	18,981	20,464	20,112
Franklin	GA	12,837	15,243	16,705	20,314	22,048
Fulton	GA	604,835	591,977	650,697	816,190	926,197
Gwinnett	GA	73,664	169,432	356,979	595,584	808,719
Habersham	GA	20,823	25,098	27,799	36,095	43,080
Hall	GA	59,919	76,101	96,215	140,993	180,253
Hart	GA	15,888	18,604	19,825	23,046	25,217
Jackson	GA	21,242	25,469	30,195	41,845	60,706
Madison	GA	13,670	17,814	21,214	25,800	28,167
Stephens	GA	20,424	21,823	23,474	25,482	26,193
Cleveland	NC	72,979	83,456	85,221	96,357	98,050
Gaston	NC	148,879	163,095	175,132	190,679	206,213
Mecklenburg	NC	355,716	406,202	515,605	700,458	923,427
Anderson	SC	106,167	133,900	145,538	166,304	187,269
Cherokee	SC	36,738	41,056	44,657	52,649	55,397
Greenville	SC	242,196	289,109	321,857	380,949	452,859
Laurens	SC	49,602	52,468	58,423	69,428	66,500
Oconee	SC	41,032	48,864	57,699	66,434	74,359
Pickens	SC	59,446	79,734	94,470	111,062	119,217
Spartanburg	SC	174,560	203,673	227,580	254,443	284,713
York	SC	86,027	107,292	132,348	165,620	226,971
Total		2,843,430	3,329,588	3,981,581	5,070,011	5,993,006
Percent Change from Previous Decade		--	17%	20%	27%	18%
Source: U.S. Census						

EMPLOYMENT

Exhibit 3.6-3 shows employment growth from 1970 to 2010 using U.S. Census data. The Atlanta metropolitan area is the economic engine of Georgia. The counties within the Corridor Alternatives that have the greatest employment levels are in metropolitan Atlanta (Gwinnett, Fulton, and Clayton Counties), Charlotte (Mecklenburg County), and Greenville (Greenville County). On average, the 26 counties evaluated experienced 31-35 percent growth in employment each decade between 1970 and 2000. Between 2000 and 2010, employment in the same counties only grew by average of five percent, likely due to the Great Recession during the late 2000s. The counties with the greatest rate of employment growth between 1970 and 2010 are: Gwinnett (2,044%), Clayton (409%), Banks (350%), Barrow (252%), Mecklenburg (220%), and Hall (216%).

Exhibit 3.6-3: Historic and Existing Employment by County, 1970 - 2010

County	State	Employment				
		1970	1980	1990	2000	2010
Banks	GA	2,007	2,763	3,852	6,336	9,039
Barrow	GA	7,137	9,666	11,751	18,029	25,101
Clarke	GA	36,102	48,542	62,324	75,611	84,336
Clayton	GA	28,664	59,908	102,791	140,061	146,003
DeKalb	GA	153,800	251,100	346,873	410,987	437,556
Elbert	GA	7,558	8,996	9,586	9,880	9,040
Franklin	GA	5,173	6,164	8,365	11,696	11,617
Fulton	GA	490,433	590,837	709,581	903,380	896,220
Gwinnett	GA	17,512	58,894	181,330	349,854	375,440
Habersham	GA	8,666	11,766	15,687	18,672	18,514
Hall	GA	29,688	39,846	55,487	81,481	93,830
Hart	GA	5,925	7,232	9,833	10,771	9,312
Jackson	GA	8,222	9,325	13,010	20,159	23,585
Madison	GA	2,694	3,929	4,803	7,234	7,741
Stephens	GA	9,629	11,199	13,064	13,538	12,513
Cleveland	NC	33,385	39,777	44,144	46,868	41,891
Gaston	NC	69,787	82,989	95,449	99,292	91,507
Mecklenburg	NC	214,018	291,243	433,620	608,751	684,021
Anderson	SC	47,457	60,109	67,977	84,571	84,790
Cherokee	SC	13,958	18,267	21,931	25,820	23,198
Greenville	SC	124,669	172,492	228,056	288,306	305,843
Laurens	SC	21,178	23,392	24,923	26,626	25,548
Oconee	SC	20,755	22,704	30,991	32,421	30,582
Pickens	SC	25,003	35,389	43,067	48,137	49,912
Spartanburg	SC	83,175	106,595	129,391	148,023	148,324
York	SC	38,137	47,723	61,434	77,815	99,715
Total		1,504,732	2,020,847	2,729,320	3,564,319	3,745,178
Percent Change from Previous Decade		--	34%	35%	31%	5%

Source: Woods and Poole Economics

Generally, much of the population and employment growth occurred in either metro-Atlanta, Charlotte, or Greenville, and along the I-85 corridor.

POPULATION AND EMPLOYMENT PROJECTIONS

Exhibit 3.6-4 summarizes population and employment projections for the year 2040 by county for each of the 26 counties touched by one or more of the three Corridor Alternatives. Overall, for all counties studied, population and employment by 2040 are projected to grow by 52 percent and 61 percent, respectively. The counties with the greatest growth projections are: DeKalb (GA), Fulton (GA), Gwinnett (GA), Greenville (SC), and Mecklenburg (NC). Summing the counties within each of the Corridor Alternatives proves very little difference in the growth rates among the three. But the Greenfield Corridor counties contain slightly more population and employment than the other two.

Exhibit 3.6-4: Projected Population and Employment Growth by County, 2010 - 2040

County	State	Population			Employment		
		2010	2040	Growth	2010	2040	Growth
Banks	GA	18,415	30,167	64%	9,039	15,155	68%
Barrow	GA	69,731	108,637	56%	25,101	39,682	58%
Clarke	GA	116,668	138,907	19%	84,336	114,687	36%
Clayton	GA	259,623	378,719	46%	146,003	233,132	60%
DeKalb	GA	692,902	878,552	27%	437,556	655,337	50%
Elbert	GA	20,112	19,793	-2%	9,040	9,464	5%
Franklin	GA	22,048	24,991	13%	11,617	14,900	28%
Fulton	GA	926,197	1,176,203	27%	896,220	1,315,105	47%
Gwinnett	GA	808,719	1,740,454	115%	375,440	760,915	103%
Habersham	GA	43,080	48,727	13%	18,514	23,262	26%
Hall	GA	180,253	259,18	44%	93,830	144,843	54%
Hart	GA	25,217	30,023	19%	9,312	12,727	37%
Jackson	GA	60,706	87,860	45%	23,585	36,543	55%
Madison	GA	28,167	39,387	40%	7,741	11,185	44%
Stephens	GA	26,193	28,229	8%	12,513	14,678	17%
GA subtotal		3,298,031	4,989,829	51%	2,159,847	3,401,615	57%
Cleveland	NC	98,050	119,186	22%	41,891	53,782	28%
Gaston	NC	206,213	253,355	23%	91,507	117,977	29%
Mecklenburg	NC	923,427	1,698,408	84%	684,021	1,283,513	88%
NC subtotal		1,227,690	2,070,949	69%	817,419	1,455,272	78%
Anderson	SC	187,269	284,899	52%	84,790	136,045	60%
Cherokee	SC	55,397	65,853	19%	23,198	32,484	40%
Greenville	SC	452,859	627,171	38%	305,843	478,346	56%
Laurens	SC	66,500	73,413	10%	25,548	31,703	24%
Oconee	SC	74,359	88,736	19%	30,582	42,871	40%
Pickens	SC	119,217	183,583	54%	49,912	81,499	63%
Spartanburg	SC	284,713	374,197	31%	148,324	217,576	47%
York	SC	226,971	361,485	59%	99,715	157,741	58%

County	State	Population			Employment		
		2010	2040	Growth	2010	2040	Growth
SC subtotal		1,467,285	2,059,337	40%	767,912	1,178,265	53%
All Counties Total		**5,993,006**	**9,120,115**	**52%**	**3,745,178**	**6,035,152**	**61%**
Crescent Corridor Counties Total		5,169,617	7,691,540	49%	3,369,393	5,470,475	63%
Crescent Corridor Counties with CSX Approach Total*		5,300,054	7,888,037	49%	3,413,079	5,546,700	63%
I-85 Corridor Counties Total		5,285,062	8,150,994	54%	3,393,941	5,527,589	62%
Greenfield Corridor Counties Total		5,341,660	8,228,679	54%	3,452,179	5,604,480	62%

Source: Woods and Poole Economics
Note: The Southern Crescent Corridor Alternative with the CSX Atlanta Approach contains two additional counties, Barrow and Jackson, that are not included in the Southern Crescent with NS Approach.

AGE, INCOME AND HOUSEHOLD SIZE

Exhibit 3.6-5 presents projected changes to median age, per capita income, and household size between the years 2010 and 2040. Projections in Exhibit 3.6-5 indicate a small increase in median age, a 59 percent increase in per capita income, and a slight reduction in household size. Results at the state and county levels show a wider fluctuation in these variables. The Greenfield Corridor Alternative counties have a slightly greater increase in average age (1.8 years) than the other two Corridor Alternatives, but the other metrics are very similar among the three Corridor Alternatives.

Exhibit 3.6-5: Projected Demographic Data Changes by County, 2010 - 2040

County	State	Median Age (Years)		Per Capita Income (2005 dollars)		Persons per Household	
		2010	2040	2010	2040	2010	2040
Banks	GA	38.46	40.27	26,212	35,828	2.75	2.71
Barrow	GA	33.63	35.78	26,771	40,151	2.88	2.84
Clarke	GA	25.90	46.87	23,618	37,216	2.37	2.33
Clayton	GA	31.61	34.20	23,921	34,589	2.82	2.78
DeKalb	GA	34.30	36.39	36,986	62,015	2.50	2.46
Elbert	GA	41.01	43.07	26,255	41,298	2.47	2.44
Franklin	GA	40.81	43.60	26,246	43,232	2.51	2.48
Fulton	GA	34.19	36.14	51,963	76,759	2.36	2.33
Gwinnett	GA	33.72	32.79	29,976	48,930	2.98	2.93
Habersham	GA	38.58	39.87	25,464	39,721	2.63	2.59
Hall	GA	34.52	35.61	28,513	43,650	2.91	2.87
Hart	GA	42.60	46.49	23,573	36,198	2.43	2.39

County	State	Median Age (Years)		Per Capita Income (2005 dollars)		Persons per Household	
		2010	2040	2010	2040	2010	2040
Jackson	GA	37.08	37.70	27,541	41,856	2.80	2.76
Madison	GA	39.39	42.25	27,271	39,182	2.66	2.62
Stephens	GA	40.76	42.79	27,311	44,723	2.49	2.45
GA average		36.44	39.59	28,775	44,357	2.64	2.60
Cleveland	NC	40.34	42.40	28,430	47,823	2.49	2.48
Gaston	NC	38.91	41.01	30,764	49,955	2.54	2.53
Mecklenburg	NC	33.90	33.48	39,306	66,389	2.50	2.49
NC Average		37.72	38.96	32,833	54,722	2.51	2.50
Anderson	SC	39.73	39.08	28,149	41,800	2.50	2.50
Cherokee	SC	38.28	37.07	23,140	36,826	2.54	2.54
Greenville	SC	37.20	35.77	33,396	54,358	2.49	2.49
Laurens	SC	39.85	38.45	26,709	41,484	2.51	2.51
Oconee	SC	43.40	38.99	29,314	46,894	2.39	2.39
Pickens	SC	34.88	38.61	25,592	40,659	2.48	2.48
Spartanburg	SC	38.04	34.93	28,333	43,916	2.53	2.53
York	SC	37.22	37.90	31,046	46,599	2.59	2.58
SC Average		38.58	37.60	28,210	44,067	2.50	2.50
All Counties Average		37.58	38.72	29,939	47,715	2.55	2.53
Southern Crescent Corridor Counties Average		36.94	37.52	30,538.8	48,314.7	2.59	2.57
Southern Crescent with CSX Approach		36.79	37.46	30,209.4	47,121.0	2.58	2.56
I-85 Corridor Counties Average		37.28	38.04	29,978.5	47,121.0	2.58	2.56
Greenfield Corridor Counties Average		36.64	38.45	30,114.5	47,021.8	2.56	2.54

Source: Woods and Poole Economics

COMMUNITY FACILITIES

GDOT identified community facilities within the Corridor Alternatives using state-level databases from Georgia, South Carolina, and North Carolina.[86] The environmental screening area for purposes of this analysis consists of a 600-foot wide area centered along each Corridor Alternative, to represent actual physical impacts of the Project on existing community facilities. Exhibit 3.6-6 provides a listing of the type and number of community facilities identified within the three Corridor Alternatives; GDOT identified 489 facilities total.

Exhibit 3.6-6: Community Facility Inventory

Facility	Number	Facility	Number	Facility	Number
Amphitheatre	1	EMS	2	Park	51
Arena	1	EMS and Fire	4	Police Station	16
Auditorium	1	Fire Station	13	Post Office	10
Cemetery	43	Golf Course	7	Recreation Facility	28
Church	193	Hospital	7	School	40
City Hall	1	Library	16	Theatre	6
College	13	Medical	17	Town Hall	1
Courthouse	1	Meeting Hall	3	**TOTAL**	**489**
Daycare	11	Museum	3		

Source: ESRI; Georgia GIS; South Carolina GIS; NC One Map; Google Maps

Exhibit 3.6-7 lists the number of community facilities within each of the Corridor Alternatives and Atlanta Approach combinations. The Southern Crescent Corridor Alternative contains the greatest number of facilities, while the Greenfield Corridor Alternative contains the least.

Exhibit 3.6-7: Community Facility Summary by Corridor Alternative

Corridor Alternative	Number of Community Facilities
Crescent Corridor with NS Atlanta Approach	366
Crescent Corridor with CSX Atlanta Approach	354
I-85 Corridor with NS Atlanta Approach	187

[86] *"Base Map Data." ESRI, 2008. DVD.*

"Clearinghouse: Map Data & Aerial Photography." Georgia GIS. Georgia GIS, n.d. Web. https://data.georgiaspatial.org/index.asp (accessed on 05/23/2016)

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"GeoSpatial Portal." NC One Map, Version 1.2.2. NC One Map, n.d. Web, http://data.nconemap.gov/geoportal/catalog/main/home.page(accessed on 05/23/2016)

Corridor Alternative	Number of Community Facilities
I-85 Corridor with CSX Atlanta Approach	185
Greenfield Corridor with NS Atlanta Approach	120
Greenfield Corridor with CSX Atlanta Approach	116
Source: ESRI; Georgia GIS; South Carolina GIS; NC One Map; Google Maps	

3.6.3.2 Environmental Justice

Exhibit 3.6-8 shows 2010 U.S. Census minority and low-income characteristics for all counties in the three Corridor Alternatives, collected from the American Community Survey 5-year update. The total population in these counties that identify themselves as minority is 2,663,519, or 46 percent of the total population; 851,283 persons, or 15 percent of the total population, meet the definition of low-income. Definitions of these protected groups are described in the Methodology within Section 3.6.2.2. Higher concentrations of minority populations exist in Clayton, DeKalb, Fulton, and Gwinnett Counties in Georgia, which are part of the Atlanta metropolitan area. Generally, counties outside metropolitan Atlanta and Charlotte have smaller minority populations than the rest of the counties evaluated.

The highest percentage of low-income population among the 26 counties is in Clarke County, GA, at 31 percent. Clarke County, GA, includes the University of Georgia, which has a large student body living off campus. Low- income populations do not include students living in dormitories, but does include students living in off-campus housing.[87] The counties with the next greatest percentage of low-income populations are located in mostly rural areas: Elbert (GA), Hart (GA), and Union (SC). See Appendix A: Map Books for EJ populations mapped.

Exhibit 3.6-8: 2010 EJ Population Characteristics by County

County	Minority Population	Percent Minority Population	Low-Income Population	Percent Low-Income Population
Georgia				
Banks	1,808	10%	2,833	16%
Barrow	16,126	24%	8,295	13%
Clarke	48,492	42%	35,134	31%
Clayton	219,072	84%	42,408	16%
DeKalb	481,346	70%	107,715	16%
Elbert	7,286	36%	4,657	23%
Franklin	3,028	14%	3,883	18%
Fulton	514,966	58%	131,531	15%
Gwinnett	413,526	53%	85,096	11%
Habersham	8,034	19%	7,410	18%
Hall	62,078	35%	25,132	14%
Hart	5,855	23%	5,477	22%

[87] *U.S. Census Bureau website (accessed 1/25/2018):*

https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2010_ACSSubjectDefinitions.pdf

County	Minority Population	Percent Minority Population	Low-Income Population	Percent Low-Income Population
Jackson	9,391	16%	8,677	15%
Madison	3,752	13%	4,888	18%
Stephens	4,117	16%	4,636	18%
South Carolina				
Anderson	38,145	21%	28,348	15%
Cherokee	13,934	25%	10,581	19%
Greenville	125,587	29%	59,885	14%
Laurens	20,475	31%	12,430	19%
Oconee	9,974	14%	12,008	16%
Pickens	14,522	12%	18,115	15%
Spartanburg	81,408	29%	40,096	14%
Union	9,757	34%	5,681	20%
York	57,359	27%	26,422	12%
North Carolina				
Cleveland	24,824	25%	18,439	19%
Gaston	47,023	23%	33,210	16%
Mecklenburg	421,634	48%	108,296	12%
Total	2,653,762	45%	845,602	14%

Exhibit 3.6-9 shows the number of census tracts within each Corridor Alternative that meet EJ criteria for low-income and minority populations. This information is also mapped in the Appendix A map book.

Exhibit 3.6-9: EJ Census Block Groups by Corridor Alternative

Corridor Alternative	Number of Census Block Groups Meeting EJ Criteria	
	Minority Population	Low-Income Population
Southern Crescent Corridor with NS Atlanta Approach	173	132
Southern Crescent Corridor with CSX Atlanta Approach	167	118
I-85 Corridor with NS Atlanta Approach	126	80
I-85 Corridor with CSX Atlanta Approach	125	71
Greenfield Corridor with NS Atlanta Approach	93	56
Greenfield Corridor with CSX Atlanta Approach	55	47
Source: U.S. Census Bureau		

The following data summarizes the EJ block groups within each of the three Corridor Alternatives, exclusive of the Atlanta Approach.

- The Southern Crescent Corridor intersects 387 total block groups, 35.7percent of which meet the EJ criteria for minority population and 29.7 percent of which meet the EJ criteria for low-income population.
- The I-85 Corridor intersects 299 block groups, 32.8 percent meet the EJ criteria for minority population and 22.7 percent meet the criteria for low-income population.
- Greenfield Corridor: intersects 247 block groups, 26.3 percent meet the EJ criteria for minority population and 17.8 percent meet the criteria for low-income population.

This data demonstrates that the Southern Crescent Corridor, which contains more urban and developed areas, has greater concentrations of minority and low-income population. The Greenfield Corridor, which traverses more rural areas, contains fewer block groups meeting EJ criteria than the other two Corridor Alternatives. The EJ findings in Exhibit 3.6-9 are in line with the previously presented county-level socioeconomic data in Exhibit 3.6-8, which reveals more diverse populations in the Southern Crescent Corridor Alternative.

3.6.4 Environmental Consequences

3.6.4.1 No-Build Alternative

The No-Build Alternative assumes the rail connection would not be built between Atlanta and Charlotte. Passenger service between the two cities would consist of existing bus services, air travel, and continued automobile use along I-85. As the geographic scope and nature of the No-Build Alternative projects is limited, the potential effects of the projects are likely to be limited to the area in which the Project is located. The No-Build Alternative would have no additional direct effects to population and employment growth beyond what is projected. The limited scale of other planned transportation projects would have minimal impact on economic development. In the No-Build Alternative, all populations, including EJ populations, may experience changes in mobility with the existing transportation network due to increased demand associated with population and employment growth over time. The limited scope of other planned transportation improvements may not adequately address future needs, and all populations would be impacted by increased congestion. The added mobility benefits of rail would not be provided in the No-Build Alternative.

3.6.4.2 Corridor Alternatives

POPULATION AND EMPLOYMENT

Each of the Corridor Alternatives would improve mobility in the region by adding a new mode of transportation to increase accessibility to employment, air transportation, and opportunities for education, recreation, and commercial facilities. While all Corridor Alternatives serve the same end points, they don't all serve the same intermediate populations. For example, only the Greenfield Corridor serves Athens. Therefore, depending on the Corridor Alternative, different populations would receive the accessibility benefits from the proposed service.

Population and employment levels within the Study Area are expected to increase by 2040. The largest population and employment growth is expected to occur within Gwinnett County (Metro-Atlanta) and Mecklenburg County (Metro-Charlotte). Population and employment levels could further grow due to land development occurring at proposed station locations and along the corridor as an indirect effect of the Project.

Populations along the Corridor Alternatives could experience either potential direct effects such as property acquisition or physical alternations to property, or proximity effects, such as noise, access, or visual effects. Visual and noise effects could be more noticeable along sections of elevated rail or guideway and in areas adjacent to storage yards or stations.

ECONOMIC DEVELOPMENT AND GROWTH

The potential of the Corridor Alternatives to affect economic development, compared to the No-Build Alternative, was assessed in two ways: first by considering the potential for contingent development that could occur surrounding proposed station locations, and second, but more broadly, by considering development triggered by improved market access conditions across the entire transportation network within the Study Area. The potential market access improvement that would be offered by the Corridor Alternatives matters to existing and prospective employers as they gauge their competitive reach into supplier, customer, and labor markets. Wider market reach results in productivity and cost benefits, which ultimately support job growth greater than the No-Build Alternative.

The potential growth in population resulting from the potential increase in economic activity also would affect the public sector by increasing tax revenues while also increasing the need for educational, health care, and recreational facilities. Potential economic impacts would tend to be localized and stem from indirect effects such as changes in land use that, in turn, would cause economic activity shifts, or land takings in settings with a lack of available parcel to accommodate business relocations or future intended development. Potential direct localized economic effects could result if motor vehicle traffic must be re-routed such that access to businesses and general mobility is affected.

ENVIRONMENTAL JUSTICE

As described previously, not all Corridor Alternatives serve the same proposed station locations or EJ populations. The highest percentage of minority EJ census block groups are located in Clayton, DeKalb, Fulton, and Gwinnett counties in Georgia and in Mecklenburg County in North Carolina, all of which could be served by each Corridor Alternative. The county with the highest percentage of low-income population is Clarke County, Georgia, which is served only by the Greenfield Corridor Alternative. These populations could be affected by noise and vibration from the rail service, station construction and operation, and increased traffic and congestion around the stations. Each of these impacts will be evaluated in the Tier 2 EIS, and will be more refined as the alignment and station locations are selected.

The use of existing ROW would minimize impacts to the identified EJ communities. The analysis shows that the potential for disproportionately high and adverse effects to minority or low-income communities would be minimal, but positive impacts could be significant by improving access to jobs, shopping, and recreational areas. Potential benefits of the Corridor Alternatives could include improved connection within and outside the region, reduced travel times, lower commuting costs, and greater employment opportunities. These benefits would be experienced by all populations within each of the Corridor Alternatives.

ACQUISITION AND RELOCATION

The Project could have negative effects on populations and businesses that would be acquired for ROW and/or station construction. However, since the Project would be constructed within existing ROW, wherever reasonably feasible, the number of acquisitions and relocations is expected to be minimized. The I-85 and Southern Crescent Alternatives would potentially have fewest acquisitions and relocations because the alternatives follows existing ROW.

COMMUNITY COHESION

The Project could result in a disruption to community cohesion. If a proposed station or rail guideway is built within an existing neighborhood or community, it could act as a divide that physically separates existing populations from the surrounding community. This issue may be more relevant to the Greenfield Corridor Alternative, which proposes using new right-of-way. In addition to permanent effects, all populations may experience temporary effects during construction, including effects to access and construction traffic, noise, and visual effects.

3.6.5 Potential Mitigation

If a preferred Corridor Alternative is selected, specific impacts will be determined during a Tier 2 analysis for the Preferred Corridor Alternative and station locations. From there, the impacts on socioeconomic conditions and EJ communities will be identified in detail. Potential mitigation will depend on the nature and extent of impacts to the local communities, including displacements, noise and vibration, access, view-shed, and safety. Public and agency input will help to identify appropriate mitigation. Potential site-specific mitigation strategies might include accommodation of pedestrian access at proposed station sites, measures to reduce the impacts of noise and vibration, coordination with localities to determine primary emergency routes, and construction Best Management Practices to lessen the temporary effects on area residents during construction. Mitigation will be implemented in accordance with state and local regulations and policies. If it is not possible to avoid impacts to residential property, mitigation measures will include relocation assistance and compensation, as appropriate. All acquisitions and relocations (residences and businesses) will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. This law requires that fair and equitable assistance be provided to those persons being displaced by Federal or Federally-funded actions. The Project will also follow state laws relevant to relocation and acquisition, such as: Georgia's Eminent Domain Law (Title 22 of GA Code), South Carolina's Eminent Domain Procedure Act (Title 28, Chapter 2 of SC Code of Law), and North Carolina's Uniform Regional Assistance and Real Property Act of 1971.(Chapter 133 of NC General Statutes). Mitigation will include providing translators to non-English speaking communities and additional explanations and guidance to provide better understanding of these procedures and how the communities and individuals will be affected by the Project.

3.6.6 Subsequent Analysis

In the Tier 2 analysis, GDOT will determine the proposed station locations, storage and maintenance facility locations, and the exact alignment configuration. The analysis will also further explore impacts to EJ and socioeconomics, related to the following topics:

- Property acquisitions and residential and business relocations,
- Relocation analysis to determine adequate real estate availability,
- Community cohesion, including residential neighborhoods,
- Environmental health and safety risks to children,
- Population and employment growth as a result of the project,
- Viewshed and aesthetics impacts on the surrounding communities, and
- Demand on community facilities.

A more detailed and refined analysis will be completed for impacts to EJ populations and a determination of whether there would be a disproportionately high and adverse impact on those communities. The Tier 2 will analyze Census data for the specific alternative and alignment and will map the specific effects. In addition, information on potential minority and low-income communities

will be gathered through public outreach activities such as listening sessions, community meetings, and one-on-one conversations with public officials. These activities will provide a better understanding of the demographics of the communities and the issues and concerns of the EJ populations. The Tier 2 analysis will document the locations and characteristics of these communities along with any issues or concerns with the project. The assessment will also consider the following:

- The number of acquisitions in EJ communities compared to the Study Area population,
- The number of noise and vibrations impacts in EJ communities compared to the Study Area population,
- The number of impacts to parks and recreation facilities in EJ communities compared to the Study Area population,
- The effects on community cohesion, and
- Any transportation or access effects in EJ communities compared to the Study Area population.

GDOT will also identify the potential for environmental health risks, and safety risks that may disproportionately affect children. Potential risks will also include disproportionately high effects of air quality, exposure to hazardous materials, and safety risks from at-grade crossings. The Tier 2 analysis will ensure avoidance, minimization, or mitigation of these impacts to children. The discussion of the effects of the Project will also consider the benefits of the Project to EJ communities.

3.7 PARKLANDS, WILDLIFE REFUGES, AND RECREATIONAL AREAS

This section identifies parklands, wildlife refuges, and recreation areas within the Corridor Alternatives, and provides a qualitative assessment of the potential effects to those resources.

3.7.1 Legal and Regulatory Context

Public parklands, recreation areas, wildlife and waterfowl refuges, as well as historic properties listed on or eligible for listing on the National Register of Historic Places (NRHP) are protected under Section 4(f) of the U.S. Department of Transportation Act of 1966.[88] Section 4(f) states that the Secretary of Transportation shall not approve any program or project that requires the "use" of any publically-owned land from a public park, recreation area, wildlife and waterfowl refuge of national, state, or local significance, or publically or privately owned land of a historic site of national, state, or local significance as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land. The USDOT is required to seek concurrence from the U.S. Department of Interior before making these findings. "Use" of a Section 4(f) property can be considered the physical taking of the property, or an effect to the property that causes a substantial impairment when the activities, features, or attributes of the resource that contributes to the significance or enjoyment are substantially diminished.

Parklands that have received funding from the Land and Water Conservation Fund Act (LWCF) are afforded additional protection under Section 6(f) of the LWCF.[89] Under Section 6(f), the U.S. Department of Interior provides funding for state, county, and local efforts to advance public recreation. Once LWCF funds are used for a particular recreation project, conversion of that park facility for any non-recreational purpose is prohibited unless alternatives are assessed and steps are taken to identify, evaluate, and supply replacement parkland, at fair market value. In addition, the Secretary of Interior must grant prior approval for the conversion and replacement of the parkland.

In addition to Section 4(f) and Section 6(f) additional protections are provided under the following laws. The National Wildlife Refuge System Improvement Act of 1997 provides guidance to the Department of Interior to manage and protect the National Refuge System, a network of wildlife habitats.[90] The National Trail Systems Act of 1968 establishes the National Trail System, including national scenic trails and national recreation trails. In 1978, the law was amended to include national historic trails. Scenic and historic trails are designated by an Act of Congress, whereas the Department of the Interior and the Department of Agriculture may designate recreation trails. The National Park Service, U.S. Forest Service and Bureau of Land Management each are responsible for administering national trails.[91] The National Wild and Scenic Rivers Act of 1968 allows the Department of Interior to designate rivers to the National Wild and Scenic River System for preservation due to their wildlife, recreational, or scenic value.[92]

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[88] *49 U.S.C. § 303. More information on Section 4(f) can be found here: https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/section-4f*

[89] *54 U.S.C. § 2003. More information on Section 6(f) of the Land and Water Conservation Fund Act can be found here: https://www.nps.gov/subjects/lwcf/index.htm*

[90] *16 U.S.C. § 668dd. More information on National Wildlife Refuge System can be found here: https://www.fws.gov/refuges/*

[91] *16 U.S.C. § 1241-125. More information on the National Trail System can be found here: https://www.nps.gov/subjects/nationaltrailssystem/national-trails-system-act-legislation.htm*

[92] *16 U.S.C. § 1271-1287. More information on the National Wild and Scenic Rivers Program can be found here: https://www.nps.gov/orgs/1912/index.htm*

3.7.2 Methodology

For the identification of parklands, wildlife refuges, and recreational areas, GDOT evaluated a 600-foot wide environmental screening area for each of the three Corridor Alternatives. However, due to the potential for additional activity, noise, and construction near stations, GDOT defined a 1,000-foot wide screening area (500 feet radius) around each identified station location. The width of the environmental screening area is sufficient to:

- Account for potential effects from the improvements associated with each Corridor Alternative, including infrastructure improvements (such as embankments, aerial structures, and track improvements), ancillary facilities (such as stations, yards, and parking structures), or service changes.
- Account for contiguous parklands and wild and scenic rivers that may extend beyond the Corridor Alternative.
- Consider areas outside of the Corridor Alternative for proximity effects related to noise and vibration and visual and aesthetic changes. While noise and vibration, and visual and aesthetic changes could extend beyond the analysis area, this methodology assumes that the more prominent effects would occur close to the proposed improvement. A wider buffer around station locations intends to capture additional potential effects related to increased traffic, construction, and other activity related to stations.

GDOT collected GIS mapping data for federal, state, county, and municipal recreation areas and parks, scenic areas, state campgrounds, and national wildlife refuges. Information sources included city and county websites, the Georgia Department of Natural Resources (DNR), South Carolina Department of Parks, Recreation, and Tourism, North Carolina Division of Parks and Recreation, National Park Service, and the U.S. Forest Service.

For this Tier 1 corridor-level of analysis, GDOT described potential effects to parklands, wildlife refuges, and recreation areas broadly and qualitatively. Since site-specific locations of the proposed rail alignment, stations, and facilities are not identified during a Tier 1 environmental analysis, it is premature to determine precise Project effects on parks, wildlife refuges, and recreation areas. The Tier 2 EIS will identify specific impacts on these resources for the selected Corridor Alternative as design is further defined.

3.7.3 Affected Environment

3.7.3.1 Wildlife Refuges

The National Wildlife Refuge System is administered by U.S. Fish and Wildlife Service (USFWS). Their mission is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the U.S. for the benefit of present and future generations of Americans. Nationally, nearly 600 refuges and protected areas covering 150 million acres are protected by the National Wildlife Refuge System. These lands and waters provide habitat for endangered and threatened species as well as migrating birds and recreation opportunities for visitors.[93]

[93] *https://www.fws.gov/refuges/about*

There are no wildlife refuges as designated by the U.S. National Wildlife Refuge System within any of the Corridor Alternatives' environmental screening area.[94]

3.7.3.2 National Parks, Trails, and Forests

The National Park Service (NPS), a bureau of the U.S. Department of Interior, oversees 418 parks nationwide.[95] The NPS's mission is to preserve, unimpaired, the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. No national parks exist within the analysis area for any of the three Corridor Alternatives.

The NPS also oversees National Trails System, which includes trails of historic, scenic, and recreational value, and was created in 1968 by the National Trails System Act. The Overmountain Victory National Historic Trail begins in Abingdon, Virginia ending at Kings Mountain National Military Park in South Carolina. It follows the route of assembly of the American Patriot Army which defeated an American Loyalist army at Kings Mountain. The trail is 220 miles long and is maintained by a cooperative effort of the National Park Service, U.S. Forest Service, U.S. Army Corps of Engineers, local government agencies, local citizens' groups, historical societies, and the States of Virginia, Tennessee, North Carolina, and South Carolina. Today the historic trail is only accessible at select locations, but a commemorative motor route follows the original path as closely as possible using existing state highways. Near Gaffney, South Carolina, this commemorative motor route follows SC 11 and SC 18 which intersect with the I-85 and the Southern Crescent Corridor Alternatives.

GDOT identified one designated National Forest, the Chattahoochee, within the environmental screening area of the Corridor Alternatives. The Chattahoochee-Oconee National Forest in North Georgia spans nearly 867,000 acres, 26 counties, thousands of clear-running streams and rivers, approximately 850 miles of recreation trains, and dozens of campgrounds, picnic areas, and other recreation activity areas. Only the Southern Crescent Corridor Alternative is located within the Chattahoochee-Oconee National Forest and approximately 856.94 acres of the 867,000-acre forest are within the environmental screening area. Existing rail, used by freight and Amtrak passenger trains, travels through this section of the forest today for roughly 10 miles south of Toccoa, Georgia and runs adjacent to the forest boundary north of Toccoa toward the South Carolina border for roughly five miles[96].

