3 EXISTING ENVIRONMENT

The discussion on the existing environment describes existing conditions associated with the natural environment, land features, air quality, noise, visual conditions, cultural and community resources, transportation, and infrastructure within the Southeast High Speed Rail (SEHSR) study area. The study area for the natural and physical environment, cultural resources, and infrastructure varies from 300 to 1,000 feet in width depending on the resource, and is centered about the existing rail line or right of way (ROW). In areas where the existing railroad curves do not meet the design standards for high speed rail, the study area expands to approximately 500 feet outside of the proposed rail realignments.

The study areas for the human environment, noise, and air quality are generally larger than the project area boundaries. The larger study areas are defined by regions of influence in which a resource may potentially have noticeable project-related impacts. Regions of influence for human resources account for factors such as community sizes, geographical and political boundaries, and census boundaries. These human resources include social and economic issues, community resources, and land use planning. The air quality study area is influenced by local and regional atmospheric conditions. The noise study area is determined by the limit of noise intrusions associated with the project.

3.1 Water Resources

Before determinations can be made on the potential of the SEHSR project to impact water resources, it is necessary to review those resources within the study area. This section provides discussions on surface waters, wetlands, floodplains and floodways, and Wild and Scenic rivers.

3.1.1 Surface Water

Numerous waterbodies, including streams, unnamed tributaries, lakes, ponds, reservoirs, and swamps/marshes are located in the study area. The surface waters in Virginia and North Carolina are summarized in Table 3-1, and are depicted in the maps included in Appendix Q. Streams in the project study area range from headwater tributaries with undefined, braided channels to streams with well-defined, steep side slopes. These streams, including intermittent ones, had flowing water during the survey periods. Within the study area, much of the existing rail line follows the ridgelines that divide watersheds. As a result, most of the potential impacts are at the headwaters of tributaries. This listing may not include all streams that are associated with road crossings that may be modified during rail construction activities. These determinations will be made later in the design process.

Table 3-1
Summary of Streams, Wetlands and Other Surface Waters within Study Area by State

Section	River Basin	Streams (feet)	Wetlands (acres)	Other Waters (acres)
Virginia				
AA	James	44,250	64.9	8.8
BB	James	35,451	98.5	7.4
CC	James	42,318	99.7	4.1
	Chowan	0	7.2	0.8
DD	Chowan	12,692	97.1	11.0

Table 3-1 Summary of Streams, Wetlands and Other Surface Waters within Study Area by State				
Section	**River Basin**	**Streams** (feet)	**Wetlands** (acres)	**Other Waters** (acres)
A	Chowan	15,465	38.8	7.9
B	Chowan	30,360	29.0	12.9
C	Chowan	39,486	31.3	4.3
D	Chowan	98,467	214.7	30.0
E	Chowan	16,526	30.8	4.6
F	Chowan	17,284	11.5	1.8
G	Chowan	21,443	8.9	1.1
H	Chowan	13,003	1.9	3.2
I	Chowan	178	0.0	2.1
	Roanoke	273	0.4	1.1
J	Roanoke	17,430	7.3	0.7
K	Roanoke	25,988	17.3	2.7
L	Roanoke	4,484	1.1	2.8
Virginia Total		435,096	760.4	107.3
North Carolina				
L	Roanoke	16,608	4.1	13.0
M	Roanoke	7,734	0.3	4.9
	Tar-Pamlico	1,764	0	2.5
N	Roanoke	627	0.6	0
	Tar-Pamlico	7,492	15.4	0
O	Roanoke	2,304	0	10.7
	Tar-Pamlico	16,865	15.3	26.6
P	Roanoke	1,944	0.8	6.7
	Tar-Pamlico	6,288	2.7	1.5
Q	Tar-Pamlico	14,813	2.8	6.6
R	Tar-Pamlico	5,046	0	1.9
S	Tar-Pamlico	35,086	5.5	8.4
T	Tar-Pamlico	1,841	0	0
	Neuse	5,205	0.2	3.4
U	Neuse	36,396	1.6	8.0
V	Neuse	28,475	0.1	2.0
North Carolina Total		188,488	49.3	96.2
Study Area Total		623,584	809.7	204.0

The Virginia Department of Environmental Quality (VDEQ) and the North Carolina Division of Water Quality (NCDWQ) use different conventions for identifying streams. Appendix H lists streams in the study area by name, river basin, hydrologic unit code, and regulatory classification

3.1.1.1 Drainage Basins

One way to study a river system is to look at the area drained by the waterbody. This is called a watershed. A drainage basin is the watershed of the largest river in an area. Often, these drainage basins are divided into smaller watersheds called subbasins. Subbasins can describe a tributary or a portion of a large river. For the purposes of this

document, US Geological Survey (USGS) 8-digit cataloging units (CU) are used to describe the subbasins in the project study area.

The study area lies within the James, Chowan, and Roanoke River Basins of Virginia and the Roanoke, Tar-Pamlico, and Neuse River Basins of North Carolina. Table 3-2 and Figure 3-1 list and illustrate, respectively, the basins in relation to the project study area. The percentage of the river basins within the study area was determined using a geographic information system (GIS) analysis.

Drainage basins within the project area ultimately flow into coastal bays and sounds that outlet into the Atlantic Ocean. A discussion of these basins is included below.

Figure 3-1

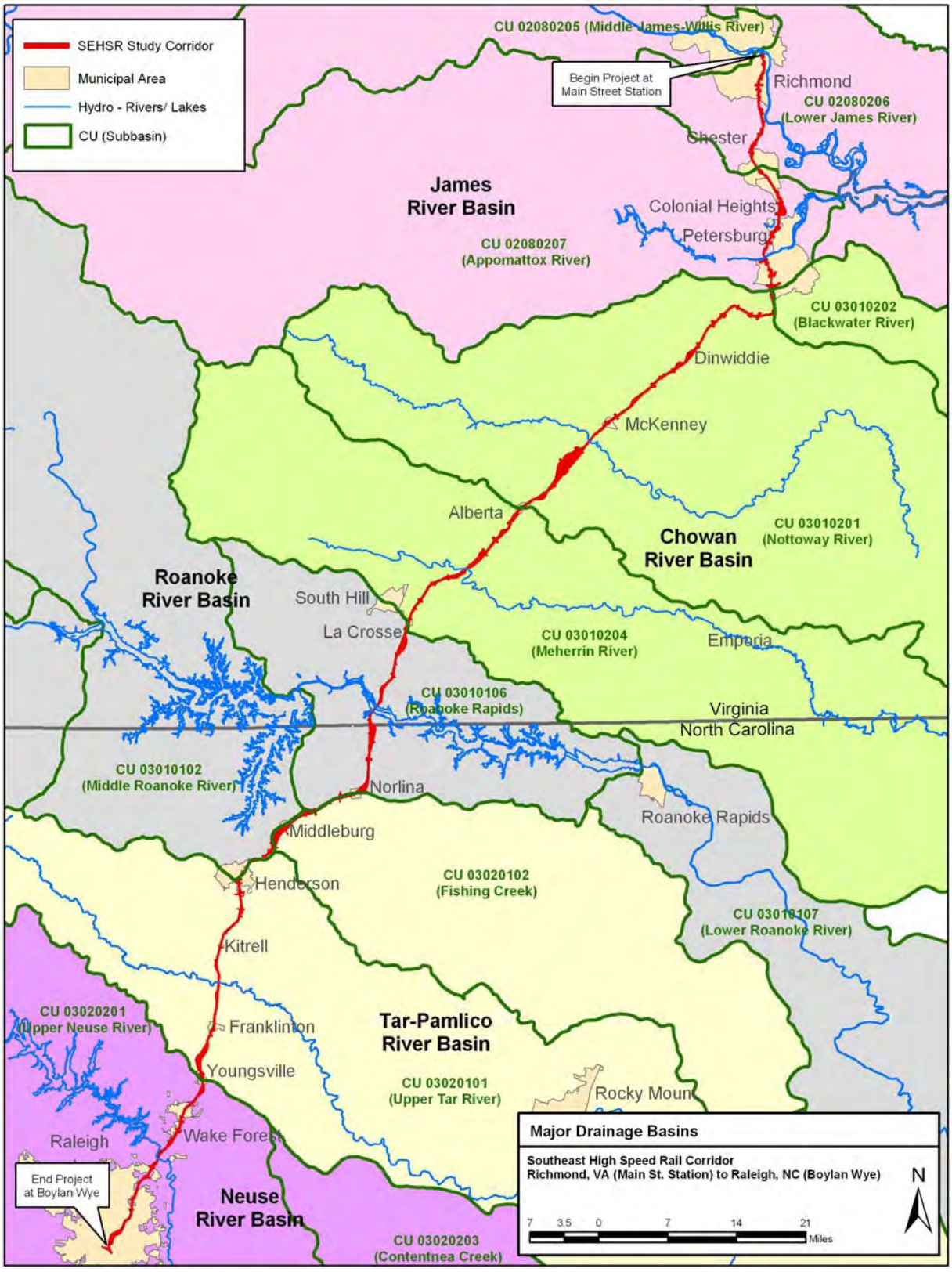

SEHSR Study Corridor
Municipal Area
Hydro - Rivers/ Lakes
CU (Subbasin)
CU 02080205 (Middle James-Willis River)
Begin Project at Main Street Station
Richmond
CU 02080206 (Lower James River)
Chester
James River Basin
Colonial Heights
Petersburg
CU 02080207 (Appomattox River)
CU 03010202 (Blackwater River)
Dinwiddie
McKenney
Alberta
CU 03010201 (Nottoway River)
Chowan River Basin
Roanoke River Basin
South Hill
La Crosse
CU 03010204 (Meherrin River)
Emporia
CU 03010106 (Roanoke Rapids)
Virginia
North Carolina
CU 03010102 (Middle Roanoke River)
Norlina
Roanoke Rapids
Middleburg
Henderson
CU 03020102 (Fishing Creek)
CU 03010107 (Lower Roanoke River)
Kitrell
CU 03020201 (Upper Neuse River)
Franklinton
Tar-Pamlico River Basin
Youngsville
CU 03020101 (Upper Tar River)
Rocky Mount
Raleigh
Wake Forest
End Project at Boylan Wye
Neuse River Basin
CU 03020203 (Contentnea Creek)
Major Drainage Basins
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
7 3.5 0 7 14 21
Miles

Table 3-2 Major River Basins in the Project Area			
Major River Basins	**Drainage Area of Entire Basin (sq. mi.)**	**Subbasins within Project Area**	**Percent of Project Area**
James	10,544	Appomattox River Lower James Middle James-Willis River	16%
Chowan	4,908	Blackwater River Meherrin River Nottoway River	38%
Roanoke	9,791	Middle Roanoke River Roanoke Rapids	16%
Tar-Pamlico	4,316	Fishing Creek Upper Tar River	19%
Neuse	5,605	Upper Neuse River	11%

Source: *NCDOT and VA DRPT, 2004a, 2008*

3.1.1.1.1 James River Basin

The James River Basin is VA's largest river basin, covering approximately 25 percent of the state's land area. The James River originates in the Allegheny Mountains, along the VA/WV state line. The basin continues southeast through the state towards Hampton Roads and ultimately the Chesapeake Bay. The project study area includes approximately 28 acres in the Middle James-Willis River (CU 02080205), 1,930 acres in the Lower James River (CU 02080206), and 2,727 acres in the Appomattox River (CU 02080207) subbasins.

The northern terminus of the study area, in the City of Richmond, lies within the Middle James-Willis River subbasin. It then continues into the Lower James River subbasin, where it crosses the James River, Walker Creek, Goode Creek, Grindall Creek, Falling Creek, Kingsland Creek, Proctors Creek, and Great Branch. Continuing south towards the City of Colonial Heights, the study area enters the Appomattox River subbasin. It crosses Timsbury Creek, Swift Creek, Oldtown Creek, Fleets Branch, and the Appomatox River before entering the City of Petersburg. Continuing south, the study area crosses unnamed tributaries to Lieutenant Run and Rohoic Creeks.

Virginia's Chesapeake Bay Preservation Act (CBPA) was enacted in 1988 to improve water quality in the Chesapeake Bay and its tributaries by requiring the use of effective conservation planning and pollution prevention practices when using and developing environmentally sensitive lands. The CBPA established a cooperative relationship between the Virginia Department of Conservation and Recreation (VDCR) and local governments within Tidewater Virginia. Under the CBPA, localities in Tidewater are those whose waters drain into the Chesapeake Bay. In the SEHSR project area, the cities of Richmond, Colonial Heights, and Petersburg, as well as Chesterfield County are within Tidewater Virginia and fall under the requirements of the CBPA.

The VDCR states that the CBPA addresses non-point source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The lands that make up Chesapeake Bay Preservation Areas are those that have the potential to impact water quality most directly: Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). RPAs are meant to protect and benefit water quality and include tidal waters, tidal wetlands, or perennial streams and its related wetlands. RMAs are lands that, without proper management, have the potential to damage water quality and include highly erodible soils, highly permeable soils, steep slopes, non-tidal wetlands not included in the RPA, lands within the 100-year floodplain, and include at least the 100-foot area contiguous to the RPA.

3.1.1.1.2 Chowan River Basin

The Chowan River Basin is located in the northeastern Coastal Plain of southeastern Virginia. Approximately 76 percent of the drainage basin lies in Virginia and the remainder lies in North Carolina. The project study area includes approximately 58 acres in the Blackwater River (CU 03010202), 7,843 acres in the Nottoway River (CU 03010201), and 3,182 acres in the Meherrin River (CU 03010204) subbasins.

The study area traverses a small portion of the Blackwater River subbasin near the City of Petersburg before it enters the Nottoway River subbasin. It then crosses waters within the Nottoway River subbasin from south of the City of Petersburg to north of Dinwiddie County. Major stream crossings in this part of the study area include Arthur Swamp, Rocky Branch, Hatcher Run, Gravelly Run, and Little Cattail Creek.

From north of Dinwiddie County south to the Town of Alberta in Brunswick County, the study area crosses the southernmost section of the Nottoway River subbasin. Major stream crossings in this section include Stony Creek, Snap Lodge Branch, Sappony Creek, Buckskin Creek, Great Creek, Nottoway River, Great Branch, Waqua Creek, and Sturgeon Creek.

From the Town of Alberta to the Town of La Crosse in Mecklenburg County, the study area crosses waters within the Meherrin River subbasin. Major stream crossings in this area include Gum Branch, Roses Creek, Great Creek, Briery Branch, Shining Creek, Meherrin River, and Taylors Creek.

The Meherrin River, which originates in Virginia, is the only major tributary to join the Chowan in North Carolina. Anadromous fish spawning areas have been identified in the main streams of the Meherrin and Chowan Rivers; however, no anadromous fish areas have been located within a one-mile vicinity of the study area. Anadromous fish are those like salmon, which hatch in fresh water, mature in the ocean, and return to fresh water to spawn. The Meherrin River in Brunswick County, VA, was designated a state Scenic River in June 2006.

3.1.1.1.3 Roanoke River Basin

The Roanoke River Basin arises from the eastern slopes of the Blue Ridge Mountains and upper Piedmont of west central Virginia. In Virginia, the basin covers approximately 6,380 square miles or about 16 percent of the state. The project study area includes approximately 4,043 acres in the Roanoke Rapids (CU 03010106) and 544 acres in the Middle Roanoke River (CU 03010102) subbasins. Within the study area, the Roanoke

River main stream is impounded by the Kerr Reservoir-Lake Gaston complex located along the VA/North Carolina state line. The Roanoke River continues southeastward through North Carolina towards the Albemarle Sound.

Surface waters within the study area from the Town of La Crosse, VA, to Norlina, NC, drain into Lake Gaston, located in the Roanoke Rapids subbasin. Lake Gaston is a 49,000-acre impoundment used as water supply for the towns of Roanoke Rapids and Weldon and the City of Virginia Beach, and for recreation and hydroelectricity. Major stream crossings in the Virginia portion of the study area include Parham Creek, Hewey Creek, Roanoke River (Lake Gaston), and Smith Creek (Lake Gaston).

Anderson Swamp Creek is the southernmost stream to drain into the Middle Roanoke subbasin. Its confluence is at the Kerr Scott Reservoir.

3.1.1.1.4 Tar-Pamlico River Basin

The Tar-Pamlico River Basin is the fourth largest in North Carolina and is one of four basins located entirely within the state. The Tar-Pamlico River system originates in the Piedmont of north central North Carolina and continues eastward towards the Pamlico Sound. The project study area includes approximately 3,789 acres in the Upper Tar River (CU 03020101) and 1,743 acres in the Fishing Creek (CU 03020102) subbasins.

All surface waters within this basin are given a supplemental classification of Nutrient Sensitive Waters (NSW) (NCDWQ, 2000). This designation is given to waterbodies that are prone to excessive growth of macroscopic or microscopic vegetation (e.g., algal blooms) that can damage aquatic life. NCDWQ has developed certain management processes to limit the amount of nutrients entering these subbasins, thereby reducing the excessive growth. The Tar-Pamlico River Basin Nutrient Sensitive Waters Management Strategy includes a rule to maintain and protect riparian buffers in the basin (15A NCAC 02B .0259). A riparian buffer is a vegetated (usually forested) area adjacent to a stream that helps shade and partially protects a stream from the impact of nearby land uses by removing pollutants and runoff.

The City of Henderson is on the boundary of the Tar-Pamlico and Roanoke River Basins. The study area passes through downtown Henderson and closely follows US 1 to the Vance County line on the ridge between Long Creek to the west and Buffalo Creek to the east. The Vance/Franklin County boundary is the Tar River.

Between the Vance County line and Franklinton, the study area crosses Taylor's Creek and an unnamed tributary to the Tar River. The study area passes through the town of Franklinton. Just south of Franklinton it crosses Cedar Creek. Cedar Creek is a major tributary to the Tar River.

The southernmost subbasin in the Tar River Basin is Brandy Creek. Brandy Creek does not have a NCDWQ data collection site within the watershed.

3.1.1.1.5 Neuse River Basin

The Neuse River Basin is the third largest river basin in North Carolina and is one of four basins located entirely within the state. The Neuse River system originates from the headwaters of the Flat and Eno Rivers and continues eastward towards the Pamlico

Sound. The project study area includes approximately 3,094 acres in the Upper Neuse River (CU 03020201) subbasin.

Like the Tar-Pamlico Basin, all surface waters within the Neuse Basin have been given a supplemental classification of NSW by NCDWQ (NCDWQ 2000). North Carolina has adopted the Neuse Basin Nutrient Sensitive Waters Management Strategy that includes a rule to maintain and protect riparian buffers in the basin (15A NCAC 2B .0233).

South of Youngsville and north of Wake Forest, the study area enters the Neuse River Basin at the eastern headwaters of Richland Creek watershed. This watershed is located within a rapidly developing area near Wake Forest. To the east of the study area is the Smith Creek Watershed.

The southernmost section of the study area lies within the City of Raleigh in the Crabtree Creek watershed. Streams in and around Raleigh have been severely impacted by urbanization.

3.1.1.2 Water Quality

Under the federal Clean Water Act (CWA), as amended in 1972, states were required to develop water quality standards (WQS). These standards are used to identify water quality problems and support efforts to achieve and maintain protective water quality conditions. A WQS consists of four basic elements:

- The designated uses of a waterbody (e.g., recreation, water supply, aquatic life, agriculture) are those uses that society, through public hearings offered by various units of government, determines should be attained and maintained in the waterbody
- Water quality criteria are descriptions of the conditions in a waterbody necessary to support the designated uses
- Antidegradation policies protect the existing uses of waters and maintain waterbodies with qualities above those needed to meet established standards and/or exceeds levels necessary to protect aquatic life and recreational uses
- General policies address implementation issues such as low flows, variances, mixing zones (USEPA, 2004)

States are required to assess the health of surface waters and to report the extent to which WQS are met as established under Section 305(b) of the CWA. When a waterbody cannot meet one of more of its assigned designated uses, it is listed as impaired under Section 303(d) of the CWA. To restore these waters, the state must establish total maximum daily loads (TMDLs) that are designed to reduce contamination to the level where designated uses can be met (Hoskinson et al., 2003).

Surface waters that could be especially sensitive to impacts by the proposed SEHSR project include those used for water supplies and impaired waters that are listed on the CWA Section 303(d) list (see Tables 3-3 and 3-4). Section 303(d) waters for Virginia are from the state's 2008 list. Waters for North Carolina are from the state's 2006 list because the 2008 list is pending USEPA approval at the time of publication of this DEIS.

Table 3-3 Water Supply Surface Waters within Study Area			
State	**Stream Name**	**Basin**	**Classifications**
VA	Ashton Creek and unnamed tributaries	James	PWS
VA	Timsbury Creek and unnamed tributaries	James	PWS
VA	Swift Creek and unnamed tributaries	James	PWS
VA	Unnamed tributaries to Lieutenant Run	James	PWS
VA	Unnamed tributary to Flat Creek	Roanoke	PWS
VA	Unnamed tributary to Little Genito Creek	Roanoke	PWS
VA	Parham Creek and unnamed tributaries	Roanoke	PWS
VA	Hewey Creek and unnamed tributaries	Roanoke	PWS
VA	Roanoke River (Lake Gaston) and unnamed tributaries	Roanoke	PWS
VA	Smith Creek (Lake Gaston)	Roanoke	PWS
VA	Unnamed tributaries to Reedy Branch	Roanoke	PWS
NC	Anderson Swamp Creek and unnamed tributaries	Roanoke	WS-III
NC	Tar River and unnamed tributaries	Tar-Pamlico	WS-IV
NC	Unnamed tributary to Taylor's Creek	Tar-Pamlico	WS-IV

Sources: North Carolina Department of Environment and Natural Resources; 2000, Virginia State Water Control Board; 2003.

Notes:

PWS - VA Public Water Supply

WS-III - NC waters listed as water supplies that are generally in low to moderately developed watersheds

WS-IV - NC waters listed as water supplies that are generally in moderately to highly developed watersheds

Table 3-4 CWA 303(d) List of Impaired Surface Waters within Study Area		
State	**Stream Name**	**Basin**
VA	James River	James
VA	Goode Creek	James
VA	Falling Creek	James
VA	Kingsland Creek	James
VA	Proctors Creek	James
VA	Oldtown Creek	James
VA	Appomattox River	James
VA	Rohoic Creek	James
VA	Lieutenant Run	James
VA	Rowanty Creek and tributaries (includes Gravelly Run, Arthur Swamp, Hatcher Run, Rocky Branch, Reedy Branch, and unnamed tributaries)	Chowan
VA	Sappony Creek	Chowan

Table 3-4 CWA 303(d) List of Impaired Surface Waters within Study Area		
VA	Buckskin Creek	Chowan
VA	Roses Creek	Chowan
VA	Great Creek	Chowan
VA	Briery Branch	Chowan
VA	Hagood Creek	Roanoke
VA	Roanoke River (Lake Gaston)	Roanoke
VA	Smith Creek (Lake Gaston and upstream portion)	Roanoke
NC	Smith Creek	Roanoke
NC	Nutbush Creek	Roanoke
NC	Perry Creek	Neuse
NC	Marsh Creek	Neuse
NC	Crabtree Creek	Neuse
NC	Pigeon House Branch	Neuse

Sources: *North Carolina Department of Environment and Natural Resources, 2006; Virginia Department of Environmental Quality, 2008*

The 303(d)-listed streams are also described below, including the type of impairment.

3.1.1.2.1 James River Basin

In the Lower James subbasin, streams that are on Virginia's 303(d) list of impaired streams include the James River (dissolved oxygen, benthics, *E. coli*, and PCBs in fish tissue), Goode Creek (*E. coli*), Falling Creek (*E. coli* and dissolved oxygen), Kingsland Creek (*E. coli* and pH), and Proctors Creek (*E. coli*). Notable streams in the Appomattox River subbasin that are on Virginia's 303(d) list of impaired streams include Oldtown Creek (dissolved oxygen and fecal coliform), Rohoic Creek (*E. coli*), Lieutenant Run (*E. coli),* and the Appomattox River (*E. coli*, approved TMDL).

3.1.1.2.2 Chowan River Basin

Notable streams in the Meherrin River subbasin that are on Virginia's 303(d) list of impaired streams include Briery Branch (fecal coliform),Great Creek (*E. coli*), and Roses Creek (*E. coli*, approved TMDL), and the Meherrin River (*E. coli*, downstream of the project corridor). Notable streams in the Nottoway River subbasin that are on Virginia's 303(d) list of impaired streams include Buckskin Creek (fecal coliform),Sappony Creek (*E. coli*), Arthur Swamp (*E. coli*), Rowanty Creek and tributaries (dissolved oxygen and pH), and Hatcher Run (fecal coliform).

3.1.1.2.3 Roanoke River Basin

Lake Gaston (including the Roanoke River and Smith Creek arms) is on Virginia's 303(d) list of impaired streams for dissolved oxygen and PCBs in fish tissue in the Roanoke Rapids subbasin. Also on the Virginia 303(d) list are Hagood Creek (*E. coli*) and Smith

Creek above Lake Gaston (dissolved oxygen, pH, and *E. coli*). Smith Creek and Nutbush Creek in the North Carolina portion of this basin have impaired biological integrity.

3.1.1.2.4 Neuse River Basin

The southernmost section of the study area lies within the City of Raleigh, NC, in the Crabtree Creek watershed. Streams in and around Raleigh have been severely impacted by urbanization. These streams, which have impaired biological integrity, include Crabtree Creek, Pigeon House Branch, Perry Creek, and Marsh Creek.

3.1.2 Wetlands

US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, USGS 7.5-minute topographic quadrangle maps, US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil surveys, and recent color aerial photography were reviewed prior to field reconnaissance to identify potential wetland locations. Wetlands within the study area were delineated from October 2003 to January 2004 and from March 2007 to May 2007. Wetlands were delineated based on criteria established in the United States Army Corps of Engineers Wetlands Delineation Manual [United States Army Corps of Engineers (USACE), 1987]. Within North Carolina, wetlands were also evaluated based on criteria established in the Guidance for Rating the Values of Wetlands in North Carolina (NCDEHNR, 1995). Prior to issuance of the final environmental impact statement, the NC Wetland Assessment Methodology will be performed on all impacted wetland systems; this methodology was not in place at the time wetland field reconnaissance was conducted for the DEIS.

Criteria used to delineate jurisdictional wetlands include evidence of hydric soils, hydrophytic vegetation, and hydrology. A total of 474 wetland systems were identified within the study area, with 425 located in Virginia and 49 in North Carolina. They are listed in Appendix I and depicted on the maps included in Appendix Q. A total of 802.2 acres of wetlands (760.4 acres in VA and 41.8 acres in NC) were delineated within the study area. The preliminary jurisdictional wetland determinations have been approved by USACE for application of impact avoidance and minimization protocols but will be refined after a final alternative has been selected.

NCDWQ wetland ratings ranged from 14 to 90 (out of a possible 100 score) for wetlands in North Carolina. Wetlands in Virginia were similar to those found in North Carolina but were not rated using the NCDWQ rating protocol. Wetland communities are distinguished primarily by vegetation type and duration of hydrology.

Based on the Cowardin Classification (Cowardin et al., 1979), there are four primary wetland categories in the study area: palustrine forested (PFO), palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine unconsolidated bottom (PUB).

Forested wetland occurs in narrow bands associated with rivers and streams and topographically low areas. Cowardin *et al.* (1979) typically identify this community as a Palustrine Forested Broad-leaved Deciduous habitat with temporary to seasonal flooding (PFO1A and PFO1C).

Palustrine emergent communities occur most often within the study area in or near man-made or beaver-influenced ponds. These emergent wetlands are typically identified as Palustrine Emergent semi-permanently flooded habitats (PEM1F).

Shrubs, young trees, and trees or shrubs that are small or have been stunted due to environmental conditions are all likely species to occur in a scrub-shrub wetland (Cowardin *et al.*, 1979). This community within the study area is typically identified by Cowardin *et al.* (1979) as Palustrine Scrub-shrub Broad-leaved Deciduous habitat with temporary to seasonal flooding (PSS1A and PSS1C).

Most of the unconsolidated bottom communities (PUB) are farm ponds located near the headwaters of small drainages where the flow of water has been obstructed by man-made dams. They are typically identified by Cowardin *et al.* (1979) as PUBHh or PUBHx.

The Cowardin Classification system is used and described on the NWI maps. However, some wetlands depicted on the NWI maps did not meet "jurisdictional" status within the study area and therefore were not delineated. Also, many wetlands within the study area that were delineated in the field were not identified on the NWI maps and do not have a Cowardin Classification.

The majority of wetlands in the study area in both Virginia and North Carolina are headwater forests, which may be of high quality. The NCDWQ rating scores for these wetland types in North Carolina ranged between 50 and 90. A more detailed description of the wetland types found in the study area is located in the Natural Resources Technical Report (NRTR) and Addendum prepared for the project (NCDOT and VA DRPT, 2004a, 2008). A summary of wetlands delineated within the study area by section and state is provided in Table 3-1.

3.1.3 Floodplains and Floodways

The Federal Emergency Management Agency (FEMA) defines a floodplain as any land area susceptible to being inundated by floodwater from any source during a 100-year flood event (also called a 1 percent flood). FEMA regulations provide management criteria for states and localities to follow in these areas. To assist states in determining 100-year floodplains, FEMA is involved in extensive mapping activities to delineate these areas (USDOI, 1994).

A floodplain is composed of two parts, the floodway and the floodway fringe. FEMA defines the regulatory floodway as the "channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the entire Base Flood (100-year flood) discharge can be conveyed with no greater than a 1.0-foot increase in the base flood elevation (BFE)" (FEMA, 2002). The floodway fringe is the area between the floodway boundary and the 100-year floodplain boundary.

Data from FEMA Flood Insurance Rate Maps (FIRMs) were analyzed and the FEMA Zone designations were determined for the 100-year FEMA floodplains that cross the high speed rail corridor. All of the FEMA floodplain crossings identified in the project corridor are shown on Figures 3-2 and 3-3. These flood zone crossings fall into three designations: Zone A, AE, or A1-A30. Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study by approximate methods of analysis. Because detailed hydraulic analyses are not performed for such areas, no BFE or depths are shown within this zone. Zones AE and A1-A30 are the flood insurance rate zones that correspond to the 1-percent annual chance floodplains that are

determined in the Flood Insurance Study by detailed methods of analysis. In most instances, BFE derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

The FEMA floodplain data were obtained from two different sources. The floodplain information for Virginia was digitized into GIS from FEMA maps downloaded from the FEMA Map Service Center (USDOI, 2008). The floodplain data for North Carolina were obtained from the North Carolina interactive mapping site (North Carolina Floodplain Mapping Program, 2008).

Figure 3-2

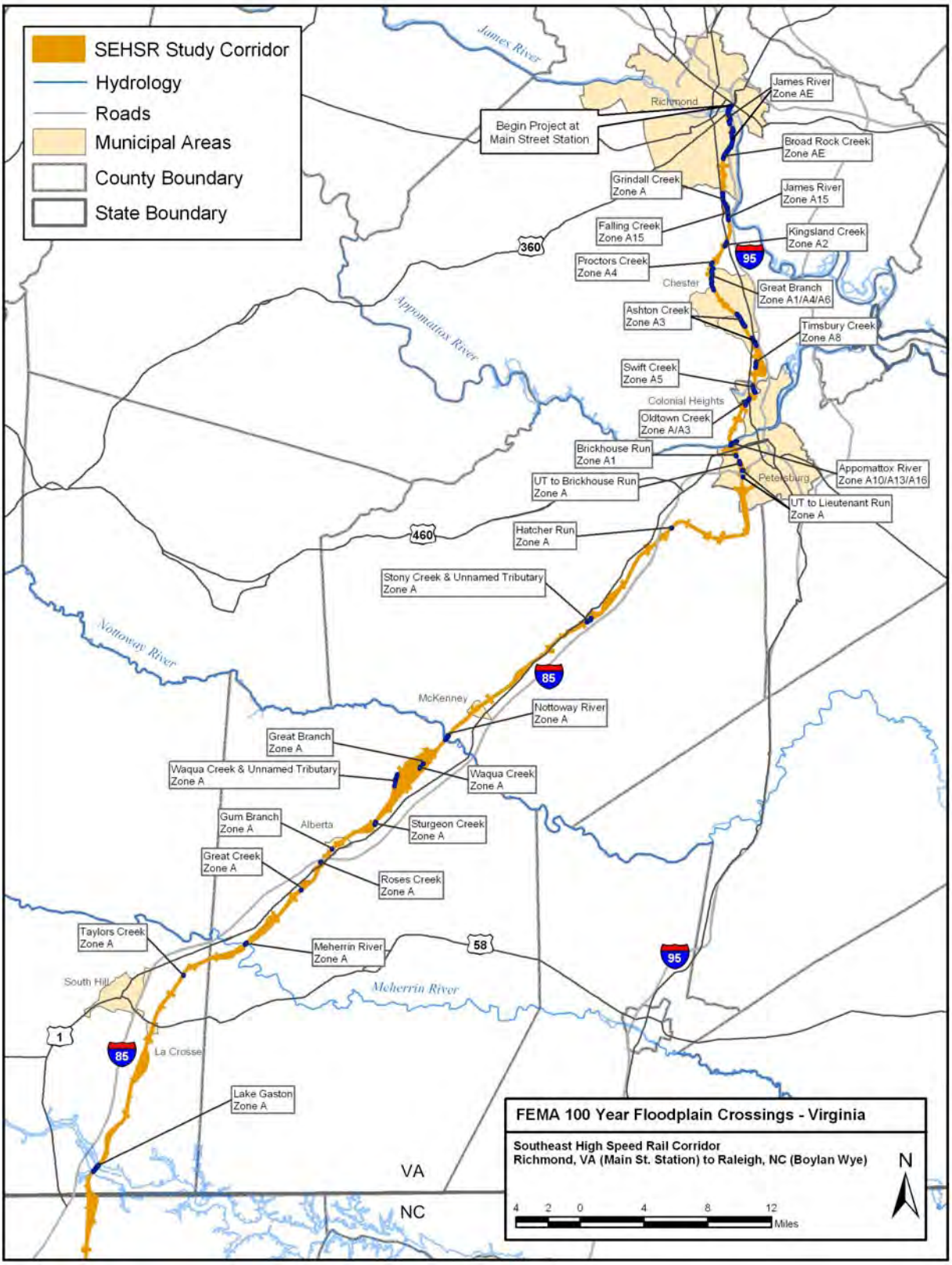
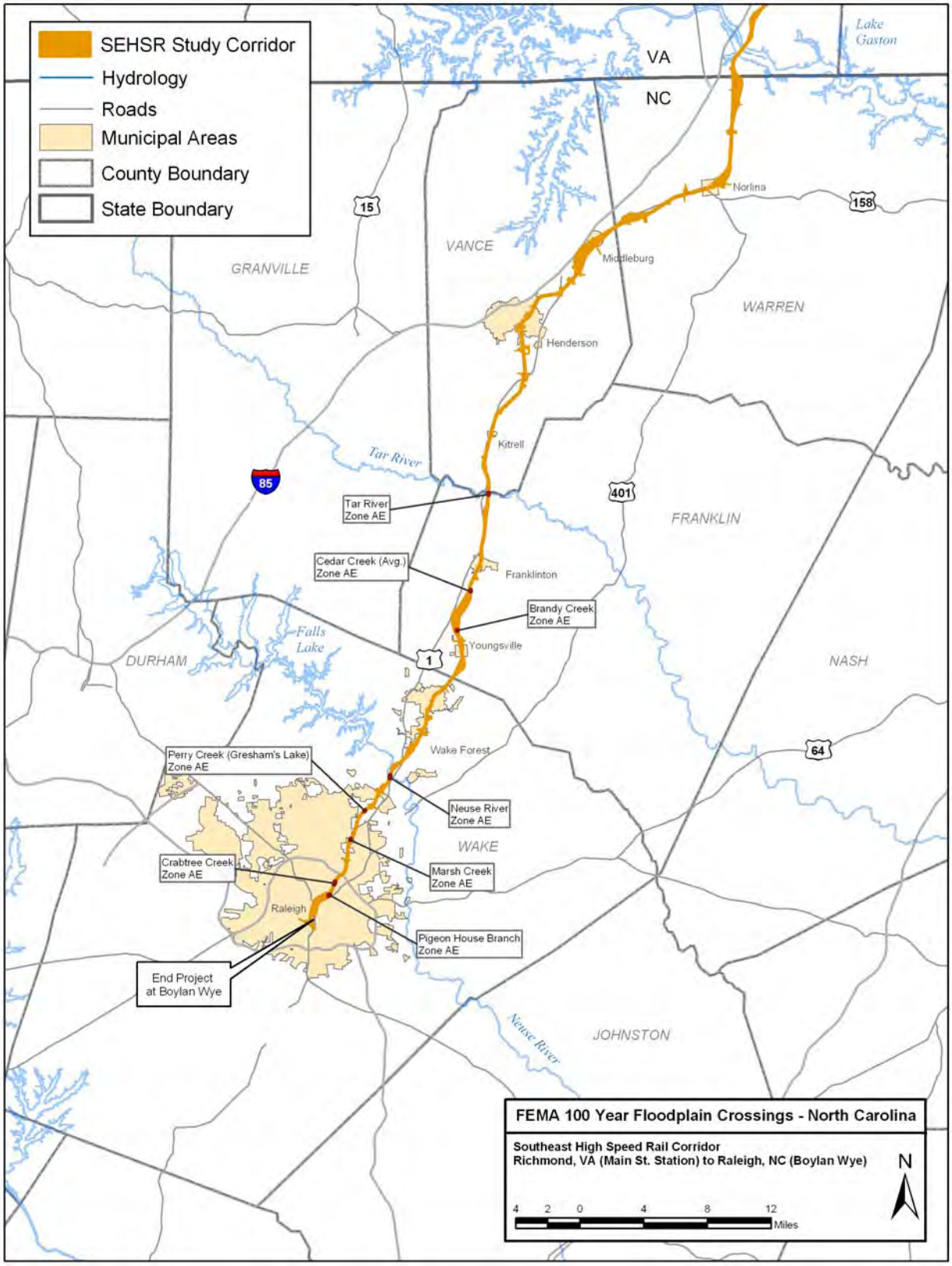

SEHSR Study Corridor
Hydrology
Roads
Municipal Areas
County Boundary
State Boundary
James River
Appomattox River
Nottoway River
Meherrin River
Richmond
Begin Project at Main Street Station
James River Zone AE
Broad Rock Creek Zone AE
Grindall Creek Zone A
James River Zone A15
Falling Creek Zone A15
Kingsland Creek Zone A2
Proctors Creek Zone A4
Chester
Great Branch Zone A1/A4/A6
Ashton Creek Zone A3
Timsbury Creek Zone A8
Swift Creek Zone A5
Colonial Heights
Oldtown Creek Zone A/A3
Brickhouse Run Zone A1
Petersburg
Appomattox River Zone A10/A13/A16
UT to Brickhouse Run Zone A
UT to Lieutenant Run Zone A
Hatcher Run Zone A
Stony Creek & Unnamed Tributary Zone A
McKenney
Nottoway River Zone A
Great Branch Zone A
Waqua Creek & Unnamed Tributary Zone A
Waqua Creek Zone A
Gum Branch Zone A
Alberta
Sturgeon Creek Zone A
Great Creek Zone A
Roses Creek Zone A
Taylors Creek Zone A
Meherrin River Zone A
South Hill
La Crosse
Lake Gaston Zone A
360
460
58
95
85
1
VA
NC
FEMA 100 Year Floodplain Crossings - Virginia
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
4 2 0 4 8 12
Miles

Figure 3-3


SEHSR Study Corridor
Hydrology
Roads
Municipal Areas
County Boundary
State Boundary
VA
NC
Lake Gaston
Norlina
158
15
VANCE
GRANVILLE
Middleburg
WARREN
Henderson
Kittrell
Tar River
85
401
FRANKLIN
Tar River Zone AE
Cedar Creek (Avg.) Zone AE
Franklinton
Brandy Creek Zone AE
Youngsville
Falls Lake
DURHAM
1
NASH
Wake Forest
64
Perry Creek (Gresham's Lake) Zone AE
Neuse River Zone AE
WAKE
Crabtree Creek Zone AE
Marsh Creek Zone AE
Raleigh
Pigeon House Branch Zone AE
End Project at Boylan Wye
Neuse River
JOHNSTON
FEMA 100 Year Floodplain Crossings - North Carolina
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
4 2 0 4 8 12
Miles

3.1.4 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271-1287) mandates that "[i]n all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas." The act establishes Wild Rivers as those which:

- Are free of impoundments (manmade dams)
- Have unpolluted waters
- Have watersheds or shorelines that are essentially primitive and undeveloped
- Are inaccessible except by trails

Scenic Rivers meet the first three of the above criteria; however, they can be accessible by roadways. Recreational Waters are readily accessible by road or railroad, have undergone some development along their shorelines, and may have undergone some impoundment or diversion in the past.

To meet requirements under Section 5(d) of this act, the National Park Service has established and maintains a Nationwide Rivers Inventory (NRI) of river segments that potentially qualify as a national Wild, Scenic, or Recreational river area. The NRI qualifies as a comprehensive plan under Section 10(a) (2) (A) of the Federal Power Act. To be listed in the NRI, a river must be free-flowing and possess one or more outstandingly remarkable values (ORVs). ORVs relate to such attributes as the scenery, recreational opportunities, and habitat provided.

Under provisions of the Wild and Scenic Rivers Act, if a federal action compromises the designation of a Wild and Scenic River or forecloses the possibility of future designation (for rivers currently in the NRI), the implementation of the federal action must be coordinated with the US Department of the Interior (USDOI). Applicable state standards for scenic rivers include the Commonwealth of Virginia Scenic Rivers Act and the North Carolina Natural and Scenic Rivers Act.

There are four rivers designated as Virginia Scenic Rivers in the study area, of these, two are in the NRI (see Table 3-5). The James River and Appomattox are also listed as Scenic Rivers in Virginia in the study area. However, the segments of these rivers that are listed in the NRI are outside the study area. Two waterbodies in North Carolina (Fishing Creek, Neuse River) that pass through the study area are also listed in the NRI. However, the listed segments of these streams are located outside of the project area, and their potential listing would not be impacted by this project.

Table 3-5
Streams in the Study Area Included in the Nationwide Rivers Inventory

River	Location	Listed ORV	DOI Comments
Nottoway River	Fort Nottoway to Nottoway Reservoir, Sussex, Greenville, Dinwiddie, Brunswick, and Nottoway Counties, VA	O	Wild River, corridor and surrounding watersheds largely undeveloped
Meherrin River	Emporia, VA, to US 1, Greenville, Brunswick, Mecklenburg, and Lunenburg Counties, VA	O	Wild River, corridor and surrounding watersheds essentially undeveloped

Table 3-5 Streams in the Study Area Included in the Nationwide Rivers Inventory			
River	**Location**	**Listed ORV**	**DOI Comments**
Tar River	River Mile 99, SR 1933 Bridge to River Mile 192, Nash, Franklin, Vance, Granville, and Person Counties, NC	C, F, G, H, R, S, W	Attractive stream with several whitewater segments; secluded picturesque ravines and gorges.

Source: US DOI, National Parks Service. Rivers, Trails, and Conservation Assistance Program; January 2004
Notes:
O-Listed for other, unspecified reasons
C-Cultural resources
F-Fish resources
G-Geologic resources
H-Historic resources
R-Recreational resources
S-Scenic resources
W-Wildlife resources

3.1.5 US Coast Guard Waters

The United States Coast Guard (USCG) has jurisdiction over navigable waters. According to 33 CFR 2.05-25, navigable waters are defined as waters subject to the ebb and flow of tide; or any water that is presently used and/or is susceptible to use in its natural condition, or by reasonable improvement, as a means to transport interstate and foreign commerce. A bridge permit from the USCG may be required for projects that construct a new bridge or reconstruct an existing bridge over navigable water.

In a letter dated November 5, 2009, the USCG determined that the SEHSR crossing of the James River in Richmond, VA, is the only waterway in the project corridor subject to USCG jurisdiction. The SEHSR crossings of the Appomattox River (near Ettrick, VA), Nottoway River (near McKenney, VA), Meherrin River (vicinity of US 1 near South Hill, VA), Tar River (vicinity of US 1 at the border of Vance County, NC, and Franklin County, NC), and Neuse River (near Capital Boulevard just north of Raleigh, NC) are not under USCG jurisdiction because they are not subject to tidal influence (Giese et al., 1985) nor are they used for interstate commerce. These rivers have active recreational use (e.g., kayaks and canoes), but cannot support commercial watercraft at the location where the SEHSR project crosses.

3.2 Topography, Geology, and Soils

3.2.1 Topography

The natural regions of Virginia and North Carolina are differentiated by the interaction of topography, geology, and soils. The northern portion of the study area (Richmond to Petersburg) lies within the Southeastern Plains ecoregion (USEPA, 2007a). The Cretaceous or Tertiary-age sands, silts, and clays of the region contrast geologically to the older igneous and metamorphic rocks of the Piedmont, and the older limestone, chert, and shale found in the Interior Plateau. Streams in this area are relatively low-gradient and sandy-bottomed (University of Purdue, undated). The remainder of the study area lies

within the Piedmont Physiographic Province. This physiographic province is generally characterized by broad uplands with low to moderate slopes and elevations between 130 to 600 feet above mean sea level. The slopes along the existing rail line range from 0 to 3 percent.

3.2.2 Geology

Bedrock within the Piedmont consists mainly of a variety of igneous and metamorphic rocks. There are some discrete zones of sedimentary rocks. Quaternary to Tertiary sandy clay and sandy saprolite with rock outcrops and joint-block boulders are located within the study area. In addition, much older Cambrian gneiss, schist, metavolcanic rock, and metamudstone are likely to occur within the study area. Mica schist is a typical source of parent material in the Piedmont, and soils are usually deep, rich in weathering products (clays and iron oxides), and have a red matrix color. Certain soils in the study area have a high shrink-swell potential. When these soils are wet, certain minerals will absorb large quantities of water, allowing the soil to expand or swell. As the soil dries, the clay minerals release the water and shrink. Shrink-swell potential is an important consideration when siting new structures.

3.2.3 Soils

The process of soil development depends upon both biotic and abiotic influences. These influences include past geologic activities, nature of parent material, environmental and human influences, plant and animal activity, time, climate, and topography. The study area has been divided into the soil associations of each respective county. A soil association is a landscape that has a distinctive, proportional pattern of soils consisting of one or more major soils and at least one minor soil. The soils within an association can vary in slope, depth, stoniness, drainage, and other characteristics (USDA, 1995).

These soil associations are described based on information obtained from USDA through published soils surveys, field technical guides, and unpublished information gathered from visits to NRCS county offices. The soil survey for City of Richmond, VA, has not been completed and because USDA no longer maps soil associations (John Harper, NRCS, pers. comm.), descriptions are not available for this portion of the project study area. It should also be noted that the general soil descriptions for Franklin County are derived from a preliminary map obtained from the Geographical Information Systems unit of NRCS. Detailed descriptions of soil associations and individual soil units within the study area are located within the SEHSR NRTR (NCDOT and VA DRPT, 2004a, 2008). Table 3-6 shows the soil associations for counties within the study area.

Table 3-6
Soil Associations Found in Counties within the Study Area

County	State	Most Common Soil Association	Description	Drainage	Comments
Chesterfield	VA	Faceville-Gritney-Kempsville	Dominantly clayey or loamy; moderate to moderately slow permeability	Well drained	Moderate shrink-swell potential

Table 3-6 Soil Associations Found in Counties within the Study Area					
County	**State**	**Most Common Soil Association**	**Description**	**Drainage**	**Comments**
		Bourne-Aquults-Tetotum	Have a fragipan (subsoil layer consisting of high bulk density, brittle when moist and very hard when dry) or loamy or clayey; moderate to moderately slow permeability	Moderately well drained	Variable soils, High water table
		Tetotum-Bourne	Dominantly loamy or have a fragipan; moderate to moderately slow permeability	Moderately well drained	High water table
		Gritney-Atlee-Lenoir	Clayey to loamy; moderately slow to slow permeability	Well drained to somewhat poorly drained	Moderate shrink-swell potential
		Lucy-Orangeburg-Rumford	Dominantly loamy; moderate to moderately rapid permeability	Well drained to somewhat excessively drained	Silty, erodible
		Ochrepts and Udults-Vaucluse	Dominantly loamy; slow permeability	Excessively well drained to well drained	Highly variable soils
Colonial Heights and Petersburg	VA	Appling-Cecil	Sandy loam to clayey loam; Moderate permeability	Well drained	Low shrink swell potential
		Mattaponi-Appling-Cecil	Dominantly clayey texture; Moderately permeable to permeable	Moderately well drained to well drained soils	
		Roanoke-Slagle-Mattaponi	Clayey to loamy texture; Low to moderate permeability	Poorly to moderately well drained soils;	Moderate shrink swell potential
Dinwiddie	VA	Mattaponi-Appling-Cecil	Dominantly clayey texture; Moderately permeable to permeable	Moderately well drained to well drained soils	

Table 3-6 Soil Associations Found in Counties within the Study Area					
County	**State**	**Most Common Soil Association**	**Description**	**Drainage**	**Comments**
		Roanoke-Slagle-Mattaponi	Clayey to loamy texture; Low to moderate permeability	Poorly to moderately well drained soils;	Moderate shrink swell potential
		Emporia-Mattaponi-Slagle	Loamy subsoil; Moderate permeability	Moderately well drained to well drained	Moderate shrink swell potential
		Appling-Cecil	Sandy Loam to clayey loam; Moderate permeability	Well drained	Low shrink swell potential
		Herndon-Georgeville	Silty to clayey loam surface, silty loam subsurface; Moderate permeability	Well drained	
Brunswick	VA	Cecil-Appling	Sandy loam to clayey loam; Moderate permeability	Well drained	Low shrink swell potential
		Appling-Helena	Clayey soils; Low to moderate permeability	Well drained to moderately well drained	
Mecklenburg	VA	Appling-Wedowee-Louisburg	Sandy loam to clayey loam; Moderate to High permeability	Well drained	
		Cecil-Hiwassee-Pacolet	Clayey loam; Moderate to moderately high permeability	Well drained	
		Cecil-Madison-Enon	Sandy loam surface, clayey subsurface; Moderate permeability	Well drained	Moderate shrink swell potential
Warren	NC	Pacolet-Cecil	Sandy loam or loam surface, clayey subsurface; Moderate permeability	Well drained	Low shrink swell potential

Table 3-6 Soil Associations Found in Counties within the Study Area					
County	**State**	**Most Common Soil Association**	**Description**	**Drainage**	**Comments**
		Cecil-Appling	Sandy loam to clayey loam; Moderate permeability	Well drained	
		Pacolet-Wedowee	Sandy loam to clayey loam; Moderate permeability	Well drained	Low shrink swell potential
		Vance-Helena	Sandy loam surface, clayey subsurface; Moderate permeability	Well drained	
		Pacolet-Saw	Sandy loam surface, clayey to coarse loamy subsurface; Moderate to high permeability	Well drained to excessively drained	
Vance	NC	Appling	Loamy surface, clayey subsurface; Moderate to moderately high permeability	Well drained	Low shrink swell potential
		Wedowee-Louisburg-Pacolet	Sandy to loamy surface, clayey to loamy subsurface; Moderate to high permeability	Well drained to excessively drained	Low shrink swell potential
Franklin	NC	Wedowee-Helena	Loamy surface, clayey subsurface; Moderate to moderately high permeability	Well drained to moderately well drained	
		Wake-Wedowee-Wateree	Sandy or loamy surface, sandy, loamy or clayey subsurface; Very low to moderate permeability	Well drained to excessively drained	

Table 3-6 Soil Associations Found in Counties within the Study Area					
County	**State**	**Most Common Soil Association**	**Description**	**Drainage**	**Comments**
		Cecil-Pacolet	Loamy surface, clayey subsoil; Moderate permeability	Well drained	Low shrink swell potential
		Appling-Vance-Helena	Sandy or loamy surface, clayey subsurface; Low to moderately high permeability	Well drained	
		Winnsboro-Wilkes	Loamy surface, clayey subsurface; Very low to moderate permeability	Well drained	
Wake	NC	Cecil -Appling	Loamy surface, loamy to clayey subsurface; Moderate permeability	Well drained	Low shrink swell potential
		Cecil	Loamy surface, clayey subsurface: Moderate permeability	Well drained	Low shrink swell potential
		Appling-Louisburg-Wedowee	Friable sandy loam to firm clay subsurface: Moderate to moderately high permeability	Well drained to excessively drained	Low shrink swell potential

3.3 Prime and Other Important Farmland

The Farmland Protection Policy Act (FPPA) of 1981 (7 CFR Part 658) requires all federal agencies to consider the impact of their activities on prime, unique, statewide, and locally important farmland soils, as defined by the USDA NRCS (Public Law 97-98, Subtitle 1, Section 1540). The NRCS, in cooperation with state and local agencies, developed a listing of Prime and Statewide Important Farmland for Virginia and North Carolina by county.

“Prime farmland” is defined as soils best suited for producing food, feed, fiber, forage, and oil seed crops. These soils are favorable for all major crops common to the county, have a favorable growing season, and receive the available moisture needed to produce high yields on an average of eight out of every ten years. Land already in or committed to urban development or water storage is not included. In addition, the classification for a particular soil

unit may be limited to only those lands that are drained and/or only those lands that are protected from or not frequently flooded.

"Unique farmlands" are used for production and specific high-value food or fiber crops. They have the special combinations of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed.

"Statewide importance" and "locally important" are terms that are defined by the appropriate state or local government agency as soils important in the agriculture of an individual county. These definitions are based on measures of the capacity of the soil to support productive farm activity, not of current cultivation.

To determine prime and other important soils in the study area, soils data were collected for each of the SEHSR counties and GIS analyses were used to identify FPPA soils. Digitized soils data (SSURGO, Soil Survey Geographic Database) were available for all but two of the project counties (USDA, 2002b-e and 2003a-c). Brunswick County, VA, and Warren County, NC, have not yet converted their soil surveys into a digital format. For those counties, hand-drawn soil unit mapping within the study area were digitized. It should be noted that soils in sections of Warren County have not yet been mapped. Unmapped sections in the study area include a 1.8-mile segment west of the town of Norlina and a 3.9-mile segment between US 1 and the Virginia border. Consequently, estimates of prime farmland soils within the Warren County portion of the study area are low.

Table 3-7 lists the approximate acres of prime and other important soils within each of the counties in the study area. It is important to note that areas of water or urban or built-up land uses were included in the analysis. These areas are not considered prime farmland; therefore, the actual amounts of prime farmland soils in the study area are less than the amounts shown.

Table 3-7
Acres of Prime and Other Important Farmland Soils within Study Area

Location	Prime	Prime if drained	Prime if drained and protected from/not frequently flooded	Prime if protected from/not frequently flooded	Statewide Importance	Local Importance
Richmond, VA	60	0	0	< 1	0	0
Chesterfield County, VA	931	223	0	0	116	0
Colonial Heights, VA	29	0	0	0	20	0
Petersburg, VA	503	0	0	0	54	0
Dinwiddie County, VA	3,096	0	0	0	785	0

Table 3-7 Acres of Prime and Other Important Farmland Soils within Study Area						
Location	**Prime**	**Prime if drained**	**Prime if drained and protected from/not frequently flooded**	**Prime if protected from/not frequently flooded**	**Statewide Importance**	**Local Importance**
Brunswick County, VA	2,533	29	486	0	788	0
Mecklenburg County, VA	1,883	0	0	0	1,332	0
Subtotal – VA	9,035	252	486	< 1	3,095	0
Warren County, NC	2,232	0	0	0	139	0
Vance County, NC	2,393	0	0	0	514	0
Franklin County, NC	1,304	0	49	0	486	0
Wake County, NC	1,040	0	0	0	1,000	74
Subtotal – NC	6,948	0	49	0	2,131	72
Total – Study Area	15,983	252	535	< 1	5,226	72

Source: NRCS SSURGO Soil Data and Prime Farmland Designations; April 2004

3.4 Mineral Resources

Mineral resources have played an important role in the growth and development of North Carolina and Virginia since their settlement. According to the USGS, the estimated value of non-fuel mineral production for Virginia was $1.16 billion in 2005 and the estimated value for North Carolina was $792 million in 2005. In 2004, Virginia ranked eighteenth among the 50 states in total non-fuel mineral production value and North Carolina ranked twenty-fifth (USGS, 2005a; USGS, 2005b).

Crushed stone is, by value, the leading non-fuel mineral in both Virginia and North Carolina, accounting for about 61 percent of VA's total non-fuel mineral production value and about 81 percent of that of North Carolina. Cement (masonry and Portland) was the second leading non-fuel mineral commodity in Virginia, followed by construction sand and gravel and lime. These four mineral commodities represented 85 percent of the state's non-fuel mineral value. In North Carolina, phosphate rock was second based on value, followed by construction sand and gravel and industrial sand and gravel (Virginia Department of Mines, Minerals and Energy Division of Natural Resources, 2004; USGS, 2005b).

Based on a review of the USGS Mineral Resources Data System (MRDS) online database and the North Carolina Permitted Active and Inactive Mines database, there are three listed mines in Virginia and four in North Carolina within the SEHSR corridor. These mines are:

- Carter Sand and Gravel Company, located in Richmond, VA (listed as past producer)
- McGowan Quarry, located in Richmond, VA (listed as past producer)
- Rowlings Quarry, located in Brunswick County, VA (listed as past producer)
- Vulcan-Greystone Quarry, located in Vance County, NC
- Franklin Quarry, located in Franklin County, NC
- Raleigh Quarry, located in Wake County, NC
- Rowland Mine in Wake County, NC (listed as past producer) (USGS, 2008).

3.5 Hazardous Material

Several federal laws, including the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), regulate hazardous materials use and hazardous waste sites. RCRA defines hazardous waste as a material that "because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or otherwise managed." Hazardous wastes can exist as solids, sludge, liquids, or vapors. Hazardous waste sites can include landfills, industrial facilities, lagoons, underground and aboveground storage tanks, solvent disposal sites, shooting ranges, and wood treatment plants.

Environmental Data Resources (EDR) conducted a review of records in several state and federal databases to gather data on sites that are listed in various hazardous waste inventories for the Petersburg to Raleigh corridor in 2004 and for the Richmond to Petersburg corridor in 2008. The purpose of this review was to determine if sites listed in these inventories were located within the proposed SEHSR corridor. The following federal databases included information on sites within the project corridor:

- Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/ Toxic Substances Control Act (TSCA) Tracking System
- Corrective Action Report – CORRACTS
- Formerly Used Defense Sites – FUDS
- EDR Proprietary Manufactured Gas Plants Database
- Integrated Compliance Information System (ICIS)
- Resource Conservation and Recovery Information System (RCRIS)
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
- CERCLIS No Further Remediation Action Planned (CERCLIS-NFRAP)
- Polychlorinated Biphenyl (PCB) Activity Database (PADS)
- Hazardous Materials Information Reporting System (HMIRS)
- Emergency Response Notification System (ERNS)
- Mines Master Index File (MINES)
- Toxic Substances Control Act (TSCA)
- FIFRA/TSCA Tracking System Administrative Case Listing (HIST-FTTS)
- RCRA Conditionally Exempt Small Quantity Generators (CESQG)
- RCRA – NRL-Non-generator)

- Material Licensing Tracking System (MLTS)
- Facility Index System/Facility Identification Initiative Program Summary Report (FINDS)
- Toxic Release Inventory System (TRIS) (EDR, 2004, 2008)

Based on the EDR review, the following state databases provided information on sites within the project corridor:

- Hazardous Substance Disposal Site (HSDS) – NC
- State Dry Cleaners Database – NC
- State Dry Cleaners Database – VA
- Comprehensive Environmental Data System – CEDS
- Leaking Underground Storage Tank (LUST) State Trust Fund Database – NC
- Voluntary Remediation Program – VA
- Voluntary Remediation Program, Brownfields – VA
- Registered Petroleum Storage Tanks - NC, VA
- Inactive Hazardous Sites Inventory – NC
- Incident Management Database – NC
- LUST Information System - NC, VA
- Solid Waste Management Facilities - NC, VA
- Pollution Complaint Database – VA
- Registered Petroleum Storage Tanks – VA
- Permitted Air Facility List – VA
- Petroleum Underground Storage Tank Database – NC
- Leaking Petroleum Storage Tanks - VA (EDR, 2004, 2008).

The sites found by the EDR query are shown in Appendix J. Sites were included if they were located within American Society for Testing & Materials (ASTM) recommended distances to the project corridor. This distance extends 2,000 feet from the project corridor. There were 254 sites within Virginia and 809 in North Carolina. A vast majority of the sites were located within between Richmond and Petersburg (225 sites) and in Wake County (602, of which 543 sites were within the Raleigh area). A number of the sites in Wake County are registered petroleum storage tanks (see Appendix J for more information) (EDR, 2004, 2008).

Based on a review of the information queried by EDR, the list of potentially contaminated sites should be considered as a screening level study. There are some important caveats to these data. In some databases, sites that have completed the remediation process may be included with sites that require cleanup. Other data sources, such as petroleum tank listings or brownfield inventory databases, may list sites that are not contaminated. Some sites were listed in multiple databases, and in some cases there was repetition of sites in the same database. For some entries, the names for sites at the same latitude and longitude differ. When this occurs, it is not always possible to determine if the sites are unique. Additional research would be required to fully evaluate the potential SEHSR construction and operation to impact these sites.