3.7.3.3 State Parks

There are no state parks within the Corridor Alternatives in Georgia or North Carolina. The I-85 Corridor Alternative runs adjacent to Lake Hartwell State Park and Recreation Area in South Carolina. Approximately 0.44 acres of the 680-acre state park are located within the environmental screening area of the Corridor Alternative. GDOT identified no other state parks within or adjacent to the environmental screening area of the Corridor Alternatives.

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[94] *National Wildlife Refuge System:* https://www.fws.gov/refuges/refugeLocatorMaps/index.html

[95] *National Park System:* https://www.nps.gov/aboutus/national-park-system.htm

[96] *More information about the Chattahoochee-Oconee National Forest and a location map can be found here:* https://www.fs.usda.gov/conf

3.7.3.4 Local Parks and Recreaction Facilites

There are numerous county, municipal, and other local public parks and recreation areas located within and adjacent to the Corridor Alternatives. Exhibits 3.7-1 through 3.7-3 summarize, by Corridor Alternatives, local resources along with other state and national resources discussed in this chapter. The tables include total park acreage and the acreage within the Corridor Alternatives. Resources that are protected under Section 4(f) of the USDOT Act and Section 6(f) of the Land and Water Conservation Fund Act are denoted.[97]

Exhibit 3.7-1: Parks and Recreation Areas within the Southern Crescent Corridor North of Atlanta Approach

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
National Forest						
Chattahoochee-Oconee National Forest	Georgia		867,000	856.94	X	
Municipal/Local Parks and/or Recreation Areas						
(pocket park)*	Fulton, GA	N. Church St. East Point, GA 30344	0.39	0.39	X	
Harris Park	Fulton, GA	2584 Milledge St., East Point, GA 30344	10.13	2.91	X	
Rose Circle Triangle	Fulton, GA	Rose Circle/White St. SW, Atlanta, GA 30310	1.36	1.33	X	
Brookline Park	Fulton, GA	Brookline St./Elbert St. SW (near Murphy Ave) Atlanta, GA 30310	0.19	Adjacent**	X	
Adair Park	Fulton, GA	866 Murphy Ave., SW Atlanta, GA 30310	11.48	3.14	X	
Fire Station No 5 Park	Fulton, GA	Trinity Ave. SW/Spring St., Atlanta, GA 30303	0.15	Adjacent**	X	
(pocket park)	Fulton, GA	Spring St. SW and Martin Luther King Jr. Dr. SW 30303	3.62	0.13	X	
Cornelia City Park	Habersham, GA	City Park Dr. Cornelia, GA 30531	18.69	10.98	X	
Doyle Street Ball Park	Stephens, GA	Frankie Flemming St., Toccoa, GA 30577	14.82	9.07	X	
Century Park	Greenville, SC	Brushy Creek Rd., Greer, SC 29650	27.59	6.84	X	X
Recreation Department	Spartanburg, SC	110 Pepper St., Central, SC 29630	4.78	3.49	X	
Liberty Recreation Department	Pickens, SC	520 Mills Ave., Liberty SC 29657	8.68	7.11	X	

[97] *Section 4(f) includes all public parklands, recreation areas, wildlife and waterfowl refuges. All but two parks identified in this document are publicly funded; Candler Field and Lullwater Park are located on the campus of Emory University, a private school in Atlanta. Section 6(f) includes only those parklands and wildlife areas that are recipients of funding from the Land and Water Conservation Fund Act, which is a relatively small number of the total parklands and other resources identified in this section.*

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
Victor Park	Spartanburg/ Greenville, SC	108 S Line St., Greer, SC 29651	5.10	2.21	X	X
Wards Creek Park	Spartanburg, SC	Elmer St., Greer, SC 29651	132.80	1.24	X	X
Veterans Memorial Park	Spartanburg, SC	Palmetto St., Cowpens, SC 29330	1.11	0.77	X	
Bessemer City Park	Gaston, NC	220 S. 14th St., Bessemer City, NC 28016	19.12	3.84	X	X
Uptown Park	Gaston, NC	W Virginia Ave./W. Pennsylvania Ave., Bessemer City, NC 28016	4.00	4.00	X	
(pocket park)	Gaston, NC	W Main Ave. and S South St., Gastonia, NC 28052	1.12	0.98	X	
Gateway Nature Preserve (adjacent to Catawba River to the east)	Mecklenburg, NC	Highway 29/74 Charlotte, NC 28214	139.77	8.67	X	
Wilmore Neighborhood Park	Mecklenburg, NC	900 Spruce St. Charlotte, NC 28203	5.42	2.66	X	
Total			**867,410.32**	**926.70**	**21**	**4**

Source: Land and Water Conservation Fund (LWCF) website; Georgia Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; and North Carolina Division of Parks and Recreation

The environmental screening areas for parklands and recreation areas are defined as being 600 feet in width along each of the Corridor Alternatives and 500 feet radius around proposed station locations.

*Notes: * "Pocket Parks" are used to describe small unnamed parks. **Some parks are adjacent to the Corridor Alternative but do not overlap, therefore an area calculation is not applicable.*

Exhibit 3.7-2: Parks and Recreation Areas within the I-85 Corridor North of the Atlanta Approach

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
State Park and/or Recreation Area						
Lake Hartwell State Park and Recreation Area	Fair Play, SC	located off SC-11, Fair Play, SC 29643	680	0.44	X	X
Municipal/Local Park and/or Recreation Area						
(pocket park)*	Fulton, GA	N. Church St. East Point, GA 30344	0.39	0.39	X	
Harris Park	Fulton, GA	2584 Milledge St., East Point, GA 30344	10.13	2.91	X	
Rose Circle Triangle	Fulton, GA	Rose Circle/White St. SW, Atlanta, GA 30310	1.36	1.33	X	
Brookline Park	Fulton, GA	Brookline St./Elbert St. SW (near Murphy Ave) Atlanta, GA 30310	0.19	Adjacent**	X	
Adair Park	Fulton, GA	866 Murphy Ave., SW Atlanta, GA 30310	11.48	3.14	X	
Fire Station No 5 Park	Fulton, GA	Trinity Ave. SW/Spring St., Atlanta, GA 30303	0.15	Adjacent**	X	
(pocket park)	Fulton, GA	Spring St. SW and Martin Luther King Jr. Dr., SW Atlanta, GA 30303	3.62	0.13	X	
Hurricane Shoals County Park	Jackson, GA	416 Hurricane Shoals Rd., Maysville, GA 30558	161.92	29.79	X	X
Lake Hartwell State Park	Oconee, SC	19138-A S Carolina 11 Fair Play, SC 29643	680.00	0.44	X	
Milliken Arboretum	Spartanburg, SC	Frontage Rd/Miliken Rd., Spartanburg, SC 29303	308.04	9.88		
(pocket park)	Gaston, NC	W Main Ave and S South St., Gastonia, NC 28052	1.12	0.98	X	
Gateway Nature Preserve (adjacent to Catawba River to the east)	Mecklenburg, NC	Highway 29/74 Charlotte, NC 28214	139.77	8.67	X	
Wilmore Neighborhood Park	Mecklenburg, NC	900 Spruce St. Charlotte, NC 28203	5.42	2.66	X	
Total			**2,003.59**	**60.76**	**13**	**2**

Source: Land and Water Conservation Fund (LWCF) website; Georgia Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; and North Carolina Division of Parks and Recreation

The environmental screening areas for parklands and recreation areas are defined as being 600 feet in width along each of the Corridor Alternatives and 500 feet radius around proposed station locations.

*Notes: * "Pocket Parks" are used to describe small unnamed parks. **Some parks are adjacent to the Corridor Alternative but do not overlap, therefore an area calculation is not applicable.*

Exhibit 3.7-3: Parks and Recreation Areas within the Greenfield Corridor North of the Atlanta Approach

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
(pocket park)*	Fulton, GA	N. Church St. East Point, GA 30344	0.39	0.39	X	
Harris Park	Fulton, GA	2584 Milledge St., East Point, GA 30344	10.13	2.91	X	
Rose Circle Triangle	Fulton, GA	Rose Circle/White St. SW, Atlanta, GA 30310	1.36	1.33	X	
Brookline Park	Fulton, GA	Brookline St./Elbert St. SW (near Murphy Ave) Atlanta, GA 30310	0.19	Adjacent**	X	
Adair Park	Fulton, GA	866 Murphy Ave., SW Atlanta, GA 30310	11.48	3.14	X	
Fire Station No 5 Park	Fulton, GA	Trinity Ave. SW/Spring St., Atlanta, GA 30303	0.15	Adjacent**	X	
(pocket park)	Fulton, GA	Spring St. SW and Martin Luther King Jr. Dr. SW Atlanta, GA 30303	3.62	0.13	X	
Gateway Nature Preserve (adjacent to Catawba River to the east)	Mecklenburg, NC	Highway 29/74 Charlotte, NC 28214	139.77	8.67	X	
Wilmore Neighborhood Park	Mecklenburg, NC	900 Spruce St. Charlotte, NC 28203	5.42	2.66	X	
Total			**172.51**	**19.23**	**9**	**0**

Source: Land and Water Conservation Fund (LWCF) website; Georgia Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; and North Carolina Division of Parks and Recreation

The environmental screening areas for parklands and recreation areas are defined as being 600 feet in width along each of the Corridor Alternatives and 500 feet radius around proposed station locations.

*Notes: * "Pocket Parks" are used to describe small unnamed parks. **Some parks are adjacent to the Corridor Alternative but do not overlap, therefore an area calculation is not applicable.*

Exhibits 3.7-4 and 3.7-5 summarize all parklands, wildlife refuges, and recreation areas located within the two Atlanta approach options, NS and CSX. The resources listed for each Atlanta approach are the same regardless of which Corridor Alternative it's combined with. The one exception is Hoschton Park in Jackson County, Georgia, which only coincides with the Greenfield Corridor Alternative using the NS approach. This combination travels east-west between Athens and Suwannee, unlike any of the other combinations.

Exhibit 3.7-4: Parks and Recreation Areas within the NS Atlanta Approach

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
(pocket park)*	Fulton, GA	State St. NW, Atlanta, GA 30363	0.86	Adjacent**	X	
(pocket park)*	Fulton, GA	Camellia Ln., NE and Main St NE, Atlanta, GA 30324	0.19	Adjacent**	X	
Brookhaven Park	DeKalb, GA	4158 Peachtree Rd., NE, Brookhaven, GA 30319	17.24	2.03	X	

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
Ashford Park	DeKalb, GA	2980 Redding Rd., NE, Brookhaven, GA 30319	4.21	3.50	X	
Thrasher Park	Gwinnett, GA	93 Park Dr., Norcross, GA 30071	2.29	1.48	X	
Pinckneyville Park	Gwinnett, GA	4758 S. Old Peachtree Rd., Norcross, GA 30071	58.10	16.59	X	
Duluth Town Green	Gwinnett, GA	Knott St., NW Duluth, GA 30096	3.42	0.40	X	
Hoschton Park***	Jackson, GA	374 Cabin Dr. Hoschton, GA 30548	38.97	4.78	X	
Total			**125.28**	**28.78**	**8**	**0**

Source: Land and Water Conservation Fund (LWCF) website; Georgia Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; and North Carolina Division of Parks and Recreation

The environmental screening areas for parklands and recreation areas are defined as being 600 feet in width along each of the Corridor Alternatives and 500 feet radius around proposed station locations.

*Notes: * "Pocket Parks" are used to describe small unnamed parks. **Some parks are adjacent to the Corridor Alternative but do not overlap, therefore an area calculation is not applicable. ***Hoschton Park is only within the Greenfield Corridor Alternative.*

Exhibit 3.7-5: Parks and Recreation Areas within the CSX Atlanta Approach

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)
Tanyard Creek Urban Forest	Fulton, GA	Goodson Ln. NW, Atlanta, GA 30309	7.24	5.33	X	
Tanyard Creek Park	Fulton, GA	Collier Rd./Walthall Dr., Atlanta, GA 30309	17.55	2.22	X	
Ardmore Park	Fulton, GA	Ardmore Rd., Atlanta, GA 30309	2.23	1.48	X	
Zonolite Park	DeKalb, GA	Zonolite Rd NE North Druid Hills, GA 30306	17.84	0.86	X	
Candler Field*	DeKalb, GA	Emory University, Druid Hills, GA 30322	6.43	2.59		
Lullwater Park*	DeKalb, GA	Emory University, Druid Hills, GA 30322	117.13	17.25		
Ira B. Melton Park	DeKalb, GA	Desmond Dr. North Decatur, GA 30033	18.65	6.81	X	
Mason Mill Park	DeKalb, GA	1340 McConnell Dr Decatur, GA 30033	11.85	0.01	X	
Harmony Grove Soccer Complex	Gwinnett, GA	119 Harmony Grove Rd, Lilburn, GA	18	13.07	X	
Lanford Park	Gwinnett, GA	25 Rockbridge Rd., Lilburn, GA 30047	7.06	4.02	X	
Lilburn City Park	Gwinnett, GA	76 Main St. NW Lilburn, GA 30047	9.40	1.97	X	
Lawrenceville City Lake (Rhodes Jordan Park)	Gwinnett, GA	100 E. Grogan St., Lawrenceville, GA 30046	159.46	11.18	X	
Total			**392.84**	**64.2**	**10**	**0**

Park	County/State	Address	Area (acres)	Area within corridor (acres)	Section 4(f)	Section 6(f)

Source: Land and Water Conservation Fund (LWCF) website; Georgia Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; and North Carolina Division of Parks and Recreation

The environmental screening areas for parklands and recreation areas are defined as being 600 feet in width along each of the Corridor Alternatives and 500 feet radius around proposed station locations.

**Candler Field and Lullwater Park are privately owned and do not fall under the jurisdiction of Section 4(f)*

3.7.4 Environmental Consequences

3.7.4.1 No-Build Alternative

The No-Build Alternative assumes no new passenger rail service between Atlanta and Charlotte. Passenger service between the two cities would consist of existing bus service, air travel, and continued automobile use along the highway system. In the No-Build Alternative, the impacts to parklands, wildlife refuges, and recreation areas could potentially occur if additional ROW is needed or if substantial changes to traffic and transit volumes or operations lead to proximity effects such as changes in noise levels and visual effects. As the geographic scope and nature of the No-Build Alternative projects is limited, the potential effects of the projects are likely to be contained to the areas in which the projects are constructed. The potential for impacts to parklands, wildlife refuges, and recreation areas would be determined through the environmental processes for those separate transportation improvements identified in the No-Build discussion in Chapter 2 of this document.

3.7.4.2 Corridor Alternatives

In this Tier 1 EIS, notwithstanding future design efforts to avoid or minimize potential impacts, GDOT identified the number and acreage of parklands, wildlife refuges, and recreational facilities that have the potential to be impacted by any of the three Corridor Alternatives, their respective station locations, and the two Atlanta approaches.

The Southern Crescent Corridor Alternative (north of the Atlanta approach) has the potential to impact 21 locations, including 856.94 acres of the Chattahoochee National Forest and portions of 18 other local parks and recreation areas totaling 69.76 acres. The unnamed pocket park in Fulton County (0.39 acre) and Uptown Park in Gaston, NC (4.0 acres) are completely within the Corridor Alternative. Two additional local parks are adjacent to, but not within, the Southern Crescent Corridor Alternative. All 21 locations classify as Section 4(f) resources and four locations classify as Section 6(f) resources.

The I-85 Corridor Alternative (north of the Atlanta approach) has the potential to impact 13 locations, including 0.44 acres of the Lake Hartwell State Park in South Carolina and portions of eleven other local parks totaling 60.32 acres. The unnamed pocket park in Fulton County (0.39 acre) is completely within the Corridor Alternative and 1.33 acres of the 1.36-acre Rose Circle Triangle Park is within the Corridor Alternative. Two additional local parks are adjacent to, but not within, the I-85 Corridor Alternative. All 13 locations classify as Section 4(f) resources and two classify as Section 6(f) resources.

The Greenfield Corridor Alternative (north of the Atlanta approach) has the potential to impact nine local parks or recreation areas, totaling 19.23 acres. The unnamed pocket park in Fulton County (0.39 acre) is completely within the Corridor Alternative and 1.33 acres of the 1.36-acre Rose Circle Triangle Park is within the Corridor Alternative. Two of these parks are adjacent to, but not within,

the Corridor Alternative. All nine locations classify as Section 4(f) resources and none classify as Section 6(f) resources.

GDOT identified seven local parks within the NS Atlanta approach and twelve local parks within the CSX Atlanta approach. The Greenfield Corridor Alternative combined with the NS approach contains one additional park, Hoschton Park in Jackson County, GA, for a total of eight local parks. All of these identified parks are classified as Section 4(f) resources except for two located within the CSX approach on the Emory University campus, a private school. Candler Field and Lullwater Park are owned and operated by the University but are available for use by the public. In order to be protected under Section 4(f), however, a resources must be publicly-owned. None of these locations classify as Section 6(f) resources

Exhibit 3.7-6 Summary of 4(f) and 6(f) Resources by Corridor Alternative

Corridor Alternative	Section 4(f) Resources	Section 6(f) Resources
Southern Crescent Corridor Alternative	21	4
I-85 Corridor Alternative	13	2
Greenfield Corridor Alternative	9	0
NS Atlanta Approach	8	0
CSX Atlanta Approach	10	0

Source: Land and Water Conservation Fund (LWCF) website; Georgia Department of Natural Resources; South Carolina Department of Parks, Recreation, and Tourism; and North Carolina Division of Parks and Recreation

The environmental screening areas for parklands and recreation areas are defined as being 600 feet in width along each of the Corridor Alternatives and 500 feet radius around proposed station locations.

3.7.5 Potential Mitigation

For this Tier 1 EIS, specific rail alignment, stations, and facilities, as well as their potential impacts, are not identified. As these are refined in the Tier 2 analysis, avoidance and mitigation measures will be explored to reduce, as much as possible and practical, impacts to the identified facilities. If a Corridor Alternative is selected and design is further defined and delineated in the Tier 2 analysis, potential impacts on parks and recreation areas will be identified in detail.

The types of mitigation that will be identified depends on the nature and extent of impacts (e.g., displacements, noise and vibration impacts, access, and safety). Public and agency input may help identify appropriate mitigation. Potential site-specific mitigation strategies might include replacement or enhancement of functions of parks and recreation areas; and ongoing consideration during design of ways to minimize Project effects.

For Section 4(f) resources that are also protected under Section 106 as an historic resource, mitigation procedures would include continued agency consultation and a Memorandum of Agreement outlining the agreed upon mitigation strategy.[98] Mitigation for resources protected under Section 6(f) must include replacement of land with similar value, location, and usefulness.[99]

[98] *36 CFR 800.6*

[99] *36 CFR 59.3*

3.7.6 Subsequent Analysis

In this section, GDOT identified all relevant resources that are located within, or adjacent to, the 600-foot wide Corridor Alternative and the 500-foot radius screening area around each station location, resulting in a comprehensive list of locations that could have potential impacts, given that the actual alignment will be proposed within the generous buffer area. During a subsequent Tier 2 analysis, a specific alignment will be selected and additional environmental review will identify specific parks and recreation areas within the alignment and station areas. Selection of the alignment will consider methods of avoiding Section 4(f) and Section 6(f) resources as well as other parklands and recreation areas. Detailed property mapping and information on the extent of public access, use, and ownership will be determined through consultation with public officials and property owners and officials with jurisdiction. Consultation will also be undertaken to determine appropriate and reasonably feasible mitigation commitments where warranted and reasonably feasible

If required, the Tier 2 analysis will include completion of a Section 4(f) evaluation that documents use of Section 4(f) properties, including a determination whether the use is considered a "permanent use", "constructive use", or "temporary use", and whether the use would be considered *de minimus*. In the case of a use, the evaluation will address Section 4(f) requirements, as applicable, involving feasible and prudent avoidance alternatives, least harm alternative, and all possible measures to minimize harm. Coordination with officials having jurisdiction, including the U.S. Department of Interior, if necessary, will be initiated. The Preliminary Section 4(f) Evaluation will be circulated as part of a Tier 2 document. If a Section 6(f) property is identified, a Section 6(f) Evaluation will be prepared and circulated, as required.

3.8 CULTURAL RESOURCES

This section provides a general overview of the cultural resources within the Corridor Alternatives environmental screening area, as well as a qualitative assessment of the potential effects of the Corridor Alternatives on these resources. The term "cultural resources" refers to a variety of built and natural places related to the "traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community…" (U.S. Department of Interior, NPS 1998). The number of known historic resources within the Corridor Alternatives is a distinguishing factor that suggests varying potential for impacts among the Corridor Alternatives.

The historic and archaeological resources analysis has been conducted by GDOT in support of the Tier 1 EIS, and the level of detail for this evaluation reflects the level of planning completed to this point. The analysis consisted of desktop review using existing electronic databases for listed and eligible National Register of Historic Places (NRHP) resources. The data is presented to facilitate future planning and to advance the selection of a Preferred Alternative for the Atlanta to Charlotte PRCIP in consultation with other environmental factors as part of the Tier 2 analysis.

A summary of the cultural resources within the three Corridor Alternatives, coupled with the Atlanta approaches, is included in Exhibit 3.8-1.

Exhibit 3.8-1: Cultural Resources Summary Table

Corridor Alternative	History - NRHP Listed Properties*	History - State Eligible Properties	Archaeology - identified Sites**
Southern Crescent Corridor with NS Atlanta Approach	66	51	21
Southern Crescent Corridor with CSX Atlanta Approach	59	51	26
I-85 Corridor with NS Atlanta Approach	36	16	59
I-85 Corridor with CSX Atlanta Approach	33	16	61
Greenfield Corridor with NS Atlanta Approach	27	13	32
Greenfield Corridor with CSX Atlanta Approach	24	13	34

Source: National Register of Historic Places
Note: The environmental screening areas are defined as being 1,000 feet in width along the Corridor Alternatives for historic properties and 600 feet in width for archaeological properties
* 5 NRHP-listed historic properties are included in both Atlanta Approach Alternatives.
** Previously identified and determined eligible for listing in the NRHP. Official determinations of eligibility from the SHPOs deferred to Tier 2.

3.8.1 Regulatory Context

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and associated implementing regulations in 36 CFR Part 800 require federal agencies to take into account the effects of their undertakings[100] on historic properties (any prehistoric or historic district, site, building, structure, or object listed on or eligible for listing on the NRHP).

36 CFR 800.16 defines historic properties to include archaeological sites, prehistoric and historic districts, sites, buildings, structures or any object that may be eligible for inclusion in the NRHP as maintained by the Secretary of the Interior. In order to qualify for inclusion, properties must meet certain criteria and possess integrity as defined by the Secretary. These criteria are set forth in 36 CFR 60.4, and are defined below:

> *"The quality of significance in American history, architecture, archaeology, engineering and culture that is present in districts, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling and that are associated with events that have made a significant contribution to the broad patterns of our history; that are associated with the lives of persons significant in our past; that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and that have yielded, or may be likely to yield, information important in prehistory or history."*

As explained in the previous section, historic properties also are protected under Section 4(f), which prohibits actions by the Secretary of Transportation that require "use" of a historic property that is listed or eligible for inclusion in the National Register, unless a determination is made that there is no feasible and prudent alternative to the use of such land, and all possible planning has been undertaken to minimize harm to the Section 4(f) property.

Each federal agency is required under Section 106 to identify all federally recognized Native American Tribes and Native American groups (32 CFR §229.7(b)(2)) having aboriginal or historic ties to its jurisdictional land and seek to determine through the relevant Tribal official(s) the location and nature of TCPs (*32 CFR §229.7(b)(1)*.

A "sacred site" is a specific, discrete, narrowly delineated location identified by a Native American Tribe or authorized Tribal representative to a federal agency as sacred by virtue of its religious significance to, or ceremonial use by, a Native American religion (Presidential E.O. 13007, Indian Sacred Sites, issued May 24, 1996). This order mandates that federal agencies accommodate Tribal access and use of Native American sacred sites to the extent practicable and avoid adverse impacts to such sites. TCPs and Native American Sacred Sites are not necessarily NRHP eligible, but are evaluated under NEPA (see *40 CFR §§1508.8, 1508.14*).

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[100] *The Advisory Council on Historic Preservation defines a Federal undertaking in 36 CFR 800.16(y) as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to State or local regulation administered pursuant to a delegation or approval by a Federal agency.*

In addition to federal laws and regulations regarding cultural resources, the following state laws are also applicable for cultural resources:

3.8.1.1 Georgia

The following laws and regulations govern preservation and archaeology programs and projects in Georgia:[101]

- **State Historic Preservation Office (1986); 12-3-50.1:** Establishes historic preservation as public policy and authorizes the Historic Preservation Division of the Department of Natural Resources to carry out a statewide historic preservation program, similar to those duties outlined in the National Historic Preservation Act.
- **Georgia Historic Preservation Act (1980, 1989); 44-10-20 et seq.:** Establishes uniform guidelines for local governments in creating historic preservation commissions and designating historic properties.
- **Georgia Register of Historic Places (1989); 12-3-50.2:** Provides state designation for historic properties. The criteria for designation are the same as the National Register.
- **Georgia Environmental Policy Act (1991) 12-16-1 et seq.:** Requires state agencies to prepare environmental assessments on actions that impact the environment, including historic properties.
- **Council on American Indian Concerns (1992, 2002); 44-12-280 et seq.:** Creates a Council on American Indian Concerns to advise on repatriation issues.
- **Grave Protection and Repatriation (1992); 44-12-260/264; 12-3-620 et seq.; 31-21-6; 31-21-44 et seq.:** Establishes policies for burials, skeletal material and funerary objects regarding archaeological research, public display, buying/selling artifacts and repatriation.
- **Abandoned Cemeteries and Burial Grounds (1991); 36-72-1 et seq.:** Strengthens cemetery protection laws by authorizing local governments to preserve and protect abandoned cemeteries, and to issue permits prior to any disturbance of burials.

3.8.1.2 South Carolina

The following laws and regulations govern preservation and archaeology programs and projects in South Carolina:[102]

- **Department of Parks, Recreation and Tourism*; 51-1-60 thru 51-1-90, SC Code of Laws:*** A duty of the Department of Parks, Recreation and Tourism is development of a coordinated plan utilizing the state's resources as a tourist attraction. The plan should include the preservation of the state's historical heritage by "acquiring and owning, recognizing, marking and publicizing areas, sites, buildings and other landmarks and items of national and statewide historical interest and significance to the history of our State." The Department is authorized to allocate funds to historic sites
- **Heritage Trust Program*; 51-17-10 to 51-17-150, SC Code of Laws:*** Creates the Heritage Trust program in the Department of Natural Resources. The purpose of the program is to inventory, evaluate, and protect the elements considered the most outstanding representatives of the state's natural and cultural heritage. The Trust accepts easements on significant

[101] *More Georgia state laws regarding cultural resources can be found here: http://georgiashpo.org/preservationlaws (accessed 5/10/2018)*

[102] *More South Carolina state laws regarding cultural resources can be found here: http://shpo.sc.gov/res/Pages/Laws.aspx (accessed 5/10/2018)*

properties and establishes heritage preserves by acquiring properties through purchase or donation.

- **Preservation and Protection of Abandoned and Unmaintained Cemeteries*; 6-1-35, SC Code of Laws:*** Authorizes counties and municipalities to preserve and protect any cemetery within their jurisdictions that the counties or municipalities determine has been abandoned. Authorizes counties or municipalities to spend public funds or use inmate labor for these cemeteries.

3.8.1.3 North Carolina

The following laws and regulations govern preservation and archaeology programs and projects in North Carolina:[103]

- **Archaeological Resources Protection Act, North Carolina General Statutes *(NCGS) 70, Article 2:*** Modeled after the federal Archaeological Resources Protection Act of 1979, this statute applies to all state-owned, occupied or controlled property except for highway rights-of-way
- **North Carolina Archaeological Record Program, *NCGS 70, Article 4:*** This statute provides a mechanism for protecting archaeological resources on private lands in North Carolina, through a voluntary system of site registration, and with applications of the state ARPA (G.S. 70, Article 2) permitting system for registered sites
- **North Carolina Environmental Policy Act, *NCGS 113A, Article 1:*** This statute declares a continuing state policy of conservation and protection of its natural resources and preservation of "the important historic and cultural elements of our common inheritance."
- **Protection and Enhancement of the Historical and Cultural Heritage of North Carolina**, ***Executive Order XVI:*** Under the gubernatorial mandate, patterned after federal Executive Order 11593, state agencies are directed to survey properties under their jurisdiction and identify those eligible for listing in the National Register of Historic Places
- **Protection of Properties in the National Register, *NCGS 121-12(a):*** This portion of the General Statutes provides an advisory and coordinative mechanism on the state level patterned after that set up on the federal level for the protection of National Register properties. The North Carolina Historical Commission (which with added members forms the State Professional Review Committee) is responsible for the approval of all properties submitted to the National Park Service for nomination to the National Register
- **Cemetery Protection, *NCGS 14, G.S. 65:*** State statutes for protecting cemeteries

3.8.2 Methodology

To comply with Section 106 of the NHPA, based on this literature review, all properties in the Area of Potential Effects (APE) were identified that are listed, or potentially eligible for listing, in the NRHP. The NHPA defines APE as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties.[104] For this Tier 1 EIS, the APE falls within the 1,000 foot-wide environmental screening area described in more detail below. According to 36 CFR Part 800.16(d), "the area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." A Tier 2 analysis of a Preferred Corridor Alternative would likely use a narrower APE than the one used in this Tier 1 EIS.

[103] *More North Carolina state laws regarding cultural resources can be found here: https://www.ncdcr.gov/ (accessed 5/10/2018)*

[104] *36 CFR Part 800.16(d)*

In this Tier 1 EIS and notwithstanding future design efforts to avoid or minimize potential impacts, the number of NRHP listed, eligible and potentially eligible cultural resources in a Corridor Alternative was used to suggest the relative potential for direct or indirect impact on or adverse effect to cultural resources. After selection of a Preferred Corridor Alternative, the Tier 2 analysis will include a detailed assessment of effects in compliance with Section 106.

Based on the files of the respective State Historic Preservation Office (SHPO) for Georgia, South Carolina, and North Carolina,[105] and the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL),[106] GDOT compiled an inventory of all architectural resources. The inventory includes buildings, sites, objects, and structures, and previously identified archaeological sites[107] in the environmental screening area for the three Corridor Alternatives and the Atlanta Approaches.

Based on previous experience with similar projects, GDOT used a 1,000-foot wide (500 feet on either side of each Corridor Alternative) environmental screening area to account for direct impacts to historic resources.

For archaeological resources, GDOT used a 600-foot wide Corridor Alternatives environmental screening area, which consists of areas where the Project would result in the disturbance of existing land surfaces. This screening area is used to accommodate anticipated construction-related soil disturbance, as well as minor alignment shifts or ancillary Project elements.

GDOT identified potential consulting parties and Native American tribes within the vicinity of the Corridor Alternatives for the Tier 1 EIS evaluation (See Appendix C: Agency and Public Coordination). Correspondence was sent from FRA and all responses from the tribes are documented in Appendix C. During subsequent analysis, additional outreach to consulting parties and tribes will occur.

The identification of resources for each Corridor Alternative was completed through the review of the literature available from the sources discussed in the following subsections.

HISTORIC RESOURCES

This analysis of historic resources was completed using desktop sources and records of previously identified eligible and listed NRHP historic properties. It is a screening-level analysis intended to inform and assist in the Tier 2. During the future Tier 2 analysis, additional formal consultation with the Georgia, South Carolina, and North Carolina SHPOs, as well as Native American Tribes, other potential consulting parties, including local jurisdictions and potentially the Advisory Council on Historic Preservation (ACHP), and key stakeholders will be will be completed. For this Tier 1 EIS:

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[105] *Georgia Department of Natural Resources, Historic Preservation Division Georgia Natural, Archaeological, and Historic Resources GIS (GNAHRGIS) http://georgiashpo.org/register/survey; South Carolina Department of Archives & History, ArchSite (GIS) http://shpo.sc.gov/research/Pages/ArchSite.aspx; North Carolina State Historic Preservation Office, HPOWEB (GIS) http://gis.ncdcr.gov/hpoweb/ (accessed on 02/24/2018).*

[106] *National Park Service, National Register of Historic Places database (NRIS) http://www.nps.gov/nr/research/data_downloads.htm; NPS, National Historic Landmarks Program lists of National Historic Landmarks (accessed on 02/24/2018).*

[107] *In coordination with their respective SHPOs, archaeological site records are managed collaboratively by the Georgia Archaeological Site File at the University of Georgia (Athens, Ga.) and the South Carolina Institute of Archaeology and Anthropology at the University of South Carolina (Columbia, S.C.). The N.C. SHPO manages its files through it Office of State Archaeology.*

- As described, a 1,000-foot wide environmental screening area for historical resources was defined for each Corridor Alternative to account for direct effects, including potential visual, noise, or vibration effects.
- Local, state, and federally designated historic and architectural properties were identified within the screening area, including resources listed on or determined eligible for listing in the NRHP.
- GDOT completed a desktop survey of identified historic structures using Georgia's Natural, Archaeological, and Historic Resources GIS (GNAHRGIS), South Carolina's ArchSite, and North Carolina's Historic Preservation Office GIS Web Service (HPOWEB).
- Previous historic property surveys and other related studies completed for Section 106 compliance were reviewed where readily available.
- Where applicable, the identified resources were verified using online aerial street-level mapping such as Google Earth Pro.
- Known architectural resources designated or determined eligible for listing as an NHL were identified.
- Potential impacts, particularly potential direct impacts (e.g., demolition, alteration, or damage from construction), to any listed or eligible historic property were identified. The potential for secondary, or indirect (e.g., change in setting or character of the surrounding area), and cumulative effects is also discussed. Further evaluation and an assessment of adverse effects will be conducted for a Preferred Corridor Alternative in the Tier 2 analysis.
- Potential mitigation measures to minimize any potential adverse effects to listed historic properties are discussed, although further analysis of listed and eligible historic properties will be included in the Tier 2 analysis.

ARCHAEOLOGY

GDOT identified potentially sensitive archaeological resources in the archaeology screening area that were previously identified and determined eligible for listing in the NRHP. However, because of the varying types of categorization of archaeological resources by the three states in the Study Area, some eligible resources may be excluded from this list. These issues would be addressed in subsequent Tier 2 analysis. More information on data collection discrepancies can be found in the next section.