3.6 Air Quality

Transportation sources generate varying amounts of ozone (O_3) and its precursors; nitrogen oxides (NO_X); hydrocarbons (HC) (specifically volatile organic compounds (VOCs)); particulate matter (PM); and/or carbon monoxide (CO) emissions, all of which are concerns for human and environmental health.

Ozone is a highly reactive pollutant that damages lung tissue, causes congestion, reduces vital lung capacity, and can also damage vegetation. From 1980 to 2007, there was a 21% decrease in the 8-hour design value O_3 concentrations in the US. A design value is a statistic that describes the air quality status of a given area relative to the level of the National Ambient Air Quality Standards (NAAQS).

Nitrogen oxides are an important precursor both to ozone and acid rain, and may affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO). NO_X plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_X forms when fuel is burned at high temperatures. The two major emissions sources are transportation and stationary fuel combustion sources, such as electric utilities and industrial boilers. NO_X can also contribute to the formation of secondary PM, which can cause headaches, eye and nasal irritation, chest pain, and lung inflammation. From 1980 to 2007, was a 43% decrease in the annual NO_2 average (i.e., arithmetic mean) in the US.

PM is the term for particles found in the air, including dust, dirt, soot, smoke, and liquid droplets. Particles less than 10 micrometers in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the largest health risks. From 1990 to 2007, there was a 28% decrease in the design value PM_{10} concentration averages. From 2000 to 2007, there was an 11% decrease in the design value $PM_{2.5}$ concentration averages in the US.

CO is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks (USEPA, undated). From 1980 to 2007, there was a 76% decrease in the 8-hour design value CO concentrations in the US.

3.6.1 Regulatory Setting

This section describes the applicable state and federal regulations governing air quality in the SEHSR corridor. It also discusses the progress Virginia and North Carolina have made toward achieving air quality standards in the SEHSR corridor.

3.6.1.1 National Ambient Air Quality Standards (40 CFR Part 50)

The Clean Air Act (CAA) and 1990 Clean Air Act Amendments (CAAA) required the USEPA to establish NAAQS for pollutants considered harmful to public health and the environment. The NAAQS are implemented by USEPA in the Code of Federal Regulations (CFR) under 40 CFR Part 50. The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Table 3-8 lists the primary and secondary standards. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air ($\mu g/m^3$). With the exception of sulfur dioxide, the secondary standards for all pollutants are the same as the primary standards.

Table 3-8 National Ambient Air Quality Standards				
Pollutant	**Primary Standards**		**Secondary Standards**	
	Level	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	35 ppm (40 mg/m^3)	1-hour [(1)]	None	
	9 ppm (10 mg/m^3)	8-hour [(1)]		
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour [(2)]	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15 µg/m^3	Annual [(3)] (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour [(4)]	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour [(5)]	Same as Primary	
	0.08 ppm (1997 std)	8-hour [(6)]	Same as Primary	
	0.12 ppm	1-hour [(7)] (Applies only in limited areas)	Same as Primary	
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m^3)	3-hour [(1)]
	0.14 ppm	24-hour [(1)]		

Source: USEPA; 2008

(1) Not to be exceeded more than once per year.

(2) Not to be exceeded more than once per year on average over 3 years.

(3) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.

(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006). Note: Designations will be in 12-09 and will take effect in 2010.

(5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

(6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 USEPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

3.6.1.2 Clean Air Act Amendments – Title I

Title I of the CAAA addresses nonattainment issues related to O_3, CO, and PM_{10}. Nonattainment areas are progressively ranked according to the severity and type of their air pollution problems. Each category of nonattainment has a label such as severe or moderate and a date for meeting the NAAQS.

3.6.1.3 Clean Air Act Amendments – Title II

Title II of the CAAA addresses mobile sources and stipulates more stringent emission standards for cars, trucks, and buses. This title also regulates fuel quality (such as gasoline volatility and diesel sulfur content); requires reformulated gasoline in the highest O_3 areas and oxygenated fuels in the highest CO areas; and requires clean-fueled vehicles for certain fleets and other pilot programs.

3.6.1.4 Clean Air Act Conformity

The CAAA require federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP). States are required to develop SIPs that explain how they will meet the requirements of the CAA. The SIP is a plan for implementation, maintenance, and enforcement of the NAAQS, and includes emission limitations and control measures to attain the standards. States must involve the public in the development of the SIP through hearings and opportunities to comment. In Virginia, the State Air Pollution Control Board administers the SIP. In North Carolina, the DENR, Division of Air Quality, administers the SIP.

Conformity to a SIP, as defined in the CAAA, means conformity to a SIP's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of such standards. The federal agency responsible for the action is required to determine if its action conforms to the applicable SIP. The USEPA has developed two sets of conformity regulations:

- Transportation projects developed or approved under the Federal Aid Highway Program or Federal Transit Act are governed by the "transportation conformity" regulation (40 CFR Part 3, Subpart A)
- Other projects, which include the federal action planned for the SEHSR project, are governed by the "general conformity" regulations. The regulations for *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* were published in the *Federal Register* on November 30, 1993. The general conformity regulation (40 CFR Part 93, Subpart B) became effective January 31, 1994. In Virginia, general conformity criteria and procedures are set forth in 9VAC5-10-20. In North Carolina, these criteria and procedures are set forth in 15 NCAC.200-.2004

The conformity regulations apply to federal actions occurring in air basins designated as nonattainment areas for criteria pollutants or in attainment areas subject to maintenance

plans (maintenance areas). Federal actions occurring in air basins that are in attainment with criteria pollutants are not subject to the conformity rule.

The regulations require that funding for construction be identified before a project can be included in a conformity analysis. Projects that are "Exempt from Regional Emissions Analysis" are listed in 40 CFR Part 93.126 (Tables 2 and 3), and include "Planning and technical studies." Because the SEHSR project is currently funded only at the planning level and does not yet have a dedicated funding source for construction, it falls under the exempt status. Once funding is secured for ROW purchase and construction, conformity analyses will be performed in accordance with 40 CFR Part 93.

3.6.1.5 Clean Air Nonroad Diesel Rule

In June 2004, as part of the Clean Air Nonroad Diesel Rule, USEPA finalized new requirements for non-road diesel fuel that will decrease the allowable levels of sulfur in fuel used in locomotives by 99 percent. Since sulfur damages exhaust emission control devices, these fuel improvements will reduce PM from existing engines. Diesel fuel currently has a sulfur content of about 3,000 ppm. The new rule cut that amount to 500 ppm in 2007, and will further cut the amount to 15 ppm in 2010.

3.6.1.6 Mobile Source Air Toxics (MSATs) Rule

Effective April 27, 2007, USEPA adopted controls on mobile source air toxics (MSATs). MSATs are emitted by motor vehicles, nonroad engines (such as lawn and garden equipment, farming and construction equipment, locomotives, and ships), aircraft, and their fuels. At this time, USEPA proposed more stringent standards for large diesel engines used in locomotives (as well as certain marine diesel engines).

In May, 2008, USEPA published the final rule adopting a comprehensive program to dramatically reduce pollution from locomotives, applying to all types of locomotives. This final rule completes an important step in USEPA's ongoing National Clean Diesel Campaign (NCDC) by adding new programs for locomotives and marine diesel engines to the clean diesel initiatives that have been already undertaken for highway, other nonroad, and stationary diesel engines in 2004. It significantly strengthens the locomotive and marine diesel programs proposed in April, 2007, especially in controlling emissions during the critical early years through the early introduction of advanced technologies and the more complete coverage of existing engines. When fully implemented, this coordinated set of new programs will reduce harmful diesel engine emissions to a small fraction of their previous levels.

Today, locomotives and marine diesel engines account for about 20 percent of mobile source NO_X emissions and 25 percent of mobile source diesel $PM_{2.5}$ emissions in the U.S. Absent this final action, by 2030 the relative contributions of NOx and $PM_{2.5}$ from these engines would have grown to 35 and 65 percent, respectively.

On a nationwide annual basis, these reductions will amount to 800,000 tons of NO_X and 27,000 tons of PM by the year 2030. For locomotives, the reduction from existing standards in PM Tiers 0 through 4 locomotives will be approximately 60, 50, 50, 50, and 90 percent, respectively. The reduction in NO_X for range year Tiers 0 through 4 will be approximately 20, 20, 20, 20, and 80 percent, respectively. All Tier idle emissions are predicted to be reduced by 50 percent for both PM and NO_X.

3.6.1.7 PM Hot Spot Analysis

On March 10, 2006, USEPA published a final rule (40 CFR 93.116) that establishes transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. The rule was followed by a March 29, 2006, guidance document issued jointly by USEPA and the Federal Highway Administration (FHWA), which provides information for state and local agencies to meet the hot-spot requirements established in the final transportation conformity rule.

Hot spot analyses are not required for projects in $PM_{2.5}$ or PM_{10} attainment area or if they are exempt from regional transportation conformity according to 40 CFR93.126 or 93.128.

3.6.2 Affected Environment

Potential air quality impacts of the proposed SEHSR project include:

- Changes in rail-related emissions due to an increase in train operations each day and a change in equipment
- Changes in the overall emissions from transportation sources
- Changes in local or microscale ambient air quality emissions, including changes from locomotive passbys, changes at various crossings that could handle additional traffic due to nearby highway-railroad crossing closures, and changes in vehicular delay due to increased traffic resulting from increased ridership

In this section, existing ambient air quality conditions and emissions in the SEHSR corridor and at specific locations are identified.

3.6.2.1 Ambient Air Quality in the SEHSR Corridor

3.6.2.1.1 Attainment/Nonattainment/Maintenance Designations

The USEPA, VADEQ, and NCDENR maintain a network of monitoring stations that sample ambient air pollutant concentrations and provide data to assess the impact of control strategies. Monitoring data from these stations are stored in the USEPA Air Quality System (AQS) database. There are no ambient monitoring stations in the Virginia section of the SEHSR study area. However, there are two stations in Chesterfield County that monitor various pollutants north of the study area. Within the North Carolina section of the SEHSR study area, there are two stations in Wake County and one station in Franklin County. Of the Wake County stations, the closest to the study area is located in Raleigh on Spring Forest Road. Within Chesterfield County, VA, there is a $PM_{2.5}$ monitor at 6700 Strathmore Road and an ozone monitor at the intersection of County Roads 655 and 654. There is also a nearby CO monitor in the City of Richmond , VA, at the Science Museum of Virginia at the intersection of DMV Drive and W Leigh Street.

In this section, 2008 AQS data (last available full year) for the transportation-related pollutants are presented and compared to the air quality standards in Table 3-8. The pollutants relevant to the SEHSR project are those emitted from transportation sources, including 8-hour O_3, CO, NO_X, and $PM_{2.5}$.

3.6.2.1.1.1 8-Hour Ozone

In June 2005, USEPA revoked the 1-hour ozone standard. In March 2008, USEPA strengthened the 8-hour ozone standard from 0.080 to 0.075 ppm for the fourth highest value in a year, rounded to the nearest 0.001 ppm. The 2008 standard applies retrospectively to monitoring data for prior years. Some locations that previously met the ozone standard may now be exceeding the level of the 2008 standard. In the project area, both Virginia and North Carolina are listed as maintenance areas for the ozone standard.

The 0.075 ppm 8-hour standard was exceeded 7 days in 2008 at the intersection of County Roads 655 and 654 in Chesterfield County, VA.

The 0.075 ppm 8-hour standard was exceeded 4 days in 2008 at the Spring Forest Road station in Raleigh, NC, in Wake County.

The 0.075 ppm 8-hour standard was exceeded 5 days in 2008 at the South Hillsborough Street station in Franklin County, NC.

3.6.2.1.1.2 Carbon Monoxide

The project is in an area that is currently designated as being in attainment of the standard in Virginia and has been designated as a maintenance area for Wake and Franklin counties in North Carolina. The 8-hour (9 ppm) and 1-hour (35 ppm) CO standard was not exceeded at any of the study area monitoring stations during 2008 and has not been exceeded from 1998 to 2008 based on available USEPA AirData website monitor values.

3.6.2.1.1.3 Nitrogen Dioxide

The project is in an area that is currently designated as being in attainment of the standard. There are no NO_2 monitoring stations in the study area.

3.6.2.1.1.4 Particulate Matter

In December 2006, USEPA strengthened the $PM_{2.5}$ 24-hour standard from 65 µg/m^3 to 35 µg/m^3 0.080 to 0.075 ppm for the fourth highest value. The 2006 standard applies retrospectively to monitoring data for prior years. Some locations that previously met the $PM_{2.5}$ standard may exceed the level of the 2006 standard.

USEPA retained the existing 24-hour PM_{10} standard of 150 µg/m^3. However, due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the Agency revoked the annual PM_{10} standard.

The project is in an area that is currently designated as being in attainment of the $PM_{2.5}$ (15 µg/m^3 annual mean, 35 µg/m^3 24-hour average) standards. These standards were not exceeded at any of the study area monitoring stations during 2008.

3.6.2.1.2 Air Quality Index

The USEPA created the Air Quality Index (AQI) to enhance the public's understanding of air pollution across the nation. Previously known as the Pollutant Standards Index, this uniform air quality index is used by state and local agencies for reporting on daily air quality to the public. The AQI provides general information to the public about air quality and associated health effects. It provides information on pollutant concentrations for ground-level O_3, PM, CO, SO_X, and NO_X. The AQI is "normalized" across pollutants so that a value of 100 represents the level of health protection associated with the health-based standard for each pollutant and a value of 500 represents the significant harm level.

An AQI value between 0 and 50 is considered “good.” Air quality is considered satisfactory, and air pollution poses little or no risk. Values between 51 and 100 are considered “moderate.” Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to O_3 may experience respiratory symptoms. AQI values between 101 and 150 are considered “unhealthy for sensitive groups." This means they are likely to be affected at lower levels than the general public. For example, people with lung disease are at greater risk from exposure to O_3, while people with either lung disease or heart disease are at greater risk from exposure to particle pollution. The general public is not likely to be affected when the AQI is in this range. AQI values greater than 150 are considered “unhealthy.” This includes the AQI categories unhealthy, very unhealthy, and hazardous. In general, very few locations across the United States ever have days in the very unhealthy or hazardous categories.

There are three AQI monitoring stations in the SEHSR study area. AQI summaries for 2008 for these stations are presented in Table 3-9.

Table 3-9
2008 Air Quality Index Summary

County	Percent of Days			
	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy
Chesterfield County, VA	75%	22%	2%	1%
Franklin County, NC	78%	20%	2%	0%
Wake County, NC	66%	31%	2%	0%

Source: *USEPA /2008 AQI Reports*

3.6.2.2 Existing Ambient Pollutant Concentrations at Selected Sites

This section describes the existing ambient pollutant conditions at selected sites within the SEHSR corridor. Carbon monoxide was chosen for microscale assessment because it is a site-specific pollutant, with higher concentrations generally found adjacent to roadways. (In contrast, ozone, and its precursors NO_X and HC), are not site-specific; rather, they are of regional concern and, therefore, were not considered in the microscale analysis.) Additionally, a preliminary PM hot-spot screening analysis was performed.

3.6.2.2.1 Carbon Monoxide

Existing CO concentrations in the project area were obtained from the monitoring stations throughout the study area. Additionally, they were also obtained from locations near the study area when specific pollutants were not being monitored within the study area (for example, no CO monitors in Chesterfield County, only in the City of Richmond.)

In Virginia, the 1-hour and 8-hour ppm CO standards (35 and 9 ppm, respectively) were not exceeded in the project area for 2008. The highest recorded value at the City of Richmond, VA, station (none in Chesterfield County) was 1.3 and 1.0 ppm for the 1-hour and 8-hour standards, respectively.

In North Carolina, the 1-hour and 8-hour ppm CO standards (35 and 9 ppm, respectively) were not exceeded in the project area for 2008. The highest recorded value in Wake County, NC was 4.0 and 2.4 ppm for the 1-hour and 8-hour standards, respectively, at the Spring Road monitor station. The highest recorded value at the US 70/NC 50 station in Wake County was 3.5 and 2.2 ppm for the 1-hour and 8-hour standards, respectively.

Microscale CO concentrations are estimated and presented in Chapter 4 for the worst-case signalized intersections in Virginia and North Carolina where traffic will be routed as a result of the consolidation of existing at-grade rail crossings to grade separations (see Section 2.2.1.2 for more information). The location of these intersections was chosen based on the worst Level-of-Service (LOS). The LOS of an intersection is a qualitative measure of capacity and operating conditions and is directly related to vehicle delay. LOS is given a letter designation from A to F, with LOS A representing very short delays and LOS F representing very long delays. In the North Carolina portion of the project, the worst-case intersection is New Hope Church Road and Atlantic Avenue in Wake County (anticipated overall LOS F in the year 2030). In the Virginia portion of the project, the worst-case intersection is Centralia Road and Chester Road in Chesterfield County (anticipated overall LOS F in the year 2030).

Microscale CO concentrations were predicted with the USEPA approved CAL3QHC computer model for the peak 1-hour and 8-hour time periods, corresponding to the averaging periods of the NAAQS. Data inputs include composite vehicle emissions factors, traffic volumes, roadway geometry, traffic signal timing/phasing, background CO concentrations, and meteorological information. Background CO concentration estimates were obtained from the VDOT Air Quality Consultant Guide and NCDENR (VDOT, 2009; NCDENR, 2007).

3.6.2.2.2 Particulate Matter

Projects can initially be screened out and a conformity determination made if they do not fall within a $PM_{2.5}$ or PM_{10} nonattainment area or if they are exempt from regional transportation conformity according to 40 CFR93.126 or 93.128.

As mentioned above, the project is in an area that is currently designated as being in attainment of the PM standards. These standards were not exceeded at any of the

study area monitoring stations during 2008. Therefore, based on this information, no PM hot-spot analysis is required.

In Virginia, the 24-hour and annual mean standards (35 and 15 µg/m^3, respectively) were not exceeded in the project area during 2008. The highest recorded value in Chesterfield County, VA, was 22.8 and 11.4 µg/m^3 for the 24-hour and annual mean standards, respectively.

In North Carolina, the 24-hour and annual mean standards (35 and 15 µg/m^3, respectively) were not exceeded in the project area during 2008. The highest recorded criteria value in Wake County, NC, was 24.6 and 12.4 µg/m^3 for the 24-hour and annual mean standards, respectively, for the Spring Road monitor station. The highest recorded value at the Lake Wheeler Road station in Wake County was 22.7 and 12.38 µg/m^3 for the 24-hour and annual mean standards, respectively.

3.7 Noise and Vibration

This section describes the basic terminologies of noise and vibration used in this report. This information will provide background for the assessment procedures described in the later sections.

3.7.1 Noise Descriptors

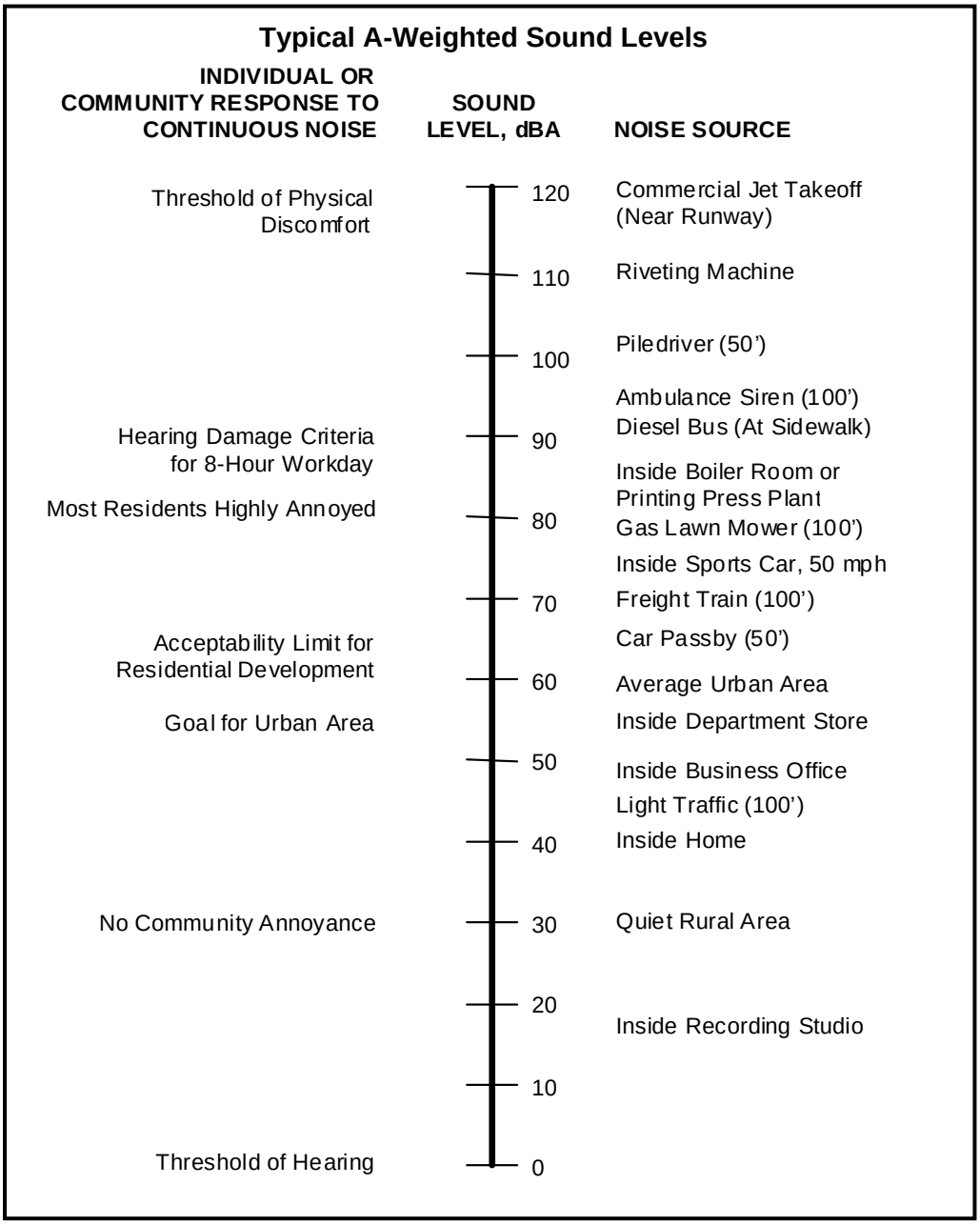
Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, or is otherwise annoying. Under certain conditions, noise may cause hearing loss, interfere with human activities, and in various ways may affect people's health and well-being.

The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in sound pressure amplitude. When describing sound and its effect on a human population, A-weighted (dBA) sound pressure levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Figure 3-4 illustrates typical A-weighted sound pressure levels for various noise sources.

Community noise levels usually change continuously during the day. The equivalent continuous A-weighted sound pressure level (L_{eq}) is normally used to describe community noise. The L_{eq} is the equivalent steady-state A-weighted sound pressure level that would contain the same acoustical energy as the time-varying A-weighted sound pressure level during the same time interval. The maximum sound pressure level (L_{max}) is the greatest instantaneous sound pressure level observed during a single noise measurement interval.

Another descriptor, the day-night average sound pressure level (L_{dn}), was developed to evaluate the total daily community noise environment. The L_{dn} is a 24-hour average sound pressure level with a 10-dB time-of-day weighting added to sound pressure levels that occur during the nine nighttime hours from 10:00 p.m. to 7:00 a.m. This nighttime 10-dB adjustment is an effort to account for the increased sensitivity to nighttime noise events. The Federal Railroad Administration (FRA) uses L_{dn} and L_{eq} to evaluate train noise impacts at the surrounding communities. (USDOT, 2005)

Figure 3-4



Source: Parsons

3.7.2 Vibration Descriptors

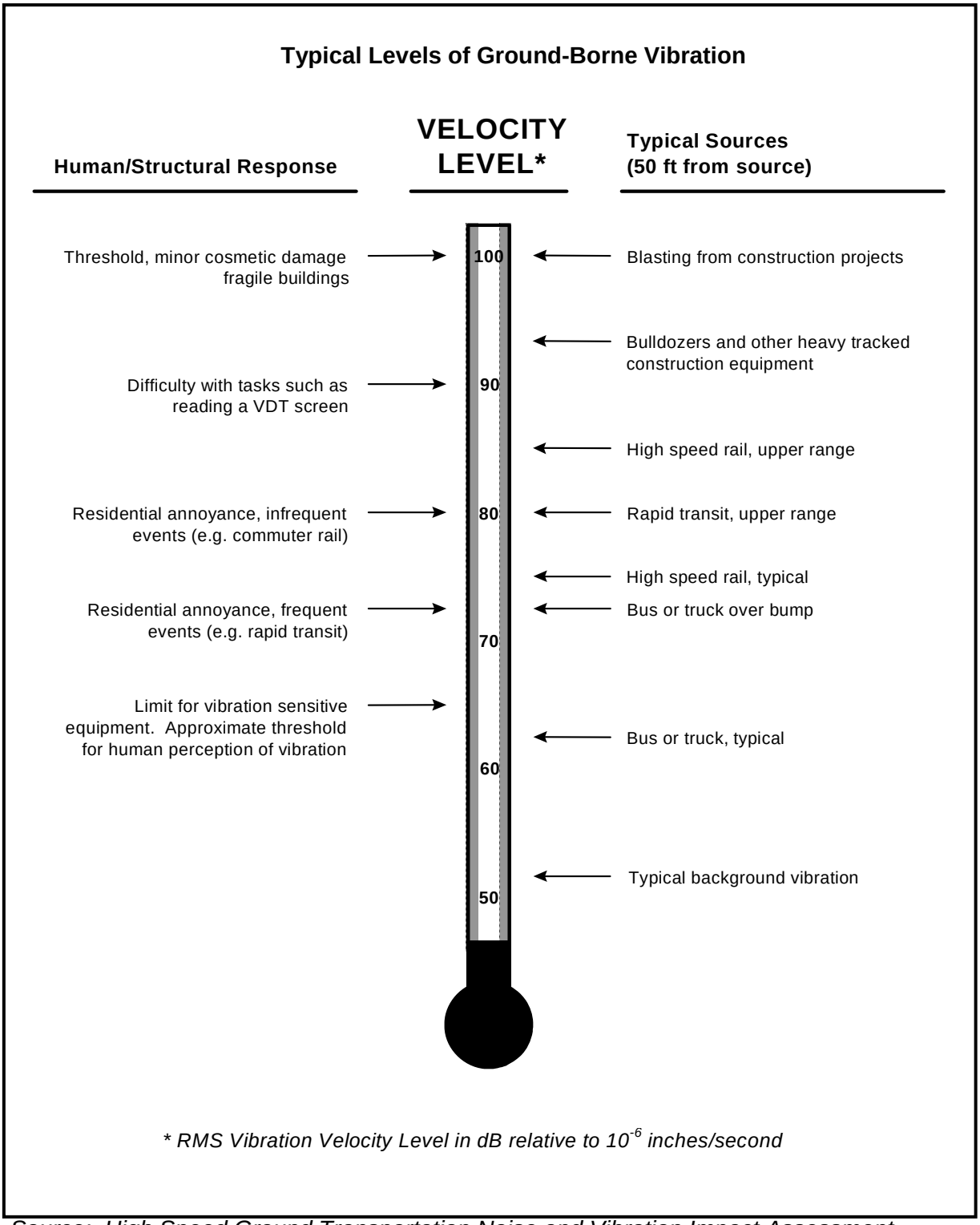
Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement, and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration. In this report, velocity will be used in describing ground-borne vibration.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is used to evaluate the potential for building damage. It is defined as the maximum instantaneous peak of the vibration signal. PPV is not considered the appropriate measurement for evaluating the human response to vibration. RMS is used to evaluate human response, since it takes some time for the human body to respond to vibration signals. The RMS of a signal is the average of the squared amplitude of the signal. For sources such as trucks or motor vehicles, PPV levels are typically 6 to 14 dB higher than RMS levels. FRA uses the abbreviation, "VdB", for vibration decibels to reduce the potential for confusion with sound decibel. (USDOT, 2005)

Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval.

Figure 3-5 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in Figure 3-5, the threshold of perception for human response is approximately 65 dB; however, human response to vibration is not usually significant unless the vibration exceeds 70 dB. Vibration tolerance limits for sensitive instruments such as MRI or electron microscopes could be much lower than the human vibration perception threshold.

Figure 3-5



Source: High Speed Ground Transportation Noise and Vibration Impact Assessment. U.S. DOT Federal Railroad Administration, 1988

3.7.3 Existing Setting

Sensitive receptors were selected by their proximity to the alignment and by land use. In general, the southern (between Henderson and Raleigh, NC) and northern (between Richmond and Petersburg, VA) portions of the project area have a higher concentration of commercial land use and residential development. The central portion (between Petersburg, VA, and Henderson, NC) is more rural, with a sizable number of residences being farmhouses. Throughout Virginia and North Carolina, there are a significant number of historic and archaeological sites. One of the final stages of the American Civil War took place in the area of the central portion of the corridor. The SEHSR corridor generally adheres to a late 1800's (post-Civil War) railroad alignment. For this reason, portions of the alignments are adjacent to historical and archaeological sites.

Aerial photos and site visits were used to identify the noise and vibration receptor sites evaluated in this study and to select representative sites to conduct background measurements throughout the corridor. Noise and vibration field measurements were conducted between September 13 and 16, 2004, and May 18 and 29, 2009.

3.7.4 Noise Measurements

Noise measurements were conducted using the following ANSI Type 1 instrumentation: Larson Davis (LD) Model 870 environmental noise monitors and LD Model 820 integrating sound level meters. The microphones used with these systems were LD Model 2559 and Bruel and Kjaer (B&K) Model 4134. All noise measurement systems were calibrated using LD Model CA250 acoustical calibrators. The instruments were calibrated and operated according to the manufacturer's specifications.

The purpose of measuring existing noise levels is to determine the appropriate impact criteria based on the FRA noise impact guidelines. A total of six long-term and ten short-term measurements were taken in 2004 and 17 long-term measurements were taken in 2009. Long-term measurement equipment was left overnight to record day-night levels (L_{dnm}, also known as DNL). Short-term measurements, 20 minutes in length, were used to determine L_{eq} at representative sites. The noise measurement sites with results are listed in Table 3-10 and the locations of the measurement sites are shown on Figure 3-6. The measured values were used to estimate existing noise levels at all other sensitive receptors along the alignment.

3.7.5 Vibration Measurements

Vibration measurements were conducted using a GeoSonic 3000EZplus portable seismograph. Vibration levels were measured on the vertical, transverse, and longitudinal axes, and the highest of the three was used for this analysis. The seismograph has an internal calibration sequence and was operated according to the manufacturer's specifications. Peak particle velocity vibrations (in inches per second) were recorded to assess potential building damage impacts based on FRA procedures and guidelines. When converting from peak particle velocity measurements into VdB a correction factor of -12 VdB was added to the passby measurements and a correction factor of -6 VdB was added to the background measurements.

A total of 18 vibration measurements were taken. The locations of the measurement sites with the background vibration measurements are listed in Table 3-11 and shown in Figure 3-6. Table 3-12 presents the results of the vibration measurements from train passbys.

Figure 3-6

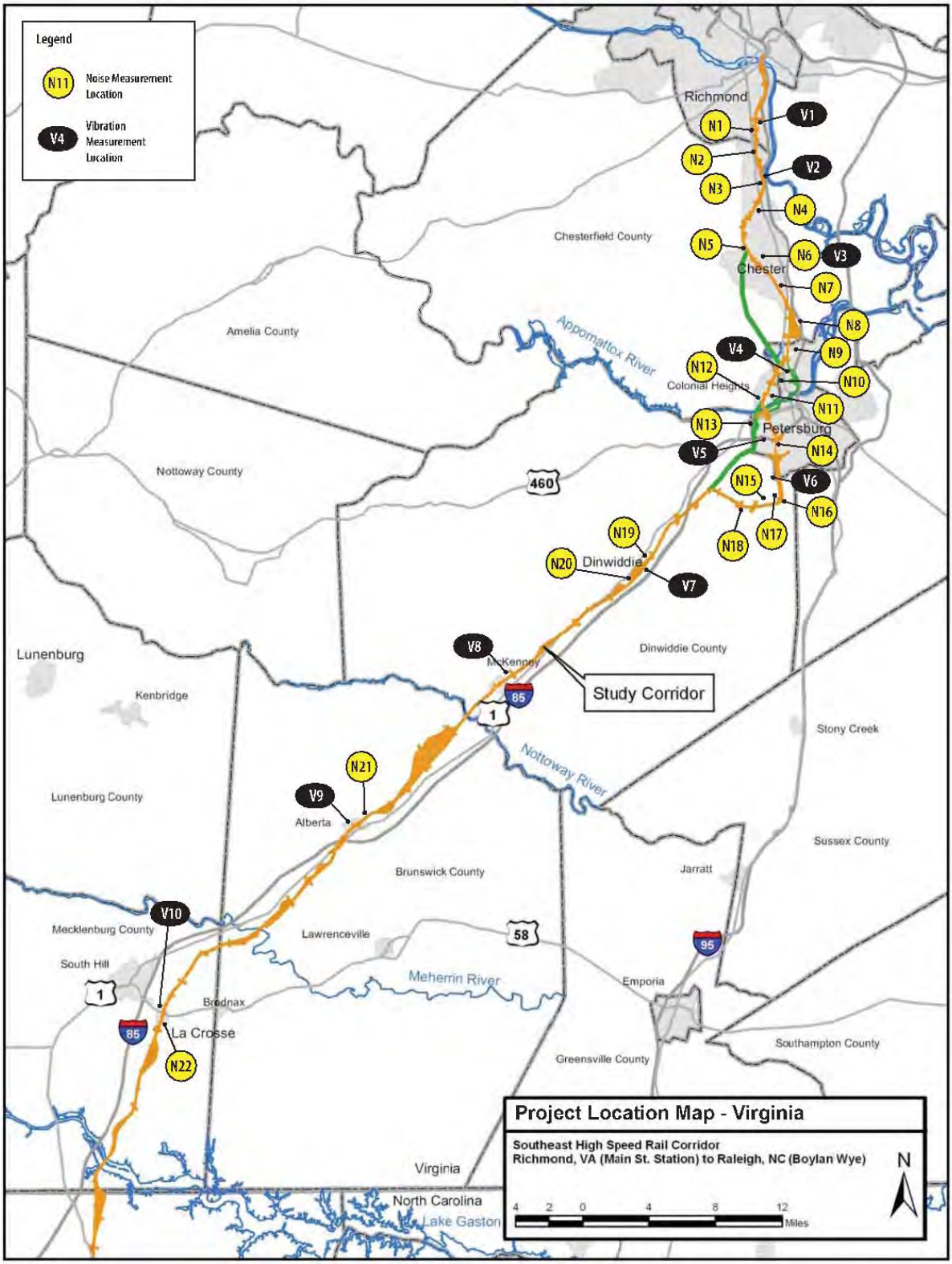

Legend
N11 Noise Measurement Location
V4 Vibration Measurement Location
Richmond
Chesterfield County
Chester
Amelia County
Appomattox River
Colonial Heights
Petersburg
Nottoway County
460
Dinwiddie
Dinwiddie County
Lunenburg
Kenbridge
McKenney
Study Corridor
Stony Creek
Nottoway River
Lunenburg County
Alberta
Sussex County
Brunswick County
Jarratt
Mecklenburg County
Lawrenceville
58
South Hill
Meherrin River
Emporia
Brodnax
La Crosse
Greensville County
Southampton County
Virginia
North Carolina
Lake Gaston
Project Location Map - Virginia
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
4 2 0 4 8 12
Miles

Figure 3-6 (continued)

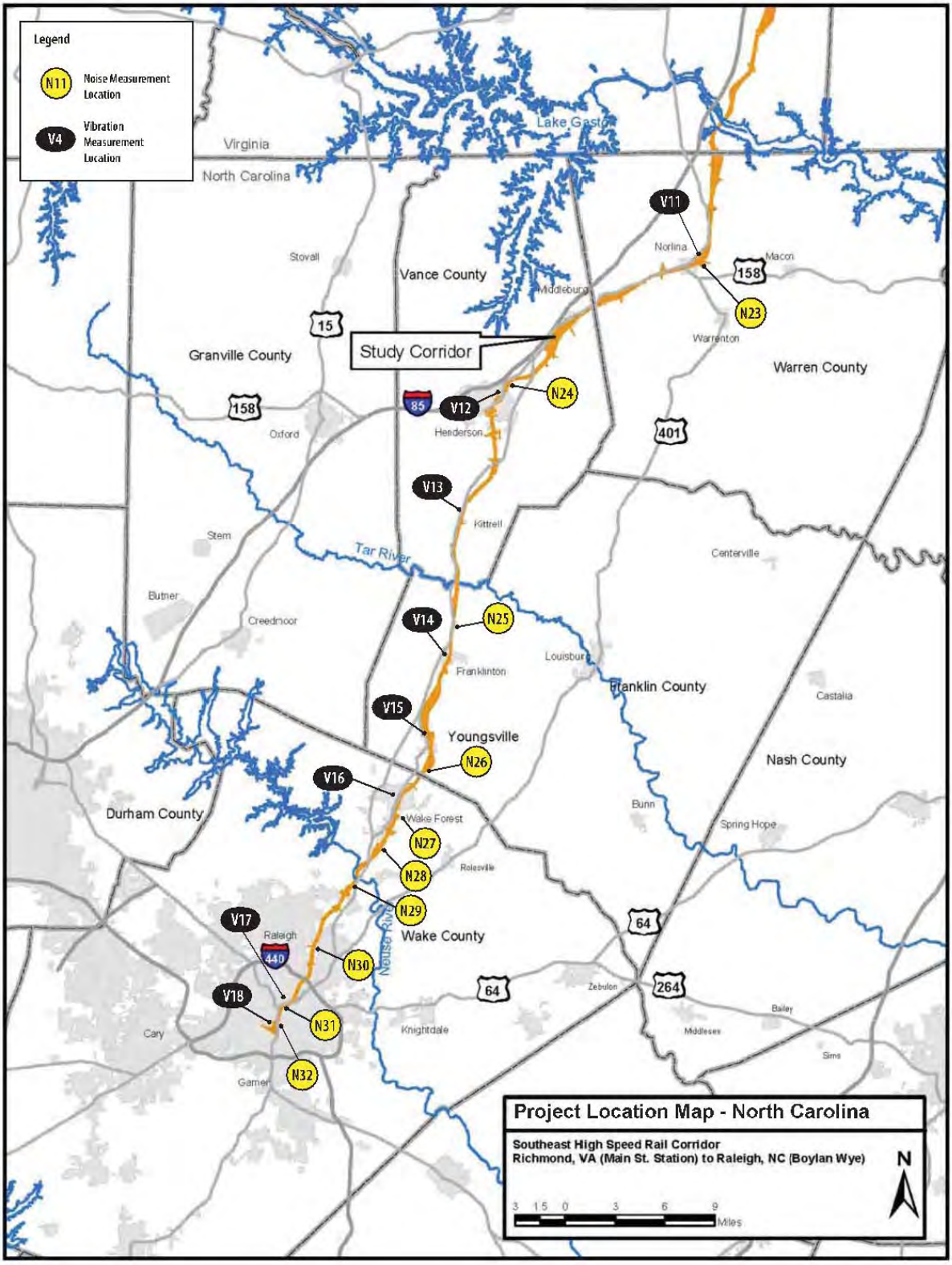


Table 3-10 Noise Measurement Sites								
Site No.	**Location**	**Location/Site Description**	**Type of Measurement**	**Date**	**Start Time**	**Duration**	**L_{eq}**	**L_{dn}[1]**
N-1	Richmond	3000 Krouse Street	Long Term	5/18/09	11:56 AM	24 hours	74	65
N-2	Richmond	3431 Keighly Street	Long Term	5/18/09	12:43 PM	24 hours	77	72
N-3	Richmond	2501 Alcott Street	Long Term	5/18/09	4:49 PM	24 hours	64	65
N-4	Chester	9025 Chester Road	Long Term	5/19/09	1:48 PM	24 hours	71	68
N-5	Chester	11435 Great Branch Drive	Long Term	5/19/09	4:57 PM	25 hours	68	72
N-6	Chester	11542 Chester Station Drive	Long Term	5/19/09	3:23 PM	24 hours	70	71
N-7	Chester	12818 Winfree Street	Long Term	5/20/09	2:00 PM	24 hours	69	72
N-8	Colonial Heights	16111 Happy Hill Road	Long Term	5/20/09	9:58 AM	24 hours	74	76
N-9	Colonial Heights	17010 Lansmill Drive	Long Term	5/20/09	4:44 PM	24 hours	81	79
N-10	Colonial Heights	31115 Farris Avenue	Long Term	5/26/09	3:49 PM	24 hours	61	63
N-11	Ettrick	20218 Loyal Avenue	Long Term	5/21/09	2:23 PM	24 hours	80	80
N-12	Ettrick	3923 River Road	Long Term	5/21/09	9:01 AM	25 hours	72	72
N-13	Petersburg	20914 Brick House Drive	Long Term	5/21/09	11:28 AM	26 hours	75	74
N-14	Petersburg	1742 Montgomery Avenue	Long Term	5/26/09	12:22 PM	27 hours	69	69
N-15	Petersburg	9313 Southwood Drive	Long Term	5/27/09	2:23 PM	33 hours	63	61
N-16	Petersburg	7706 Halifax Road	Long Term	5/27/09	1:45 PM	45 hours	60	59
N-17	Petersburg	Petersburg National Battlefield – Fort Wadsworth	Short Term	9/16/04	9:30 AM	20 minutes	52	-
N-18	Petersburg	Vaughan Road	Short Term	9/16/04	10:31 AM	20 minutes	50	-
N-19	Dinwiddie	State Highway 703	Short Term	9/16/04	11:30 AM	20 minutes	56	-
N-20	Dinwiddie	State Highway 656	Short Term	9/16/04	12:10 PM	20 minutes	49	-
N-21	Alberta	136 1st Avenue – Alberta Town Office	Long Term	9/16/04	4:46 PM	20.5 hours	50	47
N-22	La Crosse	La Crosse Town Office	Long Term	9/16/04	3:42 PM	23.0 hours	59	52
N-23	Norlina	202 Liberty Street	Short Term	9/15/04	1:45 PM	20 minutes	53	-
N-24	Henderson	574 Williams Street	Short Term	9/15/04	12:43 PM	20 minutes	57	-

Table 3-10 Noise Measurement Sites								
Site No.	**Location**	**Location/Site Description**	**Type of Measurement**	**Date**	**Start Time**	**Duration**	**L_{eq}**	**L_{dn}[1]**
N-25A	Franklinton	Cambridge Drive and U.S Route 1	Short Term	9/15/04	10:11 AM	20 minutes	62	-
N-25B	Franklinton	20 Misty Way	Long Term	5/27/09	8:54 AM	24 hours	64	55
N-26	Youngsville	123 Railroad Lane	Long Term	9/16/04	3:32 PM	18.0 hours	64	57
N-27	Wake Forest	332 Railroad Lane	Short Term	9/15/04	8:49 AM	20 minutes	59	-
N-28	Wake Forest	2705 Steeple Run Drive (Smith Creek)	Long Term	9/16/04	5:02 PM	18.1 hours	61	56
N-29	Raleigh	8401 Hobhouse Circle (Windsor Forest)	Short Term	9/14/04	11:51 AM	20 minutes	47	-
N-30	Raleigh	Devonshire Apartments	Long Term	9/15/04	4:40 PM	16.8 hours	57	54
N-31	Raleigh	327 Mulberry	Long Term	9/15/04	1:57 PM	20.2 hours	59	56
N-32	Raleigh	620 West Hargett Street	Short Term	9/14/04	9:42 AM	20 minutes	62	-

Note:
1. L_{dn} for long-term measurements only

Table 3-11 Vibration Sensitive Receptor Sites with Background Vibration Measurements										
Site No.	**Site Description/Location**	**Side of Alignment**	**Land Use[1]**	**Date**	**Time**	**Distance to Near Track Centerline, feet**	**Max RMS Velocity Level, VdB**	**PPV in/sec**		
								Long	**Vert**	**Trans**
V-1	3021 Commerce Rd., Richmond, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 4-3						
V-2	FTY Group Warehouse, Richmond, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 4-3						
V-3	11542 Chester Station Dr., Chester, VA	East	SFR	Existing Train Passby Vibration Measurement – See Table 4-3						
V-4	2801 Boulevard, Colonial Heights, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 4-3						

Table 3-11 Vibration Sensitive Receptor Sites with Background Vibration Measurements										
Site No.	**Site Description/Location**	**Side of Alignment**	**Land Use[1]**	**Date**	**Time**	**Distance to Near Track Centerline, feet**	**Max RMS Velocity Level, VdB**	**PPV in/sec**		
								Long	**Vert**	**Trans**
V-5	1510 W Washington St Petersburg, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 4-3						
V-6	Civil War Earthworks, (Petersburg National Battlefield), Petersburg, VA	East	HST	9/16/04	11:21 AM	600	68	0.005	0.005	0.005
V-7	B.T. Hargrave Hardware Store, Dinwiddie, VA	West	HST	9/16/04	12:16 PM	37	72	0.005	0.008	0.008
V-8	20714 First St (TrueValue Hardware Store), McKenney, VA	East	COM	9/15/04	4:30 PM	180	68	0.005	0.005	0.005
V-9	194 Connelly St. (Trinity St. Mark Episcopal Church), Alberta, VA	West	Church	9/15/04	3:06 PM	222	68	0.005	0.005	0.005
V-10	1950 Carter Rd. (La Crosse Baptist Church), La Crosse, VA	East	Church	9/15/04	2:37 PM	122	68	0.005	0.005	0.005
V-11	Junction Park (Junction Park Museum), Norlina, NC	West	HST	9/15/04	12:11 PM	67	74	0.010	0.008	0.01
V-12	611 North Garnett Rd. (The Rock of Reach Ministry Church), Henderson, NC	West	Church	9/15/04	10:29 AM	95	72	0.008	0.008	0.008
V-13	Confederate Graveyard, Kittrell, NC	East	HST	9/16/04	3:30 PM	102	68	0.005	0.005	0.005
V-14	Franklin Commerce Center, Franklin, NC.	East	HST	Existing Train Passby Vibration Measurement – See Table 4-3						
V-15	204 Railroad St. Youngsville Cabinet Company, Youngsville, NC	East	COM	9/14/04	3:07 PM	75	68	0.005	0.005	0.005
V-16	237 Friendship Chapel Rd. (Friendship Chapel Baptist Church), Wake Forrest, NC	East	Church	9/14/04	1:30 PM	57	68	0.005	0.005	0.005
V-17	Amtrak Station, Raleigh, NC	South	COM	Existing Train Passby Vibration Measurement – See Table 4-3						

Table 3-11 Vibration Sensitive Receptor Sites with Background Vibration Measurements										
Site No.	**Site Description/Location**	**Side of Alignment**	**Land Use[1]**	**Date**	**Time**	**Distance to Near Track Centerline, feet**	**Max RMS Velocity Level, VdB**	**PPV in/sec**		
								Long	**Vert**	**Trans**
V-18	1101 Haynes St. (Pilot Mill), Raleigh, NC	East	HST	Existing Train Passby Vibration Measurement – See Table 4-3						

Note:
1. SFR = Single Family Residences; COM = Commercial Property; HST = Historic Site.

Table 3-12 Existing Train Passby Vibration Measurements						
Site No.	**Location**	**Date**	**Time**	**Distance to Near Track Centerline, feet**	**Max RMS Velocity Level, VdB**	**PPV[1], in/sec**
V-1	3021 Commerce Rd., Richmond, VA	5/19/09	10:53 AM	51	85	0.068
V-2	FTY Group Warehouse, Richmond, VA	5/20/09	1:57 PM	55	74	0.020
V-3	11542 Chester Station Dr., Chester, VA	5/21/09	3:20 PM	118	78	0.030
V-4	2801 Boulevard, Colonial Heights, VA	5/22/09	12:04 PM	85	79	0.035
V-5	1510 W Washington St Petersburg, VA	5/27/09	11:38 AM	63	82	0.048
V-14	Franklin Commerce Center, Franklin, NC	9/14/04	5:04 PM	98	74	0.020
V-17	Amtrak Station, Raleigh, NC	9/13/04	5:56 PM	30	87	0.090
V-18	1101 Haynes St. (Pilot Mill), Raleigh, NC[2]	9/14/04	11:19 AM	37	73	0.018

Notes:
1. The PPV is the highest measured peak particle velocity from all passby events at a particular location.
2. Train passby measurement was taken at a train exchange yard with the engine moving at low speeds.

3.8 Energy

Rising energy consumption and cost are pushing a national interest in achieving energy independence for our country. Because transportation accounts for a high percentage of the United States' energy consumption, transportation choices are key elements in national energy conservation strategies. The SEHSR Tier I EIS established the benefits of the SEHSR project in terms of energy savings. Rail travel consumes less energy per passenger mile than the other primary modes of intercity transportation such as airplanes, cars, and personal trucks. In 2006, the energy use per passenger mile was 2,650 British thermal units (Btu) for intercity rail, compared to 3,261 Btu for airplanes, 3,512 Btu for cars, and 3,944 Btu for personal trucks (USDOE, 2008).

3.9 Visual Environment

The visual environment is a critical element in people's daily experience and is often a defining factor of their quality of life. Major transportation projects and facilities can affect the visual environment in many ways and to varying degrees. Impacts can range from aesthetic enhancements to an area, such as landscaping and stream restoration to detrimental impacts such as impaired vistas of open space, natural features or local landmarks.

The visual environment of the SEHSR study corridor ranges from undeveloped natural areas and small towns to large-scale industrial development and vibrant urban districts. A portion of the study corridor contains active freight and passenger rail service, while part of the study corridor follows an inactive rail corridor.

3.9.1 Virginia

3.9.1.1 City of Richmond

Throughout Richmond, VA, the study corridor follows the active CSX S-line railroad; Amtrak also operates passenger service along these tracks. The northern terminus of the study corridor is the historic Main Street Station, built in 1901. The station building has been restored and its architecture is visually striking, making it one of the most visually distinctive landmarks within the study corridor.

The area surrounding the station consists of elevated highway and rail structures, the James River floodwall, industrial land uses, and the Shockoe Bottom area – an industrial area evolving into an entertainment district with residential lofts and apartments in converted warehouses.

The corridor follows the CSX S-line across the James River, which is listed on the National Rivers Inventory; a listing of free-flowing river segments possessing one or more "outstandingly remarkable" natural or cultural values of national significance. The segment of the James River within Richmond is listed as both "Historic" and "Recreational."

Below the James River, much of the study corridor includes large-scale industrial facilities, including above-ground storage tanks. The study corridor includes stretches of I-95 before turning southwest, where it runs between highways US 1 and I-95 through more industrialized areas.

3.9.1.2 Chesterfield County

Within Chesterfield County, the study corridor continues through industrial land uses as the active CSX S-line runs south between US 1 and I-95. At Bellwood, the study corridor passes the Defense Supply Center to the west, which includes a small forested elk refuge. The study corridor then turns to the southwest where the railroad passes under US 1. The study corridor includes the parallel Chester Road for a short distance before crossing highway 288 then joins the CSX A-line railroad at Centralia, VA. From Centralia, the corridor curves to the southeast and passes through the community of Chester, VA. At this point, adjacent land uses are the original "downtown" core area of Chester, which developed around Chester Station, a 19th century rail stop. As the study corridor continues to the southeast, it begins to traverse suburban and rural-transitioning-to-suburban areas. The study corridor continues to follow the CSX A-line railroad as it crosses over US 1, Jefferson Davis Highway and then turns south, moving through industrial areas.

3.9.1.3 City of Colonial Heights

Approaching Colonial Heights, VA, land uses within the study corridor become more suburban in nature, and include fragmented woodlands, before transitioning to industrial use just north of Ellerslie Avenue, in the area of Dunlop, VA. At Dunlop, the study corridor begins to follow the active CSX A-line in a southwesterly direction through wooded and suburban areas. The study corridor crosses US 1, and then the alignment of an abandoned section of the CSX S-line before reaching Ettrick Station. Ettrick Station is a one story brick building constructed in 1955; it is currently in use by Amtrak for passenger rail service to the Petersburg area. The study corridor continues southward, passing just to the west of the Virginia State University campus and its associated land uses, then curves to the southeast, passing by the University's agricultural research fields before crossing the Appomattox River into Petersburg, VA.

3.9.1.4 City of Petersburg

In Petersburg, VA as the study corridor continues south along the CSX A-line the surrounding land use becomes mostly industrial, transitioning to suburban residential, before crossing I-85.

South of I-85, the study corridor parallels or includes Halifax Road through an area of large-scale industrial properties and woodlands. Fort Wadsworth, a Civil War era Union fort, was built on the site of the Battle of the Weldon Railroad and is visible as a series of earthen embankments. The corridor crosses Halifax Road, which is on a bridge over the railroad, then an active east-west NS freight rail line, before entering CSX's Collier Yard and Dinwiddie County.

3.9.1.5 Dinwiddie County

In Dinwiddie County, at the southern end of Collier Yard, the study corridor briefly shifts orientation from north-south to east-west along CSX's inactive Burgess Connector rail corridor. Upon entering the county, the visual environment also shifts from urban industrial to rural agricultural. The area around Burgess, VA, is primarily scattered residential development and woodlands. Near Burgess, the study corridor begins to follow the

existing but inactive CSX S-line ROW. Along this segment of the study corridor, the surrounding land uses are a mix of agriculture and rural residential development. There are several important Civil War battlefields associated with the Siege of Petersburg found throughout this area of Dinwiddie County.

Between Burgess and the community of Dinwiddie, VA, the study corridor crosses I-85 and contains views of the commercial corridor along one side and farmlands along the other. Near the community of Dinwiddie until it crosses under US 1, the study corridor is heavily wooded and the rail ROW is generally at a lower grade than nearby residential and commercial development.

Between Dinwiddie and McKenney, VA, a rural landscape with scattered residential development predominates. Within McKenney, the study corridor passes a few commercial and industrial structures, a school, and a few residential areas, then returns to a mostly rural environment before crossing the Nottoway River into Brunswick County. The Nottoway River is listed on the National Rivers Inventory as "Wild," meaning the river corridor and surrounding watershed area largely undeveloped.

3.9.1.6 Brunswick County

In Brunswick County, the study corridor passes through mostly forests and farms, along with small rural communities such as Rawlings, Kress and Warfield.

Midway through the county, the study corridor passes through the town of Alberta, VA, and crosses an inactive NS rail corridor, close to the town core. At the time of this document many of the commercial buildings are vacant and houses exist in varying states of maintenance, however the town has received substantial federal funding for downtown revitalization efforts.

South of Alberta, the study corridor crosses both I-85 and US 1, moving through more woodlands then crosses the Meherrin River in the location of the existing railroad bridge. The Meherrin River is also listed on the National Rivers Inventory as "Wild," meaning the river corridor and surrounding watershed area largely undeveloped.

3.9.1.7 Mecklenburg County

Within the northern part of the county, the study corridor passes through mostly forested areas with some farmlands and occasional residential development. Near the Forksville community, the study corridor is close to some residential areas, before curving to the south, and the rail ROW remains at a distance from Country Club Road until a few miles north of La Crosse, VA. Most of this area is wooded or agricultural.

As the study corridor nears La Crosse, the rail ROW moves closer to Country Club Road. The South Hill Country Club golf course, which is located west of the road, and residential development along the road become more visible. The study corridor runs through the middle of the town center so the visual environment is that of a small town, mostly residential but with a small amount of commercial, institutional and industrial development present.

Within the southern part of the county, the study corridor passes through mostly forested areas and some agricultural lands. Through the Marengo, VA, community, the rail ROW runs parallel with Marengo Road. This area contains several obsolete and abandoned houses. Near Bracey, VA, the study corridor passes by commercial and trucking operations along VA 903. As the study corridor approaches the Lake Gaston area, it passes between lake-oriented subdivisions, a golf course and a wastewater treatment facility.

The study corridor then crosses the Roanoke River/Lake Gaston along the existing railroad bridge, and includes views of the lake, dispersed shoreline residential development and the I-85 highway bridges. After crossing the lake, the study corridor curves southeast where it crosses and then follows Paschall Road.

3.9.2 North Carolina

3.9.2.1 Warren County

At the North Carolina border, the surrounding area is largely agricultural as the study corridor widens to accommodate an alternative that avoids the Granite Hall historic property, and straightens a curve in the inactive CSX S-line ROW. Moving southward into the community of Wise, NC, the corridor narrows, and again follows the S-line ROW through agricultural lands mixed woodlands and scattered residential development; the rail ROW then begins to parallel US 1 into Norlina, NC.

Within Norlina's town core, the CSX S-line becomes an active railroad, and turns westward. Norlina is an old railroad town; therefore, views are of older, often rail-oriented buildings in a small town setting.

After leaving Norlina, the study corridor continues to follow the CSX S-line as it runs in close proximity to US 1 through the Ridgeway and Manson communities, passing through agricultural areas, wooded areas and scattered residential and small-scale commercial and industrial development.

3.9.2.2 Vance County

Within Vance County, the visual environment remains mostly agricultural lands and forests until the study corridor approaches Middleburg. The corridor widens through Middleburg to accommodate an alternative that avoids the Holloway Farm historic property, and alternatives that improve train performance by straightening curves in the S-line. Through Middleburg, the corridor includes mostly commercial and some industrial uses. As the study corridor approaches the town of Henderson, NC, it moves through an industrial area before crossing US 1 and heading west into Henderson.

Within Henderson, the study corridor curves west and southwest, and the active CSX S-line begins to parallel North Garnett Street, which serves as the main street for downtown Henderson (despite another road named Main Street). The visual environment in this area is that of a small city downtown; although for the most part the view is of the rear facades of downtown. Near Chevasse Avenue, the CSX S-line curves to the south where it runs roughly parallel with Old Raleigh Road/US 1 Business. Much of this area has heavy commercial and industrial uses, along with some older neighborhoods. This pattern

continues well outside of Henderson until the corridor intersects US 1. South of this point the CSX S-line runs parallel with US 1 through areas that are agricultural or wooded, with some scattered residential development, and into the town of Kittrell, NC.

Kittrell is a small, older community with several houses and churches adjacent to the railroad, including a Civil War era graveyard containing both soldiers and slaves. Leaving Kittrell, the visual environment of Southern Vance County is mostly rural with woods, fields, and occasional residences. The study corridor then crosses the Tar River along the CSX S-line railroad bridge, and into Franklin County. The Tar River is listed on the National Rivers Inventory; and in Vance County, the Tar River is listed as "Wild."

3.9.2.3 Franklin County

South of the Tar River, the study corridor widens to accommodate an alternative that avoids the Person-McGhee Farm historic property. This northern part of Franklin County is currently a mostly rural visual environment. In some places, large tracts are being cleared, both for agricultural lands and pre-development. Franklin County is transitioning from a predominately rural area to a bedroom community for employment centers in the Triangle. Through the northern part of the county, the CSX S-line parallels US 1 into Franklinton, NC. North of Franklinton, new subdivisions are visible east of the study corridor.

Franklinton is an old railroad town, and the CSX S-line passes through the town core, so views are of older buildings in a small town setting of grid streets, small yards and large canopy trees. South of town, the study corridor moves away from US 1 through mostly wooded areas.

North of Youngsville, NC, the corridor passes through an area that is mostly rural in nature with scattered residential development. The corridor then passes through the Youngsville Industrial Park on the north end of the town, then through the Youngsville town core. The dominant views are of industrial areas to the west and wooded areas to the east, in addition to aging core and residential areas.

South of Youngsville the study corridor is largely wooded, interspersed with industrial and residential development.

3.9.2.4 Wake County

As the study corridor crosses into Wake County it approaches the town of Wake Forest, NC. In this rapidly suburbanizing area, the current views north of town include some commercial and residential development interspersed with woodlands and agricultural lands. Shortly before crossing Chestnut Street, the study corridor enters the town proper. Here the active CSX S-line ROW abuts White Street to the east, as it passes through established neighborhoods and then runs immediately behind the commercial buildings of the town core. This core area and several nearby neighborhoods are listed on the National Register of Historic Places. On the south side of town, the CSX S-line moves away from White Street and begins running parallel with US 1-A. Much of this area consists of commercial uses with some wooded areas and open lands along with occasional clusters of housing.

South of Wake Forest, the study corridor passes through an area of subdivisions and shopping centers. After crossing Friendship Chapel Road, the CSX S-line moves away from the US 1-A corridor so that the predominant views are of wooded areas, along with the backs of subdivisions and occasional commercial developments. After passing Ligon Mill Road, the study corridor crosses US 1 and its commercial and industrial development. The study corridor then curves almost due south, passing between commercial development to the east and wooded areas to the west before crossing the Neuse River.

South of the Neuse River, the study corridor passes between a landfill and a chemical operation's tanks and lagoons. As it crosses Durant Road, the study corridor enters the city of Raleigh, NC, passing through subdivisions, commercial land uses, and the former Cheviot Hills golf course. As it approaches I-540, the study corridor passes through a heavy industrial area and by Gresham Lake. After crossing I-540, the study corridor curves south and passes through several miles of industrial and heavy commercial areas, eventually crossing the I-440 beltline.