GDOT did not publish the exact locations of the archaeology sites in the Tier 1 EIS − only the corresponding site numbers and state because of their sensitivity to human disturbance. During the Tier 2 analysis, the final APEs for the Preferred Corridor Alternative will be delineated in consultation with the SHPOs, Indian tribes, and other consulting parties in accordance with Section 106. As described, a 600-foot wide screening area was defined for potentially sensitive archaeological resources for each Corridor Alternative for the purposes of the Tier 1 EIS to accommodate anticipated construction-related soil disturbance, as well as minor alignment shifts or ancillary Project elements.

During the Tier 2 analysis, a full field reconnaissance-level archaeological resources survey will be conducted, and official determinations of eligibility from the SHPOs will be sought for archaeological resources. In addition, the Tier 2 analysis will include an assessment of potential effects to previously identified archaeological sites.

3.8.2.1 Data Collection

HISTORIC RESOURCES

GDOT collected the data presented in the Tier 1 EIS from appropriate state repositories, the Atlanta Regional Commission (ARC), the National Park Service's (NPS) National Register Information System (NRIS), and the Database of National Historic Landmarks (NHL). Additionally, the FHWA's Final List of Nationally and Exceptionally Significant Features of the Federal Interstate Highway System ("Final List") has been consulted considering the presence of I-85 within the Project corridor(s).

The SHPOs for Georgia, South Carolina, and North Carolina are responsible for maintaining geographic information system (GIS) data on cultural resources within their states. The ARC, Atlanta's Metropolitan Planning Organization (MPO), acts as a secondary repository for spatial data on historic resources in the greater Atlanta area and was also consulted.

GDOT processed this data, removed duplicated data entries, and cross-checked and verified NRHP-listed properties with the NRIS database. Data determined to represent historic resources considered "Not eligible" for the NRHP were removed from the dataset. GDOT created four categories and applied them to the length of each Corridor Alternative to present the amassed data:

- *NRHP listed* includes properties identified as listed in the NRHP. These properties were cross-checked with the NRIS database;
- *State/Local NRHP eligible* determination includes:
  - Section 106 eligibility determination: a property that has been determined eligible for listing on the NRHP by SHPO as a result of a previous survey but has not been nominated for listing;
  - State-maintained historic registry properties; and
  - Local historic designated properties (i.e., local landmark, local district).
- *Located in an NRHP- listed historic district* includes properties that likely contribute to the NRHP-listed historic district; and
- *Unknown NRHP eligibility* includes properties listed in data requests but whose eligibility determination was either not included or ambiguous.

The Tier 1 EIS only resources categorized as "NRHP listed" or "State/Local NRHP eligible." Accompanying Map Books are presented for each Corridor Alternative in Appendix A.[108] Data categorized as "Located in a NRHP listed historic district" or "Unknown NRHP eligibility" are included in Appendix D: Supporting Technical Data. Due to the general density of historic resource data for "Located in a NRHP listed Historic District" and "Unknown Eligibility," specifically for communities throughout Georgia, these datasets are not presented in map form. These properties will be further analyzed during Tier 2.

Some data limitations existed during this Tier 1 EIS that will be improved upon during Tier 2 and will utilize field examinations of historic resources:

[108] *Data has not been field confirmed; errors originating at the source, in field collection and/or recordation, for example, remain a possibility.*

- Time sensitivity – some historic properties may not be covered in older surveys that were used for this analysis
- Changes or alterations may have occurred to previously identified historic properties, potentially altering their eligibility status
- Some eligibility data may not yet be available electronically

Regardless of the data limitations, the information is sufficient for the purpose and scope of the tiered review of historic properties. The assembled data provide a corridor-ide snapshot for each Corridor Alternative and provides a broad context for future analysis to be completed in the Tier 2 analysis.

ARCHAEOLOGY

The three states included in the Archaeological Assessment are in the process of converting their archaeological site mapping and data into GIS databases. However, each state's approach to this process is somewhat different, and they are at different points in completing this process. As a result, the process of collecting comparable data from each state's records required different procedures.

All three states are consistent in categorizing sites that have been formally determined Eligible for the NRHP or Not Eligible for the NRHP, although formal eligibility determinations for archaeological sites in all the states are relatively rare. However, there is additional variability in how sites without formal determinations of eligibility are categorized, to reflect either a positive or negative assessment of potential eligibility. Georgia includes a category indicating a negative assessment of potential eligibility: "Recommended Ineligible." Like Georgia, South Carolina has an additional category that reflects a negative assessment of potential eligibility: "Probably Not Eligible." South Carolina also includes two additional categories that reflect a positive assessment of potential eligibility. The term "Potentially Eligible" is used to reflect a positive determination that a site appears to potentially meet the criterion for eligibility, while the term "Additional Work" indicates that additional investigation is recommended to further assess NRHP status. For the purposes of this Tier 1 EIS, resource tables will only identify potentially sensitive archaeological resources in the archaeology screening area that were previously identified and determined "Eligible for Listing" in the NRHP.

The following paragraphs discuss the specific data collection GDOT utilized for Georgia, South Carolina, and North Carolina.

3.8.2.2 Georgia

The Georgia Historic Preservation Division (HPD) of the Department of Natural Resources (DNR) manages Georgia's Natural, Archaeological and Historic Resources GIS (GNAHRGIS) database. It is an interactive Web-based registry and geographical information system designed to catalog information about the natural, archaeological, and historic resources of Georgia.[109] This information has been compiled by the HPD (the SHPO) in collaboration with the Georgia Archaeological Site File at the University of Georgia. In the GNAHRGIS system, historic properties include buildings, structures, historic sites, landscapes, and districts included in the HPD's Historic Resources Survey or listed in the NRHP.

[109] *Georgia Department of Natural Resources, Historic Preservation Division, "Historic Resources Survey/GNAHRGIS," http://georgiashpo.org/registerandsurvey (accessed on 2/18/2018).*

HISTORIC RESOURCES

The GNAHRGIS system has some limitations:

- Survey data is not routinely or systematically updated to the GNAHRGIS system
- Qualitative data concerning a particular data points' NRHP status is not included

Every effort was made to verify these data prior to classification and/or removal by utilizing Google Earth Street View.[110] Where a definitive "Not eligible" classification could not be made, the data point was coded "Unknown NRHP eligibility" and remained in the dataset as such.

ARCHAEOLOGY

A desktop survey of identified previously recorded archaeological sites was completed using the GNAHRGIS system, which allowed for the definition of resources within the 600-foot wide environmental screening area and the capture of GIS data for any previously identified archaeological sites that fell within a portion of the screening area. GIS maps were created within the GNAHRGIS platform and hard copies of the maps and associated site data tables were printed and used for the archaeological analysis. Copies of scanned site files and site data forms were collected and used to cross check the information contained in the GIS data tables.

3.8.2.3 South Carolina

South Carolina's ArchSite combines data from the South Carolina Department of Archives and History (SCDAH) and the South Carolina Institute of Archaeology and Anthropology (SCIAA) to provide researchers access to information on the state's archaeological and built heritage. ArchSite is a web-based site that utilizes GIS mapping and contains datasets for: National Register-listed properties; buildings and structures evaluated for National Register eligibility (surveyed after 1990); areas surveyed for cultural resources (primarily since 1998); countywide historic architectural survey data for 13 counties; archaeological sites; and civil war earthworks thematic survey data.[111] Historic resources identified during Section 106 surveys are consistently uploaded to ArchSite resulting in an updated and fairly comprehensive data source.

HISTORIC RESOURCES

Data from ArchSite were coded and symbolized according to the four established categories regarding eligibility. For South Carolina, NRHP eligibility is clearly identified in nearly every case, and there is only one site classified as "Unknown NRHP eligibility."

ARCHAEOLOGY

Archaeological data for South Carolina was collected in coordination with the staff of the SCIAA. They provided the team with the digital data that was used to produce mapping and tabular data for analysis. As with the Georgia sites, copies of scanned South Carolina site files and site data forms were collected and used to cross check the information contained in the GIS data tables.

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[110] *Specific imagery dates vary on Google Earth Street View 2018.*

[111] *South Carolina Department of Archives & History, "Consultant's Guide to Survey & National Register Files," http://shpo.sc.gov/tech/Pages/default.aspx (accessed on 2/15/18).*

3.8.2.4 North Carolina

North Carolina's Historic Preservation Office (HPO) maintains a statewide database of historic properties available for public review via the HPOWEB Map Service.[112]

HISTORIC RESOURCES

The HPO provided data for historic resources, which are classified in one of five classes established by HPO, including:

- NR – Listed in the NRHP;
- SL – *Study Listed*, which includes properties identified by the National Register Advisory Committee as potentially eligible for the NRHP;
- DOE – *Determination of Eligibility*, which includes resources that have been determined eligible by SHPO through the Section 106 Process;
- LL – *Local Landmarks,* which are locally designated landmarks and districts; and
- S – *Surveyed*, which includes resources recorded by field surveys that do not have an official historic designation.

Data considered not eligible, or ineligible, and data that included notes indicating the property had been demolished, were coded "Not eligible" and were removed from the dataset. Every effort was made to verify these data prior to classification and/or removal by utilizing Google Earth Street View.[113] Where a definitive "Not eligible" call could not be made, the data point was coded "Unknown NRHP eligibility" and remains in the dataset as such. North Carolina included 26 resources within the environmental screening areas without an associated NRHP eligibility.

HPOWEB updates the state-wide dataset monthly resulting in a fairly comprehensive data source. Given the date of the data transfer, data in HPOWEB was compared to the North Carolina dataset, and these reexaminations resulted in one newly identified (in 2013) NRHP-eligible historic resource within the screening area for the Southern Crescent Corridor Alternative and one change in eligibility status from Unknown to NRHP Listed.

ARCHAEOLOGY

Through coordination with the HPO archaeological staff, GDOT found that there were relatively few archaeological sites recorded within the environmental screening area located in North Carolina.

3.8.2.5 National Park Service's NRIS Inventory and Database of National Historic Landmarks

The National Park Service's NRIS database includes more than 84,000 entries of historic sites that are currently listed, were once listed but removed, or are pending nominations in the National Register. The NRIS dataset was utilized to cross-reference NRHP-listed resources recorded by each state. Cross examination of the data did not reveal any omissions from state-maintained records.

A review of the database of NHLs was also completed. No NHLs or NHL nominations are located within the Corridor Alternatives.

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[112] *North Carolina State Historic Preservation Office, "GIS Metadata: Data Sources, Data Status, and Data Disclaimers," (4/3/2014). http://www.hpo.ncdcr.gov/gis/CountyDisclaimers.html (accessed on 2/15/18). The source contains multiple links and general information pertaining to accuracy and limitations of assembled data.*

[113] *Specific imagery dates vary Google Earth Street View 2013.*

3.8.2.6 Agency Coordination

As part of the cultural resources effort, FRA sent coordination letters on July 9, 2015, to the state historic preservation officers of Georgia, South Carolina, and North Carolina, and to historic preservation-focused agencies and organizations to request information on known eligible historic properties within the screening area. The following are organizations that received the Tier 1 early coordination letters:

- Advisory Council on Historic Preservation;
- Atlanta Regional Commission;
- Atlanta Urban Design Commission;
- Charlotte Regional History Consortium;
- Charlotte-Mecklenburg Historic Landmarks Commission;
- Georgia Mountains Regional Commission;
- Georgia State Historic Preservation Officer;
- National Park Service - Southeast Region;
- North Carolina State Historic Preservation Officer;
- North Carolina Office of Archives and History;
- Northeast Georgia Regional Commission; and
- South Carolina Department of Archives and History - State Historic Preservation Officer.

Letters were received from the Georgia SHPO on July 27, 2015, and from the North Carolina Department of Cultural Resources – State Historic Preservation Office on August 13, 2015. An email was received from the Atlanta Urban Design Commission on August 25, 2015; all responses are included in Appendix C.

FRA has also coordinated with several tribes via early coordination letters sent on July 9, 2015 (Appendix C). These tribes were identified using a compiled list of documented, federally recognized tribes with former and current habitation in Georgia, South Carolina, and North Carolina within the screening area. The list of tribes that were sent early coordination letters for the Tier 1 EIS includes:

- Eastern Band of Cherokee Indians;
- United Keetoowah Band;
- Cherokee Nation;
- Poarch Band of Creek Indians;
- Coushatta Tribe of Louisiana;
- Muscogee (Creek) Nation National Council;
- Kialegee Tribal Town;
- Muscogee (Creek) Nation;
- Thlopthlocco Tribal Town;
- Alabama-Coushatta Tribe of Texas;
- Seminole Nation of Oklahoma;

- Catawba Indian Tribe; and
- Tuscarora Nation.

One phone call and follow-up email was received on August 3, 2015, from the Catawba Indian Tribe noting that their concerns are more specific to Section 106 once a route has been established. An email from the United Keetoowah Band was received on August 19, 2015, stating they want to be involved in the consultation for the Project. A letter from the Alabama-Coushatta Tribe of Texas dated August 27, 2015, was received stating that there are no known impacts to cultural assets of the tribe based on the Project; however, they requested information as the results become available (see Appendix C). FRA will use input from the tribes, including their Tribal Historic Preservation Offices (THPOs), to identify cultural resource issues of concern to be addressed in future Tier 2 analyses, and Section 106 consultation will continue not only with Native American tribes, but also with the SHPOs and other consulting parties

3.8.3 Affected Environment

Exhibit 3.8-2 presents historical resources listed on the NRHP and those that are potentially eligible for listing that are known to exist within each Corridor Alternative and Atlanta approach. Exhibits 3.8-3 through 3.8-26 provide more detail by Corridor Alternative. The archaeological review identified sites in each Corridor Alternative are also listed. A summary of the cultural resources can be found in Exhibit 3.8-2 below. The Southern Crescent Corridor Alternative with either Atlanta Approach has the highest number of NRHP listed historic properties, as was as the highest number of state eligible historic properties. The I-85 Corridor Alternative with either Atlanta Approach has the highest number of identified archaeological sites in the screening area. There are no previously identified NRHP-eligible historic resources in the NS Atlanta Approach or the CSX Atlanta Approach.

Exhibit 3.8-2: Cultural Resources Summary Table

Corridor Alternative	History - NRHP Listed Properties*	History - State Eligible Properties	Archaeology - identified Sites**
Southern Crescent Corridor with NS Atlanta Approach	66	51	21
Southern Crescent Corridor with CSX Atlanta Approach	59	51	26
I-85 Corridor with NS Atlanta Approach	36	16	59
I-85 Corridor with CSX Atlanta Approach	33	16	61
Greenfield Corridor with NS Atlanta Approach	27	13	32
Greenfield Corridor with CSX Atlanta Approach	24	13	34

Source: HNTB and PB
Note: The environmental screening areas are defined as 1,000 feet in width for historic properties and 600 feet for archaeological properties.
** 5 NRHP-listed historic properties are included in both Atlanta Approach Alternatives.*
** Previously identified and determined eligible for listing in the NRHP. Official determinations of eligibility from the SHPOs deferred to Tier 2.

3.8.3.1 Southern Crescent Corridor

Exhibit 3.8-3 below summarizes the number of listed, eligible, or identified historic and archaeological resources located within the Southern Crescent Corridor environmental screening area. A listing of the National Register of Historic Places listed sites and districts for the Southern Crescent Corridor and the Southern Crescent Corridor Atlanta Approaches can be found in Exhibit 3.8-4 through Exhibit 3.8-6.

Exhibit 3.8-3: Summary of Historic and Archaeological Resources in Southern Crescent Corridor and Approaches

Corridor Alternative	History - NRHP Listed Properties	History - State Eligible Properties	Archaeology identified sites*
Southern Crescent Corridor	50	51	19
Southern Crescent - NS Atlanta Approach	16**	N/A	2
Southern Crescent - CSX Atlanta Approach	9**	N/A	7

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, Georgia Archaeological Site Files, South Carolina SHPO, SC ArchSite, South Carolina Institute of Archaeology and Anthropology, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)
** Eligibility for Archaeology sites not identified in summary chart – only previously identified sites*
*** 5 NRHP-listed historic properties are included in both Atlanta Approach Alternatives.*
Note: The environmental screening areas are defined as 1,000 feet in width for historic properties and 600 feet in width for archaeological properties along the Corridor Alternative.
**** The railroad corridors of both Crescent and CSX are considered NRHP-eligible resources but are not included in the overall number; however, the railroads will be evaluated in the Tier 2 EIS.*

HISTORY

A review of previously identified NRHP-Listed historic resources for the Southern Crescent Corridor and Atlanta Approaches are found in Exhibits 3.8-4 through Exhibit 3.8-6. These resources are also mapped in Appendix A.

Exhibit 3.8-4: Southern Crescent Corridor - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81218	College Park Historic District	1893	District	Fulton	GA	NRHP	1 of 51
80795	East Point Industrial District	1875-1949	District	Fulton	GA	NRHP	1 of 51
81760	Oakland City Historic District	1880	District	Fulton	GA	NRHP	2 of 51
81620	Adair Park Historic District	1897	District	Fulton	GA	NRHP	2 of 51
81291	West End Historic District	1894	District	Fulton	GA	NRHP	2 of 51
80625	Atlanta University Center Historic District	1865	District	Fulton	GA	NRHP	2 of 51
80221	Castleberry Hill Historic District	1890s-1959	District	Fulton	GA	NRHP	2 of 51
81120	Selig Company Building	1900-1949	Building	Fulton	GA	NRHP	2 of 51

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81059	Cooledge, F. J., and Sons, Company--Hastings' Seed Company	1913	Building	Fulton	GA	NRHP	2/3 of 51
81675	Westinghouse Electric Company Building	1923	Building	Fulton	GA	NRHP	2/3 of 51
81687	Southern Railway North Avenue Yards Historic District	1925	District	Fulton	GA	NRHP	2/3 of 51
81053	Atlanta Spring and Bed Company--Block Candy Company	1900	Building	Fulton	GA	NRHP	3 of 51
80890	Atlanta Buggy Company and Warehouse--Hatcher Bros. Furniture Company	1903	Building	Fulton	GA	NRHP	3 of 51
81683	Means Street Historic District	1869	District	Fulton	GA	NRHP	3 of 51
85002244	Lula Residential Historic District	1873-1934	District	Hall	GA	NRHP	15 of 51
80047	Irvin General Merchandise Store	1911	Building	Habersham	GA	NRHP	17 of 51
81647	Loudermilk Boarding House	1911	Building	Habersham	GA	NRHP	17 of 51
11000879	Toccoa Downtown Historic District	1850-1974	District	Stephens	GA	NRHP	20 of 51
80178	Stephens County Courthouse	1907	Building	Stephens	GA	NRHP	20 of 51
80186	Schaefer-Marks House	1897	Building	Stephens	GA	NRHP	20 of 51
792	Southern Railway Passenger Station	1885	Building	Oconee	SC	NRHP	23 of 51
97	Seneca Historic District	1873	District	Oconee	SC	NRHP	24/25 of 51
336	Ram Cat Alley Historic District	1887	District	Oconee	SC	NRHP	25 of 51
806	Easley High School Auditorium	1909	Building	Pickens	SC	NRHP	29 of 51
115	Woodside Cotton Mill Village Historic District	1902	District	Greenville	SC	NRHP	31 of 51
7	Southern Bleachery and Print Works	1924-1952	Building	Greenville	SC	NRHP	33 of 51
139	Greer Depot	1913	Building	Greenville	SC	NRHP	34 of 51
302	Greer Downtown Historic District	1910-1930	District	Greenville	SC	NRHP	34 of 51
310	Davenport House	1921	Building	Greenville	SC	NRHP	34 of 51
386	Arcadia Mill Historic District	1923	Building	Spartanburg	SC	NRHP	37 of 51
800	Cowpens Depot	1896	Building	Spartanburg	SC	NRHP	39 of 51
34/35	Gaffney Residential Historic District	ca. 1890-ca. 1930	District	Cherokee	SC	NRHP	41 of 51
49	Gaffney Commercial Historic District	1875-1950	District	Cherokee	SC	NRHP	41 of 51
310	Jefferies House	1884	Building	Cherokee	SC	NRHP	41 of 51
811	Carnegie Free Library	1914	Building	Cherokee	SC	NRHP	41 of 51
CL0350	Margrace Mill Village Historic District	1919	District	Cleveland	NC	NRHP	45 of 51
CL0955	West End Historic District	1882-1955	District	Cleveland	NC	NRHP	45 of 51
CL0783	King Street Overhead Bridge	1938	Structure	Cleveland	NC	NRHP	45 of 51
CL0785	Southern Railway Company Overhead Bridge	1919	Structure	Cleveland	NC	NRHP	45 of 51
CL0349	Central School Historic District	Late 19th-early 20th Century	District	Cleveland	NC	NRHP	45 of 51

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
GS1572	Bessemer City Downtown Historic District	c.1880-1950	District	Gaston	NC	NRHP/ HPOWEB	46 of 51
GS0503	Loray Mill Historic District	1900-1935	District	Gaston	NC	NRHP	47 of 51
GS0594	Loray Mill Historic District Boundary Expansion	1901-1920	District	Gaston	NC	NRHP	47 of 51
GS1093	Downtown Gastonia Historic District	Late 19th early 20th Century	District	Gaston	NC	NRHP	47 of 51
GS0016	Third National Bank Building	1923	Building	Gaston	NC	NRHP	48 of 51
GS0405	Robinson-Gardner Building	1897	Building	Gaston	NC	NRHP	48 of 51
GS0015	First National Bank Building	1916-17	Building	Gaston	NC	NRHP	48 of 51
GS1076	Mayworth School	1921	Building	Gaston	NC	NRHP	48 of 51
GS0024	Belmont Historic District	19-20th Century	District	Gaston	NC	NRHP	49 of 51
GS0030	(former) United States Post Office	1939	Building	Gaston	NC	NRHP	49 of 51

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to Map Book in Appendix A.*

Exhibit 3.8-5: Southern Crescent Corridor Norfolk Southern Atlanta Approach - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81131	King Plow Company**	1900-1949	Buildings	Fulton	GA	NRHP	3 of 51
81764	Howell Interlocking Historic District**	1889	District	Fulton	GA	NRHP	3 of 51
81421	Ashby Street Car Barn**	1927	Building	Fulton	GA	NRHP	3 of 51
81082	Van Winkle, E., Gin and Machine Works**	1889; 1912	Building	Fulton	GA	NRHP	3 of 51
80626	Atlanta Waterworks Hemphill Avenue Station	1892	Building	Fulton	GA	NRHP	3 of 51
80182	Peachtree Southern Railway Station	1918	Building	Fulton	GA	NRHP	3 of 51
81028	Brookwood Hills Historic District**	1925-1974	District	Fulton	GA	NRHP	3 of 51
80830	Garden Hills Historic District	1925-1949	District	Fulton	GA	NRHP	3 of 51
81117	Peachtree Highlands-Peachtree Park Historic District	1900-1974	District	Fulton	GA	NRHP	3/4 of 51
80955	Oglethorpe University Historic District	1915	District	DeKalb	GA	NRHP	4 of 51
80119	Norcross Historic District	1870	District	Gwinnett	GA	NRHP	6 of 51
81599	The Superb (Southeastern Railway Museum)	1911	Structure	Gwinnett	GA	NRHP	7 of 51
80046	John Quincy Allen House	1911	Building	Gwinnett	GA	NRHP	9 of 51
81020	Bona Allen House	1911	Building	Gwinnett	GA	NRHP	9 of 51

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
80120	Flowery Branch Commercial Historic District	1871-1934	District	Hall	GA	NRHP	11 of 51
80729	Chicopee Mill and Village Historic District	1927	District	Hall	GA	NRHP	12 of 51

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to map book in Appendix A;*

*** Resources included in both Norfolk Southern and CSX Atlanta Approaches (5 sites total).*

Exhibit 3.8-6: Southern Crescent Corridor CSX Atlanta Approach - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81131	King Plow Company**	1900-1949	Buildings	Fulton	GA	NRHP	3 of 15
81764	Howell Interlocking Historic District**	1889	District	Fulton	GA	NRHP	3/4 of 15
81421	Ashby Street Car Barn**	1927	Building	Fulton	GA	NRHP	3/4 of 15
81082	Van Winkle, E., Gin and Machine Works**	1889; 1912	Building	Fulton	GA	NRHP	3/4 of 15
81783	Berkeley Park Historic District	1900-1974	District	Fulton	GA	NRHP	3/4 of 15
81028	Brookwood Hills Historic District**	1925-1974	District	Fulton	GA	NRHP	4 of 15
81448	Druid Hills Historic District	1900-1949	District	DeKalb	GA	NRHP	4 of 15
81634	Emory Grove Historic District	1900-1949	District	DeKalb	GA	NRHP	4 of 15
249543	Decatur Waterworks	1928-1948	District	DeKalb	GA	NRHP	5 of 15

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to map book in Appendix A;*

*** Resources included in both Norfolk Southern and CSX Atlanta Approaches (5 sites total).*

Certain historic property types are associated with a historic railroad corridor and may include rail depots, rail yards and industrial building types, e.g., mills and warehouses. Many of the NRHP-listed resources within the Southern Crescent Corridor Alternative with Norfolk Southern Approach and CSX Approach appear to have a historic association with the railroad itself. Other resources identified are associated with commercial uses and generally include downtown historic districts. It is not surprising to find historic commercial and/or downtown districts in close association with the railroad corridor (See Appendix A). The 51 eligible state and local sites are found in Exhibit 3.8-7.

Exhibit 3.8-7: Southern Crescent Corridor– State and Local Determination Eligible Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
770311-8	Southern Railway Buildings – Multiple Property Resource	1907-1926	Buildings	Fulton	GA	GDOT	2 of 51
770311-11	Circle Wye Railroad Junction and Associated Railroad Corridors	1846	Site	Fulton	GA	GDOT	2 of 51
770311-24	Wilder Manufacturing Company Building	1907	Building	Fulton	GA	GDOT	2 of 51
770311-27	Nelson Street Bridge	1906	Structure	Fulton	GA	GDOT	2 of 51
770311-28	Peters Street Bridge	1935	Structure	Fulton	GA	GDOT	2 of 51
58329	Coats and Clark Administrative Offices	1944	Building	Stephens	GA	GNAHRGIS	20 of 51
58294	Hudgin's Furniture (present)	1944	Building	Stephens	GA	GNAHRGIS	20 of 51
58295	Troup's Studio/Hallmark Cards	1914	Building	Stephens	GA	GNAHRGIS	20 of 51
58296	Dr. MacBath House	1904	Building	Stephens	GA	GNAHRGIS	20 of 51
58297	Hudgin's House (historic)	1934	Building	Stephens	GA	GNAHRGIS	20 of 51
58298	Hogsed House (historic)	1915	Building	Stephens	GA	GNAHRGIS	20 of 51
58299	Railroad Maintenance Building	1944	Building	Stephens	GA	GNAHRGIS	20 of 51
58300	Railroad Station	1915	Building	Stephens	GA	GNAHRGIS	20 of 51
58301	Burrell's Chevrolet (historic)	1944	Building	Stephens	GA	GNAHRGIS	20 of 51
58348	Robert Groves (Graves) house	1914	Building	Stephens	GA	GNAHRGIS	20 of 51
58271	Old Toccoa Post Office; Toccoa Municipal Building	1931	Building	Stephens	GA	GNAHRGIS	20 of 51
58491	House (Central Hall)	1892	Building	Stephens	GA	GNAHRGIS	20 of 51
58375	Brewer Stark House	1924	Building	Stephens	GA	GNAHRGIS	20 of 51
58378	House	1934	Building	Stephens	GA	GNAHRGIS	20 of 51
58389	Collins House	1894	Building	Stephens	GA	GNAHRGIS	20 of 51
58390	House (New South Cottage)	1904	Building	Stephens	GA	GNAHRGIS	20 of 51
58426	House	1929	Building	Stephens	GA	GNAHRGIS	20 of 51
58391	House	1932	Building	Stephens	GA	GNAHRGIS	20 of 51
58392	House	1932	Building	Stephens	GA	GNAHRGIS	20 of 51
58393	House (Colonial Revival and EVR)	1937	Building	Stephens	GA	GNAHRGIS	20 of 51
58394	House (Georgian Cottage)	1914	Building	Stephens	GA	GNAHRGIS	20 of 51
58430	House	1929	Building	Stephens	GA	GNAHRGIS	20 of 51
58526	Hartwell Mill	1884	Building	Stephens	GA	GNAHRGIS	20 of 51
17414	Site Number 0050	Unknown	Building	Oconee	SC	ArchSite	23 of 51
5662	Seneca Depot	ca. 1910	Building	Oconee	SC	ArchSite	25 of 51
698	Central Roller Mills Historic District	1903	District	Pickens	SC	ArchSite	27 of 51
17418	Site Number 0082	1890; 1990s	Building	Pickens	SC	ArchSite	29 of 51
6481	Dunhams Bridge/Site Number 1263	1925	Structure	Greenville	SC	ArchSite	30/31 of 51
543	F.W. Poe Manufacturing Company Store and Office Building	ca. 1900	Building	Greenville	SC	ArchSite	32 of 51
554	Dr. James Nesbit House	1894, 1917	Building	Greenville	SC	ArchSite	33 of 51

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
687	Pacific Mills Mill Village Historic District	1920s	District	Spartanburg	SC	ArchSite	35 of 51
7078	Jones-West House	Unknown	Building	Spartanburg	SC	ArchSite	35 of 51
9093	Site Number 186-0051	Unknown	Building	Cherokee	SC	ArchSite	40 of 51
7058	Vassy Homeplace	1835; 1880s	Building	Cherokee	SC	ArchSite	40 of 51
CL0584	Grover Historic District	Unknown	District	Cleveland	NC	HPOWEB	44 of 51
CL0013	First Andrew Manney House	ca. 1872	Building	Cleveland	NC	HPOWEB	45 of 51
GS0896	Bridge No. 165 (DOT 350165)	1919	Structure	Gaston	NC	HPOWEB	46 of 51
GS0404	Myrtle Mill Village Historic District	Unknown	District	Gaston	NC	HPOWEB	47 of 51
GS0400	Arlington Mill Village Historic District	Unknown	District	Gaston	NC	HPOWEB	47 of 51
GS1614	Arlington School and Peedin School	1922, 1949	Buildings	Gaston	NC	HPOWEB	47 of 51
GS1625	Piedmont and Northern Railway Linear Historic District	1910-1916	Linear District	Gaston, Mecklenburg	NC	HPOWEB	48/49/51 of 51
GS0382	Lowell Teacherage	ca. 1924	Building	Gaston	NC	HPOWEB	48 of 51
GS0135	Bank of Belmont	1926-1927	Building	Gaston	NC	HPOWEB	49 of 51
MK2983	W.P.A. Douglas Airport Hanger	1936-1937	Building	Mecklenburg	NC	HPOWEB	50 of 51
MK3071	Ford Motor Company Automotive Parts Distribution Center	1952	Building	Mecklenburg	NC	HPOWEB	50 of 51
MK2932	Wilmore Local Historic District	Unknown	District	Mecklenburg	NC	HPOWEB	51 of 51

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)
** "Exhibit (Map)" refers to map book in Appendix A*

There are no previously identified NRHP-eligible historic resources in the NS Atlanta Approach or the CSX Atlanta Approach. Further study may reveal historic structures associated with either railroad including but not limited to previously unrecorded railroad bridges and other associated structures. The railroad corridors, along with the potential for adverse effects to it and other historic resources, would be considered during a Tier 2 analysis.

ARCHAEOLOGY

A review of previously identified cultural resources for the Southern Crescent Corridor resulted in the identification of 19 archaeological sites (See Exhibit 3.8-8). The Georgia SHPO has determined one site, 9FU91 in Georgia, to be eligible for the NRHP. Four sites in South Carolina have been evaluated as potentially eligible (38GR0190, 38PN0039, 38PN0044 and 38SP0310). There are two sites identified in the Norfolk Southern Atlanta Approach and seven sites in the CSX Atlanta Approach with one site, 9DA355, listed on the NRHP (See Exhibit 3.8-9 and Exhibit 3.8-10).

Exhibit 3.8-8: Southern Crescent Corridor (not including Atlanta Approaches) – Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP Eligibility Status	Temporal Affiliation	Site Type	Notes
9FU90	GA	None	Unknown	Prehistoric: Unknown	Lithic Scatter	Cultivated and eroded.
9FU91	GA	Atlanta City Garbage Crematory	Determined Eligible	Historic: Unknown	Historic garbage crematory	Disturbed and eroded.
9FU410	GA	None	Recommended Ineligible	19th-20th Century	Historic Scatter	Associated railroad and warehouse district.
9FU582	GA	Orme-Magnolia Trolley Line	Recommended Ineligible	20th Century	Abandoned trolley tracks	Destroyed.
9HL435	GA	None	Recommended Ineligible	19th-20th Century	Stone Culvert	Railroad culvert, endangered by natural erosion, railroad improvements.
9HL436	GA	None	Recommended Ineligible	19th-20th Century	Stone Culvert	Railroad culvert, endangered by slope erosion, railroad maintenance.
9HL443	GA	Oakwood Pottery	Undetermined	20th Century (1895-1910)	Historic Stoneware Pottery	Stoneware Kiln remnants and waste dump of the circa 1900 Oakwood Pottery Site; largely destroyed.
9HL592	GA	None	Recommended Ineligible	19th-20th Century	19th-20th Artifact Scatter	Scatter of late 19th-20th century artifacts along a railroad junk yard and tracks. Filled in well on site.
38GR0190	SC	American Mill Village	Potentially Eligible	19th-20th Century	Former Mill Village	Mill village built in the last decade of the 19th century and destroyed in the late 1930s. Roads, sidewalks, cement stairs, brick piers throughout.
38GR0236	SC	None	Probably Not Eligible	Prehistoric: Unknown 19th-20th Century	House site, Lithic Scatter	No subsurface features found.
38GR0238	SC	None	Probably Not Eligible	19th Century	Surface Scatter	Widely dispersed mid to late 19th century historic scatter.
38GR0276	SC	None	Probably Not Eligible	20th Century	Farm House and Historic Scatter	House also has an associated farm complex consisting of a barn, a modern two car garage, storage and equipment shed.
38PN0039	SC	SCHD Pickens 2	Potentially Eligible	Historic	Surface Scatter	None
38PN0044	SC	SCHD Pickens 7	Potentially Eligible	19th-20th Century	Surface Scatter	Remaining structural materials are deteriorating wooden timbers, stone foundations, rusting iron bedstead, ornamental shrubbery and open well.