Inside of the I-440 beltline, the industrial and heavy commercial development pattern continues. Shortly after passing over Whitaker Mill Road, the active CSX S-line passes over Capital Boulevard. At this point, the study corridor widens to include both the CSX S-line, on the east side of Capital Boulevard; and the Norfolk Southern NS-line on the west side of Capital Boulevard. The CSX S-line runs parallel with the highway along a ridge behind the commercial development along Capital Boulevard. The historic Mordecai neighborhood sits adjacent to the tracks along the east side, as does the historic Pilot Mill buildings and surrounding new urbanist Pilot Mill Village. On the west side of Capital Boulevard, the NS-line enters Glenwood Yard, the NS rail yard, which is bordered by residential and commercial development. The study corridor then curves south as it passes through the CSX rail yard and the redeveloping Seaboard district, where old industrial buildings have been converted to commercial uses. The corridor then crosses Peace Street as it enters downtown Raleigh.

The initial view is of the state government office complex with the downtown Raleigh skyline in the background, although immediately adjacent to the study corridor are parking garages. The study corridor then passes through what is currently a mixed light industrial, commercial and back office district that is transitioning towards office, entertainment and housing. On the west side of the corridor, is the developing Glenwood South entertainment district; through this length of the corridor, the NS-line is at a higher grade, and crosses the downtown streets on bridges. The two rail lines meet at Jones Street, where the study corridor includes the Powerhouse Square entertainment district, a redeveloped former industrial area. Due to substantial grade changes, the rail line moves along a recessed corridor behind the adjacent commercial development, passing under Hillsborough and Morgan Streets. At this point, the study corridor enters the Boylan Wye area, where this project terminates. The immediate view to the east is of older brick buildings within the Warehouse District (another industrial area transitioning towards entertainment and office uses) with the Raleigh skyline behind. The view to the south is of the Amtrak station with the Boylan Heights National Register District on the hill behind. The view to the west is of an older neighborhood, the Boylan Avenue bridge and both NS and North Carolina Railroad (NCRR) rail corridors.

3.10 Biological Resources

The SESHR study area passes through several natural communities of associated plants and animals. These natural communities are defined by their dominant flora and fauna and how these biotic components relate to their environment. A brief discussion of natural communities in the project area is provided in Section 3.10.1.

Throughout the US, there are populations of flora and fauna declining either as a result of natural forces or human impacts on the environment. Some of these declining species are protected under Section 7 of the Endangered Species Act (ESA) of 1973. North Carolina and Virginia have also established endangered species lists. Threatened and endangered species listed for each city and county in the SEHSR project study area are described in Section 3.10.2.

3.10.1 Natural Communities

Natural communities provide habitat for a variety of mammals, birds, reptiles, and amphibians. Generally, the most commonly found plants are used to classify natural communities. There are both terrestrial and aquatic natural communities in the project study area. The terrestrial communities include mixed forest, pine forest, and maintained/disturbed systems. Wetlands, man-made and beaver ponds, streams, and river floodplains comprise the aquatic communities in the project study area.

3.10.1.1 Terrestrial Communities

Terrestrial communities in the project study area include natural and manmade systems that are characterized as mixed forest, pine forest, and maintained/disturbed systems. Naturally forested uplands are located upslope of the forested wetland and floodplain systems. Forested wetland and floodplain systems typically associated with the mixed forest and pine forest systems are described in the Aquatic Communities (Section 3.10.1.2).

Biologists inventoried terrestrial communities in the project study area. Field observations and additional research were compiled to assess areas of each system type in the study area. This assessment is included in the SEHSR NRTR (NCDOT and VA DRPT, 2004a, 2008).

Maintained/disturbed communities account for about 45 percent of the terrestrial study area. This community includes habitats that have recently been or are currently impacted by human disturbance, such as residential lawns, maintained roadside and railroad ROW, agricultural fields, and utility line easements.

Mixed forests account for about 32 percent of the terrestrial study area. In general, mixed forest systems are typically found adjacent to agricultural fields and residential development and consist of a variety of hardwood species.

Pine forest systems are located in fragmented areas throughout the study area and comprise 23 percent of the total land area. Loblolly pine (*Pinus taeda*) is the dominant plant species in this system. The fragmented nature of this community is likely due to past hardwood timbering activities.

Table 3-13 provides a list of representative terrestrial community flora and fauna species that may be found in the project study area. Table 3-14 summarizes the acreage of terrestrial communities for localities in the project study area.

Table 3-13
Terrestrial Community Representative Flora & Fauna

Common Name	Scientific Name	Terrestrial Community System		
		Mixed Forest	Pine Forest	Maintained /Disturbed
Flora				
American beech	*Fagus grandifolia*	●	●	●
black gum	*Nyssa sylvatica*	●	●	
black oak	*Quercus velutina*	●	●	
highbush blueberry	*Vaccinium corymbosum*	●	●	●
loblolly pine	*Pinus taeda*	●	●	●
netted chain fern	*Woddwardia areolata*	●	●	
northern red oak	*Quercus rubra*	●	●	
red maple	*Acer rubrum*	●	●	●
royal fern	*Osmunda regalis*	●	●	
shag bark hickory	*Carya ovata*	●	●	●
southern red oak	*Quercus falcata*	●	●	●
sweetgum	*Liquidambar styraciflua*	●	●	●
sycamore	*Platanus occidentalis*	●		●
tulip poplar	*Liriodendron tulipifera*	●	●	●
Virginia chain fern	*Woodwardia virginica*	●		
white oak	*Quercus alba*	●	●	●
Fauna				
American toad	*Bufo americanus*	●	●	
box turtle	*Terrapene carolina*	●	●	
Carolina chickadee	*Poecile carolinensis*	●	●	●
eastern cottontail	*Sylvilagus floridanus*	●	●	●
eastern garter snake	*Thamnophis sirtalis*	●	●	●
northern cardinal	*Cardinalis cardinalis*	●	●	●
rat snake	*Elaphe obsoleta*	●	●	●
whitetail deer	*Odocoileus virginianus*	●	●	●
wild turkey	*Meleagris gallopavo*	●	●	●

Source: NCDOT and VA DRPT, 2004a, 2008

Table 3-14
Terrestrial Communities Summary

Location	State	Mixed Forest (Acres)	Pine Forest (Acres)	Maintained/Disturbed (Acres)
Richmond	VA	45.13	0.00	683.67
Chesterfield	VA	542.56	81.08	1,855.94

Table 3-14 Terrestrial Communities Summary				
Colonial Heights	VA	37.38	1.64	406.49
Petersburg	VA	161.71	40.41	620.07
Dinwiddie	VA	1,667.25	744.08	918.27
Brunswick	VA	3,880.58	658.26	1,142.29
Mecklenburg	VA	1,057.23	531.82	1,326.26
Warren	NC	885.66	299.68	1,763.79
Vance	NC	418.56	80.30	2,611.48
Franklin	NC	1,039.36	217.17	1,042.34
Wake	NC	346.55	184.36	2,180.16

Source: NCDOT and VA DRPT, 2004a, 2008

3.10.1.2 Aquatic Communities

The aquatic communities in the project study area include wetlands, man-made and beaver ponds, streams, and river floodplains. These aquatic communities may provide habitat cover and breeding opportunities for fish, aquatic organisms, amphibians, birds, reptiles, and mammals. In addition, these aquatic communities may provide food sources for terrestrial fauna. Aquatic communities also remove nutrients from the water, buffering adverse effects of upstream impacts to downstream water quality.

As described in Section 3.1.1, there are 326 waterbodies including streams, unnamed tributaries, and man-made and beaver ponds within the study area (226 in Virginia and 100 in North Carolina). Streams throughout the project study area range from headwater tributaries with undefined braided channels to streams with well defined moderate, moderately sloping, or steep side slopes. A more detailed description of waterbodies within the project study area is provided in the SEHSR NRTR (NCDOT and VA DRPT, 2004a, 2008).

As described in Section 3.1.2, wetland systems can be divided into four general palustrine categories: PFO, PSS, PEM, and PUB. Wetland systems are typically located along the streams and include a combination of headwater forest, seeps, freshwater emergent marsh, and bottomland depressions. These well-saturated forested wetlands exist along small headwater stream bottoms and seeping toe-slopes and are characterized by braided channels. Wetland systems within the project study area are closely associated with floodplain systems. Wetland and floodplain systems are located down slope of terrestrial communities and have production export functions as a result of organic litter development from high densities of vegetation. A more detailed description of wetland and floodplain systems within the project study area is provided in the SEHSR NRTR. Table 3-15 provides a list of representative aquatic community flora and fauna species that may be found in the project study area.

Table 3-15 Aquatic Community Representative Flora & Fauna								
Common Name	Scientific Name	Aquatic Community System						
		Wetlands				Flood-plain	Stream	Man-Made & Beaver Pond
		PFO	PSS	PEM	PUB			
Flora								
American beech	*Fagus grandifolia*	●				●		
black gum	*Nyssa sylvatica*	●				●		
highbush blueberry	*Vaccinium corymbosum*	●	●	●		●		
loblolly pine	*Pinus taeda*	●	●	●		●		
netted chain fern	*Woddwardia areolata*	●	●	●		●		
northern red oak	*Quercus rubra*	●				●		
possom-haw	*Viburnum nudum var. nudum*	●	●	●		●		
red maple	*Acer rubrum*	●	●	●		●		
river birch	*Betula nigra*	●	●			●		
royal fern	*Osmunda regalis*	●	●	●		●		
shag bark hickory	*Carya ovata*	●				●		
smooth alder	*Alnus serrulata*	●	●	●		●		
southern red oak	*Quercus falcata*	●	●	●		●		
sweetgum	*Liquidambar styraciflua*	●	●	●		●		
sycamore	*Platanus occidentalis*	●	●	●		●		
tulip poplar	*Liriodendron tulipifera*	●	●	●		●		
Virginia chain fern	*Woodwardia virginica*	●	●	●		●		
white oak	*Quercus alba*	●	●	●		●		
Fauna								
American toad	*Bufo americanus*	●	●		●	●	●	●
bluegill	*Leponis macrochirus*				●		●	●
box turtle	*Terrapene carolina*	●	●		●	●		●
Carolina	*Poecile*	●	●	●				

Table 3-15 Aquatic Community Representative Flora & Fauna								
Common Name	Scientific Name	Aquatic Community System						
		Wetlands				Flood-plain	Stream	Man-Made & Beaver Pond
		PFO	PSS	PEM	PUB			
chickadee	*carolinensis*							
common carp	*Cyprinus carpio*				●		●	●
eastern cottontail	*Sylvilagus floridanus*	●	●	●		●		
eastern garter snake	*Thamnophis sirtalis*	●	●	●		●		
green frog	*Rana clamitans*	●	●	●	●	●	●	●
mallard	*Anas platyrhynchos*				●			●
mud salamander	*Pseudotriton montanus*	●	●	●	●	●	●	●
northern cardinal	*Cardinalis cardinalis*	●	●					
rat snake	*Elaphe obsoleta*	●	●	●				
snapping turtle	*Chelydra serpentina*				●			●
swamp darter	*Etheostoma fusiforme*				●		●	●
two lined salamander	*Eurycea bislineta*				●		●	●
whitetail deer	*Odocoileus virginianus*	●	●	●				
wild turkey	*Meleagris gallopavo*	●	●					
wood duck	*Aix sponsa*				●			●

Source: NCDOT and VA DRPT, 2004a, 2008

3.10.2 Rare and Protected Species

Natural causes or human impacts can contribute to the declines in some populations of plants and animals. Under federal law, any action that could potentially have a negative impact on plant or animal species classified as Endangered (E), Threatened (T), Proposed Endangered (PE), or Proposed Threatened (PT) is subject to review by the USFWS under Section 7 provisions of the Endangered Species Act (ESA) of 1973. The National Marine Fisheries Service (NOAA Fisheries) also has regulatory authority under the ESA; however, the species regulated by NOAA Fisheries are not found in the study area. The Virginia and North Carolina USFWS field offices have listed nine federally protected species for counties in the study area.

Biologists conducted field surveys to inventory natural resources, wildlife communities and habitats, for threatened and endangered species. Assessments of wildlife community composition involved general qualitative habitat evaluations based on the existing vegetative communities. Table 3-16 summarizes the federally listed species and provides a habitat assessment for these species in the study area. A detailed description of the threatened and endangered species survey performed for each federally listed species is provided in the NRTR (NCDOT and VA DRPT, 2004a, 2008). It should be noted that a population of an endangered plant (Michaux's sumac) was discovered within the existing rail ROW in Brunswick County.

Table 3-16
Federally Protected Species in the Study Area

Scientific Name	Common Name	Status	County/State	Species Habitat	Habitat Present
Haliaeetus leucocephalus	Bald eagle	BGEPA	Richmond, Chesterfield, Mecklenburg/ VA Warren, Vance, Wake/ NC	mature forests near large bodies of water	Yes
Picoides borealis	Red-cockaded woodpecker	E	Wake/NC	mature open pine forests (mainly longleaf pine)	No
Percina rex	Roanoke logperch	E	Dinwiddie, Brunswick, Mecklenburg/ VA	medium to large streams and rivers with moderate gradient and relatively silt-free substrates	Yes
Alasmidonta heterodon	Dwarf wedgemussel	E	Chesterfield, Dinwiddie/VA Warren, Vance, Franklin, Wake/NC	streams with a slow to moderate current; clean, nearly silt free, well-oxygenated water with a firm sand, gravel, or muddy sand substrate	Yes
Pleurobema collina	James River spinymussel	E	Chesterfield/ VA	river runs with moderate current with sand, gravel, and cobble substrata	Yes
Elliptio steinstansana	Tar River spinymussel	E	Warren, Franklin/NC	fast-flowing rivers and large streams with well oxygenated riffles; relatively silt-free gravel and/or coarse sand substrate	Yes
Rhus michauxii	Michaux's sumac	E	Chesterfield, Dinwiddie, Brunswick, Mecklenburg/ VA Franklin, Wake/NC	rocky or sandy open woods, woodland edges, and roadsides; dependent on disturbance; needs full sunlight	Yes

Table 3-16 Federally Protected Species in the Study Area					
Scientific Name	**Common Name**	**Status**	**County/State**	**Species Habitat**	**Habitat Present**
Ptilimnium nodosum	Harperella	E	Mecklenburg/ VA	rocky or gravel shoals and margins of clear, swift-flowing stream sections; edges of intermittent pineland ponds in the Coastal Plain	No
Aeschynomene virginica	sensitive joint-vetch	T	Chesterfield/ VA	fresh to slightly brackish tidal river shores and estuarine river marsh borders.	No

Source: USFWS, 2008

Notes:

T Threatened denotes any native or once native species that is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a Threatened species under the ESA.

E Endangered denotes a species in danger of extinction throughout all or a significant portion of its range.

BGEPA Bald and Golden Eagle Protection Act

Individual states may provide additional protections for rare plant and animal species, such as Federal Species of Concern (FSC), which are not afforded federal protection under the ESA. FSC species that are listed as Endangered, Threatened, or Special Concern (SC) on the Virginia Department of Conservation and Recreation (VDCR) and North Carolina Natural Heritage Program (NCNHP) lists of Rare Plant and Animal Species are afforded protection under state laws (the Endangered Plant and Insect Species Act of Virginia of 1979, the Virginia Wildlife Diversity and Fisheries Regulations, and the North Carolina Plant Protection and Conservation Act of 1979). Currently, these laws do not apply to state transportation projects; however, the North Carolina Wildlife Resources Commission has requested that transportation projects include a listing of federal or state designated threatened, endangered, or special concern species (NC Wildlife Resources Commission, 1997).

The Virginia and North Carolina USFWS field offices list 24 FSC species for the counties in the study area. Baker Engineering biologists conducted habitat surveys throughout the study area for FSC species habitat. Table 3-17 summarizes FSC species listed for counties in the study area and states whether habitat was found present for the species during the survey. Additional information on protected plant and animal species is included in the SEHSR NRTR (NCDOT and VA DRPT, 2004a, 2008).

Table 3-17 Federal Species of Concern in the Study Area					
Scientific Name	**Common Name**	**NCNHP Status**	**VDCR Status**	**County/State**	**Habitat Present**
Aimophila aestivalis	Bachman's sparrow	SC	T	Dinwiddie, Brunswick/VA Warren, Wake/NC	Yes
Etheostoma collis lepidinion	Carolina darter	SC	T	Wake/NC	No
Heterodon simus	Southern hognose snake	SC	NL	Wake/NC	Yes
Lythrurus matutinus	Pinewoods shiner	SR	NL	Warren, Vance, Franklin, Wake/NC	Yes
Myotis austroriparius	Southeastern myotis	SC	NL	Wake/NC	Yes
Noturus furiosus population 1	Neuse madtom	SC	NL	Franklin/NC	Yes
Noturus furiosus population 2	Carolina madtom	SR	NL	Vance/NC	Yes
Anguilla rostrata	American eel	NL	NL	Franklin, Vance, Warren, Wake/NC	Yes
Ambloplites cavifrons	Roanoke bass	SR	SR	Franklin, Warren, Wake/NC	Yes
Elliptio lanceolata	Yellow lance	E	SC	Chesterfield, Brunswick/VA Warren, Vance, Franklin, Wake/NC	Yes
Fusconaia masoni	Atlantic pigtoe	E	T	Dinwiddie, Brunswick, Mecklenburg/VA Warren, Franklin, Wake/NC	Yes
Lampsilis cariosa	Yellow lampmussel	E	NL	Vance, Franklin/NC	Yes
Lasmigona subviridus	Green floater	E	SC	Wake/NC	Yes
Speyeria diana	Diana fritillary butterfly	SR	NL	Wake/NC	Yes
Isoetes hyemalis	Winter quillwort	NL	SR	Mecklenburg/VA	Yes
Juncus caesariensis	New Jersey rush	NL	SR	Dinwiddie/VA	Yes
Lindera subcoriacea	Bog spicebush	E	NL	Wake/NC	No

Table 3-17 Federal Species of Concern in the Study Area					
Scientific Name	**Common Name**	**NCNHP Status**	**VDCR Status**	**County/State**	**Habitat Present**
Monotropsis odorata	Sweet pinesap	SR-T	NL	Wake/NC	Yes
Phacelia covillei	Buttercup phacelia	SR-T	NL	Vance/NC	Yes
Pycnanthemum torrei	Torrey's mountain-mint	NL	SR	Dinwiddie/VA	Yes
Lotus unifoliolatus var. helleri	Prairie Birdsfoot-trefoil	NL	NL	Warren/NC	Yes
Sagittaria weatherbiana	Grassleaf arrowhead	SR-T	NL	Wake/NC	Yes
Desmodium ocroleucum	Creamflower tick-trefoil	NL	SH	Chesterfield/VA	Yes
Trillium pusillum var. virginianum	Virginia least trillium	NL	SR	Chesterfield, Dinwiddie/VA, Wake/NC	Yes

Source: USFWS, 2008

Notes:

E Endangered denotes a species in danger of extinction throughout all or a significant portion of its range.

SC A Special Concern species is one that requires monitoring but may be taken or collected and sold.

SR A Significantly Rare species is not listed as Endangered, Threatened, or Special Concern but exists in the state in small numbers and has been determined to need monitoring.

SR-T A Significantly Rare species that is rare throughout its range (fewer than 100 populations).

T A Threatened species is any native or once native species that is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a Threatened species under the ESA.

NL Not Listed

Migratory birds are those that fly long distances from their winter habitats to summer nesting grounds and back to their over-wintering grounds annually. The Migratory Bird Treaty Act (MBTA) is included in 50 CFR 10.13 and provides a list of species of birds protected by the Act. The USFWS interprets migratory bird protections under MBTA to extend to structures and trees that are being actively used by migratory birds for nesting. At those times, it is illegal to destroy migratory bird nests (including trees with nests) that contain eggs or young or cause an adult to abandon its nest due to disturbances from any sort of construction. However, it is not illegal to prevent birds from nesting during or prior to the construction period.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, requires federal agencies to take action to implement the MBTA. Appropriate actions include evaluating the effect agency actions have on migratory birds and identifying impacts with a measureable negative effect on migratory bird populations. If such actions are identified, the federal agency must mitigate the effects and consult with USFWS prior to initiating the action.

There are more than 800 species of birds covered under the MBTA; however, the SEHSR project is not located near a major bird migration flyway. The closest flyway is the Atlantic Flyway, the main branch of which passes over the North Carolina and Virginia coast. However, several species of birds may migrate through the project area, while other migratory birds live in the North Carolina and Virginia Piedmont and Virginia Coastal Plain during winter or summer. Examples of some of the more common species and when they are present in the Mid-Atlantic Piedmont are listed in Table 3-18.

Table 3-18
Migratory Bird Species of the North Carolina and Virginia Piedmont

Common Name	Scientific Name	Residence
Wood duck	*Aix sponsa*	Yearlong
Ring-necked duck	*Athya collaris*	Winter
Red-tailed hawk	*Buteo jamaicensis*	Yearlong
Mourning dove	*Zenaida macroura*	Yearlong
Yellow-billed cuckoo	*Coccyzus americanus*	Summer
Chimney swift	*Chaetura pelagic*	Summer
Ruby-throated hummingbird	*Archilochus colubris*	Summer
Belted kingfisher	*Ceryle alcyon*	Yearlong
Red-headed woodpecker	*Melanerpes erythrocephalus*	Yearlong
Yellow-bellied sapsucker	*Sphyrapicus varius*	Summer
Eastern wood-pewee	*Contopus virens*	Summer
Eastern phoebe	*Sayornis phoebe*	Yearlong
Purple martin	*Progne subis*	Summer
Blue jay	*Cyanocitta cristata*	Yearlong
American crow	*Corvus brachyrhynchos*	Yearlong
Carolina chickadee	*Poecile carolinsis*	Yearlong
Red-breasted nuthatch	*Sitta Canadensis*	Winter

Table 3-18 Migratory Bird Species of the North Carolina and Virginia Piedmont		
Common Name	**Scientific Name**	**Residence**
Carolina wren	*Thryothorus ludovicianus*	Yearlong
Ruby-crowned kinglet	*Regulus calendula*	Winter
Eastern bluebird	*Sialia Sialis*	Yearlong
American robin	*Turdus migratorius*	Yearlong
Northern mockingbird	*Mimus polyglottos*	Yearlong
Northern parula	*Parula Americana*	Spring/fall migrant
Black-throated blue warbler	*Dendroica caerulescens*	Spring/fall migrant
Scarlet tanager	*Piranga olivacea*	Summer
Northern cardinal	*Cardinalis cardinalis*	Yearlong
Indigo bunting	*Passerina cyanea*	Summer
Field sparrow	*Spizella pusilla*	Yearlong
Red-winged blackbird	*Agelaius phoeniceus*	Yearlong

Source: North Carolina Division of Parks and Recreation, 2009

3.11 Community Resources

This section provides descriptions and documentation of established communities and other elements of the human environment existing within the SEHSR study area. The Community Resources section helps define the context and character of the study area and the varied communities and neighborhoods within it. Documenting these elements of the human environment helps create an understanding of communities' values and needs. Incorporating these values and needs into the decision-making process allows transportation projects to be compatible with the human environment and become an asset to communities and neighborhoods affected by the SEHSR project, as well as to the region as a whole.

Community resources are discussed by topical subsection and, where applicable, these are further defined by geographic subsections. Community resource subsections include:

- Demographics. By political groupings and Census areas, by race and ethnicity, by age bracket, and by income group.

- Economics. Current economic resources and conditions within each community and the SEHSR region.

- Land Use and Planning. Adopted plans and related guides for development and infrastructure.

- Neighborhoods and Communities. Social and cultural elements that create and define the human environment.

- Community Facilities and Services. Existing social infrastructure and services that support people and communities.

3.11.1 Demographics

This section uses 1990 and 2000 Census data to examine population and demographic data including race, ethnicity, age and income. For Tier II analysis the study area was defined as block groups within or adjacent to the rail study corridor (Appendix K). The demographics of the study area will be compared with the same measures for the city or county and for the state.

The SEHSR study area varies from urban state capitals to booming suburbs to rural and small town areas with stable or declining populations. At the time of the 2000 Census a total of 204,345 people were living in the bi-state study area.

3.11.1.1 Race

The local study area with the highest proportion of minority residents is Petersburg, VA, where slightly more than 82% of the population is non-white or mixed race. The local study area with the lowest proportion of minority residents is Colonial Heights, VA, where slightly more than 15% of the population is non-white or mixed race. These two localities directly border each other. Racial diversity within the project area is illustrated in Tables 3-19 and 3-20.

Table 3-19
Virginia Localities and Study Areas - Race

Location	Total	White	Black	American Indian	Asian	Pacific Islander	Other	Multi-Racial
Virginia	7,078,515	5,116,929 (72.3%)	1,384,008 (19.6%)	22,394 (0.3%)	256,355 (3.6%)	3,617 (0.1%)	138,381 (2.0%)	156,831 (2.2%)
Richmond	197,790	76,204 (38.5%)	112,655 (57.0%)	511 (0.3%)	2,438 (1.2%)	115 (0.1%)	2,972 (1.5%)	2,895 (1.5%)
Study Area	10,646	2,835 (26.6%)	7,298 (68.6%)	15 (0.1%)	71 (0.7%)	15 (0.1%)	232 (2.2%)	180 (1.7%)
Chesterfield	259,903	198,872 (76.5%)	46,134 (17.8%)	832 (0.3%)	6,363 (2.4%)	97 (<0.0%)	3,141 (1.2%)	4,464 (1.7%)
Study Area	38,142	25,165 (66.0%)	10,563 (27.7%)	90 (0.2%)	732 (1.9%)	37 (0.1%)	531 (1.4%)	1,024 (2.7%)
Colonial Heights	16,897	15,148 (89.6%)	1,019 (6.0%)	72 (0.4%)	368 (2.2%)	0 (0.0%)	183 (1.1%)	107 (0.6%)
Study Area	7,875	6,648	961	24	169	0	144	31

Table 3-19 Virginia Localities and Study Areas - Race								
Location	**Total**	**White**	**Black**	**American Indian**	**Asian**	**Pacific Islander**	**Other**	**Multi-Racial**
		(84.4%)	(10.8%)	(0.3%)	(2.1%)	(0.0%)	(1.8%)	(0.4%)
Peters-burg	33,740	6,212 (18.4%)	26,419 (78.3%)	51 (0.2%)	257 (0.8%)	18 (0.1%)	330 (1.0%)	453 (1.3%)
Study Area	12,098	1,620 (13.4%)	9,932 (82.1%)	26 (0.2%)	114 (0.9%)	0 (0.0%)	279 (2.3%)	127 (1.0%)
Dinwiddie	24,533	15,913 (64.9%)	8,216 (33.5%)	66 (0.3%)	63 (0.3%)	0 (0.0%)	164 (0.7%)	111 (0.5%)
Study Area	11,517	6,996 (60.7%)	4,351 (37.8%)	30 (0.3%)	48 (0.4%)	0 (0.0%)	23 (0.2%)	69 (0.6%)
Brunswick	18,419	7,723 (41.9%)	10,394 (56.4%)	24 (0.1%)	109 (0.6%)	0 (0.0%)	71 (0.4%)	98 (0.5%)
Study Area	7,067	2,680 (37.9%)	4,323 (61.1%)	17 (0.2%)	4 (0.0%)	0 (0.0%)	8 (0.1%)	26 (0.4%)
Mecklen-burg	32,380	19,190 (59.3%)	12,599 (38.9%)	26 (0.1%)	146 (0.4%)	13 (<0.0%)	192 (0.6%)	214 (0.7%)
Study Area	5,595	3,235 (57.8%)	2,246 (40.1%)	9 (0.2%)	61 (0.6%)	6 (0.1%)	24 (0.4%)	14 (0.2%)

Source: 2000 Census

Table 3-20 North Carolina Localities and Study Areas - Race								
Location	**Total**	**White**	**Black**	**American Indian**	**Asian**	**Pacific Islander**	**Other**	**Multi-Racial**
North Carolina	8,049,313	5,802,165 (72.1%)	1,734,154 (21.5%)	100,956 (1.3%)	111,292 (1.4%)	3,699 (<0.0%)	185,138 (2.3%)	111,909 (1.4%)
Warren	19,972	7,793 (39.0%)	10,826 (54.2%)	819 (4.1%)	73 (0.4%)	24 (0.1%)	232 (1.2%)	205 (1.0%)
Study Area	5,205	2,113 (40.6%)	3,009 (57.8%)	16 (0.3%)	9 (0.2%)	6 (0.1%)	21 (0.4%)	31 (0.6%)
Vance	42,954	20,778 (48.4%)	20,791 (48.4%)	105 (0.2%)	133 (0.3%)	4 (<0.0%)	719 (1.7%)	424 (1.0%)
Study Area	25,432	10,925 (43.0%)	13,399 (52.7%)	86 (0.3%)	97 (0.4%)	4 (<0.0%)	645 (2.5%)	276 (1.1%)
Franklin	47,260	31,290 (66.2%)	14,097 (29.8%)	342 (0.7%)	177 (0.4%)	16 (<0.0%)	989 (2.1%)	349 (0.7%)

Table 3-20 North Carolina Localities and Study Areas - Race								
Location	**Total**	**White**	**Black**	**American Indian**	**Asian**	**Pacific Islander**	**Other**	**Multi-Racial**
Study Area	14,471	9,821 (67.9%)	3,891 (26.9%)	44 (0.3%)	65 (0.4%)	6 (<0.0%)	488 (3.4%)	156 (1.1%)
Wake	627,846	453,928 (72.3%)	123,058 (19.6%)	2,271 (0.4%)	20,722 (3.3%)	317 (0.1%)	16,484 (2.6%)	11,066 (1.8%)
Study Area	66,297	44,466 (67.1%)	16,861 (25.4%)	246 (0.4%)	1,606 (2.4%)	91 (0.1%)	1,696 (2.6%)	1,331 (2.0%)

Source: 2000 Census

3.11.1.2 Ethnicity

Persons of Hispanic origins may be of any racial category as Hispanic indicates ethnicity rather than race. The local study area with the highest proportion of Hispanic residents is Wake County, NC, at 6.5%. The local study areas with the lowest proportion of Hispanic residents are Dinwiddie and Brunswick County, VA, at 0.5% and 0.3% respectively. Hispanic populations within the project area are illustrated in Tables 3-21 and 3-22.