Site Number	State	Site Name	NRHP Eligibility Status	Temporal Affiliation	Site Type	Notes
38SP0238	SC	BMW-1-85	Additional Work	Historic	House site	Structural remains consist of well, house pad, several large trees including one cedar and a fenced-in yard area.
38SP0280	SC	Site 1	Probably Not Eligible	20th Century	Surface Scatter	No cultural features.
38SP0310	SC	Wallace DuPre House	Potentially Eligible	Late 19th Century	House Site	Home site of affluent family with associated outbuildings and landscape features.
31MK112	NC	None	Not Eligible	Prehistoric: Unknown	Lithic scatter	Disturbed by erosion.
31MK114	NC	None	Not Eligible	Prehistoric: Unknown	Lithic scatter	Disturbed by railroad construction activity.

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

Exhibit 3.8-9: Southern Crescent Corridor Norfolk Southern Atlanta Approach – Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP Eligibility Status	Temporal Affiliation	Site Type	Notes
9GW153	GA	Barrett	No determination	Multi-component Prehistoric	Surface artifact scatter	Amateur collection
9GW167	GA	None	No determination	Historic	Old railroad station	No notes

Source: PB, GNAHRGIS, Georgia Archaeological Site File

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

Exhibit 3.8-10: Southern Crescent Corridor CSX Atlanta Approach – Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP Eligibility Status	Temporal Affiliation	Site Type	Notes
9DA354	GA	1993 DIGIT	Recommended Ineligible	Prehistoric Unknown Historic	Lithic Scatter. House Site	Disturbed
9DA355	GA	Decatur Waterworks	NRHP Listed	19th century	Historic waterworks	Undisturbed
9DA356	GA	None	Recommended Ineligible	19th-20th century	Historic Artifact Scatter	Surface scatter only
9GW515	GA	None	Recommended Ineligible	19th-20th century	House site	Shallow and eroded
9GW516	GA	None	Recommended Ineligible	20th century	Historic Artifact Scatter	Modern artifacts
9GW593	GA	None	Recommended Ineligible	20th century	House site	Disturbed
9JK236	GA	None	Recommended Ineligible	20th century	House site	Gutted house with scattered modern trash and foundation stones.

Source: PB, GNAHRGIS, Georgia Archaeological Site File
Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

3.8.3.2 I-85 Corridor

Exhibit 3.8-11 below summarizes the number of listed, eligible, or identified historic and archaeological resources located within the I-85 Corridor environmental screening area. A listing of the National Register of Historic Places listed sites and districts for the I-85 Corridor and the I-85 Corridor Atlanta Approaches can be found in Exhibit 3.8-12 through Exhibit 3.8-14.

Exhibit 3.8-11: Summary of Historic and Archaeological Resources in I-85 Corridor and Approaches

Corridor Alternative	History - NRHP Listed Properties	History - State Eligible Properties	Archaeology identified sites*
I-85 Corridor (not including Atlanta Approaches)	24	16	55
I-85 - NS Atlanta Approach* **	12**	N/A	4
I-85 - CSX Atlanta Approach* **	9**	N/A	6

Source: HNTB, PB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, Georgia Archaeological Site Files, South Carolina SHPO, SC ArchSite, South Carolina Institute of Archaeology and Anthropology, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** Eligibility for Archaeology sites not identified in summary chart – only previously identified sites*

*** 5 NRHP-listed historic properties are included in both Atlanta Approach Alternatives based on proximity.*

**** The railroad corridors of both Crescent and CSX are considered NRHP-eligible resources but are not included in the overall number; however, the railroads will be evaluated in the Tier 2 EIS.*

HISTORY

A review of previously identified historic resources for the I-85 Corridor and the two Approaches are identified in Exhibit 3.8-12, Exhibit 3.8-13 and Exhibit 3.8-14 (see also Appendix A).

Exhibit 3.8-12: I-85 Corridor - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81218	College Park Historic District	1893	District	Fulton	GA	NRHP	1 of 50
80795	East Point Industrial District	1875-1949	District	Fulton	GA	NRHP	1 of 50
81760	Oakland City Historic District	1880	District	Fulton	GA	NRHP	2 of 50
81620	Adair Park Historic District	1897	District	Fulton	GA	NRHP	2 of 50
81291	West End Historic District	1894	District	Fulton	GA	NRHP	2 of 50
80625	Atlanta University Center Historic District	1865	District	Fulton	GA	NRHP	2 of 50
80221	Castleberry Hill Historic District	1890s-1959	District	Fulton	GA	NRHP	2 of 50
81120	Selig Company Building	1900-1949	Building	Fulton	GA	NRHP	2 of 50
81059	Cooledge, F. J., and Sons, Company--Hastings' Seed Company	1913	Building	Fulton	GA	NRHP	2/3 of 50
81675	Westinghouse Electric Company Building	1923	Building	Fulton	GA	NRHP	2/3 of 50
81687	Southern Railway North Avenue Yards Historic District	1925	District	Fulton	GA	NRHP	2/3 of 50
81053	Atlanta Spring and Bed Company--Block Candy Company	1900	Building	Fulton	GA	NRHP	3 of 50
80890	Atlanta Buggy Company and Warehouse--Hatcher Bros. Furniture Company	1903	Building	Fulton	GA	NRHP	3 of 50
81683	Means Street Historic District	1869	District	Fulton	GA	NRHP	3 of 50
330	New Hope Farm	1885	Buildings/ Farm	Spartanburg	SC	NRHP	35 of 50
GS0503	Loray Mill Historic District	1900-1935	District	Gaston	NC	NRHP	46 of 50
GS0594	Loray Mill Historic District Boundary Expansion	1901-1920	District	Gaston	NC	NRHP	46 of 50
GS1093	Downtown Gastonia Historic District	Late 19th Century-early 20th Century	District	Gaston	NC	NRHP	46 of 50
GS0016	Third National Bank Building	1923	Building	Gaston	NC	NRHP	47 of 50
GS0405	Robinson-Gardner Building	1897	Building	Gaston	NC	NRHP	47 of 50
GS0015	First National Bank Building	1916-17	Building	Gaston	NC	NRHP	47 of 50
GS1076	Mayworth School	1921	Building	Gaston	NC	NRHP	47 of 50

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
GS0024	Belmont Historic District	19th Century-early 20th Century	District	Gaston	NC	NRHP	48 of 50
GS0030	(former) United States Post Office	1939	Building	Gaston	NC	NRHP	48 of 50

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, South Carolina Institute of Archaeology and Anthropology, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to map book in Appendix A.*

Exhibit 3.8-13: I-85 Corridor Norfolk Southern Atlanta Approach (including Greenfield section) - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81131	King Plow Company**	1900-1949	Buildings	Fulton	GA	NRHP	3 of 50
81764	Howell Interlocking Historic District**	1889	District	Fulton	GA	NRHP	3 of 50
81421	Ashby Street Car Barn**	1927	Building	Fulton	GA	NRHP	3 of 50
81082	Van Winkle, E., Gin and Machine Works**	1889; 1912	Building	Fulton	GA	NRHP	3 of 50
80626	Atlanta Waterworks Hemphill Avenue Station	1892	Building	Fulton	GA	NRHP	3 of 50
80182	Peachtree Southern Railway Station	1918	Building	Fulton	GA	NRHP	3 of 50
81028	Brookwood Hills Historic District**	1927	District	Fulton	GA	NRHP	3 of 50
80830	Garden Hills Historic District	1925-1949	District	Fulton	GA	NRHP	3 of 50
81117	Peachtree Highlands-Peachtree Park Historic District	1920	District	Fulton	GA	NRHP	3/4 of 50
80955	Oglethorpe University Historic District	1915	District	DeKalb	GA	NRHP	4 of 50
81599	The Superb (Southeastern Railway Museum)	1911	Structure	Gwinnett	GA	NRHP	7 of 50
80119	Norcross Historic District	1870	District	Gwinnett	GA	NRHP	6 of 50

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to map book in Appendix A; ** 5 NRHP resources included in both Norfolk Southern and CSX Atlanta Approaches.*

Exhibit 3.8-14: I-85 Corridor CSX Atlanta Approach - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81131	King Plow Company**	1900-1949	Buildings	Fulton	GA	NRHP	3 of 12
81764	Howell Interlocking Historic District**	1889	District	Fulton	GA	NRHP	3 of 12

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81421	Ashby Street Car Barn**	1927	Building	Fulton	GA	NRHP	3 of 12
81082	Van Winkle, E., Gin and Machine Works**	1889, 1912	Building	Fulton	GA	NRHP	3 of 12
81783	Berkeley Park Historic District	1900-1974	District	Fulton	GA	NRHP	3 of 12
81028	Brookwood Hills Historic District**	1925-1974	District	Fulton	GA	NRHP	3 of 12
81448	Druid Hills Historic District	1900-1949	District	DeKalb	GA	NRHP	4 of 12
81634	Emory Grove Historic District	1900-1949	District	DeKalb	GA	NRHP	4 of 12
249543	Decatur Waterworks	1928-1948	District	DeKalb	GA	NRHP	4 of 12

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to map book in Appendix A; ** 5 NRHP resources included in both Norfolk Southern and CSX Atlanta Approaches.*

It is worth highlighting the scarcity of NRHP-listed historic resources in the screening area for the I-85 Corridor Alternative that are not shared with the Southern Crescent Corridor. The I-85 Corridor includes only one NRHP-listed rural historic resource outside of the greater Atlanta and Charlotte metropolitan areas (See Appendix A: Map Books). Eligible state and local sites are found in Exhibit 3.8-15.

Exhibit 3.8-15: I-85 Corridor - State Listed or Recognized Eligible Resources/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
770311-24	Wilder Manufacturing Company Building	1907	Building	Fulton	GA	GDOT	2 of 50
770311-28	Peters Street Bridge	1935	Structure	Fulton	GA	GDOT	2 of 50
770311-8	Southern Railway Buildings	1912	Buildings/ Multiple Property	Fulton	GA	GDOT	2 of 50
770311-27	Nelson Street Bridge	1906	Structure	Fulton	GA	GDOT	2 of 50
770311-11	Circle Wye Railroad Junction and Associated Railroad Corridors	1846	Site	Fulton	GA	GDOT	2 of 50
17075	Site Number 0901	Unknown	Unknown	Greenville	SC	ArchSite	33 of 50
GS1327	Wolfe Family Dairy Farm	Late-1800s	Buildings/ Farm	Gaston	NC	HPOWEB	46 of 50
GS0404	Myrtle Mill Village Historic District	Unknown	District	Gaston	NC	HPOWEB	46 of 50
GS0400	Arlington Mill Village Historic District	Unknown	District	Gaston	NC	HPOWEB	46 of 50
GS1614	Arlington School and Peedin School	1922, 1949	Buildings	Gaston	NC	HPOWEB	46 of 50
GS1625	Piedmont and Northern Railway Linear Historic District	1910-1916	District	Gaston/ Mecklenburg	NC	HPOWEB	46/47/50 of 50
GS0382	Lowell Teacherage	ca. 1924	Building	Gaston	NC	HPOWEB	47 of 50
GS0135	Bank of Belmont	1926-27	Building	Gaston	NC	HPOWEB	48 of 50

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
MK2983	W.P.A. Douglas Airport Hangar	1936-37	Building	Mecklenburg	NC	HPOWEB	49 of 50
MK3071	Ford Motor Company Automotive Parts Distribution Center	1952	Building	Mecklenburg	NC	HPOWEB	50 of 50
MK2932	Wilmore Local Historic District	Unknown	District	Mecklenburg	NC	HPOWEB	50 of 50

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, South Carolina Institute of Archaeology and Anthropology, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)
*Note: * "Exhibit (Map)" refers to map book in Appendix A*

ARCHAEOLOGY

The I-85 Corridor generally follows I-85 between Atlanta and Charlotte. The exception is in the approach segments into each terminus. A review of previously identified historic resources for the I-85 Corridor resulted in the identification of 55 archaeological sites (See Exhibit 3.8-16). One of these, site 9FU91 in Georgia, has been formally determined Eligible for the NRHP and one site in South Carolina, site 38GR0224, has been formally determined Eligible. Seven sites in South Carolina have been evaluated as Potentially Eligible (38GR0179, 38GR0222, 38GR0223, 38SP0094, 38SP0159, 38SP0268 and 38SP0272). There are four sites identified in the Norfolk Southern Atlanta Approach and six sites in the CSX Atlanta Approach with one site, site 9DA355, listed on the NRHP (See Exhibit 3.8-17 and Exhibit 3.8-18).

Exhibit 3.8-16: I-85 Corridor– Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9FU90	GA	None	Unknown	Prehistoric: Unknown	Lithic Scatter	Cultivated and eroded.
9FU91	GA	Atlanta City Garbage Crematory	Determined Eligible	Historic: Unknown	Historic Scatter	Disturbed by erosion.
9FU410	GA	None	Recommended Ineligible	19th-20th Century	Historic Scatter	Associated railroad and warehouse district.
9FU582	GA	Orme-Magnolia Trolley Line	Recommended Ineligible	20th Century	Abandoned trolley tracks	Destroyed.
38AN0174	SC	SCHD Anderson 5	Probably Not Eligible	19th-20th Century	Surface Scatter	Several buildings (not surveyed) probably are part of a tenant farm. Slope erosion.
38AN0215	SC	None	Probably Not Eligible	Middle Archaic	Lithic Scatter	Low density lithic scatter (Morrow Mountain Point).
38CK0081	SC	None	Probably Not Eligible	Prehistoric: Unknown Late 19th-20th Century	Surface Scatter	The site consists of a low density non-diagnostic prehistoric lithic scatter and a moderate density late nineteenth/early twentieth century historic scatter.
38CK0082	SC	None	Probably Not Eligible	Prehistoric: Unknown Late 19th-20th Century	Surface Scatter	The site consists of a moderately low density non-diagnostic prehistoric lithic scatter and moderately dense late nineteenth/early twentieth century historic scatter representing an old house location.
38GR0163	SC	None	Probably Not Eligible	Prehistoric: Unknown Early 20th Century	Surface Scatter, Building Debris	Freshly bulldozed area with numerous historic artifacts of early 20th century to recent age. Appears to be debris from recent removal of one or more houses. Houses indicated on current USGS for site location. Large area of natural quartz scatter also present.
38GR0179	SC	Salem Methodist Church Cemetery	Potentially Eligible	18th-19th Century	Church Site and Cemetery	Cemetery is situated on hill top overlooking Saluda River flood plain, containing from 20 to 30 interments, historic Salem Methodist Church founded in 1700s.
38GR0180	SC	None	Probably Not Eligible	Prehistoric: Unknown 20th Century	Surface Scatter	Light surface scatter of mixed prehistoric and historic artifacts.
38GR0183	SC	None	Probably Not Eligible	20th century (1937-1980s)	Brick School Foundation	WPA built school constructed in 1937, demolished in the early 1980s.
38GR0221	SC	None	Not Eligible	19th-20th Century	House Site	Site is a subsurface deposit of 19th and 20th century artifacts indicative of an occupation or dwelling. Concrete capped well or privy remains.
38GR0222	SC	None	Potentially Eligible	19th-20th Century	House Site	Tenant shack associated with a limited early 20th century deposit.

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
38GR0223	SC	None	Potentially Eligible	Prehistoric: Unknown 19th Century	House Site	Structure is an occupied I-House built c. 1860. Its integrity is good and the condition of the structure is fair.
38GR0224	SC	None	Eligible	19th Century	House Site	Building #293-0902 is a Hall/Parlor house c. 1880 and its integrity and condition are both good. A stained glass transom and sidelights are the only Greek Revival elements. Two outbuildings exist.
38GR0356	SC	Find 2	Probably Not Eligible	19th-20th Century	Surface Scatter	Possible trash dump associated with house.
38GR0357	SC	NSA07	Probably Not Eligible	Prehistoric: Unknown	Lithic Scatter	Sparse prehistoric lithic artifact scatter likely impacted by the urban development Home Depot store.
38OC0150	SC	Redneck Site	Probably Not Eligible	Prehistoric: Unknown	Lithic Scatter	Low-density lithic scatter; flooding and wave activity have caused artifacts to wash from bank.
38OC0156	SC	DD	Probably Not Eligible	Woodland 19th Century	Lithic Scatter	High-density scatter of lithic and a handful of sherds at water's edge in extensively eroded and disturbed low contour.
38OC0157	SC	EE	Probably Not Eligible	Prehistoric: Unknown	Lithic Scatter	Isolated flakes observed on steep slope, in cut swath; appear to be deposited by erosion (sheet wash).
38SP0094	SC	SCHD Spartanburg 18	Potentially Eligible	Middle – Late Archaic	Prehistoric Scatter	Some erosion.
38SP0146	SC	SCHD Spartanburg 61	Probably Not Eligible	Early – Late Archaic 20th Century	Lithic scatter Historic Scatter	Heavily eroded.
38SP0147	SC	SCHD Spartanburg 62	Probably Not Eligible	18th-20th Century	Surface Scatter	High density historic scatter.
38SP0148	SC	SCHD Spartanburg 63	Probably Not Eligible	Early Archaic, Late Woodland, Mississippian 19th-20th Century	Surface Scatter	I-85 Improvements Project. Low density prehistoric lithics, moderate density historic.
38SP0149	SC	SCHD Spartanburg 64	Probably Not Eligible	19th-20th Century	Surface Scatter	Sparse surface scatter.
38SP0150	SC	SCHD Spartanburg 65	Probably Not Eligible	20th Century	House Site	Structural remains.
38SP0151	SC	None	Probably Not Eligible	19th Century	Surface Scatter	Collapsed shed with fieldstone piers.
38SP0159	SC	BMW-1-23	Potentially Eligible	19th/20th Century	House Site	BMW Plant, house/ outbuildings/well/midden.
38SP0185	SC	BMW-1-19	Probably Not Eligible	19th/20th Century	House site	BMW Plant. Concrete capped well or privy remains.
38SP0186	SC	BMW-1-20	Probably Not Eligible	20th Century	Surface scatter	BMW Plant – Historic scatter.
38SP0187	SC	BMW-1-21	Probably Not Eligible	20th Century	House site	BMW Plant. Extant 1860s I-house. Good integrity.

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
38SP0188	SC	BMW-1-22	Probably Not Eligible	20th Century	House site	BMW Plant. Extant c 1880 Hall & Parlor house (#293-0902), Good integrity and condition. Outbuildings
38SP0189	SC	BMW-1-24	Probably Not Eligible	Prehistoric: Unknown 20th Century	Lithic Scatter	BMW Plant. Small prehistoric scatter. Possible trash dump associated with house. Eroded
38SP0199	SC	BMW-1-35	Probably Not Eligible	Prehistoric: Unknown 20th Century	House Site	BMW Plant. Extant house/barn/well. North portion of site may be intact under a parking lot.
38SP0200	SC	BMW-1-36	Probably Not Eligible	Prehistoric: Unknown 20th Century	Lithic Scatter	BMW Plant. Small prehistoric and historic scatter.
38SP0217	SC	BMW-1-54	Probably Not Eligible	Early Archaic , Mississippian	Lithic Scatter	BMW Plant. Scatter on exposed surfaces.
38SP0218	SC	BMW-1-55	Probably Not Eligible	19th/20th Century	Surface Scatter	BMW Plant. Historic surface scatter.
38SP0219	SC	BMW-1-56	Probably Not Eligible	20th Century	Dump	BMW Plant. Brick and cinderblock shed.
38SP0264	SC	JR1-1	Probably Not Eligible	Prehistoric: Unknown	Lithic Scatter	Surface grabs collection. Field is severely eroded.
38SP0268	SC	Geer 1	Potentially Eligible	19th/20th Century	House Site	Foundations, well, privy and midden.
38SP0269	SC	Geer 2	Not Eligible	Middle Woodland 20th Century	Lithic and Historic Scatters	Bulldozed terrace.
38SP0270	SC	Geer 4	Not Eligible	20th Century	House Site	School/tenet house.
38SP0271	SC	Well 1	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Low density scatter.
38SP0272	SC	Well 2	Potentially Eligible	Prehistoric: Unknown 20th Century	House Site	Tenet house associated with Snoddy farm house.
38SP0273	SC	Well 3	Probably Not Eligible	Prehistoric: Unknown 19th/20th Century	Lithic scatter, House Site	Low density scatter.
38SP0274	SC	Well 4	Probably Not Eligible	19th/20th Century	House Site	Low density scatter.
38SP0275	SC	Well 7	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Low Density scatter.
38SP0276	SC	Well 9	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Low Density scatter.
38SP0278	SC	Wingo House	Not Eligible	20th Century	House Site	Extant mid-20th house.
38SP0317	SC	Site 1	Not Eligible	19th Century	Cemetery	Smith Family Graveyard. Some graves may have been moved.
38SP0318	SC	Site 2	Not Eligible	20th Century	House Site	House demolished.
31GS370	NC	None	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Disturbed by erosion.
31MK112	NC	None	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Disturbed by erosion.
31MK114	NC	None	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Disturbed by railroad construction activity.

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

Exhibit 3.8-17: I-85 Corridor with NS Atlanta Approach –Recorded Archaeological Sites

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9GW153	GA	Barrett	No determination	Multi-component Prehistoric	Surface artifact scatter	Amateur collection
9GW167	GA	None	No determination	Historic	Old railroad station	No notes
9GW591	GA	None	Recommended Ineligible	Prehistoric - Historic	House site	Destroyed
9GW592	GA	None	Recommended Ineligible	Prehistoric	Lithic scatter	Destroyed

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

Exhibit 3.8-18: I-85 Corridor CSX Atlanta Approach –Recorded Archaeological Sites

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9DA354	GA	1993 DIGIT	Recommended Ineligible	Prehistoric Unknown Historic	Lithic Scatter. House Site	Disturbed
9DA355	GA	Decatur Waterworks	NRHP Listed	19th century	Historic waterworks	Undisturbed
9DA356	GA	None	Recommended Ineligible	19th-20th century	Historic Artifact Scatter	Surface scatter only
9GW515	GA	None	Recommended Ineligible	19th-20th century	House site	Shallow and eroded
9GW516	GA	None	Recommended Ineligible	20th century	Historic Artifact Scatter	Modern artifacts
9GW593	GA	None	Recommended Ineligible	20th century	House site	Disturbed

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

3.8.3.3 Greenfield

Exhibit 3.8-19 below summarizes the number of listed, eligible, or identified historic and archaeological resources located within the Greenfield Corridor environmental screening area. A listing of the National Register of Historic Places listed sites and districts for the Greenfield Corridor and the Greenfield Corridor Atlanta Approaches can be found in Exhibit 3.8-20 through Exhibit 3.8-22.

Exhibit 3.8-19: Summary of Historic and Archaeological Resources in Greenfield Corridor and Approaches

Corridor Alternative	History - NRHP Properties	History - State Eligible Properties	Archaeology identified sites*
Greenfield Corridor	15	13	28
Greenfield - NS Atlanta Approach***	12**	None	4
Greenfield - CSX Atlanta Approach***	9**	None	6

Source: HNTB, PB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, Georgia Archaeological Site File, South Carolina SHPO, SC ArchSite, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

*Note: * Eligibility for Archaeology sites not identified in summary chart – only previously identified sites*
*Note: ** 5 NRHP-listed historic properties are included in both Approaches based on proximity.*
*Note: *** The railroad corridors of both Crescent and CSX are considered NRHP-eligible resources but are not included in the overall number; however, the railroads will be evaluated in the Tier 2 EIS.*

HISTORY

A review of previously identified historic resources for the Greenfield Corridor and the two Atlanta Approaches are shown in Exhibit 3.8-20 through Exhibit 3.8-23 (also see Appendix A: Greenfield Corridor Map Book).

Exhibit 3.8-20: Greenfield Corridor - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81218	College Park Historic District	1893	District	Fulton	GA	NRHP	1 of 55
80795	East Point Industrial District	1875-1949	District	Fulton	GA	NRHP	1 of 55
81760	Oakland City Historic District	1880	District	Fulton	GA	NRHP	2 of 55
81620	Adair Park Historic District	1897	District	Fulton	GA	NRHP	2 of 55
81291	West End Historic District	1894	District	Fulton	GA	NRHP	2 of 55
80625	Atlanta University Center Historic District	1865	District	Fulton	GA	NRHP	2 of 55
80221	Castleberry Hill Historic District	1890s-1959	District	Fulton	GA	NRHP	2 of 55
81120	Selig Company Building	1925-1949; 1900-1924	Building	Fulton	GA	NRHP	2 of 55
81059	Cooledge, F. J., and Sons, Company--Hastings' Seed Company	1913	Building	Fulton	GA	NRHP	2 of 55
81675	Westinghouse Electric Company Building	1923	Building	Fulton	GA	NRHP	2/3 of 55
81687	Southern Railway North Avenue Yards Historic District	1925	District	Fulton	GA	NRHP	2/3 of 55
81053	Atlanta Spring and Bed Company--Block Candy Company	1900	Building	Fulton	GA	NRHP	2/3 of 55

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
80890	Atlanta Buggy Company and Warehouse--Hatcher Bros. Furniture Company	1903	Building	Fulton	GA	NRHP	3 of 55
81683	Means Street Historic District	1869	District	Fulton	GA	NRHP	3 of 55
80769	Shields-Ethridge Farm	Unknown	Buildings/ Farm	Jackson	GA	NRHP	14 of 55

Source: Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

**** "Exhibit (Map)" refers to Map** Book in Appendix A*

Exhibit 3.8-21: Greenfield Corridor with NS Approach - National Register of Historic Places Listed Sites/Districts

	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
81131	King Plow Company**	1900-1949	Buildings	Fulton	GA	NRHP	3 of 55
81764	Howell Interlocking Historic District**	1889	District	Fulton	GA	NRHP	3 of 55
81421	Ashby Street Car Barn**	1927	Building	Fulton	GA	NRHP	3 of 55
81082	Van Winkle, E., Gin and Machine Works**	1889; 1912	Building	Fulton	GA	NRHP	3 of 55
80626	Atlanta Waterworks Hemphill Avenue Station	1892	Building	Fulton	GA	NRHP	3 of 55
80182	Peachtree Southern Railway Station	1918	Building	Fulton	GA	NRHP	3 of 55
81028	Brookwood Hills Historic District**	1927	District	Fulton	GA	NRHP	3 of 55
80830	Garden Hills Historic District	1925-1949	District	Fulton	GA	NRHP	3 of 55
81117	Peachtree Highlands-Peachtree Park Historic District	1920	District	Fulton	GA	NRHP	3/4 of 55
80955	Oglethorpe University Historic District	1915	District	DeKalb	GA	NRHP	4 of 55
80119	Norcross Historic District	1870	District	Gwinnett	GA	NRHP	6 of 55
81599	The Superb (Southeastern Railway Museum)	1911	Structure	Gwinnett	GA	NRHP	7 of 55

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)
** "Exhibit (Map)" refers to map book in Appendix A; ** 5 NRHP resources included in both Norfolk Southern and CSX Atlanta Approaches.*

Exhibit 3.8-22: Greenfield Corridor CSX Atlanta Approach - National Register of Historic Places Listed Sites/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit*
81131	King Plow Company**	1900-1949	Buildings	Fulton	GA	NRHP	3 of 12
81764	Howell Interlocking Historic District**	1889	District	Fulton	GA	NRHP	3 of 12

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit*
81421	Ashby Street Car Barn**	1927	Building	Fulton	GA	NRHP	3 of 12
81082	Van Winkle, E., Gin and Machine Works**	1889; 1912	Building	Fulton	GA	NRHP	3 of 12
81783	Berkeley Park Historic District	1900-1974	District	Fulton	GA	NRHP	3 of 12
81028	Brookwood Hills Historic District**	1925-1974	District	Fulton	GA	NRHP	3 of 12
81448	Druid Hills Historic District	1900-1949	District	DeKalb	GA	NRHP	4 of 12
81634	Emory Grove Historic District	1900-1949	District	DeKalb	GA	NRHP	4 of 12
249543	Decatur Waterworks	1928-1948	District	DeKalb	GA	NRHP	4 of 12

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)

** "Exhibit (Map)" refers to map book in Appendix A;*

*** Resources included in both Norfolk Southern and CSX Atlanta Approaches.*

There are no NRHP-listed properties in the Greenfield Corridor Alternative in South Carolina and North Carolina. Because the Greenfield Corridor would utilize the Norfolk Southern corridor or CSX corridor in its approaches to Atlanta, all but one NRHP-listed historic resource − the Shields-Ethridge Farm (Site ID 80769) − within the environmental screening area for the Greenfield Corridor are located within the Approaches (See Appendix A: Map Book). Eligible state and local sites are found in Exhibit 3.8-23.

Exhibit 3.8-23: Greenfield Corridor Alternative - State Listed or Recognized Eligible Resources/Districts

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
770311-24	Wilder Manufacturing Company Building	1907	Building	Fulton	GA	GDOT	2 of 55
770311-28	Peters Street Bridge	1935	Structure	Fulton	GA	GDOT	2 of 55
770311-8	Southern Railway Buildings	1912	Buildings/Multiple Property	Fulton	GA	GDOT	2 of 55
770311-27	Nelson Street Bridge	1906	Structure	Fulton	GA	GDOT	2 of 55
770311-11	Circle Wye Railroad Junction and Associated Railroad Corridors	1846	Site	Fulton	GA	GDOT	2 of 55
236673	Moriah Primitive Baptist Church and Cemetery	1888	Site	Madison	GA	GNAHRGIS	19 of 55
648	McGee Farmstead	1865; 1920	Buildings/ Farm	Anderson	SC	ArchSite	26 of 55
17747	House-Unidentified	Unknown	Building	York	SC	ArchSite	49 of 55
GS1321	Clarence Wilson Barn and Corn Crib	Early 20th century	Site	Gaston	NC	HPOWEB	50 of 55

Site ID	Site Name	Year(s)	Type	County	State	Source	Exhibit (Map)*
MK2983	W.P.A. Douglas Airport Hangar	1936-37	Building	Mecklenburg	NC	HPOWEB	53 of 55
MK3071	Ford Motor Company Automotive Parts Distribution Center	1952	Building	Mecklenburg	NC	HPOWEB	53 of 55
MK2932	Wilmore Local Historic District	Unknown	District	Mecklenburg	NC	HPOWEB	54 of 55
GS1625	Piedmont and Northern Railway Linear Historic District	Unknown	Linear District	Mecklenburg	NC	HPOWEB	55 of 55

Source: HNTB, State Historic Preservation Office (SHPO) for Georgia, GNAHRGIS, ARC, South Carolina SHPO, SC ArchSite, South Carolina Institute of Archaeology and Anthropology, North Carolina SHPO- HPOWEB, the National Park Service's (NPS) inventory of NRHP-listed properties and database of National Historic Landmarks (NHL)
*Note: * "Exhibit (Map)" refers to map book in* ***Appendix*** *A*

There are no previously identified NRHP-eligible historic resources in the Greenfield Norfolk Southern Atlanta Approach or the CSX Atlanta Approach.

ARCHAEOLOGY

The Greenfield Corridor is designed to allow for high speeds and eliminate interference with other modes of travel. A review of previously identified cultural resources for the Greenfield Corridor resulted in the identification of 28 archaeological sites, although only one of these, site 9FU91, has been formally determined Eligible for the NRHP (See Exhibit 3.8-24). There are four sites identified in the Norfolk Southern Atlanta Approach and six sites in the CSX Atlanta Approach with one site, 9DA355, listed on the NRHP (See Exhibit 3.8-25 and Exhibit 3.8-26).

Exhibit 3.8-24: Greenfield Corridor Alternative–Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9FU90	GA	None	Unknown	Prehistoric: Unknown	Lithic Scatter	Cultivated and eroded.
9FU91	GA	Atlanta City Garbage Crematory	Eligible	Historic: Unknown	Historic Scatter	Disturbed by erosion.
9FU410	GA	None	Recommended Ineligible	19th-20th century	Historic Scatter	Associated railroad and warehouse district.
9FU582	GA	Orme-Magnolia Trolley Line	Recommended Ineligible	20th century	Abandoned trolley tracks	Destroyed.
9CA61	GA	Newton Bridge	Unknown	Middle Archaic, Woodland, Late Mississippian	Surface Scatter	Surface scatter of a significant prehistoric material (points, ceramics, animal bone, shell, etc.).
9CA82	GA	Farmer Construction Company	Unknown	Archaic	Lithic Scatter	Very close to 9CA80 and 9CA81 may be continuous with them.
9JK236	GA	None	Recommended Ineligible	20th century	House Site	Structural remains
9MD11	GA	None	Ineligible	Prehistoric: Unknown	Lithic Scatter	Site has been adversely impacted.

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9HA23	GA	None	Recommended Ineligible	Prehistoric: Unknown	Lithic and ceramic	Endangered by combustion turbine.
9HA39	GA	None	Recommended Ineligible	Late 19th-Early 20th	Historic House	Endangered by barrow pit activities.
9HA120	GA	None	Recommended Ineligible	19th-20th	Historic Scatter	Endangered by pipeline construction.
9HA131	GA	None	Recommended Ineligible	Prehistoric: Unknown 19th century	Lithic Scatter	Low density lithic scatter, eroded. One 19th century ceramic.
9HA132	GA	None	Recommended Ineligible	Prehistoric: Unknown	Lithic Scatter	Low density lithic scatter, eroded.
38AN0087	SC	Site -48	Probably Not Eligible	Middle Archaic	Surface Scatter	Very light scatter with point and end scraper – Good Research Potential.
38AN0222	SC	None	Additional Work	Middle-Late Archaic, Middle Woodland	Surface Scatter - Occupation site	Additional Work Recommended.
38CK0005	SC	Killdeer Site	Additional Work	Middle Archaic 19th century	Surface Scatter	Additional Work Recommended.
38CK0007	SC	Site-3	Additional Work	Prehistoric: Unknown Historic Chimney	House Site	Stable - Additional Work Recommended.
38LU0195	SC	DC-26	Probably Not Eligible	20th century	Rock Mound from field clearing	Rock mound (1m high) is on moderately steep ridge side slope – Moderate erosion.
38LU0199	SC	DC-30	Probably Not Eligible	20th century	Tin Shed	Site is in middle of cultivated field. Small wooded-sided tin roofed shed. Probably for storage of farming equipment, seeds, fertilizers, etc.
38SP0264	SC	JR 1-1	Probably Not Eligible	Prehistoric: Unknown	Lithic Scatter	Lithic scatter in a highly eroded clear-cut area.
38SP0269	SC	None	Not Eligible	Middle Woodland 20th Century	Lithic Scatter, Historic Scatter	Surface scatter of prehistoric artifacts and modern garbage on a bulldozed creek terrace.
38SP0311	SC	Revisit 1	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Surface lithic scatter heavily disturbed by gas pipeline, fiber optic cable.
38SP0318	SC	Site 2	Not Eligible	20th Century	House Site	Concrete block foundation (three sides remain), portion of a wood post and wire fence line, brick well pump house with wood frame and asphalt shingle roof.