Table 3-21 Virginia Localities and Study Areas - Ethnicity		
Location	**Total**	**Hispanic**
Virginia	7,078,515	327,273 (4.6%)
Richmond	197,790	5,239 (2.6%)
Study Area	10,646	337 (3.2%)
Chesterfield	259,903	7,063 (2.7%)
Study Area	38,142	1,366 (3.6%)
Colonial Heights	16,897	293 (1.7%)
Study Area	7,875	191 (2.4%)
Petersburg	33,740	607 (1.8%)
Study Area	12,098	323 (2.7%)
Dinwiddie	24,533	306 (1.2%)
Study Area	11,517	55 (0.5%)
Brunswick	18,419	179 (1.0%)
Study Area	7,067	24 (0.3%)
Mecklenburg	32,380	451 (1.4%)
Study Area	5,595	64 (1.1%)

Table 3-22 North Carolina Localities and Study Areas - Ethnicity

Location	Total	Hispanic
North Carolina	8,049,313	372,964 (4.6%)
Warren	19,972	365 (1.8%)
Study Area	5,205	82 (1.6%)
Vance	42,954	1,831 (4.3%)
Study Area	25,432	1,478 (5.8%)
Franklin	47,260	1,991 (4.2%)
Study Area	14,471	835 (5.8%)
Wake	627,846	34,135 (5.4%)
Study Area	66,297	4,322 (6.5%)

Source: 2000 Census

3.11.1.3 Age

According to the 2000 Census 1,735,824 Virginians, or 24.5%, were under age 18 while 790,567, or 11.2%, were age 65 or older. In North Carolina 1,961,317, or 24.4%, were under age 18 while 969,822, or 12.0%, age 65 or older (Tables 3-23 and 3-24). The dependency ratio of working age persons to non-working is 1.8/1 in Virginia and 1.7/1 in North Carolina.

Within the SEHSR project area localities range from urban centers with large working age populations to rural counties with higher proportions of older residents. Age groupings are illustrated in the following tables.

Table 3-23
Virginia Localities and Study Areas - Age

Location	Under Age 18	Age 65 or Older
Virginia	24.5%	11.2%
Richmond	21.9%	13.4%
Study Area	27.8%	10.0%
Chesterfield	28.2%	8.1%
Study Area	26.9%	7.9%
Colonial Heights	22.5%	18.7%
Study Area	23.0%	18.3%
Petersburg	24.8%	15.6%
Study Area	25.5%	15.4%
Dinwiddie	24.0%	12.2%
Study Area	23.5%	12.6%
Brunswick	20.4%	14.6%
Study Area	22.7%	15.8%

Table 3-23 Virginia Localities and Study Areas - Age		
Location	**Under Age 18**	**Age 65 or Older**
Mecklenburg	21.5%	17.8%
Study Area	20.1%	17.8%

Source: 2000 Census

Table 3-24 North Carolina Localities and Study Areas - Age		
Location	**Under Age 18**	**Age 65 or Older**
North Carolina	24.4%	12.0%
Warren	23.5%	17.4%
Study Area	21.9%	15.5%
Vance	27.0%	12.8%
Study Area	28.8%	12.0%
Franklin	25.7%	11.1%
Study Area	26.4%	9.6%
Wake	25.0%	7.3%
Study Area	23.4%	7.5%

Source: 2000 Census

3.11.1.4 Income and Poverty

The SEHSR study area is not monolithic nor does it represent a single economic region. To paint a more detailed picture along the corridor, state and local household and per capita income measures are compared with those of the highest and lowest block groups within each local study area.

According to the 2000 Census, 656,641 Virginians and 958,667 North Carolinians were found to live below thresholds for federal poverty level status (Tables 3-25 and 3-26). In the Virginia SEHSR study area, both urban centers and rural counties had poverty levels higher than the state average while suburban counties had lower poverty rates. In the North Carolina SEHSR study area, the urban center had poverty levels lower than the state average, the adjacent suburban county had a poverty rate equivalent with the state average, while rural counties had higher poverty levels.

Federal poverty rates are based in large part on the available food budget with the result that most high poverty areas are also more rural. Recent studies have found that in urban and suburban areas housing costs followed by transportation are more indicative of poverty levels. To this end rates of home ownership and households without vehicles were also documented.

Table 3-25 Virginia Localities and Study Areas - Income and Poverty							
Location	Median Household Income		Per Capita Income		Below Poverty Level	Owner Occupied Housing	No Vehicle Household
	Low*	High*	Low*	High*			
Virginia	$46,677 (average)		$23,975 (average)		9.6%	68.1%	7.7%
Richmond	$31,121 (average)		$20,337 (average)		21.4%	46.1%	21.6%
Study Area	$9,583	$41,985	$4,182	$33,427	30.0%	36.7%	25.6%
Chester-field	$58,537 (average)		$25,286 (average)		4.5%	80.9%	3.3%
Study Area	$20,893	$82,336	$6,148	$37,613	9.2%	70.9%	6.3%
Colonial Heights	$43,224 (average)		$23,659 (average)		5.5%	69.4%	5.9%
Study Area	$33,173	$38,500	$17,093	$25,661	7.4%	53.4%	7.8%
Peters-burg	$28,851 (average)		$15,989 (average)		19.6%	51.5%	20.9%
Study Area	$11,563	$40,820	$11,682	$23,474	16.4%	51.9%	14.8%
Dinwiddie	$41,582 (average)		$19,122 (average)		9.3%	79.2%	5.1%
Study Area	$31,923	$57,660	$14,736	$25,597	9.0%	76.5%	5.1%
Brunswick	$31,288 (average)		$14,890 (average)		16.5%	77.7%	11.6%
Study Area	$25,737	$40,500	$14,424	$17,471	15.6%	76.2%	13.1%
Mecklen-burg	$31,380 (average)		$17,171 (average)		15.5%	74.3%	9.7%
Study Area	$25,729	$35,859	$12,211	$19,824	13.5%	82.3%	9.1%

Source: 2000 Census

* Of the Census block groups in the study area within the city or county.

Table 3-26 North Carolina Localities and Study Areas - Income and Poverty							
Location	Median Household Income		Per Capita Income		Below Poverty Level	Owner Occupied Housing	No Vehicle Household
	Low*	High*	Low*	High*			
North Carolina	$39,184 (average)		$20,307 (average)		12.3%	69.4%	7.5%
Warren	$28,351 (average)		$14,716 (average)		19.4%	77.2%	10.7%

Table 3-26 North Carolina Localities and Study Areas - Income and Poverty							
Location	Median Household Income		Per Capita Income		Below Poverty Level	Owner Occupied Housing	No Vehicle Household
	Low*	High*	Low*	High*			
Study Area	$23,208	$31,691	$11,494	$15,801	19.0%	71.6%	11.3%
Vance	$31,301 (average)		$15,897 (average)		20.5%	66.2%	12.3%
Study Area	$12,917	$43,214	$8,571	$32,070	24.2%	62.7%	14.3%
Franklin	$38,968 (average)		$17,562 (average)		12.6%	77.8%	6.7%
Study Area	$29,643	$51,217	$14,671	$21,433	11.7%	81.2%	6.8%
Wake	$54,988 (average)		$27,004 (average)		7.8%	65.9%	4.9%
Study Area	$8,316	$77,873	$4,881	$40,386	9.7%	55.5%	7.7%

Source: 2000 Census
* Of the Census block groups in the study area within the city or county.

3.11.2 Economics

3.11.2.1 Community Economic Profile

The SEHSR corridor traverses three distinct macro regions across two states (Table 3-27). Within these regions are smaller areas and communities ranging from city centers and suburbs to small towns and rural areas. Some of these areas are bustling job centers or booming bedroom communities, while others may be stable or declining.

Table 3-27 State Profile Comparisons		
	Virginia	North Carolina
Civilian Labor Force (2006)	3,999,000	4,465,000
Labor Force Participation Rate (2006)	68.90%	66.33%
Total Employment (2006)	3,879,000	4,251,000
% change 2005-2006	2.46%	3.36%
% change 2001-2006	10.29%	9.18%
Unemployment Rate (2006)	3.00%	4.80%
Manufacturing Employment (2006)	288,700	553,300
Total Manufacturing Employment % Non-Farm (2006)	7.75%	13.76%
Total Service Employment % Non-Farm (2006)	85.25%	80.01%

Table 3-27 State Profile Comparisons		
	Virginia	**North Carolina**
High School Graduates – 25+ years (2005)	85.4%	82.3%
College Graduates – 25+ years (2005)	33.2%	25.1%
Per Capita Income (2006)	$39,173	$32,234
% Change Per Capita Income (2005-2006)	4.45%	3.84%
Median Family Income (2006)	$66,886	$52,336
Population (2006)	7,642,884	8,856,505

Source: North Carolina EDIS online database, State Profile Comparisons, 2008

3.11.2.1.1 Virginia

3.11.2.1.1.1 Richmond

Richmond is the largest city within the Richmond-Petersburg MSA and, as the state capital, state government is the city's largest employer. The city is also a major financial center. From largest to smallest, employment by sector as of 2005 is as follows:

- Services – 40.9%
- Government – 29.4%
- Trade – 9.0%
- Manufacturing – 6.5%
- Financial – 5.6%
- Construction – 4.6%
- Transportation/Utilities – 2.1%
- Information – 1.9%
- Mining – 0%

Major manufacturing employers include International Paper Company and Philip Morris USA. Other major employers include Chippenham Medical Center, Dominion Resources Inc., Federal Reserve Bank of Richmond, Virginia Commonwealth University (VCU), Medical College of Virginia (MCV) Hospitals, UPS Freight, SunTrust Banks, and Verizon. Recent closings, reductions and layoffs have affected building products, back office operations, medical supplies and food products manufacturing.

3.11.2.1.1.2 Chesterfield County

Chesterfield is located between Richmond and Petersburg/Colonial Heights and is one of the fastest growing communities in the state. The area has attracted a highly skilled labor force and the county has a substantial inventory of available commercial and industrial properties. From largest to smallest, employment by sector as of 2005 is as follows:

- Services – 35.2%
- Trade – 19.1%

- Government – 15.8%
- Construction – 8.5%
- Manufacturing – 8.5%
- Financial – 6.6%
- Transportation/Utilities – 4.2%
- Information – 1.9%
- Mining – 0.2%

Major manufacturing employers are Alcoa, Alstom Power Inc., Armkel, EI DuPont Inc, Hill PHOENIX Inc, and Philip Morris. Other major employers include Capital One, CJW Medical Center, Defense Supply Center Richmond, Food Lion Inc, JC Penney, Ukrop's Super Markets, and UPS. Recent closings, reductions and layoffs have affected fabric manufacturing and tobacco products.

3.11.2.1.1.3 Colonial Heights

Colonial Heights directly abuts Petersburg and these two cities function as a single economic entity. Colonial Heights serves as the retail center for the area. From largest to smallest, employment by sector as of 2005 is as follows:

- Trade – 40.4%
- Services – 38.6%
- Government – 8.0%
- Manufacturing – 3.8%
- Financial – 3.8%
- Construction – 3.2%
- Information – 0.8%
- Transportation/Utilities – 0.1%
- Mining – 0%

Major manufacturing employers are Metal Building Components Inc, Mundet Inc, Roslyn Converters Inc, Sun Chemical Corp, and The Antioch Company. Other major employers include Colonial Heights Convalescent Co, JC Penney, Ukrop's Super Markets, Wal-Mart.

3.11.2.1.1.4 Petersburg

Petersburg directly abuts Colonial Heights and these two cities function as a single economic entity. Petersburg serves as the industrial center for the area. As the site of a critical Civil War battle Petersburg has numerous historic sites and buildings, and heritage tourism is a growing part of the economy. From largest to smallest, employment by sector as of 2005 is as follows:

- Services – 36.6%
- Government – 21.2%
- Trade – 18.2%
- Manufacturing – 12.7%
- Construction – 4.9%
- Financial – 3.2%
- Transportation/Utilities – 2.4%
- Information – 0.8%
- Mining – 0%

Major manufacturing employers are BI Chemicals Inc, Boars Head Provisions, Brenco Inc, Inland Temple Container, and Titmus Optical Inc. Other major employers include BP Short & Son Paving Company, Roper Bros Lumber, Southside Regional Medical Center, Virginia State University and Virginia T's. A recent reduction affected Titmus Optical.

3.11.2.1.1.5 Dinwiddie County

Dinwiddie County is part of the Petersburg/Colonial Heights economic region such that roughly twice as many county residents commute to jobs outside the county as work within it. Much of the northern Dinwiddie is associated with the Petersburg National Battlefield. From largest to smallest, employment by sector as of 2005 is as follows:

- Government – 54.8%
- Manufacturing – 14.9%
- Services – 13.8%
- Construction – 6.9%
- Trade – 5.5%
- Mining – 2.7%
- Financial – 1.5%
- Information – 0%

Major manufacturing employers are Chaparral Virginia Inc, Philip Morris USA and Tindal Concrete Co. Other major employers include Central State Hospital and Wal-Mart.

3.11.2.1.1.6 Brunswick County

Brunswick County is part of the south-central Piedmont Region of Virginia, which is also known as Southside Virginia. This is an agricultural area between the Richmond-Petersburg region in Virginia and the Triangle region in North Carolina. By occupation farming and forestry employ 5.5% of the work force. Recreation associated with Lake Gaston accounts for some of service and trade employment. Almost as many residents commute to work outside the county as remain within it, with about a third of these commuting to jobs in Mecklenburg County. From largest to smallest, employment by sector as of 2005 is as follows:

- Services – 33.3%
- Government – 29.2%
- Manufacturing – 9.8%
- Trade – 9.0%
- Mining – 7.5%
- Construction – 5.9%
- Transportation/Utilities – 3.6%
- Financial – 1.7%
- Information – 0%

Major manufacturing employers include Brick & Tile Corp, Brunswick Box Co, Hyponex Corp, Virginia Carolina Forest Inc, and Vulcan Materials. Other major employers include Brunswick Correctional Center, Southside Virginia Community College and St. Paul's College.

3.11.2.1.1.7 Mecklenburg County

Mecklenburg County is part of the south-central Piedmont Region of Virginia, which is also known as Southside Virginia. This is traditionally an agricultural area between the Richmond-Petersburg region in Virginia and the Triangle region in North Carolina, although manufacturing has increased in importance. Recreation associated with Lake Gaston and Kerr Lake (also known as Buggs Island Lake) accounts for some of service and trade employment. From largest to smallest, employment by sector as of 2005 is as follows:

- Services – 35.1%
- Government – 16.6%
- Trade – 15.9%
- Manufacturing – 13.1%
- Transportation/Utilities – 7.6%
- Construction – 4.9%
- Financial – 3.4%
- Mining – 2.2%
- Information – 1.2%

Major manufacturing employers include American Building Co, Brodnax Mills Inc, Carlisle Motion Control, International Veneer Co, Lawson Mardon Wheaton Inc, Sherwood Foods Inc., Virginia Homes Manufacturing, and Virginia Quilting Inc. Other major employers include Community Memorial Health Center, Huss Inc., Mecklenburg Electric Cooperative, Parker Oil Co., and The DRS Group. Recent closings, reductions and layoffs have affected textiles and clothing-related operations.

3.11.2.1.2 North Carolina

3.11.2.1.2.1 Warren County

Warren County is a peripheral part of the Raleigh-Durham MSA, also known as the Triangle region. This is traditionally an agricultural area, although manufacturing has increased in importance. Recreation associated with Lake Gaston accounts for some of service and trade employment. From largest to smallest, employment by sector as of 2005 is as follows:

- Government – 32.7%
- Services – 32.0%
- Manufacturing – 16.9%
- Trade – 7.7%
- Construction – 6.1%
- Transportation/Utilities – 2.3%
- Financial – 1.2%
- Information – 1.0%
- Mining – 0%

Major manufacturing employers include Elberta Crate & Box Co, Temple Inland, Glen Raven Mills, and Cast Stone Systems. Other major employers include Cochrane Furniture Co and Data Services America.

3.11.2.1.2.2 Vance County

Vance County is also a peripheral part of the Triangle Region. Recreation associated with Lake Gaston accounts for some of service and trade employment. From largest to smallest, employment by sector as of 2005 is as follows:

- Service – 39.7%
- Trade – 18.3%
- Government – 17.8%
- Manufacturing – 13.3%
- Transportation/Utilities – 4.2%
- Construction – 4.0%
- Financial – 1.6%
- Information – 1.1%
- Mining – 0%

Major manufacturing employers include Wal-Mart distribution center, Pacific Coast Feather Co, Staint Gobain Containers, Purolator Products, Handcrafted Homes and IAMS. Other major employers include Variety Stores, Royal Home Fashions, mental health services and Corporate Express.

3.11.2.1.2.3 Franklin County

Franklin in a suburbanizing county within the Triangle Region. Along with its own employment base much of the county's recent population growth has been fueled by proximity to jobs in Wake County and Research Triangle Park. According to 2003 Census data, only 20.2% of Franklin residents work within the county while 43.2% commute to jobs in Wake County. From largest to smallest, employment by sector as of 2005 is as follows:

- Service – 30.8%
- Manufacturing – 22.2%
- Government – 21.3%
- Trade – 13.4%
- Construction – 8.9%
- Transportation/Utilities – 1.5%
- Financial – 1.1%
- Information – 0.7%
- Mining – 0%

Major manufacturing employers include Flextronics International, Novozymes NA, Nomaco K-Flex, Hon Industries, Food Lion distribution center, and Captive-Aire Systems. Other major employers include Sprint, Franklin Regional Medical Center, Wal-Mart and Louisburg College.

3.11.2.1.2.4 Wake County

Wake County is the most populous county within the Raleigh-Durham MSA and is, along with Research Triangle Park, a hub of the Triangle region. Wake is a regional employment center with over 382,000 jobs in 2003. From largest to smallest, employment by sector as of 2005 is as follows:

- Service – 43.5%
- Government – 18.2%
- Trade – 16.0%
- Construction – 7.1%
- Manufacturing – 5.2%
- Information – 4.0%
- Financial – 3.4%
- Transportation/Utilities – 2.6%
- Mining – 0%

Major manufacturing employers include Cisco Systems, Eaton Corp, Waste Industries, and Food Lion distribution center. Other major employers include WakeMed, SAS Institute, Rex Healthcare, Progress Energy, Verizon Wireless, First Citizens Bank, Longistics, and Misys Healthcare Systems.

3.11.2.2 Agriculture

The Virginia and North Carolina Departments of Agriculture statistics indicate that agriculture is an important element of their economies. In Virginia, agribusiness generates more than $25 billion in total sales and triggers an additional $6 billion from associated industries, and provides 14% of all jobs statewide (Virginia Department of Agriculture and Consumer Services, 2008). North Carolina's agribusiness contributes $62.6 billion annually to the state's economy and accounts for nearly 20 percent of North Carolina's jobs and income (North Carolina Department of Agriculture and Consumer Services, 2008).

Cities and counties with the SEHSR study area vary from urban state capitals to suburban bedroom communities to rural areas; therefore, the relative economic importance of agriculture varies substantially as well. Agriculture is a minor element of the economy within the Richmond metropolitan area. It employs only about 0.2% of the Richmond workforce, 0.3% of Chesterfield County and Colonial Heights, and 0.6% of Petersburg. Agricultural employment increases in suburban fringe Dinwiddie County to 2.1% and in more rural Brunswick and Mecklenburg Counties to 7.8% and 3.5%, respectively.

In North Carolina, agriculture employs 5.4% of the workforce in rural Warren County. In suburban fringe Vance and Franklin Counties agricultural employment drops to 1.7% and 2.1%, respectively. Much like metropolitan Richmond, only 0.5% of the workforce in urban Wake County is involved with agriculture.

While agriculture does not employ many people within the overall study area, in places it makes a substantial contribution to the local economy. Agricultural sales amounted to 23% of total sales within both Dinwiddie County, VA, and Warren County, NC. In other rural and exurban counties agricultural sales constituted 10.5% (Brunswick County, VA), 7.1% (Franklin County, NC), 3.3% (Mecklenburg County, VA) and 2.2% (Vance County, NC) of total sales.

3.11.2.3 Tourism

Tourism within the study area is as varied as the local economies. Tourist activities include arts, recreation, sporting events, and historical sites.

3.11.2.3.1 Virginia

As the state Capital of Virginia, the **Richmond metropolitan area** is home to numerous museums and arts centers, including the Science Museum of Virginia, Virginia Museum of Fine Arts, Virginia Historical Society, Virginia Performing Arts Center, Children's Museum of Richmond, the Museum of the Confederacy and the Chesterfield Museum Complex. Other attractions include numerous historic houses, plantations and districts; regional battlefields; the Lewis Ginter Botanical Gardens; various theaters and performing arts companies; ethnic festivals ranging from the Richmond Highland Games to a "Taste of India," and the Metro Richmond Zoo. University cultural and sporting events are also important tourist draws, as are minor league professional sports. Several major universities are located in Richmond, including Virginia Commonwealth University, the University of Richmond, and Virginia Union University, as well as several community colleges. Richmond is also home to minor league professional soccer, baseball, and ice hockey clubs. Both the Richmond International Raceway and Southside Speedway bring National Association for Stock Car Auto Racing (NASCAR) fans to the area. The Richmond Metropolitan Convention Center and Visitors Bureau estimates over 5 million visitors come to the region each year and spend over $1 billion.

The central focus of visitors to the **Petersburg-Dinwiddie area** is Civil War history associated with the Siege of Petersburg. Within the region are various battlefields and historic sites, such as Pamplin Park and the Petersburg National Battlefield Park. Related attractions include the National Museum of the Civil War Soldier, Siege Museum, Blandford Church and Centre Hill Museum. Fort Lee houses the Army Quartermaster and Army Women's Museums. In addition, Petersburg continues to revitalize its downtown as an arts and entertainment district. For example, the Shockoe Bottom Arts Center recently relocated there from Richmond. There are also local theater groups, a symphony, and a ballet company. The popular Artfest (previously called the Poplar Lawn Arts Festival) is held in the spring. The Virginia Motorsports Park also brings drag racing fans to the area. Virginia State University is located in Ettrick across the Appomattox River from Petersburg.

Tourism in Brunswick and Mecklenburg Counties is primarily associated with Lake Gaston, especially for activities such as bass fishing tournaments. However, visitors are also drawn to the Brunswick County Lake, Great Creek Lake, Nottoway River reservoir and Buggs Island Lake. In Mecklenburg County, other attractions include MacCallum More Museum and Gardens and the Roanoke River Museum in the Prestwould Plantation house.

3.11.2.3.2 North Carolina

Vance and Warren Counties also depend heavily on Lake Gaston and Kerr Lake, as well as other water-related recreation destinations, to attract visitors. In Warren County, other attractions include the Lakeland Cultural Arts Center, Norlina Train Museum and Medoc Mountain State Park. Vance County is home to the East Coast Drag Times Hall of Fame, which includes the annual Corbitt Truck Show and "Show, Shine, Shag and Dine Car Show." Harper's Motor Speedway is located near Kittrell.

Tourism is a very minor economic activity in **Franklin County**. Agri-tourism is the most common activity with some arts and crafts activities as well.

As a state capital, the **Raleigh metropolitan area** is home to the North Carolina Museum of History, Museum of Science and Art, and Marbles Kids Museum, among others. Other attractions include historic sites and houses, the JC Raulston Arboretum, Progress Energy Center for the Performing Arts, Time Warner Cable Music Pavilion at Walnut Creek, Booth Amphitheater, and various other theaters and performing arts companies, as well as festivals ranging from St. Patrick's Day to Lazy Daze Arts & Crafts. Raleigh is home to the Carolina Hurricanes hockey team, as well as the athletic and cultural events of North Carolina State University, Peace College, Shaw University, Meredith College, Saint Augustine's College and other schools. The Greater Raleigh Convention & Visitors Bureau estimates visitors to the region contributed over $1.2 billion to the economy.

3.11.3 Land Use and Transportation Planning

This section identifies the entities responsible for the oversight of general land development and transportation advancement in and around the SEHSR study area. Areas of authority for regional authorities are shown in Figures 3-7 through 3-10.

3.11.3.1 Regional Planning

3.11.3.1.1 Virginia

A Planning District Commission (PDC) is a political subdivision of the Commonwealth of Virginia. A PDC is made up of elected officials and citizens appointed by its member local governments. The SEHSR study area traverses three PDC regions – the Richmond Regional, Crater, and Southside PDCs.

3.11.3.1.1.1 Richmond Regional PDC

The Richmond Regional PDC is a regional entity serving the counties of Charles City, Chesterfield, Goochland, Hanover, Henrico, New Kent and Powhatan, the Town of Ashland, and the City of Richmond. Relative to the SEHSR study area, the Richmond Regional PDC serves all of Richmond and all but the southern portion of Chesterfield County.

Transportation planning for the urbanized area of the Richmond Regional PDC is performed by the Metropolitan Planning Organization (MPO) (Figure 3-7). The Richmond Regional MPO has produced and adopted planning documents including the Transportation Improvement Program (TIP), the 2026 Richmond Long Range Transportation Plan and the Richmond Rail Transit Feasibility Study.

Rail transit plans for the Richmond region include several commuter rail and light rail lines providing service to Main Street Station, as well as a proposed commuter rail line that would potentially share the same ROW as SEHSR between Main Street Station and Petersburg.

Figure 3-7
Richmond Area MPO Study Area

Source: *http://www.richmondregional.org/*

3.11.3.1.1.2 Crater PDC

The Crater PDC is a regional entity serving the counties of Charles City, Chesterfield, Dinwiddie, Greenville, Prince George, Surry and Sussex and the Cities of Colonial Heights, Petersburg, Emporia and Hopewell (Figure 3-8). Relative to the SEHSR study area, the Crater PDC serves all of Colonial Heights and Petersburg, but only the southern portion of Chesterfield County (Crater Planning District Commission, 2003).

Transportation planning for the urbanized area of the Crater PDC is performed by the Tri-Cities MPO. The Tri-Cities MPO has produced and adopted planning documents including the TIP, 2026 Tri-Cities Transportation Plan and Tri-Cities Area Transit Development Program. Relative to the study area, only the northeast portion of Dinwiddie County is part of the MPO.

The Tri-Cities Transportation Plan documents existing Amtrak service at Ettrick Station as well as proposals for the SEHSR and Richmond/Hampton Roads High Speed Rail. The plan also notes that the City of Petersburg has been awarded transportation enhancement funds for the Appomattox River Heritage Trail to renovate “historic passenger train station and planning land acquisition and at least partial construction of approximately two miles of pedestrian/bicycle trail along the Appomattox River.”

Figure 3-8
Crater Planning District Commission Study Area

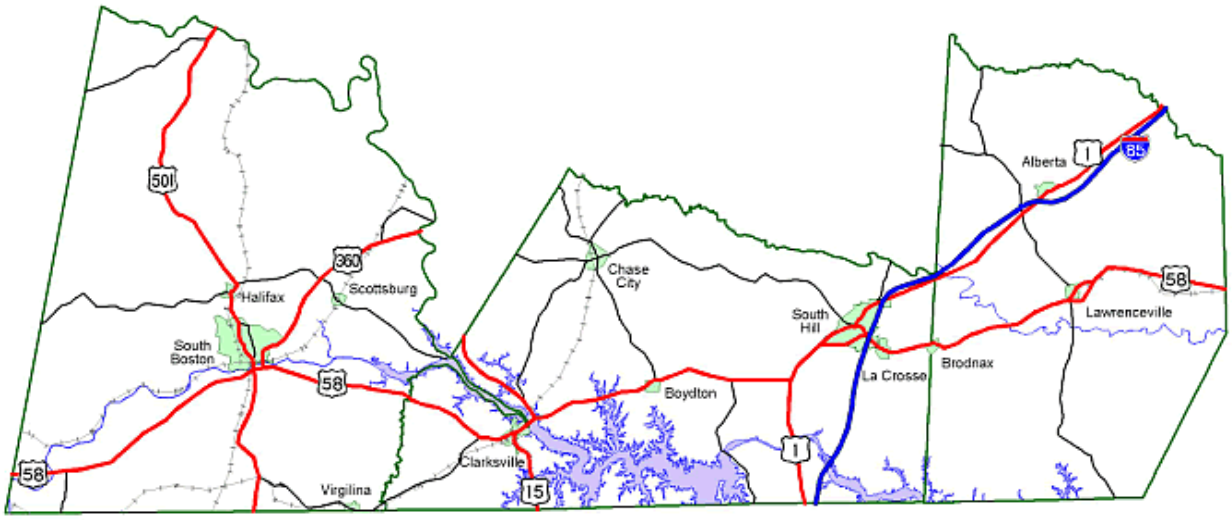
Source: http://www.craterpdc.state.va.us/

3.11.3.1.1.3 Southside PDC

The Southside PDC is a regional entity serving the counties of Brunswick, Halifax, and Mecklenburg and the Towns of South Boston and South Hill (Figure 3-9).

The Southside PDC lacks any sizable urbanized areas; therefore, this region does not have an MPO. Transportation planning within this region is the responsibility of VDOT in coordination with the local governments (Southside PDC, 2004).

Figure 3-9
Southside Planning District Commission Study Area



Source: http://www.southsidepdc.org/

3.11.3.1.2 North Carolina

Within North Carolina, a Council of Government (COG) is a political subdivision made up of elected officials appointed by its member local governments. The SEHSR study corridor traverses two COG regions, Kerr-Tar (Region K) and Triangle J (Region J) COGs.

3.11.3.1.2.1 Kerr-Tar Regional COG

The Kerr-Tar Regional COG is a regional entity serving Warren, Vance, Franklin, Granville, and Person Counties and the municipalities within these counties.

Transportation planning for the Kerr-Tar Regional COG is performed by the Kerr-Tar Rural Planning Organization (RPO). In North Carolina, RPOs are the rural equivalent of MPOs and are responsible for the TIP, long range transportation plans, and transit planning. The Kerr-Tar RPO region is developing or has developed several Comprehensive Transportation Plans underway, including Franklin County (in progress) and Warren County (completed).