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
38SP0321	SC	Site 5	Not Eligible	20th Century	Surface Scatter	Surface scatter of twentieth century artifacts on an eroded ridge slope. Material likely to have been re-deposited.
38YK0082	SC	Site-24	No Determination	Prehistoric: Unknown	Lithic Scatter	Identified via surface collection – eroded.
38YK0355	SC	LR-1-9	Not Eligible	20th Century	Surface Scatter	Old house that has been graded. Piles of building rubble bulldozed around the base of a large old tree.
31MK112	NC	None	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Disturbed by erosion.
31MK114	NC	None	Not Eligible	Prehistoric: Unknown	Lithic Scatter	Disturbed by erosion.

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

Exhibit 3.8-25: Greenfield Corridor Alternative with NS Atlanta Approach –Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9GW153	GA	Barrett	No determination	Multi-component Prehistoric	Surface artifact scatter	Amateur collection
9GW167	GA	None	No determination	Historic	Old railroad station	No notes
9GW591	GA	None	Recommended Ineligible	Prehistoric - Historic	House site	Destroyed
9GW592	GA	None	Recommended Ineligible	Prehistoric	Lithic scatter	Destroyed

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

Exhibit 3.8-26: Greenfield Corridor Alternative with CSX Atlanta Approach –Previously Recorded Archaeological Sites

Site Number	State	Site Name	NRHP	Temporal	Site	Notes
9DA354	GA	1993 DIGIT	Recommended Ineligible	Prehistoric Unknown Historic	Lithic Scatter. House Site	Disturbed
9DA355	GA	Decatur Waterworks	NRHP Listed	19th century	Historic waterworks	Undisturbed
9DA356	GA	None	Recommended Ineligible	19th-20th century	Historic Artifact Scatter	Surface scatter only
9GW515	GA	None	Recommended Ineligible	19th-20th century	House site	Shallow and eroded
9GW516	GA	None	Recommended Ineligible	20th century	Historic Artifact Scatter	Modern artifacts
9GW593	GA	None	Recommended Ineligible	20th century	House site	Disturbed

Source: PB, GNAHRGIS, Georgia Archaeological Site File, SC ArchSite, and North Carolina SHPO- HPOWEB

Note: The environmental screening areas are defined as being 600 feet in width to accommodate shifts and potential direct impacts.

3.8.4 Environmental Consequences

This section identifies the potential for the Corridor Alternatives to have an adverse effect or negative impact on resources protected by Section 106 of the NHPA identified in the Tier 1 EIS. This assessment is limited in scope since, short of demolition, what constitutes an adverse effect to an individual property will vary depending on the characteristics that qualify it for inclusion in the NRHP. The potential for adverse impacts on NRHP-listed or state/locally determined NRHP-eligible historic or archaeological resources would be further analyzed during Tier 2 , in full compliance with Section 106 of the NHPA, and as more detailed design information is available for review of the Preferred Alternative and specific service routes are identified. The Project would consist of the development of complementary transportation facilities along the Preferred Corridor Alternative, which may include but is not limited to, train stations and maintenance facilities. These complementary transportation facilities have not been considered in this analysis. If any adverse effects are identified during the Tier 2 analysis, they would be addressed through SHPO/THPO consultation and in compliance with Section 106 of the NHPA and Section 106-implementionregulations.

As explained in Section 1.1.2.3, the initial designated section of the SEHSR was the Washington, DC to Charlotte, NC section, for which FRA, FHWA, NCDOT and DRPT completed a Tier I EIS and ROD in 2002. Subsequently, in 2017 as part of the Tier 2 EIS and ROD for the Raleigh, NC to Richmond, VA section of the SEHSR, FRA, NCDOT, DRPT, the VA and NC SHPOs, and the ACHP signed a programmatic agreement (SEHSR PA) that established responsibilities and procedures under Section 106 for the Washington, DC to Charlotte, NC section, with the intent that a separate memorandum of agreement (MOA) would be used to determine mitigation for adverse effects to any Section 106 resources. The SEHSR PA contemplated adding other portions of the SEHSR and other project components, and specifically noted the Atlanta to Charlotte corridor. FRA anticipates that, should additional funding for Tier 2 studies become available, the SEHSR PA will be amended to add the Atlanta to Charlotte corridor, and will govern Section 106 determinations.

An adverse effect is found when a federal action alters, directly or indirectly, any of the characteristics of a NRHP-listed and/or eligible historic resource in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse effects that could occur as a result of this Project include:

- Physical destruction of or damage to all or part of the property;
- Removal of the property from its historic location;
- Change of the character of the property's use or change of physical features within the property's setting that contribute to its historic significance; and/or
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features ("proximity effects").

FRA and GDOT would initiate the Section 106 review process early in a Tier 2 study of the Preferred Alternative. Potential consulting parties would have an opportunity to review and comment on the eligibility of potential cultural resources and the proposed effects of the Project on those eligible resources.

3.8.4.1 No-Build Alternative

The No-Build Alternative assumes a rail connection would not be built between Atlanta and Charlotte. Passenger service between the two cities would consist of existing bus services, air travel, and continued automobile use along I-85/75, I-20, and I-77. The No-Build Alternative does not develop any rail infrastructure or extend the SEHSR Corridor network from Charlotte to Atlanta, and it maintains Amtrak's current and future plans for its Crescent passenger rail service. In the No-Build Alternative, the impacts to cultural resources could potentially occur if additional ROW is needed or if substantial changes to traffic and transit volumes or operations lead to proximity effects such as changes in noise levels and visual effects.

As the geographic scope and nature of the No-Build Alternative projects are limited, the potential effects of the projects are likely to be contained to the area in which the projects will be constructed. The potential for impacts to cultural resources would be determined through the environmental processes for the already planned transportation improvements. For the purposes of this Tier 1 EIS, the No-Build Alternative would result in no adverse effects to the previously documented cultural resources located within the route alternatives.

3.8.4.2 Corridor Alternatives

As discussed in Section 3.8.2 of this Tier 1 EIS, GDOT identified all properties in the environmental screening area that are listed, or potentially eligible for listing, in the NRHP. After selection of a Preferred Alternative, at which time the design of this Project will have progressed to a point sufficient to enable site-specific analyses of potential effects on protected cultural resources, the Tier 2 analysis will include a detailed assessment of effects in compliance with Section 106.

Cultural resources located within the Southern Crescent, I-85, and Greenfield Corridor Alternatives, which may be in the area potentially disturbed by the proposed construction, include multiple NRHP-listed or eligible individual structures and districts. Direct impacts on NRHP resources would result in a change of character to the property, alter the use, or result in the loss of a structure or a portion of a property. Proximity effects, such as visual and noise or vibration impacts on historic resources, could occur within the screening area. As the Project proceeds into Tier 2, avoidance and minimization of adverse effects to these properties will be considered. For the Atlanta Approaches, GDOT assumes that the majority of the approaches would be constructed within existing railroad ROW, which would minimize the potential for adverse direct effects to historic properties. However, minor ROW acquisition may be necessary at certain locations. Proximity effects may include altering the visual setting, as well as increased noise and/or vibration levels due to the introduction of train traffic within

the immediate vicinity of rural historic resources. Due to the relative low density of cultural resources outside the urban areas, alternative alignments may have success in avoiding effects to rural historic resources.

The Southern Crescent Corridor would have the potential to impact more historic resources than the I-85 Corridor and the Greenfield Corridor due to the route paralleling the existing railroad corridor, which itself is a potential historic resource.[114] As a historic transportation corridor through Georgia, South Carolina, and North Carolina, the railroad corridor attracted economic development along its path, which in part explains the higher occurrence of historic resources, and particularly historic districts, in the Southern Crescent Corridor. GDOT assumes that the majority of the alternative may be constructed within existing rail ROW, which would minimize the potential for adverse direct effects to historic properties. However, minor ROW acquisition may be necessary at certain locations. As the Project proceeds into a Tier 2analysis, avoidance and minimization of adverse effects to these properties will be considered.

Historic resources located within the I-85 Corridor include multiple NRHP listed or eligible structures and districts. Based on this screening, the I-85 Corridor would have the potential to impact more historic resources than the Greenfield Corridor but less than the Southern Crescent Corridor. Proximity effects along I-85 may include altering the visual setting as well as increased noise levels and/or vibration levels due to the introduction of train traffic within the immediate vicinity of historic resources. However, it is worth noting that in some cases, I-85 is currently an element within most of the previously identified historic resources' setting and would be taken into account in the evaluation of potential impacts. Regardless, due to the relative low density of identified historic resources outside of the urban areas, alternative alignments may be implemented to avoid or minimize adverse effects to rural historic resources.

The Greenfield Corridor would have the potential to impact fewer cultural resources than the Southern Crescent Corridor and the I-85 Corridor. However, additional resources may be identified with a more intense-level analysis in Tier 2. Direct impacts to NRHP resources could result in a change of character to the property or its use, or could result in the loss of a structure or a portion of a property. As the Project proceeds into Tier 2, avoidance and minimization of adverse effects to these properties will be considered. Due to the relative low density of cultural resources outside the urban areas, alternative alignments may have success in avoiding effects to rural historic resources.

3.8.5 Potential Mitigation

Potential mitigation measures are presented here in a general manner. If potential adverse effects are determined through subsequent analysis, an MOA, or multiple MOAs, with specific mitigation measures will be developed as warranted by GDOT, SCDOT, and NCDOT through consultation with the FRA, the SHPOs of Georgia, South Carolina and North Carolina, other consulting parties and tribal partners in accord with NHPA Section 106 (ACHP 2004) and applicable state regulations. If NRHP-eligible archaeological sites cannot be avoided or protected, data recovery excavations could be conducted to mitigate the adverse impacts. Cemeteries and burial sites will be avoided to the extent

[114] *In August 2018, the ACHP issued a program comment that exempts from Section 106 undertakings that might affect historic properties within rail rights-of-way. Should this Project progress to a Tier 2 analysis, FRA will determine whether the Program Comment would apply to any historic resources, including the rail corridor itself.*

feasible. Any effects to cemeteries that cannot be avoided will be treated in accordance with the federal and state requirements identified in Section 3.8.1 of this Tier 1 EIS.

Through the analysis conducted as part of this Tier 1 EIS, only those cultural resources that were identified as listed in the NRHP or identified as eligible for the NRHP through state or local designations were evaluated for their proximity to the proposed route corridors. Because the details of construction and potential impacts have not been determined, it is not possible to propose mitigation measures.

3.8.6 Subsequent Analysis

It should be noted that there are likely, as yet unidentified, resources to be identified, analyzed, assessed and avoided through an intensive cultural resources inventory to be conducted during the Tier 2 EIS. As explained in Section 3.8.5, FRA anticipates that, should funding for Tier 2 study become available, the SEHSR PA will be amended to add the Atlanta to Charlotte corridor, and the SEHSR PA will then govern Section 106 roles and responsibilities. In general, specific Preferred Corridor alignments will be defined in a Tier 2 study. At that time, all cultural resources 50 years old or older (or a time period determined in consultation with the SHPOs), will be identified through field work to complete the desktop identifications in Chapter 3.8. All resources will be evaluated to determine whether or not they meet the NRHP criteria. FRA, GDOT, SCDOT and NCDOT will consider NRHP eligible or listed resources as Section 106 resources. Officials with jurisdiction will be identified and consulted for potential Section 106 resources. Consultation will be performed with public officials, property owners/officials with jurisdiction, SHPOs, tribal representatives, and other consulting parties regarding the effects of the Project on Section 106 resources and measures to minimize harm.

3.9 WATER RESOURCES

In this section, GDOT identifies water related resources including wetlands, streams, lakes, and floodplains that are present either entirely or partially within the Corridor Alternatives and discusses relevant federal and state regulations. It also briefly describes the potential impacts that the Project could have on water quality. In this Tier 1 EIS, GDOT identified and documented the number and acreage of water resources, including impaired waters. A soils analysis and concerns relative to groundwater, including the locations of aquifers and recharge areas, will be investigated in a future Tier 2 analysis.

3.9.1 Legal and Regulatory Requirements

3.9.1.1 Federal Regulatory Context

Multiple federal authorities provide protections for water resources and are applicable to the Project, including the Clean Water Act[115] (CWA), Executive Order 11990, DOT Order 5660.1A, the Rivers and Harbors Act of 1899[116], the Flood Disaster Protection Act[117], Executive Order 11988, DOT Order 5650, and the National Wild and Scenic Rivers Act[118], which are all described in the following paragraphs. Further, FRA's Procedures for Considering Environmental Impacts[119] require FRA to consider water quality, wetlands, and ecological systems during the environmental evaluation process in addition to meeting the Clean Water Act and permitting programs administered by the U.S. Army Corps of Engineers (USACE).

CLEAN WATER ACT

Originally enacted as the Federal Water Pollution Control Act of 1948, the Federal Water Pollution Control Act Amendments of 1972, as amended by the U.S. Clean Water Act (CWA) of 1977 and the Water Quality Act of 1987[120], protects the surface water quality of jurisdictional waters of the U.S. and regulates the discharge of pollutants from point sources into these resources through permitting requirements. Waters of the U.S. are defined in the CWA as waters used for interstate or foreign commerce, industry, or travel, waters subject to tidal flow, all interstate waters and wetlands, the territorial sea, tributaries of Waters of the U.S., and wetlands adjacent to Waters of the U.S.[121]

Section 402

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit program. Under this program, the EPA has regulatory authority over point source discharges on a sector-

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[115] *33 USC § 1251, et seq. (2002). Clean Water Act of 1972.*

[116] *33 USC § 403. Section 10 of the Rivers and Harbors Appropriation Act of 1899.*

[117] *42 U.S.C. § 4001-4128. Flood Disaster Protection Act.*

[118] *16 U.S.C. § 1273. National Wild and Scenic Rivers Act.*

[119] *64 FR 28545. FRA Procedures for Considering Environmental Impacts (May 26, 1999).*

[120] *33 USC § 1251, et seq. More information available on EPA's website here: https://www.epa.gov/laws-regulations/summary-clean-water-act (accessed on 04/10/2018)*

[121] *40 CFR § 230.3(s). More information can be found here: https://www.epa.gov/wotus-rule/about-waters-united-states (accessed 4/10/2018)*

wide basis to protect water quality of the receiving waters and can designate permitting authority to the states. Point sources are discrete conveyances such as pipes or man-made ditches.

Section 404

Discharges of dredged or fill material into Waters of the U.S. (including wetlands) are regulated under Section 404 of the Clean Water Act and require a permit for unavoidable impacts. The principle behind the Section 404 permitting process is that dredged or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable impact either individually or in combination with known and/or probable impacts of other activities. The EPA developed the Section 404 permitting program, as well as related guidance and regulations, in conjunction with the Secretary of the Army acting through the Chief of Engineers. Additionally, Section 401 of the CWA requires that any applicant for a Section 404 permit also obtain a Water Quality Certification from the state or states in which the project is located.

Section 303(d) and 305(b)

Section 303(d) of the CWA requires states to identify impaired waters as part of routine monitoring and reporting. In this context, impaired waters are those bodies of water that contain levels of pollutants that do not meet the EPA's standards for good water quality. For impaired waters, states develop a strategy for reducing pollutant levels and meeting water quality standards. Additionally, section 305(b) requires states to broadly report on the overall condition of all aquatic resources in their state. EPA supports states developing joint reports to satisfy both 303(d) and 305(b).

EXECUTIVE ORDER 11990 – PROTECTION OF WETLANDS

In addition to the Section 404 permitting program that regulates infill, Executive Order 11990 directs federal agencies to avoid and minimize adverse impacts associated with the modification or destruction of wetlands, and to avoid new construction in wetlands unless there is no practicable alternative.[122] In support of this Executive Order, U.S. DOT Order 5660.1.A directs the DOT to avoid new construction in wetlands unless there is no practicable alternative and the proposed action includes all practicable measures to minimize any resulting harm to wetlands. The regulatory definition of wetlands states:

> *"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, and similar areas."* [123]

[122] *Executive Order 11990-Protection of Wetlands, 42 FR 26961, 3 CFR, 1977 Comp., p. 121. Available online here: https://www.archives.gov/federal-register/codification/executive-order/11990.html (accessed 4/10/2018).*

[123] *See 40 CFR § 239.2. See also 33 CFR § 328.3.*

The regulatory definition emphasizes the three essential characteristics that a wetland possesses: hydric soils,[124] a prevalence of hydrophytic vegetation,[125] and a persistent wetland hydrology.

EXECUTIVE ORDER 11988 – FLOODPLAIN MANAGEMENT AND PROTECTION

Executive Order 11988 – Floodplain Management and Protection,[126] (as implemented by the Department of Transportation by USDOT Order 5650.2[127]) directs federal agencies to avoid to the extent possible, the long and short term effects associated with the occupancy and modification of floodplains. It requires efforts to avoid direct or indirect support of development within 100-year floodplains wherever there is a reasonable alternative, and prohibits floodplain encroachments which are hazardous, not economically viable, result in incomplete uses of the floodplain, or would cause a critical interruption of an emergency transportation facility, a substantial flood risk, or an effect on the floodplain's natural resource values.

Projects that encroach upon 100-year floodplains must be supported with additional specific information. The USDOT Order 5650.2, Floodplain Management and Protection, prescribes "policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of floodplain effects in agency actions, planning programs and budget requests." Environmental review documents should indicate potential risks and effects from proposed transportation facilities.

FLOOD DISASTER PROTECTION ACT

The Flood Disaster Protection Act of 1973 (FDPA), requires the identification of all flood-prone areas, the provision of flood insurance where applicable, and the purchase of insurance for structures in special flood-hazard areas. [128] The FDPA applies to any federally assisted project in an area identified as having special flood hazards. Projects should avoid construction in, or develop a design to be consistent with, FEMA-identified flood hazard areas.

RIVERS AND HARBORS ACT

Section 10 of the U.S. Rivers and Harbors Act regulates structures constructed over navigable waters.[129] It defines navigable waters as those that are subject to tidal flows and/or are used for interstate or foreign trade, either presently or in the past.[130] The U.S. Army Corps of Engineers (USACE) has regulatory authority over work in, over, or under navigable waters, including wharfs, piers, and structures (excluding bridges and

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[124] *Hydric soils are soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." (NRCS, 2010)*

[125] *Hydrophytic vegetation is plant-life that "requires or can tolerate prolonged inundation or soil saturation during the growing season." (USACE, 2012)*

[126] *Executive Order 11988- Floodplain Management (42 FR 26951, 3 CFR, 1977 Comp., p. 117) is available online here: https://www.archives.gov/federal-register/codification/executive-order/11988.html (accessed 4/10/2018)*

[127] *USDOT Order 5650 sets forth the USDOT's policy for interpreting Executive Order 11988-Floodplain Management*

[128] *42 U.S.C. §§ 4001-4128.*

[129] *33 USC § 403. Section 10 of The Rivers and Harbors Appropriation Act of 1899.*

[130] *Full definition of navigable waters, per 33 CFR Section 329.3 can be found online here: http://www.nap.usace.army.mil/Portals/39/docs/regulatory/regs/33cfr329.pdf (accessed 4/10/2018)*

structures permitted by the USCG), and work such as dredging or disposal of dredged material, or excavation, filling, or other modifications to navigable waters.

WILD AND SCENIC RIVERS ACT

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.[131] Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Designated segments need not include the entire river and may include tributaries. River classifications as Wild, Scenic, or Recreational are defined as follows by the Wild and Scenic Rivers Act:

- Wild river areas: Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.
- Scenic river areas: Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational river areas: Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

To satisfy Section 5(d) of the Wild and Scenic Rivers Act, the NPS has compiled a Nationwide Rivers Inventory (NRI), which is a listing of more than 3,400 free-flowing river segments "that are believed to possess one or more 'outstandingly remarkable' or natural or cultural values judged to be of more than local or regional significance."[132] Under a 1979 Presidential Directive, and related CEQ procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments. Furthermore, all federal agencies must consult with the NPS regarding potential impacts to NRI-listed river segments prior to taking action.

3.9.1.2 State Regulatory Context

Similar to the Waters of the U.S. defined in the CWA, Georgia, South Carolina and North Carolina each define state waters and provide additional protections that are implemented by state environmental agencies. State agencies also work with USACE and EPA to implement portions of the CWA.

GEORGIA

The Official Code of Georgia (O.C.G.A.) § 12-7-1 defines Georgia State Waters as

> "any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface or subsurface water, natural and artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the

[131] *16 U.S.C. § 1273. National Wild and Scenic Rivers Act.*

[132] *National Park Service, 2011. "National Center for Recreation and Conservation, Nationwide Rivers Inventory." Available at: http://www.nps.gov/ncrc/programs/rtca/nri/index.html (accessed on 04/10/2018)*

> property of a single individual, partnership, or corporation, except as may be defined in the [O.C.G.A.] § 12-7-71(7)."[133]

These state waters are protected by the Georgia Erosion and Sedimentation Control Act of 1975, in compliance with the National Pollutant Discharge Elimination System (NPDES) permit as required under Section 402 of the CWA. The Georgia Department of Natural Resources (GADNR) Environmental Protection Division (EPD) mandates vegetative buffers adjacent to banks of state waters (not including wetlands) to protect water quality and habitat. These buffers range from 25 feet to 50 feet depending on the type of water resource. GADNR EPD regulates the state-mandated buffers in Georgia. Certain construction activities within the buffer area require buffer variance to comply with the NPDES permit under Section 402 of the CWA.

SOUTH CAROLINA

In South Carolina, Waters of the State are defined by the Pollution Control Act of 1976 as

> "lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean within the territorial limits of the State, and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially within or bordering the State or within its jurisdiction."[134]

Waters of the State are jointly regulated by the South Carolina Department of Health and Environmental Control (DHEC) and the USACE, Charleston District under Section 401 and Section 404 of the CWA. Buffer requirements are not regulated by state laws in South Carolina. Pursuant to State Regulation 19-450, Permits for Construction in Navigable Waters, all navigable waters in the state are public trust properties and are regulated by the DHEC Bureau of Water. The DHEC requires a Construction in Navigable Waters Permit for impacts to state navigable waters.

NORTH CAROLINA

North Carolina General Statute § 143-212 defines Waters of the State as

> "any stream, river, brook, swamp, lake, sound, tidal estuary, bay, creek, reservoir, waterway, or other body or accumulation of water, whether surface or underground, public or private, or natural or artificial, that is contained in, flows through, or borders upon any portion of this State, including any portion of the Atlantic Ocean over which the State has jurisdiction."[135]

This regulatory definition includes all wetlands.

Title 15A North Carolina Administrative Code (NCAC) Subchapter 2B provides for definition and protection of riparian buffers. Under this rule, the following specific river basins receive protection and maintenance of existing buffers: Neuse River Basin, Catawba River Basin (below Lake James), and Tar-Pamlico River Basin.

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[133] *Erosion and Sedimentation Act of 1975, O.C.G.A. § 12-7-1, et seq.,(2011). Available at: https://gaswcc.georgia.gov/documents/ocga-12-7-1-erosion-and-sedimentation-control-act (accessed on 4/10/2018)*

[134] *South Carolina Pollution Control Act of 1976, South Carolina Code of Laws § 48-1-10 et seq., 2013. Available at: http://www.scstatehouse.gov/code/t48c001.php (accessed on 04/10/2018)*

[135] *North Carolina General Statue § 143-212,Article 21 Water and Air Resources, effective July 2007.*

Riparian state-mandated vegetative buffers are regulated by the North Carolina Division of Water Quality (DWQ) and can vary between 25 feet and 50 feet, depending on the type and location of the water resource. Construction variances may be required for certain construction activities within the protected buffer. The DWQ also regulates discharge, including dredged or fill material, into isolated wetlands and isolated surface waters pursuant to North Carolina code.[136]

The North Carolina Sedimentation Control Pollution Act of 1973 prevents erosion and sedimentation by prohibiting visible off-site sedimentation. The law governs all land-disturbing activities (with some exceptions for agriculture, mining, and forestry) and requires those that will disturb one acre or more of land to submit and gain approval of an erosion control plan before any land disturbing activity begins. In addition, a "buffer zone" is required along any natural waterway or lake. The buffer zone/strip must be wide enough to retain all visible sediment within the first 25 percent of the buffer zone nearest the disturbed area. Additionally, along trout streams, the buffer zone must be a minimum of 25 feet wide. All disturbed areas must be stabilized by vegetation or other suitable erosion control methods and off-site sedimentation must be prevented using ground cover.[137]

3.9.2 Methodology

The analysis in this section focuses on identifying water resources wholly or partially located in the Corridor Alternatives. GDOT calculated the area of those waters for a high level comparison of the potential impacts for Corridor Alternative. To accomplish this, GDOT performed desktop analysis, relying on readily available information from various agencies, summarized in Exhibit 3.9-1.

Exhibit 3.9-1: Summary of Water Resource Data Collection

Resource	Information Collected	Source
Wetlands	Location, number, and size of crossings	National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service (U.S. FWS): https://www.fws.gov/wetlands/
Rivers, Streams, and Lakes	Location, number, and size of crossings	National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service: https://www.fws.gov/wetlands/
	Hydrologic unit code (HUC) and watershed	U.S. Geological Survey's (USGS) National Hydrography Dataset (NHD): https://nhd.usgs.gov/NHD_High_Resolution.html
	Designation of Wild and Scenic Rivers	The NPS's Nationwide Rivers Inventory: https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm
Impaired Waters	Location, number, and size of crossings	GA Department of Natural Resources Environmental Protection Division (DNR EPD): https://epd.georgia.gov/georgia-305b303d-list-documents SC Department of Health and Environmental Control (DHEC): http://www.scdhec.gov/HomeAndEnvironment/Water/ImpairedWaters/Overview/

[136] *Title 15A North Carolina Administrative Code, Subchapter 2H Procedures for Permits: Approvals, Section 0.1300 Discharges to Isolated Wetlands and Isolated Waters, effective April 2003.*

[137] *North Carolina Sedimentation Pollution Control Act of 1973, N.C.G.S. § 113A-50, et seq.*

Resource	Information Collected	Source
		NC Division of Water Quality (DWQ): https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment/integrated-report-files
100-year Floodplains	Location, number, and size of crossings Special Flood Hazard Area (SFHA) type	FEMA Digital Insurance Rate Map: https://www.fema.gov/national-flood-hazard-layer-nfhl

For each Corridor Alternative, GDOT used a 600-foot wide environmental screening area, 300 feet measured from the center of the Corridor Alternative. At station areas, GDOT used a 1,000-foot wide screening area, 500 feet radius around each station. This larger environmental screening area is intended to capture resources that could be impacted by additional construction and activity surrounding stations, like parking facilities, and associated traffic, etc.

3.9.2.1 Wetlands

The USFWS identifies and maintains maps of vegetated wetlands on the National Wetland Inventory (NWI).[138] These mapped wetlands have the potential to be identified as special aquatic sites by the EPA and regulated by the USACE under Section 404.

GDOT collected wetland mapping data from the NWI and determined the total acreage of wetlands falling within the Corridor Alternatives.

The NWI maps used for data collection in this Tier 1 EIS are based on a classification system known as the Cowardin System, which classifies the types of "ecosystems" related to water resources. Typical vegetated wetlands in the Southeast Piedmont Region include, but are not limited to, Palustrine Forested (PFO), Palustrine Emergent (herbaceous) (PEM), and Palustrine Scrub-Shrub (PSS) wetlands based on the Cowardin classification system.[139]

3.9.2.2 Rivers, Streams, and Lakes

GDOT used desktop survey to identify perennial and intermittent streams and rivers, lakes, and ponds, identified as Waters of the U.S. and Waters of the state in GA, SC, and NC. GDOT calculated the area in acres for each lake and pond crossing and calculated the length in feet of each river and stream crossing.

In addition to the wetlands and water bodies identified using the NWI, GDOT also collected GIS data from the United States Geological Survey's (USGS) National Hydrography Dataset to identify waterbodies' hydrologic unit codes (HUC), watersheds, and additional resources. GDOT also referenced the NPS's

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[138] *The National Wetland Inventory is maintained by the U.S. Fish and Wildlife Service and is available online here: https://www.fws.gov/wetlands/ (accessed 4/10/2018)*

[139] *Cowardin, L. M. et al, Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service (USFWS), USFWS/OBS-79/31, 1979.*

Nationwide Rivers Inventory to identify any rivers that have been classified by the Department of the Interior as wild, scenic, or recreational, under the Wild and Scenic Rivers Act.[140]

3.9.2.3 Impaired Waters

GDOT assembled a listing of 303(d) waters from the Georgia (GA) Department of Natural Resources (DNR) Environmental Protection Division (EPD), the South Carolina (SC) Department of Health and Environmental Control (DHEC), and the North Carolina (NC) Division of Water Quality (DWQ) websites. Similar to other resources, GDOT calculated the acreage of impaired waters within the Corridor Alternatives.

3.9.2.4 Floodplains

A floodplain is defined by FEMA as the area adjoining a river or stream that has been or may be covered by floodwaters during storm events. Hundred-year floodplains[141] were identified using data from the Digital Flood Insurance Rate Map (DFIRM). [142] GDOT then calculated the total acreage of floodplains within each Corridor Alternative. Additionally, GDOT identified the type of flood zone, referred to as special flood hazard area (SFHA), for each 100-year floodplain.

3.9.3 Affected Environment

The following section describes the water resources GDOT identified for each of the three Corridor Alternatives (excluding the Atlanta Approach) and for each of the two Atlanta Approach options. Detailed maps of all resources are located in the Map Book in Appendix A.

3.9.3.1 Southern Crescent Corridor Alternative

As shown in Exhibit 3.9-22, the Southern Crescent Corridor Alternative is located at least partly within 38 wetlands, as mapped in the National Wetlands Inventory (NWI), totaling approximately 30 acres. The majority of the wetlands are located in South Carolina. Wetlands are classified in the NWI by the type of vegetation, source of the water, and other characteristics. All of the wetlands identified in the Southern Crescent Corridor Alternative are classified as palustrine, meaning non-tidal, containing no or low salt content, and dominated by trees or shrubs. There are several sub-classifications of palustrine wetlands present along the Southern Crescent, such as forested, scrub-shrub, emergent, and unconsolidated shore, which are noted in Exhibit 3.9-2 as well.

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[140] *16 USC § 1271-1287. Wild and Scenic Rivers Act.*

[141] *The term "hundred-year flood" refers to an event that statistically has a 1% chance of occurring annually. FEMA estimates the magnitude and impact of these floods to draw floodplain maps.*

[142] *FEMA flood maps and other data layers prepared by FEMA are available online using the National Flood Hazard Map: https://www.fema.gov/national-flood-hazard-layer-nfhl (accessed 4/10/2018)*

Exhibit 3.9-2: Wetlands within the Southern Crescent Corridor Alternative

State	Type of Wetland				
	Palustrine Forested	Palustrine Scrub-Shrub	Palustrine Emergent	Palustrine Unconsolidated Shore	Total
Georgia					
Number of Crossings	2	2	0	0	**4**
Acreage*	3	1	0	0	**4**
South Carolina					
Number of Crossings	16	4	3	1	**24**
Acreage*	11	4	3	1	**19**
North Carolina					
Number of Crossings	3	3	2	2	**10**
Acreage*	2	3	1	1	**7**
Total					
Number of Crossings	**21**	**9**	**5**	**3**	**38**
Acreage*	**16**	**8**	**4**	**2**	**30**

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Sources: National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service (U.S. FWS); HNTB

Most of the wetlands that GDOT identified in this Corridor Alternative occur in the floodplains of, and adjacent to, the following perennial streams and open waters:

- Broad River
- Enoree River
- North Tyger River
- Oconee River
- Reedy River
- Saluda River
- Seneca River
- South Fork Catawba River
- Tugaloo River
- Chinquapin Creek
- Coneross Creek
- Dicks Creek
- Golden Creek
- Halfway Branch
- Kings Creek
- Lake Wylie
- Lawsons Fork Creek
- Paw Creek
- Richland Creek
- Thicketty Creek
- Toxaway Creek
- Walton Creek

Exhibit 3.9-3 shows the total number of rivers, streams, lakes, and ponds wholly or partly within the Southern Crescent, and Exhibit 3.9-4 displays the number that are considered impaired waters under Section 303(d) of the Clean Water Act. Out of the 246 total surface waters within the Southern Crescent, fifteen are listed as impaired due to pollution levels. Appendix D: Supporting Technical Data provides a detailed listing of the waterway and water body crossings by state and county and their classification as an impaired water segment.

The Southern Crescent Corridor Alternative is located within 15 watersheds, three of which are EPA Region 4 Priority Watersheds: Upper Chattahoochee River (HUC 03130001), Saluda River (HUC 03050109), and Upper Catawba River (HUC 03050101). Portions of the Enoree River, Middle Tyger River, North Tyger River, Fairforest Creek, and Broad River in South Carolina have been listed on the NRI by the NPS. None of the rivers within this Corridor Alternative are classified as wild, scenic, or recreational per the Wild and Scenic Rivers Act.