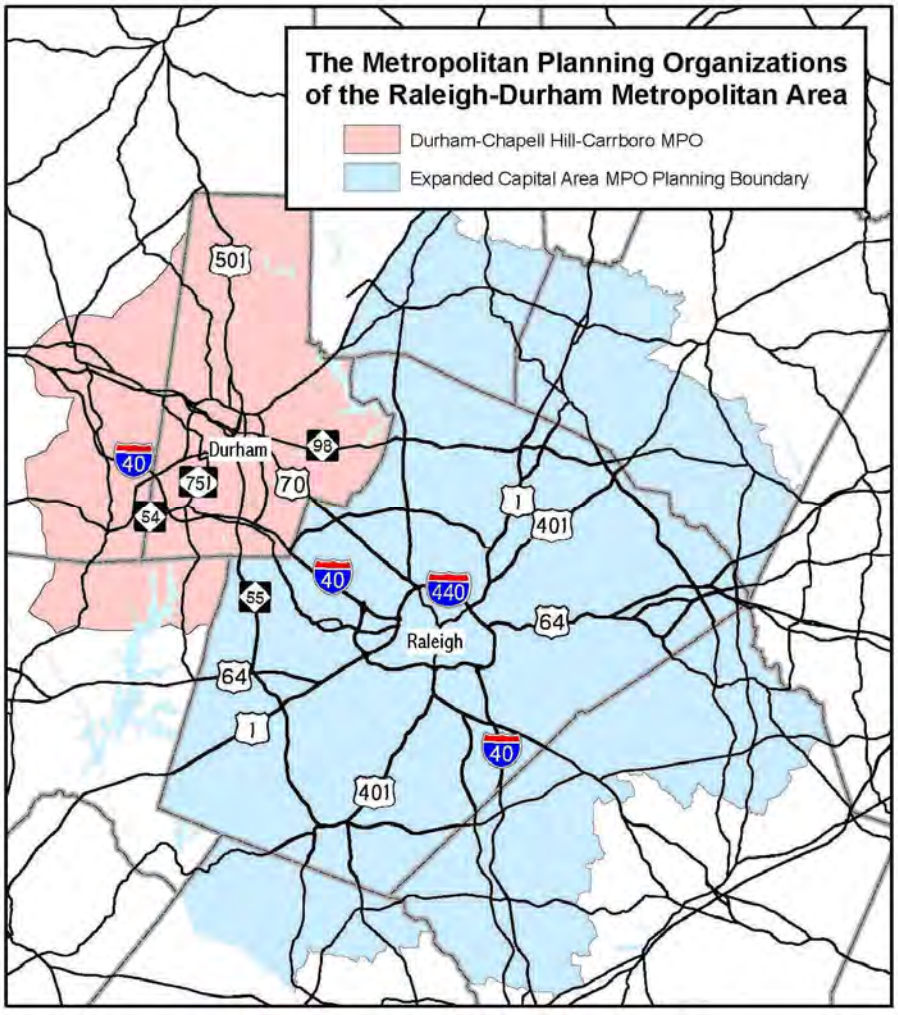
The previous Norlina Thoroughfare Plan has been replaced with the Warren County Comprehensive Transportation Plan, which covers the entire county. This plan is a joint effort between the town of Norlina, the North Carolina Department of Transportation (NCDOT), and the Kerr-Tar RPO. It includes the SEHSR project.

3.11.3.1.2.2 Triangle J COG

The Triangle J COG is a regional entity serving Chatham, Durham, Johnston, Lee, Moore, Orange, and Wake counties. Transportation planning for the urbanized area of the COG is performed by the Capital Area MPO (CAMPO). Relative to the SEHSR study area, CAMPO serves Wake County and the southern portion of Franklin County (Figure 3-10). CAMPO has produced and adopted planning documents including the Metropolitan TIP and the 2030 Long Range Transportation Plan (CAMPO, 2004). CAMPO's plans do not reference SEHSR.

Transit planning is performed by Triangle Transit (TT) for both CAMPO and the adjacent Durham-Chapel Hill-Carrboro MPO. TT has completed both a regional rail system plan and associated DEIS, but has decided not to pursue federal funding. Phase II rail transit plans for the Raleigh region involve a commuter rail line that would potentially share the same ROW as SEHSR from north Raleigh to downtown Raleigh.

Figure 3-10
CAMPO Study Area



Source: http://www.campo-nc.us/

3.11.3.2 County & Municipal Planning

3.11.3.2.1 Virginia

All localities in Virginia are required to prepare and adopt a plan to guide the physical development of land, and to review the plan at least every 5 years and update as necessary.

3.11.3.2.1.1 City of Richmond

The Comprehensive Planning Division of the Richmond Community Development Department is responsible for developing and updating the City's long range plans, including the 2020 Master Plan. This Master Plan incorporates the general concept behind SEHSR through the general transportation strategy of "Promot[ing] the development of high speed passenger rail service connecting Richmond to other areas in Virginia and along the East Coast" (Richmond Master Plan, 2000).

3.11.3.2.1.2 Chesterfield County

The Chesterfield County Planning Department is responsible for developing and updating the County's long range plans, including the comprehensive Plan for Chesterfield. The "Riverfront Plan" includes a proposed linear riverfront trail extending about a mile on each side of the proposed SEHSR Appomattox River crossing, the location of which is noted on plan drawings (Chesterfield County Riverfront Plan, 1997).

The SEHSR project is specifically noted in the Ettrick Village Plan. The Village Plan recommends use of the existing local street network around the station to accommodate traffic. It also notes that the proposed conservation and recreation area along the river should not interfere with SEHSR Appomattox River crossing (Ettrick Village Plan, 2004).

3.11.3.2.1.3 City of Colonial Heights

The Colonial Heights Planning and Community Development Department is responsible for developing and updating the City's long range plans. Other than a statement supporting the County's proposed Appomattox riverfront park, the City's Comprehensive Community Development Plan makes no reference to the SEHSR.

3.11.3.2.1.4 City of Petersburg

The Petersburg Planning Department is responsible for developing and updating the City's long range plans, including the Petersburg Comprehensive Plan. The transportation section of the Comprehensive Plan makes no reference to the SEHSR.

3.11.3.2.1.5 Dinwiddie County

The Dinwiddie County Planning Department is responsible for developing and updating the County's long range plans, including the 2002 update of the

Comprehensive Land Use Plan (Dinwiddie County Planning Commission, 2002). The County also provides planning services for McKenney, its only incorporated town. Although the Planning Department's website provides a direct link to the SEHSR website so citizens may stay informed about the project, the County's plan makes no reference to the SEHSR.

3.11.3.2.1.6 Brunswick County

Brunswick County and three Towns – Alberta, Lawrenceville and Brodnex – all adopted the County's Vision 2015 Comprehensive Land Use Plan in 1999 (Brunswick County, 1999). The plan makes no reference to the SEHSR.

3.11.3.2.1.7 Mecklenburg County

The Mecklenburg County Southside Planning District Commission is responsible for developing and updating the County's long range plans. The County and three Towns - Chase City, Clarksville, and South Hill – all have adopted comprehensive plans.

3.11.3.2.2 North Carolina

Localities in North Carolina are empowered to prepare and adopt a plan to guide the physical development of land. While state law does not require localities to adopt a land development plan, for a transportation plan to be adopted, localities must have a land development plan adopted no more than five years earlier.

3.11.3.2.2.1 Warren County

The Kerr-Tar COG, Warren County Planning Board and Warren County Planning Department are responsible for developing and updating the County's long range plans, including the 2002 Warren County 2022 Comprehensive Development Plan (Land Use Plan). The transportation section of the plan states, "the potential for the Southeast High Speed Rail Corridor (rapid passenger transit system) to come through Warren County offers great potential for development benefits" (Warren County, 2002).

3.11.3.2.2.2 Vance County

The Vance County Planning and Development Department is responsible for developing and updating the County's long range plans, including the 1996 Vance County Land Use Plan. The plan document makes no reference to SEHSR. The City of Henderson's Department of Planning, Community and Downtown Development is responsible for developing and updating the City's long range plans, including the obsolete 1976 land use plan (Henderson Planning Department, 1976). The County's plan makes no reference to SEHSR.

The Henderson-Vance Downtown Development Commission, in coordination with the North Carolina Main Street Program (NC Department of Commerce, Division of Community Assistance) is responsible for developing redevelopment plans for downtown Henderson. The downtown revitalization effort incorporates a location for a SEHSR station and includes a growth plan for the project's anticipated mobility benefits.

3.11.3.2.2.3 Franklin County

The Franklin County Planning Department is responsible for developing and updating the County's long range plans, including the 2000 Franklin County Comprehensive Land Use Plan, which also involves planning for the towns of Bunn, Youngsville, Franklinton, Louisburg and Centerville (Franklin County, 2000). The transportation sections of the County's plan make no reference to SEHSR. The Town of Franklinton also has its own Comprehensive Land Use Plan, adopted in 1989 and updated in 2006. The Town's plan makes no reference to SEHSR.

3.11.3.2.2.4 Wake County

The Wake County Planning Department is responsible for developing and updating the County's long range plans, including the 2003 Land Use Plan update and two area plans, the Northeast Area and Falls Lake Land Use Plans, which are respectively east and west of the study area. The County's plan makes no reference to SEHSR (Wake County, NC, Planning Department, 2003).

The Wake Forest Planning and Zoning Department is responsible for developing and updating the Town's long rang plans, including the Land Development Plan (1985), Community Comprehensive Plan 2020 (1997), a transportation plan (2003) and the Renaissance Plan for Downtown Wake Forest (2004). Both the transportation plan and Renaissance Plan reference SEHSR, including such aspects as proposed grade separations and the possibility of using the SEHSR corridor for regional rail service (Wake Forest Transportation Plan, 2003, 2004).

The Raleigh Planning Department is responsible for developing and updating the City's long range plans, including the Comprehensive Plan, Livable Streets and various small area plans. Engineering studies are currently underway on a proposed intermodal center, a "multi-functional transit center" that would link the Triangle Transit "regional rail station with facilities for Interstate High Speed Rail, Amtrak, local bus service, inter-city bus service, taxis, pedestrians and bicyclists" (City of Raleigh, Undated).

Most small area plans acknowledge the existing CSX rail corridor that the SEHSR study area generally follows through Raleigh; however, these plans either simply document the rail corridor's existence or predicate any land use classifications on current freight or proposed regional commuter rail services. The Glenwood South small area plan does not reference SEHSR specifically, but makes frequent references to pedestrian and transit options to reduce dependence on automobiles within this mixed-use district. This plan calls for extending pedestrian connections between the West Street area and Glenwood South "to strengthen pedestrian and land use connections" (City of Raleigh, 2007). The study area passes through this proposed "Pedestrian Business Overlay District."

3.11.4 Neighborhoods and Communities

This section documents and describes the urban residential areas, small towns and distinct neighborhoods within the SEHSR study area. Industrial and commercial areas, subdivisions, scattered rural development, and farmlands are documented elsewhere in this chapter.

3.11.4.1 Virginia

3.11.4.1.1 City of Richmond

The neighborhoods adjacent to Main Street Station are Shockoe Bottom and Shockoe Slip. Historically an industrial area, they now comprise an emerging district of high end condominiums, art galleries, restaurants and entertainment venues. For example, Tobacco Row in Shockoe Bottom is an adaptive reuse project turning former warehouses into a grocery, pharmacy, and condos. According to the 2000 Census, the area is Richmond's fastest growing census tract.

The area below the James River is often called the Southside of Richmond, which should not be confused with the Southside Virginia region along the North Carolina border. Much of this area is industrial and heavy commercial. One of the first neighborhoods along the SEHSR study area is just north of Philip Morris Industries along Ruffin Road. This is a workforce neighborhood straddling the existing rail corridor between I-95 and US 1. The Ruffin Road neighborhood is primarily residential, with an elementary school, community center and city park east of the corridor, and a small church to the west. A similar neighborhood exists west of the rail corridor south of Bells Road.

3.11.4.1.2 Chesterfield County

Most of Chesterfield County contains a suburban development pattern of subdivisions, commercial corridors and shopping centers, and industrial areas.

The community core area of Chester extends from Hundred Road to around Daniels Street. Chester developed around a stop on the Richmond & Petersburg Railroad, with Railroad Street paralleling the rail corridor. Grid-pattern blocks are laid out with their long sides paralleling the tracks so the old core area is nine blocks long but only four deep (two streets on either side of the rail corridor). Most development within this grid pattern is residential, the bulk of which fronts internal streets rather than the rail corridor. Commercial and institutional development first developed along Hundred Road at the northern end of the core. As the surrounding area suburbanized, most new commercial development has occurred around the intersection of US 1 and VA 10 and the I-95 interchange area.

Ettrick also straddles the existing rail corridor, but its development pattern and demographics appear to be shaped more by Virginia State University, an historically black college. As the SEHSR study area passes Dupuy Road, Ettrick Park abuts the rail corridor to the west while a fairly dense residential neighborhood abuts it to the east. This neighborhood, unlike Chester's old core, was not built along the railroad but adjacent to the university. The influence of the university is also evident in that, according to the 2000 Census, 75 percent of the population is African-American and 40 percent is in the 18-24 age bracket. The long term presence of the railroad is evidenced by the Amtrak station's location at the southern end of Ettrick Park, which itself straddles the active rail corridor. Ettrick's growth appears to be mostly to the west and northwest.

3.11.4.1.3 City of Colonial Heights

Colonial Heights and Petersburg essentially form a single urbanized area, with Colonial Heights accounting for much of the suburban residential and commercial development. The central development focus of Colonial Heights is US 1, known locally as the "Boulevard." Except where it crosses both Ellerslie Avenue and US 1, the SEHSR study area is almost completely hidden from most of the community as it generally runs behind the developed area fronting the Boulevard. The linear development pattern of Colonial Heights is completely auto-oriented and thus unaffected by the presence of a rail corridor. Future growth may continue north, but may also expand towards the east.

3.11.4.1.4 City of Petersburg

In contrast to Colonial Heights, Petersburg accounts for much of the urban residential and industrial development. After the SEHSR study area passes Washington Street, it passes through an industrial area, with older workforce residential neighborhoods to the east and west. A similar urban neighborhood abuts the tracks south of Stuart Avenue west of the rail corridor. Suburban-style infill neighborhoods are adjacent to the SEHSR study area around Youngs Road to the west and Juniper Road to the east. A few older workforce houses are located along Lincoln Street west of the SEHSR study area, while a large, urban workforce neighborhood extends north and south along the rail corridor to the east. The remainder of the SEHSR study area is adjacent to either industrial development or undeveloped lands. Urbanized Petersburg essentially ends as the SEHSR study area crosses I-85.

3.11.4.1.5 Dinwiddie County

Most of Dinwiddie County contains a rural residential and agricultural development pattern, within large tracks of woodlands, with some scattered residential and commercial development along major roads such as US 1.

The community core of Dinwiddie (also called Dinwiddie Courthouse) is clustered around the intersection of Boydton Plank Road (US 1) and Courthouse Road. This cluster serves as the county's center for government and commerce. Residential development patterns adjacent to the core are mostly linear, following roads radiating out from the core. A small commercial development cluster exists along the inactive rail corridor south of Haddon Street; however, all other development is linear and oriented towards roadways, particularly Boydton Plank Road.

McKenney is an old railroad village where part of the core area developed along Railroad Street and Factory Street adjacent to the inactive rail corridor. The village core has a loose street grid, six blocks long and three deep, southeast of the rail corridor and northeast of Doyle Boulevard (VA 40). More recent development is in a linear pattern, mostly oriented northwest-southeast along Doyle Boulevard, Sunnyside Road and Depot Road, with minor clusters at the Boydton Plank Road intersection and I-85 interchange.

3.11.4.1.6 Brunswick County

Most of Brunswick County contains a rural residential and agricultural development pattern, within large tracks of woodlands, with some scattered residential and commercial development along US 1.

Alberta is an old railroad village, with an intersection of the now inactive CSX and NS rail corridors within its town core. Most of the town is older buildings, some well-maintained and some in need of repair, and many commercial buildings are vacant or underutilized. In 2003, the town commissioned the Alberta Downtown Plan as part of an effort to secure federal Community Development Block Grant funds to assist with redevelopment and revitalization projects. Alberta's plans for economic development include converting the inactive NS rail corridor to become part of the Tobacco Heritage Trail and creating an industrial park straddling the CSX rail corridor adjacent to the south side of Boydton Plank Road.

3.11.4.1.7 Mecklenburg County

Most of Mecklenburg County contains a rural residential and agricultural development pattern, within large tracks of woodlands, with some residential and commercial development along US 1. Lake-oriented subdivisions and development occur at the southern end of the county near Lake Gaston.

The Town of La Crosse straddles the inactive rail corridor from US 58 south to Hillcrest Street. La Crosse was a former rail stop and the now closed La Crosse Hotel was built just east of the rail corridor in the early 20th century. Most of the town's commercial and industrial buildings face the rail corridor across Main Street to the west. The fire station, the town's main building, faces the rail corridor from across Carolina Street. The town is actively working on economic development projects for the core area, including renovating and reopening the hotel for use as a railway station, and creating a Tobacco Heritage Trail greenway along the inactive east-west NS rail corridor. Residential areas are mostly older, some well maintained and some in need of repair. The residential parts of town are arranged on a loose street grid around all sides of the core. Some development continues south of town along St. Tammany Road west of the rail corridor.

Bracey is a tiny highway crossroads area with a few scattered houses; however, the predominant development pattern is commercial and trucking operations oriented toward VA 903 and its interchange with I-85. Several structures in this area are dilapidated or vacant. The old Bracey railroad station building has been moved and is located within the study corridor on the north end of Bracey.

3.11.4.2 North Carolina

3.11.4.2.1 Warren County

Most of Warren County contains a rural residential and agricultural development pattern, within large tracks of woodlands, with some residential, commercial and industrial development along US 1. Lake-oriented subdivisions and development occur at the northern end of the county near Lake Gaston.

Norlina is an old railroad town developed around the intersection of the inactive CSX line and an active CSX line, as well as the intersection of US 1 with US 158/401. Within the town core area, some heavy commercial buildings are oriented toward the railroad corridors along Liberty and Hyco Streets. Many of the core's buildings are oriented towards streets perpendicular to the rail corridors and most non-residential buildings are located between Main Street south of the rail corridors and US 1 to the north. Residential areas are along a loose street grid to the north and south of the core area. Some lower density suburban development has occurred east of the core between the two rail corridors.

3.11.4.2.2 Vance County

Middleburg is a small, predominantly minority community straddling both US 1 and the active rail corridor. A small residential area of about eight square blocks lies north of US 1 along both sides of Lee Avenue. E.O. Young Elementary school is immediately to the southwest. Most of the area south of US 1 and the rail corridor is large scale commercial development, including a large Georgia-Pacific operation. Middleburg is immediately east of the US 1 interchange with I-85, with Chex Truck World and related restaurants located to the northwest.

Henderson is a much larger, predominantly minority city south of I-85 and west of the US 1 Bypass, through which the SEHSR study area and other rail corridors pass. Henderson is a heavy industry center, much of which is located along the SEHSR study area to the northeast and south of the urban core. Within the urban core, the active rail corridor essentially separates residential neighborhoods and commercial activities to the east from Garnett Street, Henderson's "main street," to the west. Henderson's older neighborhoods are mostly smaller houses along a rectilinear street grid commonly aligned with the rail corridor. Housing towards the northeast is a mix of middle class and workforce housing. Adjacent to the core, the housing is a mix of workforce and lower income housing. Residential areas in South Henderson are mostly lower income and often vacant. Outside of the SEHSR study area, newer residential development is mostly to the west and follows a more suburban pattern. South Henderson is almost entirely heavy commercial and industrial development as far south as Bear Pond Road and Peter Gill Road. Many industries located here to have access both to rail corridors and to US 1.

Kittrell is a small village originally built straddling the active rail corridor with much of the core area oriented towards the rail line as well as towards Main and Church Streets, which run perpendicular to the tracks. Much of this "interior" area is now residential and institutional, including Zeb Vance Elementary. The community's limited commercial development is oriented to the US 1 corridor.

3.11.4.2.3 Franklin County

Franklinton is an old railroad town built straddling both the active rail corridor and the old alignment for US 1 (now US 1-A), which remains the town's main street. The street grid reflects the orientations of US 1 and NC 56. The SEHSR study area is mostly residential and institutional, including both Franklinton Elementary and Franklinton High schools, but the commercial core is centered on Mason Street just west of the rail corridor.

Although there is some commercial development around the US 1 interchange with NC 56, the dominant growth pattern appears to be to the east.

Youngsville is another small community built straddling the active rail corridor and the old alignment for US 1. The street grid reflects the orientation of US 1, NC 96, and the rail corridor, with older houses surrounding the town core. Most structures are oriented towards streets running perpendicular to the active rail corridor. Northwest of the core is a newer industrial park developed along the west side of the rail corridor. Youngsville does not exhibit a clear growth pattern; however, Wake County's growth is expanding towards the community.

3.11.4.2.4 Wake County

Wake Forest is the northernmost community in Wake County and its subdivisions are spreading into Franklin County. The town's core and urban neighborhoods developed on both sides of the active rail corridor. Initially, it was a small town heavily focused on mills and the local college. (Wake Forest University has since moved to Winston-Salem – Southeastern College and Seminary has taken its place.) Today, Wake Forest is a bedroom community for people commuting to Raleigh and Research Triangle Park. Most new housing is for middle to upper income households, as is the restored historic housing. However, pockets of lower income and workforce housing remain. The DuBois Center, for example, is a community center serving lower income residents through special school programs, tutoring, job training and a food bank. Wake Forest has active plans to revitalize its downtown core area. Regardless, most new commercial development is drawn to the US 1 corridor, because it is the primary commuter route.

Between Wake Forest and the area within Raleigh known as "inside the [I-440] Beltline," lie a combination of newer, middle to upper income subdivisions and master planned communities, such as Heritage Wake Forest, and older workforce housing, apartments and manufactured housing communities, such as Litchford Mobile Homes. This outer area of suburban housing is separated from more urban neighborhoods and districts by a swath of industrial and commercial development along the SEHSR study area.

Once the rail corridor crosses Capital Boulevard ("inside the Beltline"), the SEHSR study area enters urban Raleigh, with the historic Mordecai and neo-traditional Pilot Mill Village neighborhoods adjacent to the ROW, and Peace College close by. The state government office complex lies along much of the eastern edge of the SEHSR study area. The rail corridor travels through several districts (Glenwood South, Powerhouse Square and the Warehouse District, collectively known as West Side) transitioning from industrial and commercial to mixed use entertainment, office and residential. Most residential development in this area has occurred since 2000 and consists primarily of mill conversions and high-end condos. Most downtown neighborhoods were oriented towards workforce housing, government employees and college faculty, but now gentrification and high cost infill development are causing a demographic shift within downtown.

3.11.5 Community Facilities and Services

This section of the chapter documents and in some cases describes the public facilities and services available along the SEHSR study area.

Any public facility or services physically located within the SEHSR study area is listed herein. Regional facilities located outside of the SEHSR study area as well as services provided throughout an entire jurisdiction are also documented.

3.11.5.1 Public Educational Facilities

3.11.5.1.1 Virginia

3.11.5.1.1.1 City of Richmond

Ruffin Road Elementary is located at 2001 Ruffin Road, east of the existing rail corridor and at grade crossing. The school is located in an isolated, lower income neighborhood just north of the Philip Morris industrial complex. Ruffin Road provides the only access to this school, which is also connected with a city park and community center.

3.11.5.1.1.2 Chesterfield County

Bensley Elementary is located at 6600 Strathmore Road in Richmond, east of the existing rail corridor. The school is located just north of the Defense Supply Center. Dundas Road is the closest access road crossing the existing rail corridor.

Ettrick Elementary is located at 20910 Chesterfield Avenue in Ettrick, east of the existing rail corridor. The school is located about two blocks west of Virginia State University. Chesterfield Avenue is the closest access road crossing the existing rail corridor.

Chester Middle is located at 3900 W. Hundred Road in Chester, east of the existing rail corridor. The school is located in close proximity to old town Chester. Hundred Road is the closest access road crossing the existing rail corridor.

Perrymont Middle is located at 8610 Perrymont Road in Richmond, east of the existing rail corridor. The school is located southeast of the Defense Supply Center. Kingsland Road is the closest access road crossing the existing rail corridor.

3.11.5.1.1.3 City of Colonial Heights

Lakeview Elementary is located at 401 Taswell Avenue, west of the existing rail corridor. The school is located south of Lakeview Avenue and west of the Boulevard. The Boulevard is the closest access road crossing the existing rail corridor.

North Elementary is located at 3201 Dale Avenue, west of the existing rail corridor. The school is located east of the Boulevard. East Ellerslie Avenue is the closest access road crossing the existing rail corridor.

3.11.5.1.1.4 City of Petersburg

J.E.B. Stuart Elementary is located at 100 Pleasants Lane, west of the existing rail corridor. The school is located about seven blocks east of Central State Hospital. Dupuy Road is the closest access road crossing the existing rail corridor.

Westview Elementary is located at 1100 Patterson Street, east of the existing rail corridor. The school is centrally located within a residential neighborhood. Lincoln Street is the closest access road crossing the existing rail corridor.

3.11.5.1.1.5 Dinwiddie County

Southside Elementary is located at 10305 Boydton Plank Road, west of the former rail corridor. The school is located between Burgess and Dinwiddie village. Dabney Mill Road and Quaker Road are the closest access roads crossing the SEHSR study area.

Sunnyside Elementary is located at 10203 Sunnyside Road in McKenney, northwest of the former rail corridor. The school is located northwest of McKenney's town core. Doyle Road is the closest access road crossing the SEHSR study area.

3.11.5.1.1.6 Brunswick County

No schools in Brunswick County are located within the study area.

3.11.5.1.1.7 Mecklenburg County

No schools in Mecklenburg County are located within the study area.

3.11.5.1.2 North Carolina

3.11.5.1.2.1 Warren County

Northside Elementary is located on US 1 north of the existing rail corridor. The school is located within the Norlina town core. Division Street and US 158 are the closest access roads crossing the existing rail corridor.

3.11.5.1.2.2 Vance County

E.O. Young Jr. Elementary is located at 6655 Broad Street (US 1) in Middleburg, west of the existing rail line. The school is located just southwest of the town core. Allison Cooper Road is the closest access road crossing the existing rail corridor.

L.B. Yancey Elementary is located at 311 Hawkins Drive in Henderson, east of the existing rail line. The school is located in south Henderson. St. Matthews Street is the closest access road crossing the existing rail corridor.

Zeb Vance Elementary is located at 4800 Raleigh Road in Kittrell, west of the existing rail line. The school is located in the town core. East Main Street is the closest access road crossing the existing rail corridor.

Henderson Middle is located at 219 Charles Street in Henderson, east of the existing rail line. The school is located in central Henderson. Charles Street and East Andrews Avenue are the closest access roads crossing the existing rail corridor.

Northern Vance High is located at 293 Warrenton Road in Henderson, north of the existing rail line. The school is located in northeast Henderson. Warrenton Road is the closest access road crossing the existing rail corridor.

The Kittrell Job Core Center is located at 1096 US 1 South, west of the existing rail line. The training center is located along Kittrell's highway corridor. West Chavis Road and East Main Street are the closest access roads crossing the existing rail corridor.

3.11.5.1.2.3 Franklin County

Franklinton Elementary is located at 431 South Hillsborough Street in Franklinton, west of the existing rail line. The school is located near the town core. Hawkins Street is the closest access road crossing the existing rail corridor.

Franklinton High is located at 3 North Main Street in Franklinton, west of the existing rail line. The school is located within the town core. Mason Street is the closest access road crossing the existing rail corridor.

3.11.5.1.2.4 Wake County

Forest Pines Drive Elementary is located at 530 E. Perry Avenue in Wake Forest, southeast of the existing rail line. The school is located northeast of the town core. Perry Avenue is the closest access road crossing the existing rail corridor.

Wake Forest Elementary is located at 136 W. Sycamore Avenue in Wake Forest, west of the existing rail line. The school is located south of the town core. Elm Avenue is the closest access roads crossing the existing rail corridor.

Raleigh Charter High School is located at 1111 Haynes Street in Raleigh, east of the existing rail line. The school is located in north of downtown Raleigh in the former Pilot Mill building. Wake Forest Road and Peace Street (both of which are grade separated) are the closest access roads crossing the existing rail corridor.

Peace College is located at 15 Peace Street in Raleigh, east of the existing rail line. The college is located immediately north of downtown Raleigh. Wake Forest Road and Peace Street (both of which are grade separated) are the closest access roads crossing.

3.11.5.2 Emergency Services

3.11.5.2.1 Emergency Management and Hazardous Materials

3.11.5.2.1.1 Virginia

Emergency management for the Virginia segment of the study corridor is administered by the Virginia Department of Emergency Management, Divisions 1 and 3.

The Virginia hazardous materials emergency response program provides enhanced, state-of-the-art technical response capabilities and extensive, multi-level, broad-based environmental planning and training programs. Team G, based in Henrico County, is responsible for the Virginia segment of the study corridor.

3.11.5.2.1.2 North Carolina

Emergency management for the North Carolina segment of the study corridor is administered by the North Carolina Department of Crime Control and Public Safety, Division of Emergency Management, Central Branch Areas 6 and 7.

The North Carolina Hazardous Materials Regional Response Team (RRT) program is a system of six teams strategically located within the state to provide hazardous materials response services to the citizens of North Carolina. An RRT is available to respond with technical support, manpower, specialized equipment and/or supplies whenever an incident exceeds local capabilities. Team 4, based in Durham, is responsible for the North Carolina segment of the study corridor.

3.11.5.2.2 Policing

Chesterfield, Dinwiddie, Brunswick, Mecklenburg, Warren, Vance, Franklin and Wake Counties all provide some degree of policing through their Sheriff's Department. Richmond, Colonial Heights, Petersburg, Henderson, Franklinton, Youngsville, Wake Forest and Raleigh all have their own municipal police departments.

3.11.5.2.3 Fire & Emergency Medical Services

Fire and Emergency Medical Services (EMS) are provided at county and municipal level throughout the study corridor.

3.11.5.2.3.1 Virginia

The City of Richmond's Department of Fire and Emergency Services provides fire, rescue and EMS within municipal boundaries through 20 fire stations. The City has several specialty unites, including river rescue, heavy rescue, repelling, and hazardous materials. There are no emergency facilities located within the study corridor in Richmond, but the Medical College of Virginia Campus of Virginia Commonwealth University, the Richmond Fire Station 1/R1, Richmond Fire Station 13, and Richmond Fire Station 21 are located nearby.

Chesterfield County's Fire and EMS Department, a combination career/volunteer system, provides fire, rescue and EMS throughout the county through 20 fire and 9 rescue stations. The Bensley-Bermuda Volunteer Rescue Squad's Station 2 and Station 3, and the Chesterfield Fire and EMS Station 17 are located within the study corridor; while the Bensley-Bermuda Volunteer Rescue Squad Station 12, and the Chesterfield Fire and EMS Station 1 and Station 3 are located nearby.

Colonial Heights' Fire and EMS Department, a combination career/volunteer system, provides fire, rescue and EMS within municipal boundaries through 2 stations. Neither of these stations are in the study corridor, but both are nearby.

Petersburg's Department of Fire, Rescue and Emergency Services provides fire, rescue and EMS within municipal boundaries. None of Petersburg's emergency facilities are located within the study corridor, however Petersburg Company 3 and Company 5 are located nearby.

Dinwiddie County's Division of Fire and EMS, a combination career/volunteer system provides fire, rescue and EMS throughout the county through 6 fire stations and 3 rescue squads. There are no emergency facilities located within the study corridor; however the Dinwiddie Rescue Squad, the Dinwiddie Volunteer Fire Department Company 1, and the McKenney Volunteer Fire Department Company 3 are located near or adjacent to the study corridor.