Exhibit 3.9-3: Surface Waters within the Southern Crescent Corridor Alternative

State	Perennial Streams & Rivers	Intermittent Streams & Rivers	Lakes	Ponds
Georgia				
Number of Crossings	14	19	1	7
Size*	6,583 L.F.	13,283 L.F.	4 Ac.	2 Ac.
South Carolina				
Number of Crossings	66	67	4	22
Size*	37,137 LF.	48,027 L.F.	29 Ac.	8 Ac.
North Carolina				
Number of Crossings	23	8	5	10
Size*	11,977 L.F.	3,459 L.F.	23 Ac.	5 Ac.
Total				
Number of Crossings	**103**	**94**	**10**	**39**
Size*	**55,697 L.F.**	**64,769 L.F.**	**56 Ac.**	**15 Ac.**

**L.F. = Linear Feet; Ac. = Acre*
**Numbers have been rounded to the nearest linear foot or acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Sources: NWI maintained by the U.S. FWS; USGS's National Hydrography Dataset (NHD); HNTB

Exhibit 3.9-4: Impaired Waters within the Southern Crescent Corridor Alternative

State	Surface Waters	Impaired Waters per Sec. 303(d) of CWA
Georgia	41	3
South Carolina	159	9
North Carolina*	46	3
Total	**246**	**15**

***Note:** Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.*
**All waters in NC are in Category 5 – 303(d) List for Mercury due to a statewide fish consumption advice for several fish species.*
Sources: State environmental agencies (GA DNR-EPD, SC DHEC, and NC DWQ); HNTB

As shown in Exhibit 3.9-5, the Southern Crescent contains portions of approximately 180 floodplain systems, totaling approximately 397 acres.

Exhibit 3.9-5: FEMA 100-year Floodplains within Southern Crescent Corridor Alternative

State	Number of Floodplain Crossings	Area of Floodplain Crossings (acres)*
Georgia	11	38
South Carolina	122	310
North Carolina	47	49
Total	**180**	**397**

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Source: FEMA Flood Insurance Maps; HNTB

The 100-year floodplains located within the Southern Crescent are associated with various major waterways and waterbodies, and their unnamed tributaries, which are listed in Appendix D by state and county and are mapped in the Map Book in Appendix A. Of the 180 floodplains located within the Southern Crescent Corridor Alternative, 29 are associated with a particular floodway, which are listed as follows:

- Catawba River
- Enoree River
- Flint River
- North Tyger River
- Reedy River
- South Fork Catawba River
- South Tyger River
- Fairforest Creek
- Flat Creek
- Irwin Creek
- Lawsons Fork Creek
- Maple Creek
- Paw Creek
- Perkins Creek
- Taggart Creek

3.9.3.2 I-85 Corridor Alternative

As shown in Exhibit 3.9-6, the I-85 Corridor Alternative is located at least partly within 127 wetlands, as mapped in the NWI, totaling approximately135 acres. The majority of the wetlands are located in South Carolina. Wetlands are classified in the NWI by the type of vegetation, source of the water, and other characteristics. All of the wetlands identified in the I-85 Corridor Alternative are classified as palustrine, meaning non-tidal, containing no or low salt content, and dominated by trees or shrubs. There are several sub-classifications of palustrine wetlands present along this Corridor Alternative, such as forested, scrub-shrub, emergent, and unconsolidated shore, which are noted in Exhibit 3.9-6 as well.

Exhibit 3.9-6: Wetlands within the I-85 Corridor Alternative

State	Type of Wetland				
	Palustrine Forested	Palustrine Scrub-Shrub	Palustrine Emergent	Palustrine Unconsolidated Shore	Total
Georgia					
Number of Crossings	25	12	4	0	**41**
Acreage*	31	15	3	0	**49**
South Carolina					
Number of Crossings	52	12	11	1	**76**
Acreage*	56	12	10	1	**79**
North Carolina					
Number of Crossings	3	4	2	1	**10**
Acreage*	2	3	1	1	**7**
Total					
Number of Crossings	**80**	**28**	**17**	**2**	**127**
Acreage*	**89**	**30**	**14**	**2**	**135**

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Sources: National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service (U.S. FWS); HNTB

Most of the larger wetlands that GDOT identified in this Corridor Alternative occur in the floodplains of, and adjacent to, the following perennial streams and open waters:

- Broad River
- Hudson River
- Middle Fork Broad River
- Middle Oconee River
- Mulberry River
- North Fork Broad River
- South Fork Catawba River
- Abernethy Creek
- Anderson Reservoir
- Beaverdam Creek
- Big Brushy Creek
- Brushy Creek
- Buffalo Creek
- Carlan Creek
- Chinquapin Creek
- Dixon Branch
- Gravelly Creek
- Grays Creek
- Grove Creek
- Hurricane Creek
- Jimmies Creek
- Jones Creek
- Lake Wylie
- Lake Hartwell
- Laurel Creek
- Lawsons Fork Creek
- Nails Creek
- Opossum Creek
- Paw Creek
- Rocky Creek
- Six and Twenty Creek
- Stephens Creek
- Thicketty Creek
- Turkey Creek
- Walnut Creek

Exhibit 3.9-7 shows the total number of rivers, streams, lakes, and ponds wholly or partly within the I-85 Corridor Alternative and Exhibit 3.9-8 displays the number that are considered impaired waters under Section 303(d) of the Clean Water Act. Out of the 410 total surface water crossings, fourteen are listed as impaired due to pollution levels. Appendix D provides a detailed listing of the waterway and water body crossings by state and county and their classification as an impaired water segment.

The I-85 Corridor Alternative travels through 17 watersheds, of which four are considered Region 4 Priority Watersheds by the EPA: Upper Chattahoochee River, Upper Savannah River (HUC 03060103), Saluda River, and Upper Catawba River. Segments of the Middle Oconee River, North Oconee River, and Middle Fork Broad River in Georgia, and the Enoree River, North Tyger River, Fairforest Creek, and Broad River in South Carolina located within the I-85 Corridor Alternative are listed on the NRI by the NPS. None of the rivers within this Corridor Alternative are classified as wild, scenic, or recreational per the Wild and Scenic Rivers Act.

Exhibit 3.9-7: Surface Waters within the I-85 Corridor Alternative

State	Perennial Streams & Rivers	Intermittent Streams & Rivers	Lakes	Ponds
Georgia				
Number of Crossings	47	38	4	18
Size*	26,478 L.F.	28,109 L.F.	11 Ac.	6 Ac.
South Carolina				
Number of Crossings	109	85	17	19
Size*	61,035 L.F.	46,783 L.F.	63 Ac.	5 Ac.
North Carolina				
Number of Crossings	33	20	6	14
Size*	18,901 L.F.	11,163 L.F.	23 Ac.	9 Ac.
Total				
Number of Crossings	**189**	**143**	**27**	**51**
Size*	**106,414 L.F.**	**86,055 L.F.**	**97 Ac.**	**20 Ac.**

**L.F. = Linear Feet; Ac. = Acre*
**Numbers have been rounded to the nearest linear foot or acre.*
Note: For the purpose of identifying water resources, Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Sources: NWI maintained by the U.S. FWS; USGS's National Hydrography Dataset (NHD); HNTB

Exhibit 3.9-8: Impaired Waters within the I-85 Corridor Alternative

State	Total Surface Waters (number of crossings)	Impaired Waters per Sec. 303(d) of CWA (number of crossings)
Georgia	107	1
South Carolina	230	10
North Carolina*	73	3
Total	**410**	**14**

Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
**All waters in NC are in Category 5 – 303(d) List for Mercury due to a statewide fish consumption advice for several fish species.*
Sources: State environmental agencies (GA DNR-EPD, SC DHEC, and NC DWQ); HNTB

As shown in Exhibit 3.9-9, the I-85 Corridor Alternative contains portions of approximately 260 floodplain systems, totaling approximately 686 acres.

Exhibit 3.9-9: FEMA 100-year Floodplains within the I-85 Corridor Alternative

State	Number of Floodplain Crossings	Area of Floodplain Crossings (acres)*
Georgia	29	119
South Carolina	155	486
North Carolina	76	81
Total	**260**	**686**

**Area calculations are rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Source: FEMA Flood Insurance Maps; HNTB

The 100-year floodplains located within the I-85 Corridor Alternative are associated with various major waterways and waterbodies, and their unnamed tributaries, which are listed in Appendix D by state and county and are mapped in the Map Book in Appendix A. Of the 260 floodplains located within the Southern Crescent Corridor Alternative, 41 are associated with a particular floodway, which are listed as follows:

- Catawba River
- Enoree River
- Flint River
- Middle Tyger River
- North Tyger River
- Reedy River
- Saluda River
- South Fork Catawba River
- South Tyger River
- Abernethy Creek
- Bromolow Creek
- Brushy Creek
- Buffalo Creek
- Cherokee Creek
- Fairforest Creek
- Grays Creek
- Irwin Creek
- Laurel Creek
- Lawsons Fork Creek
- Oats Creek
- Paw Creek
- Rocky Creek
- Taggart Creek

3.9.3.3 Greenfield Corridor Alternative

As shown in Exhibit 3.9-210, the Greenfield Corridor Alternative is located at least partly within 82 wetlands, as mapped in the NWI, totaling approximately 97 acres. Over half of the wetland acreage is located in the South Carolina portion of the Greenfield. Wetlands are classified in the NWI by the type of vegetation, source of the water, and other characteristics. All of the wetlands identified in the Greenfield Corridor Alternative are classified as palustrine, meaning non-tidal, containing no or low salt content, and dominated by trees or shrubs. There are several sub-classifications of palustrine wetlands present along this Corridor Alternative, such as forested, scrub-shrub, emergent, and unconsolidated shore, which are noted in Exhibit 3.9-10 as well.

Exhibit 3.9-10: Wetlands within the Greenfield Corridor Alternative

State	Type of Wetland				
	Palustrine Forested	Palustrine Scrub-Shrub	Palustrine Emergent	Palustrine Unconsolidated Shore	Total
Georgia					
Number of Crossings	17	9	4	1	31
Acreage*	23	10	0	0	33
South Carolina					
Number of Crossings	25	10	1	1	37
Acreage*	41	7	3	1	52
North Carolina					
Number of Crossings	8	4	1	1	14
Acreage*	6	4	1	1	12
Total					
Number of Crossings	**50**	**23**	**6**	**3**	**82**
Acreage*	**70**	**21**	**4**	**2**	**97**

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Sources: National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service (U.S. FWS); HNTB

Most of the larger wetlands that GDOT identified in this Corridor Alternative occur in the floodplains of, and adjacent to, the following perennial streams and rivers:

- Broad River
- Enoree River
- Middle Oconee River
- North Oconee River
- North Tyger River
- Pacolet River
- Reedy River
- Rocky River
- Saluda River
- Savannah River
- South Fork Broad River
- South Fork Catawba River
- Brush Creek
- Catawba Creek
- Cedar Creek
- Coffey Creek
- Crowders Creek
- Cunningham Creek
- Fairforest Creek
- Gilkey Creek
- Horse Creek
- Jones Creek
- Lake Wylie
- Little Beaverdam Creek
- Neals Creek
- Paw Creek
- Polecat Creek
- Redstone Creek
- Sandy Creek
- South Fork Broad River
- South Durbin Creek
- South Rabon Creek
- Stoddard Creek
- Thicketty Creek
- Wards Creek
- Weems Creek

- Allison Creek
- Beaverdam Creek
- Broad Mouth Creek
- Little Cedar Creek
- Mountain Creek
- Mulberry River
- West Fork Trail Creek
- Wilson Creek

Exhibit 3.9-11 shows the total number of rivers, streams, lakes, and ponds wholly or partly within the Greenfield Corridor Alternative and Exhibit 3.9-12 displays the number that are considered impaired waters under Section 303(d) of the Clean Water Act. Out of the 514 total surface water crossings, 21 are listed as impaired due to pollution levels. Appendix D provides a detailed listing of the waterway and water body crossings by state and county and their classification as an impaired water segment; Appendix A displays these in map form.

The Greenfield Corridor Alternative passes through 14 watersheds that include four Region 4 Priority Watersheds designated by the EPA: Upper Chattahoochee River, Upper Savannah River, Saluda River, and Upper Catawba River. Segments of the NRI-listed streams include: the Broad River in Georgia and South Carolina, the North Oconee River and Middle Fork Broad River in Georgia, and the Savannah River located on the state border between Georgia and South Carolina. None of the rivers within this Corridor Alternative are classified as wild, scenic, or recreational in accordance with the Wild and Scenic Rivers Act[143].

[143] *16 U.S.C. § 1271-1287. Wild and Scenic Rivers Act.*

Exhibit 3.9-11: Surface Waters within the Greenfield Corridor Alternative

State	Perennial Streams & Rivers	Intermittent Streams & Rivers	Lakes	Ponds
Georgia				
Number of Crossings	64	27	2	38
Size*	44,904 L.F.	20,393 L.F.	12 Ac.	11 Ac.
South Carolina				
Number of Crossings	103	168	1	47
Size*	58,124 L.F.	116,655 L.F.	2 Ac.	23 Ac.
North Carolina				
Number of Crossings	30	20	5	9
Size*	14,725 L.F.	12,841 L.F.	28 Ac.	4 Ac.
Total				
Number of Crossings	**197**	**215**	**8**	**94**
Size*	**117,753 L.F.**	**149,889 L.F.**	**42 Ac.**	**38 Ac.**

**L.F. = Linear Feet; Ac. = Acre*
**Numbers have been rounded to the nearest linear foot or acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Sources: NWI maintained by the U.S. FWS; USGS's National Hydrography Dataset (NHD); HNTB

Exhibit 3.9-12: Impaired Waters within the Greenfield Corridor Alternative

State	Surface Waters	Impaired Waters per Sec. 303(d) of CWA
Georgia	131	6
South Carolina	319	11
North Carolina*	64	4
Total	**514**	**21**

Note: For the purpose of identifying water resources, Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
**All waters in NC are in Category 5 – 303(d) List for Mercury due to a statewide fish consumption advice for several fish species.*
Sources: State environmental agencies (GA DNR-EPD, SC DHEC, and NC DWQ); HNTB

As shown in Exhibit 3.9-13, the Greenfield Corridor Alternative contains portions of approximately 146 floodplain systems, totaling approximately 640 acres.

Exhibit 3.9-13: FEMA 100-year Floodplains within the Greenfield Corridor Alternative

State	Number of Floodplain Crossings	Area of Floodplain Crossings (acres)*
Georgia	21	138
South Carolina	71	419
North Carolina	54	83
Total	**146**	**640**

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above excludes the Atlanta approaches.
Source: FEMA Flood Insurance Maps; HNTB

The 100-year floodplains located within the Greenfield Corridor Alternative are associated with various major waterways and waterbodies, and their unnamed tributaries, which are listed in Appendix D by state and county and are mapped in the Map Book in Appendix A. Of the 146 floodplains located partly within the Greenfield, 40 are associated with a particular floodway, which are listed as follows:

- Catawba River
- Enoree River
- Flint River
- North Oconee River
- North Tyger River
- South Fork Catawba River
- South Tyger River
- Beaver Creek
- Bromolow Creek
- Catawba Creek
- Irwin Creek
- Noketchee Creek
- Paw Creek
- Sandy Creek
- Taggart Creek
- West Fork Trail Creek

3.9.3.4 Atlanta Approach

The previous sections discussed water resources located within each of the three Corridor Alternatives, outside the Atlanta approach. This section summarizes water resources located within the two Atlanta approaches. GDOT evaluated all six combinations of Corridor Alternatives and Atlanta approaches. GDOT and FRA will defer a decision on the Atlanta approach to a future Tier 2 EIS. Appendix D provides a detailed listing of water resources by state and county and the map book in Appendix A displays all resources within the Corridor Alternatives and their Atlanta approaches.

NS ATLANTA APPROACH

Exhibits 3.9-14 through 3.9-17 summarize all water resources identified within the NS Atlanta approach of the three Corridor Alternatives. The NS approach generally follows a ridgeline, meaning it crosses fewer wetlands, floodplains, and other waterbodies, as demonstrated in the following tables.

Exhibit 3.9-14: Wetlands within the NS Atlanta Approach

Corridor Alternative		Type of Wetland: Palustrine Forested (PFO)	Palustrine Scrub-Shrub (PSS)	Palustrine Emergent (PEM)	Total
Southern Crescent	Number	3	4	4	11
	L.F./Ac.*	7	3	5	15
I-85	Number	8	5	0	13
	Acreage*	11	4	0	15
Greenfield	Number	10	6	0	16
	Acreage*	23	10	0	33

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the NS Atlanta approach only.
Sources: National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service (U.S. FWS); HNTB

Exhibit 3.9-15: Surface Waters within the NS Atlanta Approach

Corridor Alternative		Perennial Streams	Intermittent Streams	Lakes	Ponds
Southern Crescent	Number	20	8	3	5
	L.F./Ac.*	15,275 L.F.	3,446 L.F.	11 Ac.	3 Ac.
I-85	Number	24	20	0	8
	L.F./Ac.*	17,136 L.F.	11,198 L.F.	0 Ac.	4 Ac.
Greenfield	Number	28	28	0	10
	L.F./Ac.*	18,986 L.F.	18,648 L.F.	0 Ac.	5 Ac.

**L.F. = Linear Feet; Ac. = Acre; Numbers have been rounded to the nearest linear foot or acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the NS Atlanta approach only.
Sources: NWI maintained by the U.S. FWS; USGS's National Hydrography Dataset (NHD); HNTB

Exhibit 3.9-16: Impaired Waters within the NS Atlanta Approach

Corridor Alternative	Surface Waters	Impaired Waters per Sec. 303(d) of CWA
Southern Crescent	36	9
I-85	52	7
Greenfield	66	6

Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the NS Atlanta approach only.
Sources: State environmental agencies (GA DNR-EPD, SC DHEC, and NC DWQ); HNTB

Exhibit 3.9-17: FEMA 100-year Floodplains within the NS Atlanta Approach

Corridor Alternative	Number of Floodplain Crossings	Area of Floodplain Crossings*
Southern Crescent	42	97 acres
I-85	54	76 acres
Greenfield	56	98 acres

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the NS Atlanta approach only.
Source: FEMA Flood Insurance Maps; HNTB

CSX ATLANTA APPROACH

Exhibits 3.9-18 through 3.9-21 summarize all water resources identified within the CSX Atlanta approach of the three Corridor Alternatives. The CSX approach crosses more wetlands, floodplains, and other waterbodies than the NS approach, as demonstrated in the following tables.

Exhibit 3.9-18: Wetlands within the CSX Atlanta Approach

Corridor Alternative		Palustrine Forested (PFO)	Palustrine Scrub-Shrub (PSS)	Palustrine Emergent (PEM)	Total
Southern Crescent	Number	22	8	2	32
	L.F./Ac.*	56	11	3	70
I-85	Number	21	5	2	28
	Acreage*	51	5	3	59
Greenfield	Number	22	6	2	30
	Acreage*	61	8	3	72

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the CSX Atlanta approach only.
Sources: National Wetlands Inventory (NWI) maintained by the U.S. Fish and Wildlife Service (U.S. FWS); HNTB

Exhibit 3.9-19: Surface Waters within the CSX Atlanta Approach

Corridor Alternatives		Perennial Streams	Intermittent Streams	Lakes	Ponds
Southern Crescent	Number	70	50	1	16
	L.F./Ac.*	86,175 L.F.	32,743 L.F.	1 Ac.	10 Ac.
I-85	Number	64	35	2	14
	L.F./Ac.*	82,214 L.F.	16,074 L.F.	1 Ac.	9 Ac.
Greenfield	Number	66	33	2	14
	L.F./Ac.*	83,452 L.F.	16,249 L.F.	1 Ac.	9 Ac.

**L.F. = Linear Feet; Ac. = Acre; Numbers have been rounded to the nearest linear foot or acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the CSX Atlanta approach only.
Sources: NWI maintained by the U.S. FWS; USGS's National Hydrography Dataset (NHD); HNTB

Exhibit 3.9-20: Impaired Waters within the CSX Atlanta Approach

Corridor Alternative	Surface Waters	303d listed
Southern Crescent	137	15
I-85	115	15
Greenfield	115	14

Note: For the purpose of identifying water resources, Corridor Alternatives are defined as 600 feet in width. Data presented above includes the CSX Atlanta approach only.
Sources: State environmental agencies (GA DNR-EPD, SC DHEC, and NC DWQ); HNTB

Exhibit 3.9-21: FEMA 100-year Floodplains within the CSX Atlanta Approach

Corridor Alternative	Number of Floodplain Crossings	Area of Floodplain Crossings*
Southern Crescent	197	521 acres
I-85	189	495 acres
Greenfield	193	489 acres

**Numbers have been rounded to the nearest acre.*
Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the CSX Atlanta approach only.
Source: FEMA Flood Insurance Maps; HNTB

ATLANTA APPROACH SUMMARY

Although there are differences among the six combinations of Corridor Alternatives and Atlanta approaches, the CSX approach generally includes more water resources that could experience potential impacts. The NS approach generally follows a ridgeline, meaning it crosses fewer wetlands, floodplains, and other waterbodies, as demonstrated in Exhibit 3.9-22, which summarizes the total number of water resources for the two Atlanta approaches.

Exhibit 3.9-22: Summary of Water Resources within the Atlanta Approaches

	Wetland Crossings	Surface Water Crossings	303(d) Impaired Water Crossings	Floodplain Crossings
NS Approach				
Southern Crescent	11	36	9	42
I-85	13	52	7	54
Greenfield	16	66	6	56
CSX Approach				
Southern Crescent	32	137	15	197
I-85	28	115	15	189
Greenfield	30	115	14	193

Note: Corridor Alternatives are defined as 600 feet in width. Data presented above includes the Atlanta approaches only
Source: HNTB

3.9.4 Environmental Consequences

3.9.4.1 No-Build Alternative

Under the No-Build Alternative, the Project would not be built, and the project-related impacts to water resources would not occur. Minor impacts to the water quality of surface waters from the discharge of pollutants and/or sediment associated with ongoing construction maintenance along the existing rail route, including potential culvert replacements/extensions and bridge replacements/additions, may occur. Additionally, maintenance of the existing railway ROW including mowing and trimming, spraying herbicide to control vegetation, and minor construction associated with the upkeep of a major railroad would continue. Consequently, under the No-Build Alternative, the water quality of surface waters along the corridor would remain unchanged from current conditions. A full description of the No-Build Alternative is provided in Chapter 2.

3.9.4.2 Corridor Alternatives

WETLAND IMPACTS

Wetland impacts could occur in specific locations of each Corridor Alternative where new rail, stations, and parking areas are proposed in or adjacent to wetlands. Temporary, construction-related impacts could also occur. The I-85 Corridor Alternative potentially has the most acres of wetlands and, as a result, the greatest potential to impact wetlands. The Southern Crescent Corridor Alternative has the fewest acres of wetlands, and potentially less impact on wetlands.

STREAMS AND LAKES

Potential direct impacts of the Project on streams and lakes include, but may not be limited to, permanent clearing of riparian vegetation, fill placement in waters, and stormwater runoff from impervious surfaces. These actions have the potential to alter the natural characteristics of water resources, resulting in changes in water temperature, increased nutrients and sedimentation, and alterations in stream channel circulation. The Greenfield Corridor Alternative has the greatest number of stream crossings and the greatest number of pond and lake crossings; for this reason, it the Corridor Alternative with the greatest potential to affect streams and lakes, with the I-85 Corridor Alternative close behind. The Southern Crescent Corridor Alternative has fewer stream, lake, and pond crossings, and relatively less potential to affect these resources.

FLOODPLAINS

Permanent floodplain impacts may occur in specific locations where rail, stations, parking areas, maintenance, and storage facilities are introduced in or adjacent to floodplains. The I-85 and Greenfield Corridor Alternatives have the most acres of floodplains and, therefore, the highest potential for floodplain impacts. The Southern Crescent Corridor Alternatives has relatively fewer acres of floodplains, and therefore, relatively less potential for floodplain impacts.

WATER QUALITY IMPACTS

Impacts to water quality may occur due to the addition of impervious areas at stations, parking areas, maintenance and storage facilities, and, to an extent to be determined, by the rail itself, depending on the technology selected and the design of the rail. In addition to the increased runoff rates and volume from these impervious areas, changes in drainage patterns would occur due to the piping of stormwater runoff into closed drainage systems that would have direct outfalls to receiving waters. After FRA selects a Preferred Corridor Alternative, should funding become available, a more detailed Tier 2

analysis will determine the specific increase of impervious area that would result from the development of the selected Corridor Alternative.

Each Corridor Alternative potentially could have construction effects on water resources and water quality. Such effects can result from clearing of vegetation, exposure of soil exposed due to grubbing, earth moving and grading, and other construction-related activities. These activities may cause soil erosion and sedimentation in downstream waters. Effects on groundwater could also occur during blasting/drilling activities or through natural fissures. Temporary access for construction activities and equipment also may affect water resources. The presence of heavy equipment and construction-related chemicals during construction potentially would affect water resources by increasing the risk of contamination.

Exhibit 3.9-23 summarizes the water resources within each of the three Corridor Alternatives.

Exhibit 3.9-23: Summary of Water Resources within the Corridor Alternatives

Corridor Alternative	Wetland Area (acres)	Surface Water Crossings	303(d) Impaired Water Crossings	Floodplain Area (acres)
Southern Crescent	30	246	15	397
I-85	135	410	14	686
Greenfield	97	514	21	640

3.9.5 Potential Mitigation Strategies

3.9.5.1 Wetlands, Streams, and Lakes

In accordance with the USACE's goal of no net loss of wetlands, GDOT will aim to avoid and minimize impacts and use compensatory mitigation if necessary. As design progresses, GDOT will examine reasonably feasible ways to avoid affecting wetlands, streams, and lakes that are appropriate to the scope and practicable in terms of cost. GDOT will then examine appropriate and practicable steps to reduce the potential impacts to wetlands, streams, and lakes as Project design is refined. Minimization will typically focus on decreasing the footprint of the Project in and near these resources. Other examples of minimization that will be considered include:

- Minimizing clearing and grubbing activity;
- Decreasing or eliminating discharges into streams;
- Minimization of activities within stream channels; and
- Use of spanning structures and bottomless culverts over streams.

Compensatory mitigation will be developed by GDOT during the Tier 2 analysis after potential impacts have been avoided and minimized to the extent reasonably feasible. During the Tier 2 analysi, the Project sponsor will consult the Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) to ensure that the necessary mitigation banks are still potentially available. The cost of mitigation credits is typically a function of supply and demand; thus, costs can vary and GDOT will

explore further during Tier 2 when more information will be known about the alignment. USACE is charged with regulating the discharge of dredged or fill material into wetlands via the Section 404 permit program. To be eligible for a Section 404 permit, the project sponsor must demonstrate that steps have been taken to avoid and minimize the impact, compensation is provided for any remaining impact, and no significant degradation to Waters of the U.S. will result from the Project.[144]

3.9.5.2 Floodplains

As with wetlands, streams and lakes, GDOT will examine reasonably feasible ways to avoid affecting floodplains that are appropriate to the scope and degree of the potential Project effects and practicable in terms of cost, existing technology, and logistics in light of the Project's purpose. Minimization strategies could include design aspects such as right angle crossings, typical section reductions, and increased numbers of bridge spans or span length. GDOT will develop mitigation strategies after potential impacts have been avoided and minimized to the extent reasonably feasible. Floodplain restoration is one possible strategy that would be examined, if warranted, in a future Tier 2 analysis.

3.9.5.3 Water Quality

During a future Tier 2 analysis, surface waters would be reviewed to determine where it is possible and practical to avoid or minimize impacts to these resources and to water quality. Potential mitigation measures to be considered include the use of temporary and permanent Best Management Practices (BMPs) to avoid or minimize sediment pollution and water quality impacts through reductions in stormwater runoff from the site. Additionally, an Erosion and Sediment Control (ESC) Plan would be prepared. Permanent BMPs, such as stormwater treatment or detention/retention facilities, or drainage channels/facilities, would be utilized where appropriate to improve stormwater management/flow and water quality. The application of BMPs and the proper erosion and sediment control measures would reduce the amount of erosion and sedimentation as well as minimize the volume of stormwater discharge resulting from construction activities. These measures are a condition of Section 404 CWA permits. Any impacts to waters of the U.S. will require a Section 404 permit issued by USACE, as described in the wetlands section above.

Erosion control measures would consist of applying mulch, straw, soil reinforcement matting, polymers, erosion control blankets, and/or vegetative soil stabilization. Generally, vegetative soil stabilization includes temporary and permanent seeding, sodding, ground cover, and dormant seeding. Disturbance of streamside and riparian vegetation would be kept to a minimum where feasible. In-stream construction and soil disturbing activities near streams would be conducted during low or normal flow periods in accordance with construction permits obtained prior to project construction. Discharge points would be protected with rock (or an alternative measure) to minimize scour and erosion.

Perimeter sediment control devices would be installed before commencing soil disturbing activities. Perimeter silt fences, stabilized construction entrances, drainage inlet protection, ditch checks, diversions, sediment traps, and other appropriate BMPs would be used to control sediment and runoff and to protect receiving waters during construction.

Stream crossings and structure sizing would be performed in accordance with state and federal guidelines regarding floodplain encroachment and hydraulic capacity. All new structures will comply

[144] *More information on the Section 404 permit program can be found here: https://www.epa.gov/cwa-404/section-404-permit-program*

with these guidelines. Stormwater facilities and discharges will be monitored and managed during and following construction in accordance with area requirements per the NPDES.

Other stormwater control practices may be needed to mitigate water quality impacts. In addition to detention facilities, other practices such as vegetated basins/buffers, infiltration basins, and bioswales would be evaluated to minimize transport of sediment, heavy metals, and other pollutants.

Temporary and permanent construction BMPs, such as seed, mulch, embankment protectors, grade techniques, inlet protection, silt fences, and vehicle tracking prevention would be used as appropriate during project construction. The design of these BMPs to improve the quality of stormwater runoff would be developed and designed in accordance with state DOTs and agencies, including GA DNR EPD, SC DHEC, and NC DWQ.

3.9.6 Subsequent Analysis

Should funding be available, during a future Tier 2 analysis, GDOT will identify specific potential impacts on water resources for the Preferred Corridor Alternative. The subsequent analysis would include the following:

- Field surveys of potential surface water impacts to further analyze potential impacts on water quality and to seek required permits from the appropriate agencies.
- Analysis of how the Project would contribute to total additional impervious ground surfaces and the subsequent potential additional impacts on surface run-off. This analysis would also identify potential mitigation measures.
- Geotechnical assessments to ensure that the Project would not pollute groundwater through natural fissures or during blasting/drilling activities.
- Obtaining all necessary permits.
- The usage type of each stream in the Study Area will also be documented, as well as each stream's status on the EPA 303(d) list of impaired waters.
- Field investigations and jurisdictional wetland delineations, which would include the quantification of wetland impacts.
- Determination of potential mitigation strategies to minimize potential effects.

3.10 BIOLOGICAL RESOURCES

This chapter describes the existing wildlife/aquatic species and their habitats within the 600-foot wide screening area of the proposed Corridor Alternatives, reports the potential effects of the Project on these resources, and identifies potential mitigation that could be implemented to address potential effects. The number of known threatened and endangered species and their habitats potentially affected by the Corridor Alternatives is a distinguishing factor among the Corridor Alternatives. The data is presented to facilitate future planning and the advancing of a Preferred Alternative for the Atlanta to Charlotte PRCIP in consultation with other environmental factors.

3.10.1 Legal and Regulatory Context

The following federal and state authorities provide the statutory context for analysis of biological resources:

- **Endangered Species Act**: Section 7 of the Endangered Species Act (ESA) of 1973 (16 U.S.C. §1536), requires that any action likely to affect a species classified as federally-protected be subject to review by the USFWS. Critical habitat is a term defined and used in the Act. It is a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery.
- **The Fish and Wildlife Coordination Act of 1934**: As amended in 2002, it serves to protect wildlife resources and to provide for wildlife conservation in water resource development programs by preventing the loss of and damage to such resources while providing for the improvement and development of the water resource system in the U.S. Section 2(a) of this act requires consultation with the USFWS, Department of the Interior, and the state agency exercising administration over the wildlife resources within a particular state wherein the action is proposed if the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose e.[145]
- **Magnuson-Stevens Act:** The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) is the primary law governing marine fisheries management in U.S. federal waters. First passed in 1976, the MSA fosters long-term biological and economic sustainability of our nation's marine fisheries. Key objectives of the act are to prevent overfishing, rebuild overfished stocks, increase long-term economic and social benefits, and ensure a safe and sustainable supply of seafood. Essential fish habitat (EFH) was defined by Congress in the 1996 amendments to the MSFCMA.
- **Migratory Bird Treaty Act**: The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703–712) protects all native migratory game and non-game birds with exceptions for the control of species that cause damage to agricultural or other interests in the U.S. and its territories. (50 CFR 10.13, List of Migratory Birds)
- **Bald and Golden Eagle Protection Act**: The bald eagle is protected under the Bald and Golden Eagle Protection Act (16 U.S.C. § 668) (BGEPA). The BGEPA prohibits anyone,

[145] *U.S. Fish and Wildlife Coordination Act of 1934, 16 USC § 662(a).*

without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The bald eagle is listed as threatened by the State of Georgia.

- **Georgia Environmental Policy Act (GEPA) of 1991**: GEPA (O.C.G.A. § 12-16-1) protects the cultural and natural resources of Georgia that may be impacted by a state government agency's actions.
- **Georgia Wildflower Preservation Act of 1973**: The Georgia Wildflower Preservation Act (O.C.G.A. § 12-6-170) Provides for the designation of officially protected plants and authorizes rules for the collection, transport, sale and listing of these plants.
- **Georgia Endangered Wildlife Act of 1973:** The Georgia Endangered Wildlife Act (O.C.G.A. § 27-3-130) provides for the designation and protection of rare, threatened and endangered species within the State of Georgia.
- **South Carolina Nongame and Endangered Species Conservation Act of 1974:** This Act establishes a nongame program for "species in need of management," which include species that need conservation assistance but may not be on the federal list.
- **South Carolina Scenic Rivers Act of 1989**: Sections 49-29-10 to 49-29-230, SC Code of Laws creates the State Scenic Rivers program and establishes criteria for rivers to receive this designation. Historic and cultural values are included in the criteria, along with scenic, recreational, geological, botanical, fish, and wildlife values.
- **State Environmental Policy Act (SEPA) of 1971**: Chapter 113A Pollution Control and Environmental Article 1 Environmental Policy Act. The North Carolina (or state) Environmental Policy Act of 1971 (SEPA) requires state agencies to review and report the environmental effects of all activities that involve an action by a state agency, an expenditure of public monies or private use of public land, and the potential negative environmental effect upon natural resources, public health and safety, natural beauty, or historical or cultural elements of the state.
- **Nature Preserves Act of North Carolina (G.S. 113A-164.1 to 164.11) of 2005:** The purpose of this Article is to establish and maintain a State Registry of Natural Heritage Areas and to prescribe methods by which nature preserves may be dedicated for the benefit of present and future citizens of the State.
- **NC Plant Protection and Conservation Act of 1979:** Established the North Carolina Plant Conservation Program, which includes maintenance of the state's list of endangered, threatened, and special concern plant species as well as limiting those actions that could result in a "take" of those species on the state's list.[146]

3.10.2 Methodology

A GIS map of recorded, limited site-specific accounts of terrestrial protected species, and more broadly based species locations for aquatic species, as well as areas designated as critical habitat was overlaid onto mapping of the screening area utilizing a GIS database maintained by the USFWS called the Information, Planning and Conservation System (IPAC).[147] Agency coordination and literature

[146] *North Carolina Plant Protection and Conservation Act of 1979, N.C.G.S. 106-202.12 to 106.202.19.*

[147] *USFW. Information, Planning and Conservation System, http://www.fws.gov/athens/endangered.html (accessed 2/18/18)*

reviews were used to identify any known rare, threatened, endangered, or candidate species; potential habitat; and wildlife and wildlife corridors within the Corridor Alternatives. Agency coordination was based on a review area of a half mile of the Corridor Alternatives, while the GIS mapping defines all habitats intersecting and within the 600-foot wide screening area of each Corridor Alternative. The presence of common and sensitive biological resources has been documented, and the habitat's potential for indicating the presence of sensitive species was evaluated.

Data information regarding terrestrial natural habitats and developed land areas were collected from different sources for each state. Data from the USGS Land Cover files were used to generate GIS data of habitat areas. Additionally, the North Carolina Department of Environment and Natural Resources (NCDENR) provided GIS Natural Heritage Program information regarding natural areas, including high quality natural communities and Managed Areas of conservation interest occurring in North Carolina.

Potential adverse impacts to ecology and the environment in the Corridor Alternatives have been qualitatively identified. Where potential for adverse impacts exist, measures to avoid or reduce these impacts will be explored. Additionally, areas where further analysis will be necessary in the Tier 2 EIS have been identified. The potential impacts on EFH, migratory bird habitat, bald eagle habitat, and federally and state-protected species and habitats have been addressed, although detailed EFH, habitat assessments and biological assessments under Section 7 of the U.S. Endangered Species Act would occur as part of the Tier 2 EIS. In addition, field investigations and jurisdictional wetland delineations will be conducted as required during the subsequent environmental analysis for the Preferred Alternative in the Tier 2 EIS.

To analyze the biological resources present within each Corridor Alternative, the following designations are used throughout the document:

- **Threatened and Endangered Species:** The ESA defines federal "endangered" species as those that are "in danger of extinction within the foreseeable future throughout all or a significant portion of [their] range," and defines "threatened" species as "those animals and plants likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges."[148] Vertebrate animal species and subspecies, invertebrate animal populations, and plant species and varieties (including fungi and lichens) are eligible for listing under the ESA.

- **Critical Habitat:** Threatened or endangered species may have designated critical habitat afforded for the protection of the species. According to the ESA, the term "critical habitat" for a threatened or endangered species means the following:
    - *"The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (1) essential to the conservation of the species and (2) which may require special management considerations or protection; and*
    - *Specific areas outside the geographical area occupied by the species at the time it is*

[148] *U.S. Endangered Species Act of 1973 (ESA) (16 USC § 1531-1543)*

listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species." [149]

- **Natural Habitat Areas and Wildlife:** The intent of the MBTA and the BGEPA is to offer protection to avian species in their natural habitat areas. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell migratory birds, and the BGEPA prohibits anyone from "taking" bald or golden eagles, including their parts, nests, or eggs, without a permit issued by the Secretary of the Interior. In addition to protection from direct harm, the BGEPA also prohibits activities that disrupt eagles at nests, foraging areas, and important roosts, because loss of these areas can disturb or kill eagles. Among other actions, "take" includes disturbance of eagles to the degree that it substantially interferes with breeding, feeding, or sheltering behavior, or results in injury, death, or nest abandonment. The potential for occurrences of migratory bird nesting, foraging, or roosting areas will be studied further in the Tier 2 EIS.

- **Essential Fish Habitat:** The National Oceanic and Atmospheric Administration (NOAA) works to identify and protect essential fish habitat. The NOAA Division called the National Marine Fisheries Service identifies describes, and maps EFH for Fishery Management Plans. NOAA also provides advice to federal agencies on smart development that minimizes or prevents environmental impacts to EFH. EFH is protected under the MSFCMA. EFH includes all types of aquatic habitats that are necessary for managed fish to complete their life cycle, such as areas where fish spawn, breed, feed, or grow to maturity.[150] According to the NOAA Essential Fish Habitat Mapper, no EFH is located within or near the Corridor Alternatives.

3.10.2.1 Agency Coordination

The USFWS (IPaC) website provided information on federally listed threatened and endangered species as well as designated critical habitat (DCH). The Georgia Department of Natural Resources (GADNR), South Carolina Department of Natural Resources (SCDNR), and North Carolina Department of Environmental Quality (NCDEQ) websites also provided data relating to state-listed threatened and endangered species. In addition, both the South Carolina Heritage Trust Program[151] and the North Carolina Heritage Program[152], which documents and protects rare, threatened, and endangered species and communities, provided information on federally listed threatened and endangered species and DCH.

GDOT sent letters to the USFWS and state agencies requesting data regarding known occurrences of protected species within a half mile of the Corridor Alternatives based on preliminary plans (see Appendix C, Agency and Public Coordination). Continued coordination with these agencies will occur during Tier 2.

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[149] *16 USC § 1531, as amended.*

[150] *National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) (2007) "Essential Fish Habitat and Critical Habitat: A Comparison." Available at: file:///C:/Users/01059978/Downloads/noaa_4188_DS1.pdf (accessed on 4/10/18)*

[151] *South Carolina Heritage Trust Program. http://heritagetrust.dnr.sc.gov/history.html*

[152] *North Carolina Heritage Program. https://www.ncnhp.org/*

Early coordination with the state agencies for MBTA and the BGEPA did not indicate any records of bald eagle nests within a half mile of any of the Corridor Alternatives. Land disturbance, wetland disturbance, tree and brush clearing, and culvert and bridge replacements could affect potential migratory bird and/or eagle nesting, foraging, or roosting areas that may be present in the Corridor Alternatives. Specific locations requiring clearing or structure removal would be identified in the Tier 2 analysis when a more specific extent of project limits would be determined. At that time, coordination with the state agencies, GADNR, SCDNR, and NCDEQ would take place to determine potential locations of migratory bird and/or eagle occupancy within the Preferred Alternative, in addition to determining seasonal nesting, roosting, and foraging requirements of potentially affected species.

To comply with the MBTA and the BGEPA, restrictions may be placed on the timing of clearing and other construction disturbance activities to help ensure avoidance and minimization of impacts. The identified above potential impacts to migratory birds/eagles are the same for all Corridor Alternatives, therefore there is no further discussion provided in the individual Corridor Alternative sections.

3.10.3 Affected Environment

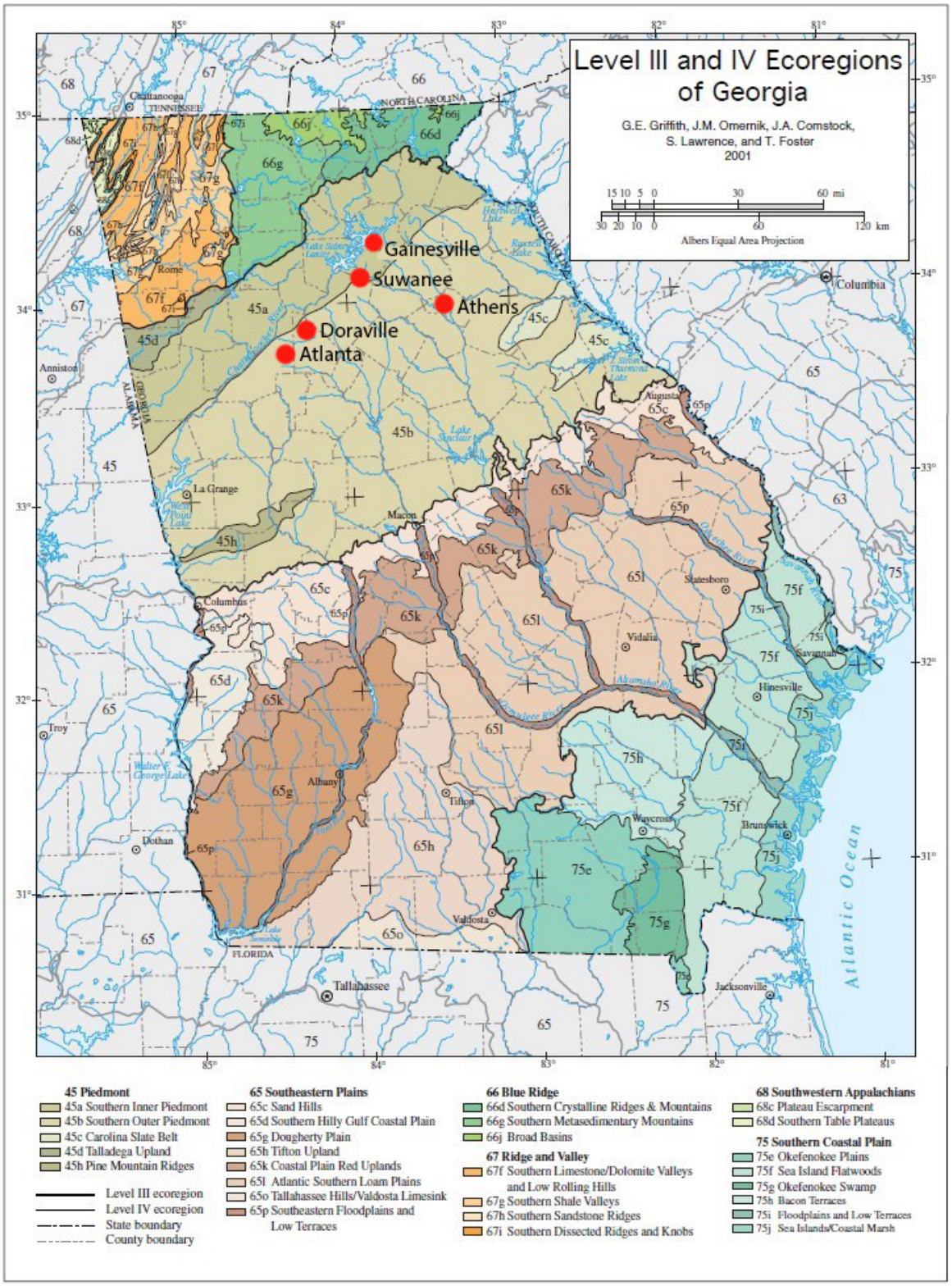
The following section describes the ecoregions and natural habitat areas found within the screening area. In addition, this section addresses threatened and endangered species and protected habitats in the 600-foot wide environmental screening areas of the Southern Crescent, I-85, and Greenfield Corridor Alternatives and the Atlanta Approaches. Preliminary data indicates that suitable habitat potentially occurs within the screening area counties for multiple protected species that are federally listed and/or listed by the states of Georgia, South Carolina, and North Carolina.

The protected species are listed by county in Exhibit 3.10-1. Inclusion in the list does not necessarily mean that the threatened or endangered species is found within the screening area or within a Corridor Alternative. Rather, the list identifies the presence of suitable habitat for a given threatened or endangered species within a county as compiled from reports by the USFWS, IPaC; GADNR, SCDNR, and NCDEQ.

3.10.3.1 Ecoregions

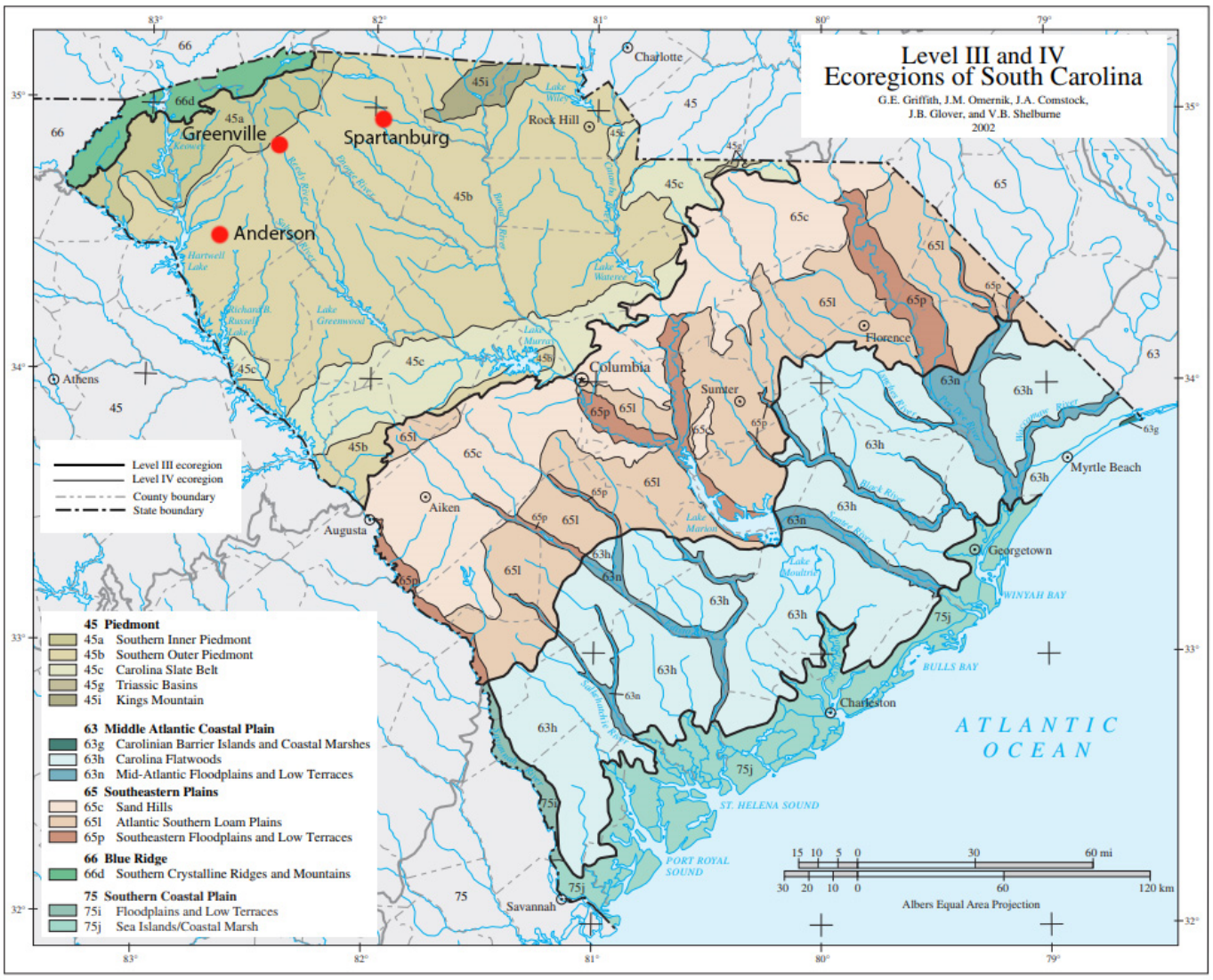
The Study Area spans one major (Level III) ecoregion – the Southeast Piedmont. EPA defines an ecoregion as an area of similarity regarding patterns in the mosaic of abiotic and biotic, aquatic and terrestrial ecosystem components, including geology, physiography, vegetation, climate, soils, hydrology, land use, and wildlife, with human beings considered as part of the biota. They are shown in Figure 3.10-1. The Piedmont is the non-mountainous area of the Appalachian Highlands, consisting of plains and hills that are a transition between the coastal plain and Appalachians.

Exhibit 3.10-1: Ecoregions in Georgia



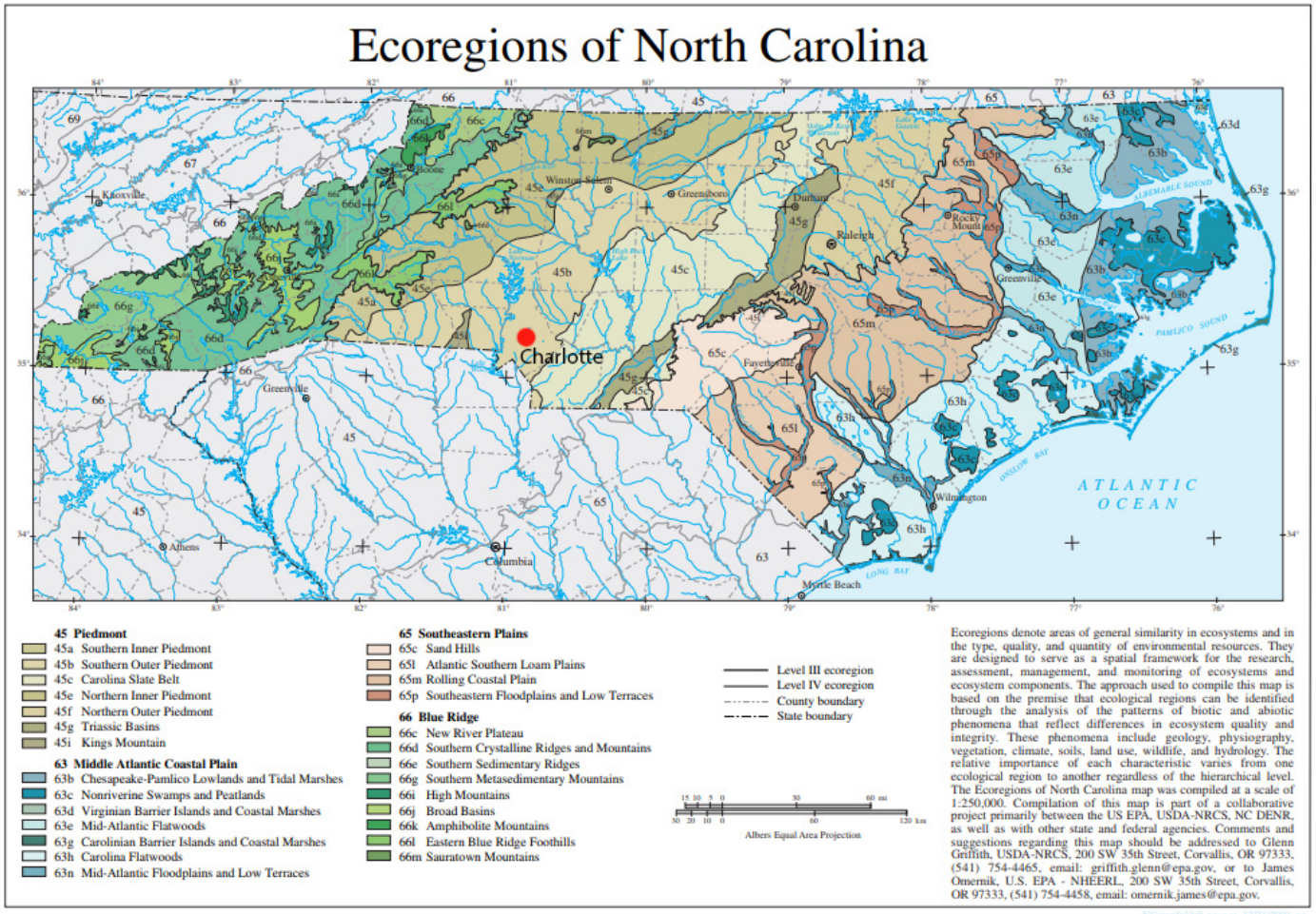
Source: GDNR website: http://www1.gadnr.org/cwcs/PDF/ga_eco_l3_pg.pdf. 2001

Exhibit 3.10-2: Ecoregions in South Carolina



Source: EPA "Ecoregion Download Files by State - Region 4"; https://www.epa.gov/eco-research/ecoregion-download-files-state-region-4

Exhibit 3.10-3: Ecoregions in North Carolina



Source: EPA "Ecoregion Download Files by State - Region 4"; https://www.epa.gov/eco-research/ecoregion-download-files-state-region-4

3.10.3.2 Natural Habitat Areas

Natural habitat areas include a combination of environmental factors that provide food, water, cover and space that a living thing needs to survive and reproduce. When natural habitat areas face fragmentation, degradation, or destruction it can impact biodiversity and contribute to species decline. One of the missions of the USFWS is to work with other agencies to conserve, protect, and enhance fish, wildlife, and plants and their habitats.[153] Knowing the location and acreage of these habitats will help GDOT to reduce the potential effects of the Project on threatened and critical habitats.

[153] *"Habitat," USFWS. https://www.fws.gov/habitat/ (accessed 4/15/18)*

The Southeast Piedmont Region consists primarily of forested areas dominated by pine and hardwood tree species. Habitat types within the Corridor Alternatives include land-use, natural terrestrial habitat, and natural aquatic habitat areas. Over the years, intensive agriculture and development have fragmented and reduced the amount of natural habitat areas. The following are brief descriptions of the land-use and natural habitat areas within the Corridor Alternatives, according to the National Land Cover Database 2006:[154]

- Developed, Open Space – Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20 percent of total cover.
- Developed, Low Intensity – Areas with a mixture of constructed materials and vegetation, which include most commonly single-family housing units. Impervious surfaces account for 20 to 49 percent of total cover.
- Developed, Medium Intensity – Areas with a mixture of constructed materials and vegetation, most commonly including single-family housing units. Impervious surfaces account for 50 to 79 percent of the total cover.
- Developed, High Intensity – Highly developed areas where people reside or work in high numbers, including apartment complexes, row houses and commercial/industrial facilities. Impervious surfaces account for 80 to 100 percent of total cover.
- Barren Land (rock/sand/clay) – Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15 percent of total cover.
- Deciduous Forest – Areas dominated by trees generally greater than five meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species are deciduous and shed foliage simultaneously in response to seasonal change.
- Evergreen Forest – Areas dominated by trees generally greater than five meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species are evergreen and maintain their leaves all year. Therefore, the canopy is never without green foliage.
- Mixed Forest – Areas dominated by trees generally greater than five meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.
- Shrub/Scrub – Areas dominated by shrub species that are less than five meters tall. The shrub canopy is typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
- Grassland/Herbaceous – Areas dominated by graminoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.

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[154] *Multi-Resolution Land Characteristics Consortium (MRLC) and USGS (2013) National Land Cover Database 2006, modified March 2013. Available at: http://www.mrlc.gov/nlcd06_leg.php (accessed on 4/10/18)*

- Pasture/Hay – Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.
- Cultivated Crops – Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.
- Woody Wetlands – Areas where forest or shrub vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or inundated with water.
- Emergent Herbaceous Wetlands – Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or inundated with water.

The following section (3.10.3.3) includes the natural habitat area acreage for each Corridor Alternative and their Atlanta Approaches.

3.10.3.3 Corridor Alternatives

The following section details the federal-listed, federal candidate, and state-listed species that occur or have the potential to occur within the Corridor Alternatives and their Atlanta Approaches. The counties where these species have the potential to occur are also listed. In addition, this section lists the acreage of natural habitat areas located within each Corridor Alternative and their Atlanta Approaches.

SOUTHERN CRESCENT CORRIDOR ALTERNATIVE

FEDERAL-LISTED THREATENED AND ENDANGERED SPECIES

The USFWS in conjunction with the State Heritage Programs of North Carolina and South Carolina currently lists 23 federal threatened or endangered species that occur or have the potential to occur in the specific counties of the Southern Crescent Corridor Alternative, as shown in Exhibit 3.10-4. Appendix D includes brief descriptions of the habitat requirements of each species listed below.

Although the species listed below have the potential to occur in various suitable habitats in the screening area, coordination with the USFWS and State Heritage Programs indicated known occurrences within a half mile of the Southern Crescent Corridor Alternative for smooth coneflower (*Echinacea laevigata*), dwarf-flowered heartleaf (*Hexastylis naniflora*), and Carolina heelsplitter (*Lasmigona decorata*).

Exhibit 3.10-4: Federal-Listed Protected Species and Federal Candidate Species Potentially Occurring within the Southern Crescent Corridor Alternative

Common name	Scientific Name	Status	State	Counties
Federal-Listed Threatened And Endangered Species				
Mussels				
Gulf moccasinshell	*Medionidus penicillatus*	E	GA	Clayton, Fulton
Oval pigtoe	*Pleurobema pyriforme*	E	GA	Clayton, Fulton
Purple bankclimber	*Elliptoideus sloatianus*	T	GA	Clayton, Fulton
Shinyrayed pocketbook	*Lampsilis subangulata*	E	GA	Clayton, Fulton
Carolina heelsplitter[5]	*Lasmigona decorata*	E	NC	Mecklenburg
Fish				
Cherokee darter	*Etheostoma scotti*	T	GA	Fulton
Plants				
Little amphianthus	*Amphianthus pusillus*	T	GA	Barrow
Michaux's sumac	*Rhus michauxii*	E	NC	Mecklenburg
Black-spored quillwort	*Isoetes melanospora*	E	GA, SC	Clayton, Hall, Banks, Barrow, Pickens
Smooth coneflower[1,2,3,4]	*Echinacea laevigata*	E	GA, SC, NC	Banks, Habersham, Stephens, Oconee, Pickens, Mecklenburg
Persistent trillium	*Trillium persistens*	E	GA, SC	Habersham, Stephens, Oconee
Small whorled pogonia	*Isotria medeoloides*	T	GA, SC	Habersham, Oconee, Greenville
Dwarf-flowered heartleaf[3,4]	*Hexastylis naniflora*	T	SC, NC	Pickens, Greenville, Spartanburg, Cherokee, Cleveland, Gaston
Mountain sweet pitcher-plant	*Sarracenia rubra* ssp. *jonesii*	E	SC	Pickens, Greenville
Bunched arrowhead	*Sagittaria fasciculata*	E	SC	Greenville
Swamp pink	*Helonias bullata*	T	SC	Greenville
Rock gnome lichen	*Gymnoderma lineare*	E	SC	Greenville
Reflexed blue-eyed grass	*Sisyrinchium dichotomum*	E	SC	Greenville
Schweinitz's sunflower	*Helianthus schweinitzii*	E	NC	Gaston, Mecklenburg
Reptiles				
Bog turtle	*Glyptemys muhlenbergii*	T (SOA)	SC, NC	Pickens, Greenville, Gaston
Mammals				
Northern long-eared bat	*Myotis septentrionalis*	E	GA, NC	Hall, Banks, Habersham, Stephens, Cleveland, Gaston, Mecklenburg

Common name	Scientific Name	Status	State	Counties
Indiana bat	*Myotis sodalis*	E	GA, SC	Hall, Habersham, Stephens, Oconee
Eastern cougar*	*Puma concolor cougar*	Extinct	SC	Pickens, Greenville
Federal Candidate Species				
Plants				
White fringeless orchid	*Platanthera integrilabia*	C	GA, SC	Habersham, Stephens, Greenville

Key: E = Endangered; T = Threatened; C = Candidate; T (SOA) = Threatened due to Similarity of Appearance

Source: GA – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); GADNR County Rare Elements http://www.georgiawildlife.com/node/2722 (August 2014)

SC – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); SCDNR Rare, Threatened and Endangered Species Inventory http://www.dnr.sc.gov/species/ (June 2014)

NC – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); NCDENR Natural Heritage Data Search http://portal.ncdenr.org/web/nhp/database-search (October 2014)

[1] USFWS GA Office coordination letter (received September 26, 2013); [2]GADNR coordination letter (received October 15, 2013);

[3] USFWS SC Office coordination letter (received September 19. 2013); [4]SCDNR coordination letter (received September 18, 2013); [5]NCDENR coordination letter (received September 26, 2013)

GA Counties – Fulton, Clayton, Hall, Banks, Habersham, Stephens; SC Counties – Oconee, Pickens, Greenville, Spartanburg, Cherokee; NC Counties – Cleveland, Gaston, Mecklenburg

**Eastern Cougar declared extinct by the USFWS on January 22, 2018 and removed from the endangered species list. Remains in this table because it was included in the original analysis and data collection.*

Critical habitat has been designated for oval pigtoe, purple bankclimber, Gulf moccasinshell, and shinyrayed pocketbook in Whitewater Creek, a tributary to the Flint River located in Fayette County, GA, approximately 14.5 miles south of the Southern Crescent Corridor Alternative.[155] The Carolina heelsplitter has designated critical habitat approximately 17 miles southeast of the Southern Crescent Corridor Alternative in Duck Creek in Union County, NC.[156] Additionally, designated critical habitat for the Indiana bat is located in White Oak Blowhole Cave in Blount County, TN, approximately 80 miles northwest of the Southern Crescent Corridor Alternative.[157]

Critical habitat has not been designated for any other federally protected species listed as potentially occurring within the Southern Crescent Corridor Alternative.

FEDERAL CANDIDATE SPECIES

According to USFWS IPaC, there is one federal candidate species - white fringeless orchid - that occurs, or has the potential of occurring, in the specific counties of the Southern Crescent Corridor Alternative, as shown in Exhibit 3.10-4.

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[155] 72 FR 57276 (November 23, 2007). Available at: http://www.gpo.gov/fdsys/pkg/FR-2007-11-15/pdf/07-5551.pdf#page=1

[156] 67 FR 44502 (July 2, 2002). Available at: http://www.gpo.gov/fdsys/pkg/FR-2002-07-02/pdf/02-16580.pdf#page=1 4/10/18)

[157] 41 FR 41914 (September 24, 1976). Available at https://ecos.fws.gov/docs/federal_register/fr115.pdf

STATE-LISTED THREATENED AND ENDANGERED SPECIES

There are also several state-listed threatened and endangered species that occur or have the potential to occur in the specific counties of the Southern Crescent Corridor Alternative, as shown in Exhibit 3.10-5. Brief descriptions of the habitat requirements of each species listed below can be found in Appendix D. Coordination with SCDNR and NCDENR indicated known occurrences within a half mile of the Southern Crescent Corridor Alternative for Georgia aster (*Symphyotrichum georgianum*) within South Carolina and North Carolina. The GADNR also indicated known occurrences within a half mile for state-listed Bachman's sparrow (*Aimophila aestivalis*) and pink ladyslipper (*Cypripedium acaule*) in Georgia. Additionally, early coordination with NCDENR indicated known occurrences of state-protected plants, tall larkspur (*Delphinium exaltatum*) and bigleaf magnolia (*Magnolia macrophylla*), within the portion of the Southern Crescent Corridor Alternative located in North Carolina.

Exhibit 3.10-5: State-Listed Protected Species Potentially Occurring within the Southern Crescent Corridor Alternative

Common name	Scientific Name	State Status	State	Counties
Birds				
Bachman's sparrow[1]	*Aimophila aestivalis*	R	GA	Fulton
Plants				
Pink ladyslipper	*Cypripedium acaule*	U	GA	Fulton
Georgia aster	*Symphyotrichum georgianum*	T	SC, NC	Cherokee, Gaston, Mecklenburg
Tall Larkspur[3]	*Delphinium exaltatum*	E	NC	Mecklenburg
Bigleaf magnolia [3]	*Magnolia macrophylla*	T	NC	Gaston

Key: E = Endangered; T = Threatened; R = Rare; U = Unusual

Source: [1]GADNR Coordination letter (received October 15, 2013); [2]SCDNR Coordination letter (received September 18, 2013);[3]NCDENR Coordination letter (received September 26, 2013)

GA Counties – Fulton, Clayton, Hall, Banks, Habersham, Stephens; SC Counties – Oconee, Pickens, Greenville, Spartanburg, Cherokee; NC Counties – Cleveland, Gaston, Mecklenburg

The SCDNR reports the following terrestrial communities within a half mile of the Southern Crescent Corridor Alternative:

- Chestnut Oak Forest – Spartanburg County, SC; and,
- Cove Forest – Spartanburg County, SC.

The NCDENR lists the following high quality natural communities within a half mile of the Southern Crescent Corridor Alternative:

- Dry-Mesic Basic Oak-Hickory Forest (Element Occurrence [EO] # 020) – contains habitat for the state threatened species Georgia aster – Mecklenburg County, NC; and,
- Mesic Mixed Hardwood Forest (EO # 216) – contains habitat for the state threatened species Georgia aster – Mecklenburg County, NC.

GADNR does not list any high-quality natural communities within a half mile of the Southern Crescent Corridor Alternative.

NATURAL HABITAT AREAS AND WILDLIFE

Developed areas comprise approximately 64 percent of the Southern Crescent Corridor Alternative while natural habitat areas, both terrestrial and aquatic, make up approximately 36 percent. Exhibit 3.10-6 lists the habitat and land-use areas present within the Southern Crescent Corridor Alternative.

Exhibit 3.10-6: Developed and Natural Habitat Areas within Southern Crescent Corridor Alternative

Habitat Type	Georgia	South Carolina	North Carolina	Total
Terrestrial – Developed (in Acres)				
Developed, Open Space	658	1,478	596	**2,732**
Developed, Low Intensity	638	1,852	1,013	**3,503**
Developed, Medium Intensity	466	824	557	**1,847**
Developed, High Intensity	562	427	262	**1,251**
Bare Rock/Sand/Clay*	26	41	5	**72**
Pasture/Hay	155	437	117	**709**
Cultivated Crops	0	0	2	**2**
Total	2,505	5,059	2,552	**10,116**
Terrestrial – Natural (in Acres)				
Deciduous Forest	1,053	2,295	308	**3,656**
Evergreen Forest	195	703	43	**941**
Mixed forest	16	29	5	**50**
Scrub/Shrub	26	44	11	**81**
Grassland/Herbaceous	269	640	69	**978**
Emergent Herbaceous Wetland	0	0	1	**1**
Woody Wetland	3	40	3	**46**

Habitat Type	Georgia	South Carolina	North Carolina	Total
Total	1,562	3,751	440	**5,753**
Aquatic				
Streams (Linear Feet)	19,866	85,164	15,436	**120,466**
Lakes (Acres)	4	29	23	**56**
Ponds (Acres)	2	8	5	**15**

Source: Natural Resource Spatial Analysis Laboratory, Institute of Ecology, University of Georgia (1998)
**Although this habitat type includes several natural areas, such as rock outcrops, that may be present within the Corridor Alternative, during the Tier 1 EIS analysis, the majority of this mapped habitat type appeared to consist primarily of disturbed areas, such as strip mines, quarries, and gravel lots.*

During the Tier 2 analysis, general habitat assessments will be conducted to confirm developed land and natural habitat areas reported above.

I-85 CORRIDOR ALTERNATIVE

FEDERAL-LISTED THREATENED AND ENDANGERED SPECIES

The USFWS currently list 24 threatened or endangered species that occur, or have the potential of occurring in the specific counties of the I-85 Corridor Alternative, as shown in Exhibit 3.10-7. Brief descriptions of the habitat requirements of each species listed below can be found in Appendix D.

Although the species listed below have the potential to occur in various suitable habitats in the Study Area, coordination with the USFWS and State Heritage Programs indicated known occurrences within a half mile of the I-85 Corridor Alternative for little amphianthus, black-spored quillwort, mat-forming quillwort, dwarf-flowered heartleaf, and Carolina heelsplitter.

Exhibit 3.10-7: Federal-Listed Protected Species Potentially Occurring within I-85 Corridor Alternative

Common name	Scientific Name	Status	State	Counties
Federal-Listed Threatened And Endangered Species				
Mussels				
Gulf moccasinshell	*Medionidus penicillatus*	E	GA	Clayton, Fulton
Oval pigtoe	*Pleurobema pyriforme*	E	GA	Clayton, Fulton
Purple bankclimber	*Elliptoideus sloatianus*	T	GA	Clayton, Fulton
Shinyrayed pocketbook	*Lampsilis subangulata*	E	GA	Clayton, Fulton
Carolina heelsplitter[5]	*Lasmigona decorata*	E	NC	Mecklenburg
Fish				
Cherokee darter	*Etheostoma scotti*	T	GA	Fulton
Plants				
Little amphianthus[2]	*Amphianthus pusillus*	T	GA	Barrow, Jackson

Common name	Scientific Name	Status	State	Counties
Michaux's sumac	*Rhus michauxii*	E	NC	Mecklenburg
Black-spored quillwort	*Isoetes melanospora*	E	GA, SC	Barrow, Jackson, Banks
Smooth coneflower	*Echinacea laevigata*	E	GA, SC, NC	Banks, Franklin, Oconee, Anderson, Mecklenburg
Persistent trillium	*Trillium persistens*	E	SC	Oconee
Small whorled pogonia	*Isotria medeoloides*	T	SC	Oconee, Greenville
Mat-forming quillwort[2]	*Isoetes tegetiformans*	E	GA	Jackson
Dwarf-flowered heartleaf[3,4]	*Hexastylis naniflora*	T	SC, NC	Greenville, Spartanburg, Cherokee, Cleveland,
Mountain sweet pitcher-plant	*Sarracenia rubra ssp. Jonesii*	E	SC	Greenville
Bunched arrowhead	*Sagittaria fasciculata*	E	SC	Greenville
Swamp pink	*Helonias bullata*	T	SC	Greenville
Rock gnome lichen	*Gymnoderma lineare*	E	SC	Greenville
Reflexed blue-eyed grass	*Sisyrinchium dichotomum*	E	SC	Greenville
Schweinitz's sunflower	*Helianthus schweinitzii*	E	NC	Gaston, Mecklenburg
Reptiles				
Bog turtle	*Glyptemys muhlenbergii*	T (SOA)	SC, NC	Greenville, Gaston
Mammals				
Northern long-eared bat	*Myotis septentrionalis*	E	GA, NC	Barrow, Banks, Franklin, Hart, Cleveland, Gaston, Mecklenburg
Indiana bat	*Myotis sodalis*	E	GA, SC	Oconee
Eastern cougar*	*Puma concolor cougar*	E	SC	Greenville
Federal Candidate Species				
Plants				
White fringeless orchid	*Platanthera integrilabia*	C	SC	Greenville

Key: E = Endangered; T = Threatened; T (SOA) = Threatened due to Similarity of Appearance

Source: GA – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); GADNR County Rare Elements http://www.georgiawildlife.com/node/2722 (August 2014)

SC – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); SCDNR Rare, Threatened and Endangered Species Inventory http://www.dnr.sc.gov/species/ (June 2014)

NC – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); NCDENR Natural Heritage Data Search http://portal.ncdenr.org/web/nhp/database-search (October 2014)

[1] USFWS GA Office coordination letter (received September 26, 2013); [2]GADNR coordination letter (received October 15, 2013); [3]USFWS SC Office coordination letter (received September 19. 2013); [4]SCDNR coordination letter (received September 18, 2013); [5]NCDENR coordination letter (received September 26, 2013)

GA Counties – Fulton, Clayton, Jackson, Barrow, Banks, Franklin, Hart; SC Counties – Oconee, Anderson, Greenville, Spartanburg, Cherokee; NC Counties – Cleveland, Gaston, Mecklenburg

**Eastern Cougar declared extinct by the USFWS on January 22, 2018 and removed from the endangered species list. Remains in this table because it was included in the original analysis and data collection.*

USFWS has designated critical habitat for oval pigtoe, purple bankclimber, Gulf moccasinshell, and shinyrayed pocketbook in Whitewater Creek, a tributary to the Flint River located in Fayette County, GA, approximately 14.5 miles south of the I-85 Corridor Alternative.[158] The Carolina heelsplitter has designated critical habitat approximately 17 miles southeast of the I-85 Corridor Alternative in Duck Creek in Union County, NC.[159] Additionally, designated critical habitat for the Indiana bat is located in White Oak Blowhole Cave, Blount County, TN, approximately 90 miles northwest of the I-85 Corridor Alternative.[160]

FEDERAL CANDIDATE SPECIES

According to USFWS IPaC, there is one federal candidate species – white fringeless orchid - that occurs, or has the potential of occurring, in the specific counties of the I-85 Corridor Alternative, as shown in Exhibit 3.10-8.

STATE-LISTED THREATENED AND ENDANGERED SPECIES

There are also several threatened and endangered species listed by each state that occur or have the potential of occurring in the specific counties of the I-85 Corridor Alternative, as shown in Exhibit 3.10-8. Brief descriptions of the habitat requirements of each species listed below can be found in Appendix D.

Coordination with GADNR indicated a known occurrence for Bachman's sparrow, pink ladyslipper, and sandbar shiner (*Notropis scepticus*) within specific locations along the portion of the Corridor Alternative within Georgia. The SCDNR reported a known occurrence for Georgia aster in South Carolina. Additionally, early coordination with NCDENR reported known occurrences for Georgia aster, big leaf magnolia, and tall larkspur within the North Carolina portion of the Corridor Alternative.

Exhibit 3.10-8: State-Listed Protected Species Potentially Occurring within I-85 Corridor Alternative

Common name	Scientific Name	State Status	State	Counties
Birds				
Bachman's sparrow[1]	*Aimophila aestivalis*	R	GA	Fulton
Fish				
Sandbar shiner[1]	*Notropis scepticus*	R	GA	Franklin
Plants				
Pink ladyslipper	*Cypripedium acaule*	U	GA	Fulton
Georgia aster[3]	*Symphyotrichum georgianum*	T	SC, NC	Cherokee, Gaston, Mecklenburg
Bigleaf magnolia [3]	*Magnolia macrophylla*	T	NC	Gaston

[158] *72 FR 220 (November 2007) Available at: http://www.gpo.gov/fdsys/pkg/FR-2007-11-15/pdf/07-5551.pdf#page=1 (accessed on 4/10/18)*
[159] *67 FR 127 (July 2002) Available at: http://www.gpo.gov/fdsys/pkg/FR-2002-07-02/pdf/02-16580.pdf#page=1 (accessed on 4/10/18)*
[160] *41 FR 187 (September 1976) Available at: https://ecos.fws.gov/docs/federal_register/fr115.pdf (accessed on 4/10/18)*

Common name	Scientific Name	State Status	State	Counties
Tall Larkspur[3]	*Delphinium exaltatum*	E	NC	Mecklenburg

Key: E = Endangered; T = Threatened; R = Rare; U = Unusual

Source: [1]GADNR Coordination letter (received October 15, 2013); [2]SCDNR Coordination letter (received September 18, 2013); [3]NCDENR Coordination letter (received September 26, 2013)

GA Counties – Fulton, Clayton, Barrow, Jackson, Banks, Franklin, Hart; SC Counties – Oconee, Anderson, Greenville, Spartanburg, Cherokee; NC Counties – Cleveland, Gaston, Mecklenburg

The NCDENR listed the following high quality natural communities within a half mile of the I-85 Corridor Alternative:

- Dry-Mesic Basic Oak-Hickory Forest (EO # 020) – contains habitat for the state threatened species Georgia aster – Mecklenburg County, NC; and,
- Mesic Mixed Hardwood Forest (EO # 216) – contains habitat for the state threatened species Georgia aster – Mecklenburg County, NC.
- GADNR and SCDNR do not list any high quality natural communities within a half mile of the I-85 Corridor Alternative.

NATURAL HABITAT AREAS AND WILDLIFE

The I-85 Corridor Alternative primarily follows I-85 ROW, which has been extensively developed. Developed areas, including rural, residential, and urban, within the Corridor Alternative encompass approximately 86 percent of the land area. Terrestrial and aquatic natural habitats comprise 14 percent of the Corridor Alternative. Exhibit 3.10-9 lists the habitat and land-use areas present within the I-85 Corridor Alternative.

Exhibit 3.10-9: Developed and Natural Habitat Areas within I-85 Corridor Alternative

Habitat Type	Georgia	South Carolina	North Carolina	Total
Terrestrial – Developed (in Acres)				
Developed, Open Space	1,159	2,268	660	**4,087**
Developed, Low Intensity	1,473	2,502	953	**4,928**
Developed, Medium Intensity	569	1,349	518	**2,436**
Developed, High Intensity	480	329	217	**1,026**
Bare Rock/Sand/Clay*	9	14	6	**29**
Pasture/Hay	218	240	39	**497**
Cultivated Crops	0	0	3	**3**
Total	3,908	6,702	2,396	**13,006**
Terrestrial – Natural (in Acres)				
Deciduous Forest	442	610	359	**1,411**
Evergreen Forest	79	184	42	**305**
Mixed forest	4	5	8	**17**

Habitat Type	Georgia	South Carolina	North Carolina	Total
Scrub/Shrub	8	10	7	**25**
Grassland/Herbaceous	115	151	31	**297**
Emergent Herbaceous Wetland	0	0	1	**1**
Woody Wetland	49	20	4	**73**
Total	697	980	452	**2,129**
Aquatic				
Streams (Linear Feet)	54,587	107,818	30,064	**192,469**
Lakes (Acres)	11	63	23	**97**
Ponds (Acres)	6	5	9	**20**

Source: Natural Resource Spatial Analysis Laboratory, Institute of Ecology, University of Georgia (1998)
**Although this habitat type includes several natural areas, such as rock outcrops, that may be present within the Corridor Alternative, during the Tier 1 EIS analysis, the majority of this mapped habitat type appeared to consist primarily of disturbed areas, such as strip mines, quarries, and gravel lots.*

GREENFIELD CORRIDOR ALTERNATIVE

FEDERAL-LISTED THREATENED AND ENDANGERED SPECIES

The USFWS currently lists 22 threatened or endangered species that occur, or have the potential to occur, in the specific counties of the Greenfield Corridor Alternative, as shown in Exhibit 3.10-10. Brief descriptions of the habitat requirements of each species listed below can be found in Appendix D.

Although the species listed have the potential to occur in various suitable habitats in the Greenfield Corridor Alternative, coordination with the USFWS and the State Heritage Programs indicated known occurrences within a half mile of Greenfield Corridor Alternative for Carolina heelsplitter and Schweinitz's sunflower.

Exhibit 3.10-10: Federal-Listed Protected Species Potentially Occurring within Greenfield Corridor Alternative

Common name	Scientific Name	Status	State	Counties
Federal-Listed Threatened And Endangered Species				
Mussels				
Gulf moccasinshell	*Medionidus penicillatus*	E	GA	Clayton, Fulton
Oval pigtoe	*Pleurobema pyriforme*	E	GA	Clayton, Fulton
Purple bankclimber	*Elliptoideus sloatianus*	T	GA	Clayton, Fulton
Shinyrayed pocketbook	*Lampsilis subangulata*	E	GA	Clayton, Fulton
Carolina heelsplitter[5]	*Lasmigona decorata*	E	SC, NC	Laurens, York, Mecklenburg
Plants				
Little amphianthus	*Amphianthus pusillus*	T	GA, SC	Madison, Jackson, Laurens, York

Common name	Scientific Name	Status	State	Counties
Michaux's sumac	*Rhus michauxii*	E	NC	Mecklenburg
Black-spored quillwort	*Isoetes melanospora*	E	GA, SC	Jackson, Madison, Clarke
Smooth coneflower	*Echinacea laevigata*	E	SC, NC	Anderson, Mecklenburg
Small whorled pogonia	*Isotria medeoloides*	T	SC	Greenville
Mat-forming quillwort	*Isoetes tegetiformans*	E	GA	Jackson
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	SC, NC	Greenville, Spartanburg, Cherokee, York, Cleveland,
Mountain sweet pitcher-plant	*Sarracenia rubra ssp. jonesii*	E	SC	Greenville
Bunched arrowhead	*Sagittaria fasciculata*	E	SC	Greenville
Swamp pink	*Helonias bullata*	T	SC	Greenville
Rock gnome lichen	*Gymnoderma lineare*	E	SC	Greenville
Reflexed blue-eyed grass	*Sisyrinchium dichotomum*	E	SC	Greenville
Schweinitz's sunflower[5]	*Helianthus schweinitzii*	E	NC	York, Gaston, Mecklenburg
Reptiles				
Bog turtle	*Glyptemys muhlenbergii*	T (SOA)	SC, NC	Greenville, Gaston
Mammals				
Northern long-eared bat	*Myotis septentrionalis*	E	GA	Hart, Cleveland, Gaston, Mecklenburg
Eastern cougar*	*Puma concolor cougar*	E	SC	Greenville
Birds				
Red-cockaded woodpecker	*Picoides borealis*	E	SC	Laurens
Federal Candidate Species				
Plants				
White fringeless orchid	*Platanthera integrilabia*	C	SC	Greenville

Key: E = Endangered; T = Threatened; T (SOA) = Threatened due to Similarity of Appearance
Source: GA – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); GADNR County Rare Elements http://www.georgiawildlife.com/node/2722 (August 2014)
SC – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); SCDNR Rare, Threatened and Endangered Species Inventory http://www.dnr.sc.gov/species/ (June 2014)
NC – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); NCDENR Natural Heritage Data Search http://portal.ncdenr.org/web/nhp/database-search (October 2014)
[1] USFWS GA Office coordination letter (received September 26, 2013); [2]GADNR coordination letter (received October 15, 2013); [3]USFWS SC Office coordination letter (received September 19. 2013); [4]SCDNR coordination letter (received September 18, 2013); [5]NCDENR coordination letter (received September 26, 2013)
GA Counties – Fulton, Clayton, Jackson, Clarke, Madison, Hart; SC Counties –Anderson, Greenville, Laurens, Spartanburg, Cherokee, Union, York; NC Counties –Gaston, Mecklenburg
**Eastern Cougar declared extinct by the USFWS on January 22, 2018 and removed from the endangered species list. Remains in this table because it was included in the original analysis and data collection.*

Critical habitat has been designated for oval pigtoe, purple bankclimber, Gulf moccasinshell, and shinyrayed pocketbook in Whitewater Creek, a tributary to the Flint River located in Fayette County, GA, approximately

14.5 miles south of the Greenfield Corridor Alternative.[161] The Carolina heelsplitter has designated critical habitat approximately 17 miles southeast of the Greenfield Corridor Alternative in Duck Creek in Union County, NC.[162] Additionally, designated critical habitat for the Indiana bat is located in White Oak Blowhole Cave, Blount County, TN, approximately 110 miles northwest of the Greenfield Corridor Alternative.[163]

FEDERAL CANDIDATE SPECIES

According to USFWS IPaC, there is one federal candidate species – white fringeless orchid - that occurs, or has the potential to occur, in the specific counties of the Greenfield Corridor Alternative, as shown in Exhibit 3.10-8.

STATE-LISTED THREATENED AND ENDANGERED SPECIES

There are also several threatened and endangered species listed by each state that occur, or have the potential to occur, in the specific counties of the Greenfield Corridor Alternative, as shown in Exhibit 3.10-11. Brief descriptions of the habitat requirements of each species listed below can be found in Appendix D.

Coordination with GADNR indicated a known occurrence within a half mile of the Greenfield Corridor Alternative for state-listed Altamaha shiner (*Cyprinella xaenura*), pink ladyslipper, and Bachman's sparrow within Georgia. Coordination with the State Heritage Programs indicated known occurrences within a half mile of the Greenfield Corridor Alternative for Georgia aster in South Carolina and North Carolina. The NCDENR also reported a known occurrence for state-listed tall larkspur in North Carolina through early coordination.

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[161] *72 FR 220 (November 2007) Available at: http://www.gpo.gov/fdsys/pkg/FR-2007-11-15/pdf/07-5551.pdf#page=1 (accessed on 10/21/2013)*
[162] *67 FR 127 (July 2002) Available at: http://www.gpo.gov/fdsys/pkg/FR-2002-07-02/pdf/02-16580.pdf#page=1 (accessed on 10/21/2013)*
[163] *41 FR 187 (September 1976) Available at: https://ecos.fws.gov/docs/federal_register/fr115.pdf (accessed on 4/10/18)*

Exhibit 3.10-11: State-Listed Protected Species Potentially Occurring within Greenfield Corridor Alternative

Common name	Scientific Name	State Status	State	Counties
Birds				
Bachman's sparrow[1]	*Aimophila aestivalis*	R	GA	Fulton
Fish				
Altamaha shiner[1]	*Cyprinella xaenura*	T	GA	Jackson
Plants				
Pink ladyslipper[1]	*Cypripedium acaule*	U	GA	Fulton
Georgia aster[2,3]	*Symphyotrichum georgianum*	T	SC, NC	Cherokee, Gaston, Mecklenburg
Tall Larkspur[3]	*Delphinium exaltatum*	E	NC	Mecklenburg

Key: E = Endangered; T = Threatened; R = Rare; U = Unusual

Source: [1]GADNR Coordination letter (received October 15, 2013); [2]SCDNR Coordination letter (received September 18, 2013); [3]NCDENR Coordination letter (received September 26, 2013)

GA Counties – Fulton, Clayton, Jackson, Clarke, Madison, Hart; SC Counties –Anderson, Greenville, Laurens, Spartanburg, Cherokee, Union, York; NC Counties –Gaston, Mecklenburg

The SCDNR reports one terrestrial community within a half mile of the Greenfield Corridor Alternative:

- Mesic Mixed Hardwood Forest – Anderson County, SC.

The NCDENR lists the following high quality natural communities within a half mile of the Greenfield Corridor Alternative:

- Dry-Mesic Basic Oak-Hickory Forest (Element Occurrence [EO] # 020) – contains habitat for the state threatened species Georgia aster – Mecklenburg County, NC; and,
- Mesic Mixed Hardwood Forest (EO # 216) – contains habitat for the state threatened species Georgia aster – Mecklenburg County, NC.

GADNR does not list any high quality natural communities within a half mile of the Greenfield Corridor Alternative.

NATURAL HABITAT AREAS AND WILDLIFE

The Greenfield Corridor Alternative mainly follows a new alignment, thus natural terrestrial and aquatic habitat areas are more prevalent encompassing approximately 60 percent of the Corridor Alternative. Developed areas comprise approximately 40 percent of the Greenfield Corridor Alternative. The habitat and developed areas that would be directly impacted by the construction of Greenfield are listed in Exhibit 3.10-12.

Exhibit 3.10-12: Developed and Natural Habitat Areas within Greenfield Corridor Alternative

Habitat Type	Georgia	South Carolina	North Carolina	Total
Terrestrial – Developed (in Acres)				
Developed, Open Space	329	498	179	**1,006**
Developed, Low Intensity	184	122	189	**495**
Developed, Medium Intensity	306	11	148	**465**
Developed, High Intensity	467	5	103	**575**
Bare Rock/Sand/Clay*	37	26	7	**70**
Pasture/Hay	1,418	2,271	148	**3,837**
Cultivated Crops	17	0	0	**17**
Total	2,758	2,933	774	**6,465**
Terrestrial – Natural (in Acres)				
Deciduous Forest	1,525	3,804	496	**5,825**
Evergreen Forest	458	1,353	152	**1,963**
Mixed forest	32	100	18	**150**
Scrub/Shrub	19	127	10	**156**
Grassland/Herbaceous	458	773	63	**1,294**
Emergent Herbaceous Wetland	0	0	1	**1**
Woody Wetland	97	84	7	**188**
Total	2,589	6,241	747	**9,577**
Aquatic				
Streams (Linear Feet)	65,297	174,779	27,566	**267,642**
Lakes (Acres)	12	2	28	**42**
Ponds (Acres)	11	23	4	**38**

Source: Natural Resource Spatial Analysis Laboratory, Institute of Ecology, University of Georgia (1998)

**Although this habitat type includes several natural areas, such as rock outcrops, that may be present within the Corridor Alternative, during the Tier 1 EIS analysis, the majority of this mapped habitat type appeared to consist primarily of disturbed areas, such as strip mines, quarries, and gravel lots.*

ATLANTA APPROACHES

FEDERAL-LISTED THREATENED AND ENDANGERED SPECIES

The USFWS currently lists the following threatened or endangered species that occur or have the potential of occurring in the specific counties of the Atlanta Approaches for each Corridor Alternative, as shown in Exhibit 3.10-13. Each Atlanta Approach include some similar species as shown on the chart.

The species listed below have the potential to occur in various suitable habitats in the screening area. The Southern Crescent CSX, I-85 CSX, and Greenfield CSX Approaches include the plant Mat-forming quillwort, which is not listed for the NS Atlanta Approach. In addition, the Southern Crescent NS and CSX Atlanta Approaches include the Northern long-eared bat and the Indiana bat.

Exhibit 3.10-13: Federal-Listed Protected Species Potentially Occurring within the Atlanta Approaches

Atlanta Approaches	Common name	Scientific Name	Status	State	Counties
Federal-Listed Threatened And Endangered Species					
Mussels					
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Gulf moccasinshell	*Medionidus penicillatus*	E	GA	Fulton
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Oval pigtoe	*Pleurobema pyriforme*	E	GA	Fulton
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Purple bankclimber	*Elliptoideus sloatianus*	T	GA	Fulton
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Shinyrayed pocketbook	*Lampsilis subangulata*	E	GA	Fulton
Fish					
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Cherokee darter	*Etheostoma scotti*	T	GA	Fulton
Plants					
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Little amphianthus	*Amphianthus pusillus*	T	GA	DeKalb, Gwinnett
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Michaux's sumac	*Rhus michauxii*	E	GA	Fulton, DeKalb
- Southern Crescent NS and CSX - I-85 NS and CSX - Greenfield NS and CSX	Black-spored quillwort	*Isoetes melanospora*	E	GA	DeKalb, Gwinnett, Hall

Atlanta Approaches	Common name	Scientific Name	Status	State	Counties
- Southern Crescent CSX - I-85 CSX - Greenfield CSX	Mat-forming quillwort	*Isoetes tegetiformans*	E	GA	Jackson
Mammals					
Southern Crescent NS and CSX	Northern long-eared bat	*Myotis septentrionalis*	E	GA	Hall
Southern Crescent NS and CSX	Indiana bat	*Myotis sodalis*	E	GA	Hall

Key: E = Endangered; T = Threatened

Source: GA – USFWS IPaC www.ecos.fws.gov/ipac/wizard (December 2014); GADNR County Rare Elements http://www.georgiawildlife.com/node/2722 (August 2014)

[1] USFWS Ga. Office coordination letter (received September 26, 2013); [2]GADNR coordination letter (received October 15, 2013)

GA Counties – Fulton, DeKalb, Gwinnett, Hall

FEDERAL CANDIDATE SPECIES

According to USFWS IPaC, there are no federal candidate species that occur, or have the potential to occur, in the specific counties of the Atlanta Approaches.

STATE-LISTED THREATENED AND ENDANGERED SPECIES

Coordination with the GADNR did not indicate any known occurrences for state-listed species within a half mile of the specific counties of the Southern Crescent NS, I-85 NS, and Greenfield NS Atlanta Approaches.

Coordination with GADNR indicated known occurrences for state-listed Chattahoochee crayfish (*Cambarus howardi*) and bay star-vine (*Schisandra glabra*) as occurring within a half mile of the Southern Crescent CSX, I-85 CSX, and Greenfield CSX Atlanta Approaches, see Exhibit 3.10-14.

Exhibit 3.10-14: State-Listed Protected Species Potentially Occurring within the Southern Crescent CSX, I-85 CSX, and Greenfield CSX Atlanta Approaches

Common name	Scientific Name	State Status	State	Counties
Crayfish				
Chattahoochee crayfish[1]	*Cambarus howardi*	T	GA	DeKalb
Plants				
Bay star-vine[1]	*Schisandra glabra*	T	GA	DeKalb

Key: T = Threatened

Source: [1]GADNR Coordination letter (received October 15, 2013)

GA Counties – Fulton, DeKalb, Gwinnett, Barrow, Jackson, Hall

NATURAL HABITAT AREAS AND WILDLIFE

Exhibit 3.10-15 shows the acres of natural habitat and wildlife areas of each proposed Atlanta Approach. During the Tier 2 EIS, general habitat assessments will be conducted to confirm developed land and natural habitat areas reported below.

Exhibit 3.10-15: Developed and Natural Habitat Areas within each Atlanta Approach

Habitat Type	Southern Crescent NS Acres	Southern Crescent CSX Acres	I-85 NS Acres	I-85 CSX Acres	Greenfield NS Acres	Greenfield CSX Acres
Terrestrial – Developed						
Developed, Open Space	826	851	831	743	801	743
Developed, Low Intensity	964	848	886	725	860	693
Developed, Medium Intensity	729	507	620	456	595	456
Developed, High Intensity	465	279	409	256	410	256
Bare Rock/Sand/Clay*	13	26	13	22	19	19
Pasture/Hay	73	233	49	151	221	255
Cultivated Crops	0	0	0	0	0	0
Total	**3,070**	**2,744**	**2,808**	**2,353**	**2,906**	**2,422**
Terrestrial – Natural						
Deciduous Forest	313	1,012	393	686	601	690
Evergreen Forest	194	399	144	362	181	403
Mixed forest	8	28	7	20	9	21
Scrub/Shrub	1	12	3	5	4	4
Grassland/Herbaceous	33	239	32	63	124	92
Emergent Herbaceous Wetland	0	0	0	0	0	0
Woody Wetland	10	74	16	62	33	76
Total	**559**	**1,764**	**595**	**1,198**	**952**	**1,286**
Aquatic						
Streams (Linear Feet)	18,721	118,918	28,334	98,288	37,634	99,701
Lakes	11	1	0	1	0	1
Ponds	3	10	4	9	5	9

Source: Natural Resource Spatial Analysis Laboratory, Institute of Ecology, University of Georgia (1998)

**Although this habitat type includes several natural areas, such as rock outcrops, that may be present within the Corridor Alternative, during the Tier 1 EIS analysis, the majority of this mapped habitat type appeared to consist primarily of disturbed areas, such as strip mines, quarries, and gravel lots.*

3.10.4 Environmental Consequences

3.10.4.1 NO-BUILD ALTERNATIVE

The No-Build Alternative assumes that a high-speed rail system would not be built between Atlanta and Charlotte. Passenger service between the two cities would consist of existing bus services, air travel, and continued automobile use along I-85, I-20, and I-77. The No-Build Alternative projects currently planned would increase roadway capacity, expand transit service, and improve transportation operations in selected portions of the screening area. In the No-Build Alternative, the impacts to biological resources could potentially occur if additional ROW or new location constructions are needed for planned projects in the screening area. The potential for impacts to biological resources would be determined through the environmental processes for the already planned transportation improvements.

Existing environmental impacts, such as erosion and sedimentation from existing railroad grades to adjacent water resources, as well as potential pollutant runoff and spill from railroad operational and maintenance activities would continue to affect any federally or state-protected species and natural terrestrial and aquatic habitats that may be present adjacent to the rail corridor. There is also the potential for temporary construction impacts from future culvert or bridge replacements along the existing rail route, as a part of ongoing maintenance.

3.10.4.2 CORRIDOR ALTERNATIVES

Within each of the Corridor Alternatives, the potential for direct impacts to protected species and their habitat will depend on the location of those species and habitat and the ability of GDOT to refine the selected Preferred Alternative to avoid or minimize impacts. Species and habitat in the vicinity of proposed station locations may be vulnerable to impacts resulting from land use changes that could be induced by the Project indirectly.

Exhibit 3.10-16 shows the number of federal and state-listed threatened and endangered species habitats that may occur within the Corridor Alternatives and their Atlanta Approaches. All Corridor Alternatives show similar potential to impact federal and state threatened and endangered species or their habitat; the I-85 Corridor Alternative has the highest potential. Similarly, the Atlanta Approaches for each Corridor Alternative also show similar potential to impact federal and state threatened and endangered species habitat. The Southern Crescent CSX Approach has the highest potential for impacts of the Atlanta Approaches.

Exhibit 3.10-16: Threatened and Endangered Species Habitats

Corridor Alternative	Potential Number of Federal Threatened and Endangered Species	Potential Number of State Threatened and Endangered Species	Total
Southern Crescent	23	5	28
NS Approach	10	0	10
CSX Approach	11	2	13
I-85	24	6	30
NS Approach	8	0	8
CSX Approach	9	2	11
Greenfield	22	5	27
NS Approach	8	0	8
CSX Approach	9	2	11

Sources: USFWS; GADNR; SCDNR; NCDNR

The increase in train traffic may consequently increase the potential for railway animal strikes with mobile protected animal species or other mobile species present in the Corridor Alternatives. Due to the existing development along the Southern Crescent and I-85 Corridors, operation of the rail route would most likely not have an adverse effect on any federally listed threatened or endangered species. Construction activities, including tree and brush clearing, habitat disturbance, placement of fill material for additional track and siding, stream relocations, culvert replacements or extensions, and bridge replacements or additions could have the potential to impact terrestrial and aquatic habitats of federally listed threatened or endangered species, if present. The detailed presence of most of the habitat types that are suitable for the federally listed species in the Corridor Alternatives would not be determined until the Tier 2 analysis.

The majority of the Greenfield Corridor Alternative extends through undeveloped and rural areas, where wildlife species may not have been already exposed to the noise, vibration, and other effects of transportation. The introduction of train traffic may consequently increase the potential for railway animal strikes with mobile protected animal species or other mobile species present in the screening area. The introduction of train traffic and railroad ROW could also increase the chances of impacts from erosion and sedimentation from railroad grades to adjacent natural aquatic habitat, in addition to potential pollutant runoff and spills from operational and maintenance activities, which could affect natural habitats and the water quality of aquatic habitats that may be adjacent to the rail corridor.

3.10.5 Potential Mitigation

GDOT, SCDOT, and NCDOT will examine appropriate and practicable steps to reduce the potential effects of the Project on threatened and critical habitats. These steps will be implemented through design refinements in consultation with state and federal agencies as appropriate. Minimization will typically focus on decreasing the footprint of the Project in and near these critical habitats and alignment shifts to avoid populations and/or habitat areas.

Since the Project could potentially affect federally listed threatened and endangered species, consultation with the USFWS and the appropriate state agencies (GADNR, SCDNR, and NCDENR), as required under Section 7 (Interagency Cooperation) of the ESA, would be initiated as informal consultation in the early stages of the Tier 2 analysis. If the USFWS and the state agencies concur that the Project is not likely to affect any federally listed species in the Study Area, the informal consultation would be complete. However, if FRA's Preferred Alternative could have the potential to affect a federally listed species, a biological assessment would be prepared to determine the Preferred Alternative's potential effect on one or more species. Mitigation measures for unavoidable adverse impacts would be determined as part of the formal consultation.

Potential mitigation and minimization strategies could include but are not limited to restricting construction activities during time of year that is sensitive to species (i.e., breeding, nesting, migration). Although the location of the proposed Southern Crescent and I-85 Corridor Alternatives along existing transportation corridors would minimize the additional impact to natural/undeveloped areas, there would still be potential for cumulative impacts. Additionally, some bird and bat species roost in transportation infrastructure (such as under bridges); therefore, mitigation strategies such as relocation or installation of new habitats of roosting areas within the existing transportation corridors would also be considered. Affected plants and trees could also be relocated. Furthermore, conservation banking[164] and in-lieu fee or in-kind mitigation could be used for unavoidable impacts to listed species and their habitats.

When a Preferred Alternative is chosen, permanent BMPs, such as grassed channels, enhanced swales, infiltration trenches, stormwater ponds, and detention ponds, would provide measures to avoid or minimize impacts to biological resources. The types of BMPs to be used will be determined as part of the Tier 2 analysis.

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[164] *Conservation banks are permanently protected lands that contain natural resource values. These lands are conserved and permanently managed for species that are endangered, threatened, candidates for listing as endangered or threatened, or are otherwise species-at-risk. Conservation banks function to offset adverse impacts to these species that occurred elsewhere, sometimes referred to as off-site mitigation. In exchange for permanently protecting the land and managing it for these species, the U.S. FWS approves a specified number of habitat or species credits that bank owners may sell (FWS, https://www.fws.gov/endangered/landowners/conservation-banking.html) (Accessed 4/12/2018)*

3.10.6 Subsequent Analysis

Tier 2 analysis will further evaluate the potential effects of the Preferred Corridor Alternative on biological resources. The analysis will include a detailed field survey to determine the presence of federally and state-protected species in the Preferred Corridor Alternative, a spatial evaluation of both plant and animal species within the Preferred Corridor Alternative, as well as the identification of potential conflict areas. Updates to the USFWS database as well as the State Heritage Program databases would be reviewed to determine any changes to protected species listings for the counties of the Preferred Alternative Corridor. Furthermore, after Project design is developed, additional coordination with the USFWS and State Heritage Programs would take place to confirm potential occurrences of protected species and suitable habitat along the selected corridor. The potential for occurrences of migratory bird nesting, foraging, or roosting habitat areas will be further investigated during the general habitat assessments. Special Provisions in coordination with the USFWS and State Heritage Programs may be required for the protection of potentially suitable habitat for terrestrial (including migratory) and/or aquatic species.