Brunswick County's Fire and EMS is a combination career/volunteer system that provides fire, rescue and EMS services throughout the county. The system includes five fire companies, two EMS agencies, and two fire and EMS companies. There are no emergency facilities located within the study corridor; however the Alberta Volunteer Fire Department Company 1 and the Brunswick Volunteer Rescue Squad are located nearby.

Mecklenburg County's volunteer fire department provides fire and EMS services throughout the county through 5 fire stations and 4 rescue squads. Additional municipal volunteer fire stations are located in the towns of South Hill, Chase City, La Crosse, Boydton and Clarksville. The La Crosse Volunteer Fire Department is adjacent to the study corridor.

3.11.5.2.3.2 North Carolina

Warren County's volunteer fire department provides fire services throughout the county through 17 fire stations. Warren County EMS provides EMS throughout most of the county while the Warren County Rescue Squad covers the northeast quadrant. The Wise Hawtree Volunteer Fire Department, Ridgeway Volunteer Fire Department and Soul City Volunteer Fire Department are located within the study corridor, while the Norlina Station #2 is located nearby, but outside the study corridor.

Vance County's Fire and Ambulance Department provides fire and EMS services throughout the county. In addition, the City of Henderson's Fire and Rescue Department provides fire and EMS services within municipal boundaries through 2 stations. The City of Henderson Fire Station #2 and Bearpond Volunteer Fire Department are inside the study corridor; while the Vance County Ambulance and Fire

Service, City of Henderson Fire Station #1, and Kitrell Volunteer Fire Department are adjacent to, or nearby the study corridor.

Franklin County's Fire Department, a combination career/volunteer system, provides fire and EMS services throughout the county and within municipalities through 8 stations. The Youngsville EMS is located within the study corridor, while the Franklinton EMS and Youngsville Fire Department Station #1 are just outside the study corridor.

Wake County's Fire/Rescue Division provides fire and rescue services within unincorporated areas of Wake County through approximately 45 stations (because Wake County is a rapidly growing area new stations are periodically added). Wake County EMS operates approximately 9 stations within the county and 4 within municipalities. The Town of Wake Forest provides fire and EMS services within municipal boundaries through 2 stations. The City of Raleigh provides fire, rescue and EMS services within municipal boundaries through 27 stations. The Wake Forest Fire Station #2, Raleigh Fire Department #22, Durant EMS and Glenwood South EMS are located within the study corridor. Located near the study corridor are the Wake Forest Fire Station #1, Wake Forest EMS, Wake Forest South EMS, Raleigh Fire Department # 15, Mini City EMS, Duke Health Raleigh Hospital, Highwoods EMS, Whittaker Mill EMS, Raleigh Fire Department #1 and Downtown EMS.

3.11.5.3 Health Services

3.11.5.3.1 Virginia

3.11.5.3.1.1 City of Richmond

Major medical facilities include the Children's Hospital of Richmond, Virginia Commonwealth University Health System, Chippenham Hospital, McGuire Veterans Medical Center, Cumberland Hospital, St. Marys Hospital, Johnston-Willis Hospital, and Richmond Community Hospital, all of which are located outside of the study area.

3.11.5.3.1.2 Chesterfield County

Johnston-Willis Hospital and St. Francis Medical Center are located outside the study area.

3.11.5.3.1.3 City of Colonial Heights

There are no major medical facilities within this city.

3.11.5.3.1.4 City of Petersburg

Major medical facilities include the Southside Regional Medical Center and the John Randolph Medical Center, both of which are outside of the study area.

3.11.5.3.1.5 Dinwiddie County

There are no major medical facilities within this county.

3.11.5.3.1.6 Brunswick County

There are no major medical facilities within this county.

3.11.5.3.1.7 Mecklenburg County

The Community Memorial Healthcenter is located outside of the study area.

3.11.5.3.2 North Carolina

3.11.5.3.2.1 Warren County

There are no major medical facilities within this county.

3.11.5.3.2.2 Vance County

Maria Parham Medical Center is located outside of the study area.

3.11.5.3.2.3 Franklin County

Franklin Regional Medical Center is located outside of the study area.

3.11.5.3.2.4 Wake County

Major medical facilities include WakeMed, WakeMed North, Western Wake Medical Center, Duke Raleigh Community Hospital, and Rex Healthcare. State medical institutions include Dorothea Dix Hospital and the Central Prison Hospital. All of these facilities are located outside of the study area.

3.11.5.4 Places of Worship & Cemeteries

The following places of worship and cemeteries, listed in alphabetical order, are located within the SEHSR study corridor.

3.11.5.4.1 Virginia

3.11.5.4.1.1 City of Richmond

All Saints Apostolic Church is located at 2001 Royall Avenue

Church of God in Christ is located at 2208 Summer Hill Ave.

Shekinah Temple Church of Our Lord Jesus Christ is located at 2102 Ruffin Road

3.11.5.4.1.2 Chesterfield County

Centralia Presbyterian Church is located at 4625 Centralia Road

Chester Church of Christ is located at 12100 Winfree Street

God Mission of Faith Church is located near Ettrick at 3718 East River Road

Historic First Baptist Church is located at 4412 Centralia Road

Kingsland Baptist Church is located near Bellwood at 8801 Perrymont Road

Macedonia Tabernacle is located near Ettrick at 3615 East River Road

St. John's Episcopal Church is located at 12201 Richmond Street

3.11.5.4.1.3 City of Colonial Heights

Calvary Baptist Church is located at 15800 Woods Edge Road

Church of The Nazarene is located at 601 Ellerslie Avenue

St. Michael's Episcopal Church is located on Old Town Drive

3.11.5.4.1.4 City of Petersburg

Greater Faith AME Zion is located at 1301 Youngs Road

Kingdom Hall is located at 3635 Halifax Road

New First Baptist Church is located at 1346 Grant Avenue

Shining Light Pentecostal Holiness Church is located at 1417 Farmer Street

Third Presbyterian Church is located at 1660 Dupuy Road

Zion Apostolic Church is located at 1601 Young's Road

3.11.5.4.1.5 Dinwiddie County

Mount Calvary Baptist Church is located at 16609 Glebe Road

Olive Branch Baptist Church is located at 11119 Boydton Plank Road

Smyrna Baptist Church is located near the county courthouse at 18725 Carson Road

3.11.5.4.1.6 Brunswick County

Lovely Zion Baptist Church is located between McKenney and Alberta on Lovely Zion Road

Mercy Seat RZUA Church is located north of Alberta on Waqua Creek Road

Trinity-St. Mark's Episcopal Church is located in Alberta at 194 Connelly Street

United Methodist Church is located in Alberta at 304 Church Street

Warfield Baptist Church and cemetery is located north of Alberta at 7318 Flat Rock Road

3.11.5.4.1.7 Mecklenburg County

First Baptist Church is located south of La Crosse on Marengo Road

Mecklenburg United Methodist Church is located in La Crosse at 6503 Marengo Road

Morning Star Apostolic is located in La Crosse at 142 Morris Town Circle

Pleasant Hill Reformed Zion Union Apostolic Church is located south of La Crosse at 4143 Marengo Road

Sardis United Methodist Church is located south of La Crosse at 3152 Marengo Road

3.11.5.4.2 North Carolina

3.11.5.4.2.1 Warren County

Bethlehem Baptist Church is located east of Paschall Station Road in the community of Wise at 1258 Cole Farm Road

Chapel of the Good Shepherd is located east of Ridgeway on Ridgeway Warrenton Road

First Baptist Church Norlina is located in Norlina at 300 Washington Street

Jerusalem United Methodist Church is located on Paschall Station Road just south of Felts Road in the community of Wise

Locust Grove Baptist Church is located on Paschall Station Road in the community of Wise

Manson Baptist Church is located in Manson on Kimball Road

New Creation Church is located in Norlina at 108 Hyco Street

Norlina United Methodist Church is located in Norlina at 401 US 1 North

Ridgeway Baptist Church is located in Ridgeway at 156 Wycoff Road

Unity Prayer House of Faith is located southwest of Norlina at 291 US Hwy 1 South

Wise Baptist Church is located at the intersection of Carrie Dunn Road and US Hwy 1 in the community of Wise

3.11.5.4.2.2 Vance County

Brookston Baptist Church is located between Middleburg and Henderson at 242 Baptist Church Road

Calvary Temple Holy Church is located at 215 Kitchen Avenue

Church of God Parsonage is located in Henderson at 305 John Deere Road

Cooks Chapel Zion Church is located in South Henderson at 210 Center Street

Cotton Memorial Presbyterian Church is located in Henderson at 511 Chestnut Street

Davis Chapel Baptist Church is located in Henderson at 742 North Chestnut Street

First Baptist Church is located in downtown Henderson at 205 Winder Street

First Congregational Christian Church is located in Henderson at 427 Rowland Street

First Presbyterian Church is located in downtown Henderson at 222 Young Street

First United Methodist Church is located in downtown Henderson at 114 Church Street

Fisher of Men Church of Our Lord Jesus Christ is located near Henderson at 163 Elsie Street

Forest Hills Baptist Church is located at the intersection of Warrenton Road and US Hwy 1 South

Kittrell Church of God is located south of Kittrell on US Hwy 1 South

Long Creek United Holy Church is located south of Kittrell 313 Oak Ridge Church Road

Middleburg Baptist Church is located in Middleburg at 80 North Plummer Avenue

Mount Zion Christian Church of Henderson is located at 995 Burr Street

New Hope Baptist Church is located north of Kittrell on Raleigh Road

North Henderson Baptist Church is located in north Henderson at 1211 N. Garnett Street

Raleigh Road Baptist Church is located near Henderson at 3892 Raleigh Road

Rock of the Reach Ministry is located in Henderson at 611 North Garnett Street

Shiloh Baptist Church is located in Henderson at 635 South College Street

St. James Episcopal Church is located in Kittrell on Williams Street

St. John's Episcopal Church is located in north Henderson on Main Street

Taylor's Chapel AME Zion Church is located in Kittrell on N. Williams Street

A Touch of Faith Community Church is located in Henderson at 601 South Williams Street

Union Chapel United Methodist Church is located north of Kittrell at 6479 Raleigh Road

United Prayer of Faith Church is located in South Henderson on Miriam Street

Victory Baptist Church is located just south of Henderson at 475 J P Taylor Road

Welcome Chapel Baptist Church is located near Henderson at 237 Welcome Avenue

Youngs Memorial Holy Church is located between Middleburg and Henderson at 1379 Brookston Road

3.11.5.4.2.3 Franklin County

First Baptist Church is located in Franklinton on South Main Street

First United Church of Christ is located at 20 West Green Street.

Franklinton Baptist Church is located at 102 West Mason Street

Franklinton United Methodist Church is located at 109 North Main Street

Grace Fellowship Church Of God is located in Youngsville at 120 West Franklin Street

Mount Pleasant Presbyterian Church is located in Franklinton on College Street

Union Grove Baptist Church is located in Youngsville at 552 North College Street

Youngsville Baptist Church is located at 315 East Main Street

3.11.5.4.2.4 Wake County

Church of God of Prophecy is located in Wake Forest at 122 N. White Street

Deliverance Holy Church of God is located in Raleigh at 626 Capital Boulevard

Friendship Chapel Baptist Church is located south of Wake Forest at 237 Friendship Chapel Road

Glen Royal Baptist Church is located in Wake Forest at 731 Elizabeth Avenue

Holy Redeemer Catholic Church is located north of Wake Forest at 1841 N. White Street

Hope Baptist Church is located in Wake Forest at 220 S. White Street

Living Word Family Church is located just south of Wake Forest on Capital Boulevard

Millbrook United Methodist Church is located in Raleigh at 1712 East Millbrook Road

Olive Branch Baptist Church is located in Wake Forest at 326 East Juniper Avenue

Powerhouse Church of Jesus Christ is located in Raleigh at 1130 North Blount Street

South Main Baptist Chapel Church is located in downtown Wake Forest at S. Main Street and W. Vernon Avenue

Spring Street Christian Church is located in Wake Forest on E. Spring Street

St Paul AME Church is located in Raleigh at 402 West Edenton Street.

Tri-Area Ministry is located in Wake Forest at 149 East Holding Avenue

Victory Tabernacle Church is located in downtown Raleigh on W. South Street

Wake Forest Baptist Church is located at 107 E. South Avenue

Wake Forest Cemetery is located in Wake Forest along N. White Street

Wake Forest Church of God is located in Wake Forest at 155 E. Cedar Avenue

Wake Forest United Methodist Church is located at 905 South Main Street

3.12 Archaeological and Historical Resources

The SEHSR project is subject to the requirements of Section 106 of the National Historic Preservation Act of 1966, which requires federal agencies to consider the effects of federally-funded, licensed, or permitted actions on properties listed on or eligible for the National Register of Historic Places (NRHP). Section 106 also gives the Advisory Council on Historic Preservation an opportunity to comment on such actions. The following section identifies archaeological and historical resources located within the project study area and describes the methods used to identify them.

The NRHP is a list of the nation's cultural resources that are considered worthy of preservation. Listed and eligible resources must meet at least one of the four NRHP key criteria:

- Criterion A - associated with events that have made a significant contribution to the broad patterns of our history; or

- Criterion B - associated with the lives of persons significant in our past; or

- Criterion C - 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; or

- Criterion D - have yielded or may be likely to yield, information important in prehistory or history

Section 106 coordination for the SEHSR project was conducted with the Virginia Department of Historic Resources (VDHR) and North Carolina State Historic Preservation Office (HPO). In addition, the National Park Service was consulted regarding Civil War battlefields.

3.12.1 Archaeological Resources

Per 36 CFR 800.4(b)(2), a phased approach was developed to determine the eligibility of archaeological sites within the SEHSR project area of potential effects (APE). The APE is the geographic area within which the character or use of resources may be changed as a result of the project. For potential archaeological resources in the SEHSR study area, the APE was defined as a 100-foot corridor that extends 50 feet on either side of the centerline of proposed construction activities when they are within current rail ROW. The APE was extended to a 200-foot corridor where construction is proposed on new location.

For the DEIS, Phase Ia investigations were completed in which archaeologists researched archaeological resources within the APE and identified areas with high, moderate, or low probability for containing archaeological sites. Phase I investigations were then completed to determine previously recorded archaeological sites and identify additional archaeological resources within the APE. However, testing to determine whether a particular resource is eligible for inclusion in the NRHP is not conducted during Phase I. The results of the Phase I investigation include all known sites listed in or previously determined eligible for the NRHP, as well as resources potentially eligible for the NRHP. For the SEHSR project, these results will be considered in the selection of the preferred alternative. Phase II investigations to determine eligibility for the NRHP, as well as determinations of the effects of the project on eligible archaeological resources, will be completed prior to the publication of the FEIS. In addition, these investigations would include any additional evaluations required where the project designs extended outside of the original archaeological APE.

During the Phase Ia investigations, researchers from Legacy Research Associates (Petersburg, VA, to Raleigh, NC) and Louis Berger, Inc., (Richmond, VA, to Petersburg, VA) reviewed site inventory files, archival maps, cultural resource reports, local histories, and historical publications. They prepared a brief historical context, summarized previous archaeological research, and mapped site locations using a GIS database. Archaeologists then used attributes of known sites to develop criteria for identifying areas with high, moderate, or low probability for containing prehistoric archaeological resources. Information from historic period maps and resources helped researchers develop probability criteria for historic period sites that have not been evaluated for archaeological potential.

During the Phase I investigations, archaeologists from Legacy Research Associates (Virginia-North Carolina state line to Raleigh, NC), Louis Berger, Inc. (Petersburg, VA, to Virginia-North Carolina state line), and Dovetail Cultural Resource Group, Inc. (Richmond, VA, to Petersburg, VA), performed archaeological surveys, mostly in undisturbed areas where the alignments extended outside of the existing rail corridor on new location (Berger,

2005; Legacy Research, 2005; 2007; Dovetail, 2009a, 2009c). These surveys included walkover reviews, shovel testing, and personal interviews. Archaeologists inventoried all archaeological resources within the surveyed APE to determine if any sites are eligible for the NRHP.

There is one archaeological site listed on the NRHP within the APE for the project. The Falling Creek Ironwork archaeological site was originally recorded as the location of the Virginia Company Ironworks in Chesterfield County, VA, established in 1619. Subsequent investigation suggests that it could also be Cary's Ironworks, destroyed in 1781 during the American Revolution. It is believed that the site has intact subsurface remains including features and an abundance of in situ artifacts. The site was listed on the NRHP in 1995 under Criterion D for its ability to contain information on area history.

Based on the archaeological surveys, there are also 26 sites within the Virginia portion of the archaeological APE and 7 sites within the North Carolina portion of the archaeological APE that are potentially eligible for the NRHP. Table 3-28 summarizes the archaeological sites in the APE that are eligible or potentially eligible for the NRHP by state and county. In addition, there were two sites in Warren County, NC, that had incomplete field assessments because of denied access. If these sites cannot be avoided by the preferred alternative, then they will need to be revisited to complete the NRHP assessment.

Table 3-28
Summary of Archaeological Sites Located within Study Area by State and County

Jurisdiction	NRHP Listed Sites	NRHP Potentially Eligible Sites	Total Sites
Virginia			
City of Richmond	0	1	1
Chesterfield County	1	14	14
City of Colonial Heights	0	1	1
City of Petersburg	0	1	1
Dinwiddie County	0	0	0
Brunswick County	0	8	8
Mecklenburg County	0	1	1
Total in VA	1	26	26
North Carolina			
Warren County	0	3	3
Vance County	0	2	2
Franklin County	0	1	1
Wake County	0	1	1
Total in NC	0	7	7
Total in Study Area	1	33	33

Source: Berger, 2005; Legacy Research, 2005; 2007; Dovetail, 2009a, 2009c; Legacy Research, 2005, 2007

3.12.2 Historical Resources

For potential historical resources in the SEHSR study area, the APE extends 250 feet on either side of the corridor center line in those areas where the proposed high speed corridor would remain within existing rail ROW. However, in town or urban settings, the APE was reduced during the field survey because often dense modern development would limit the effect of the proposed railroad on any historic resources. Where the rail designs are on new alignment, the APE was enlarged where necessary. Finally, where the railroad closely parallels modern four-lane highways, the APE extends to, but not beyond, the highway.

Historical resource surveys were also performed in the study area in two phases. In the first phase, historians identified all properties within the APE listed on or eligible for the NRHP. In the second phase, investigators performed in-depth evaluations of those properties to determine whether or not they are eligible for listing on the NRHP. During the initial investigation, historians from Mattson, Alexander, & Associates (Petersburg, VA, to Raleigh, NC) and Louis Berger, Inc., (Richmond, VA, to Petersburg, VA) conducted a Phase I preliminary architectural survey for all properties within the APE that appeared to be 50 or more years old. The investigators performed the survey and compiled their results pursuant to the National Historic Preservation Act of 1966, as amended, and the Advisory Council on Historic Preservation's *Protection of Historic Properties* (36 CFR 800), in order to meet the requirements of that document. The surveys were also done pursuant to Section 4(f) of the Department of Transportation Act of 1966, which provides additional protection for listed or eligible historic resources. These lands can only be used for a federally-funded transportation project if there is no other feasible and prudent alternative, and the project incorporates all possible planning to minimize harm.

The historians researched files at the North Carolina Division of Archives and History and the VDHR to identify all known, historic architectural resources fitting any of the following categories:

- Listed on the NRHP
- Listed on the North Carolina Study List
- Determined eligible for the NRHP through environmental assessment
- Designated as a local landmark
- Listed on the Virginia Landmarks Register
- Inventoried previously

They performed a drive-through (windshield) survey of the APE to photograph and map all resources that appeared to be 50 or more years old. They also evaluated each property and recommended further investigation of those properties appearing to be eligible for the NRHP.

Phase II investigations were performed by Mattson, Alexander, and Associates (Virginia-North Carolina state line to Raleigh, NC), Louis Berger, Inc., (Petersburg, VA, to Virginia-North Carolina state line), and Dovetail Cultural Resource Group, Inc. (Richmond, VA, to Petersburg, VA, plus additional roadwork areas throughout Virginia). Mattson, Alexander, & Associates (Petersburg, VA, to Raleigh, VA) and Dovetail Cultural Resource Group, Inc. (Richmond, VA, to Petersburg, VA) also conducted research on the Seaboard Air Line and Atlantic Coastline railroad corridors to determine if the existing railroad lines were eligible for listing in the NRHP.

Detailed evaluations included a site file review and background check, field surveys, evaluation, and documentation. Tax records were consulted to determine construction dates and the current owners of each resource. Research was conducted in county and local libraries and historical societies to gather resource-specific information. GIS was used to map the boundaries of each individual resource within the architectural APE. Sufficient narrative physical information was collected to describe each property, characterize its integrity, and assess its potential for NRHP eligibility. Table 3-29 summarizes by state and county the historic resources in the APE that are listed on or eligible for the NRHP.

Table 3-29
Summary of Historical Resources Sites Located within Study Area by State and County

Jurisdiction	NRHP Listed Sites	NRHP Eligible Sites	Total Sites
Virginia			
City of Richmond	5	4	9
Chesterfield County	1	11	12
City of Colonial Heights	1	0	1
City of Petersburg	2	3	5
Dinwiddie County	0	11	11
Brunswick County	0	4	4
Mecklenburg County	0	7	7
Multi-county resources*	0	8	8
Total in VA	9	48	57
North Carolina			
Warren County	2	5	7
Vance County	3	15	18
Franklin County	1	5	6
Wake County	14	11	25
Multi-county resources*	1	1	2
Total in NC	21	37	58
Total in Study Area	30	85	115

Source: Berger, 2005; Dovetail, 2008, 2009b; Mattson, Alexander, and Associates, 2005, 2007, 2009.

* Includes battlefields, historic railroad corridors, and other large resources.

Table 3-30 through Table 3-32 list the individual resources by state and identify the mapsheet(s) in Appendix Q where the resources are located. The resources are listed in the order they appear in the project study area from north to south. Information on the individual resources is included in the sections below.

Table 3-30 Historic Architecture Resources in the SEHSR Corridor - Virginia			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Seaboard Air Line Railroad Corridor	AA, BB, CC/ 1-19, 23-24	Chesterfield, Colonial Heights, Petersburg, Richmond	Eligible/A
C. & O. & Seaboard Railroad Depot	AA/1	Richmond	Listed/A, C
Shockoe Valley & Tobacco Row Historic District	AA/1	Richmond	Listed/A, C
Shockoe Slip Historic District	AA/1	Richmond	Listed/A, C
James River and Kanawha Canal Historic District	AA/1	Richmond	Listed/A, C
Atlantic Coast Line Railroad Corridor	AA, BB, CC/ 10-24	Chesterfield, Colonial Heights, Petersburg, Richmond	Eligible/A
Manchester Warehouse Historic District	AA/1-2	Richmond	Listed/A, C
Williams Bridge Company	AA/2	Richmond	Eligible/A, C, D
Lucky Strike/RJ Reynolds Tobacco	AA/2	Richmond	Eligible/A,C
Transmontaigne Product Services, Inc.	AA/2	Richmond	Eligible/A
Davee Gardens Historic District	AA/4	Richmond	Eligible/A, C
Dupont Spruance	AA/5-6	Chesterfield, Richmond	Eligible/A
Sheffields; Auburn Chase; Bellwood; Building 42 - DSCR Officer's Club; New Oxford	AA/8	Chesterfield	Listed/A, C, D
USDOD Supply Center Historic District; Bellwood-Richmond Quartermaster Depot Historic District	AA/7-8	Chesterfield	Eligible/A, B, C, D
Richmond & Petersburg Electric Railway	AA, BB, CC/ 4-12, 18, 22-23	Chesterfield, Colonial Heights, Petersburg, Richmond	Eligible/A
House at 3619 Thurston Rd	AA/9	Chesterfield	Eligible/C
Centralia Post Office	BB/10	Chesterfield	Eligible/A
Ragland House/4626 Centralia Rd	BB/10	Chesterfield	Eligible/C
Circle Oaks/4510 Centralia Road	BB/10	Chesterfield	Eligible/C
Chester Historic District	BB/11-13	Chesterfield	Eligible/A, C
Chester #94 Masonic Lodge	BB/12	Chesterfield	Eligible/A
Pretlow House	BB/12	Chesterfield	Eligible/B
Eichelberger House	BB/12-13	Chesterfield	Eligible/C

Table 3-30 Historic Architecture Resources in the SEHSR Corridor - Virginia			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Ellerslie	CC/17-18	Colonial Heights	Listed/A, C
Battersea	CC/24	Petersburg	Listed/A, B, C, D
North Battersea/Pride's Field Historic District	CC/23-24	Petersburg	Listed/C
Defense Road	CC/25-27	Petersburg	Eligible/A, C
Dimmock Line/Earthworks	CC/26-27	Petersburg	Eligible/A, B, C
Bridge over Defense Road	CC/26-27	Petersburg	Eligible/A, C
Evergreen	A/37	Dinwiddie	Eligible/C
Courtworth	C/44	Dinwiddie	Eligible/C
Bowen House	C/45	Dinwiddie	Eligible/C
W. Boisseau's Store, Warehouse, Dwelling	C/45	Dinwiddie	Eligible/A, C
Bank Building	C/50	Dinwiddie	Potentially Eligible/C
Mayton House	C/51	Dinwiddie	Eligible/C
Honeymoon Hill Farm	C/51	Dinwiddie	Eligible/C
Wynnhurst	D/54-55	Brunswick	Eligible/C
Blick's Store	D/54-55	Brunswick	Potentially Eligible/C
Tourist Guest House	G/74	Brunswick	Eligible/C
Oak Shades	G/74	Brunswick	Eligible/C
Evans House	H/78-79	Meckenburg	Eligible/C
Smelley House	I/82	Mecklenburg	Eligible/C
La Crosse Commercial Historic District	I/83	Mecklenburg	Eligible/A, C
Wright Farmstead	J/84-85	Mecklenburg	Eligible/A, C, D
Sardis Methodist Church	J/86	Mecklenburg	Eligible/C
Bracey Historic District	K/89	Mecklenburg	Eligible/A, C
Granite Hall/Fitts House	L/92-93	Mecklenburg	Eligible/C

Source: Berger, 2005; Dovetail, 2008, 2009b.

Table 3-31 Battlefields in the SEHSR Corridor – Virginia			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Proctor's Creek	AA, BB/7-10	Chesterfield	Eligible/A
Port Walthall Junction	BB/14-16	Chesterfield	Eligible/A
Swift Creek/Arrowfield Church	CC/16-18	Chesterfield, Colonial Heights	Eligible/A
Petersburg III/The Breakthrough	CC, DD/25-28	Dinwiddie, Petersburg	Eligible/A

Table 3-31 Battlefields in the SEHSR Corridor – Virginia			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Weldon Railroad/Globe Tavern	CC, DD/26-30	Dinwiddie, Petersburg	Eligible/A
Peebles Farm	CC, DD/27, 31-33	Dinwiddie, Petersburg	Eligible/A
Boydton Plank Road	DD, A/32-37	Dinwiddie	Eligible/A
Hatcher's Run	DD, A/31-36	Dinwiddie	Eligible/A
Lewis Farm	A/36-38	Dinwiddie	Eligible/A
Dinwiddie Courthouse	B/40-41	Dinwiddie	Eligible/A

Source: Berger, 2005; Dovetail, 2008, 2009b.

Table 3-32 Historic Architecture Resources in the SEHSR Corridor – North Carolina			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Warren County Training School	L/94-95	Warren	Eligible/A, C
Wise School	L/95	Warren	Eligible/A, C
House (East side of US 1, Wise, NC)	M/96	Warren	Eligible/C
Holtzmann Farm	M/101	Warren	Eligible/A
Chapel of the Good Shepherd	M/101-102	Warren	Listed/A, C
Dr. Thomas B. Williams House and Office	M/102	Warren	Eligible/C
William J. Hawkins House	N/103	Warren	Listed/A, B, C
Middleburg Community House (Middleburg Steakhouse)	O/108	Vance	Eligible/A, C
House (Allison Cooper Rd, Middleburg vicinity)	O/108	Vance	Eligible/C
Holloway Farm	O/109-110	Vance	Eligible/A, C
William Haywood Harris Farm	O/109-110	Vance	Eligible/A, C
Forrest Ellington Farm	O/110	Vance	Eligible/A
R. B. Carter House	P/114	Vance	Eligible/C
Henderson Historic District and Proposed Boundary Expansion	P/114-115	Vance	Listed/A, C
Houses (2 bungalows on E Young Ave)	P/115	Vance	Eligible/A, C
Mistletoe Villa	P/115	Vance	Listed/C
South Henderson Industrial Historic District	P/115-116	Vance	Eligible/A, C
Vance Flour Mill (Sanford Milling Co.)	P/115-116	Vance	Eligible/A, C
Houses (5 worker houses on 1400 block of Nicholas St)	P/116	Vance	Eligible/A, C
Houses (3 side gable houses on 1500 block of Nicholas St)	P/116	Vance	Eligible/A, C
Esso Gasoline Station	P/117	Vance	Eligible/A, C
Confederate Cemetery	Q/121	Vance	Eligible/A

Table 3-32 Historic Architecture Resources in the SEHSR Corridor – North Carolina			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Saint James Episcopal Church	Q/121	Vance	Listed/C
Hedgepetch and Finch Store	Q/121	Vance	Eligible/A, C
Person-McGhee Farm	Q, R/124-125	Franklin, Vance	Listed/A, C
Raleigh and Gaston Railroad Bridge Piers (Tar River)	Q, R/124	Vance	Eligible/A, C
Franklinton Historic District (Includes Sterling Mill Historic District)	S/127-128	Franklin	Eligible/A, C
Church	S/127-128	Franklin	Eligible/A, C
Sterling Cotton Mill	S/127-128	Franklin	Listed/A, C
Cedar Creek Railroad Bridge Piers	S/129	Franklin	Eligible/A,C
Youngsville Historic District	T/132	Franklin	Eligible/A, C
J. B. Perry House	T/132	Franklin	Eligible/C
Glen Royall Mill Village Historic District*	U/135	Wake	Listed/A, C
Wake Forest Historic District*	U/135-136	Wake	Listed/A, C
Downtown Wake Forest Historic District	U/136	Wake	Listed/A
Powell House	U/139-140	Wake	Listed/A, C
Neuse Railroad Station	U/142	Wake	Eligible/A, C
Crabtree Creek Railroad Bridge Pier	V/148	Wake	Eligible/A,C
Raleigh Bonded Warehouse	V/148-149	Wake	Listed/A, C
Mordecai Place Historic District	V/148-149	Wake	Listed/A, C
Pilot Mill*	V/149	Wake	Listed/A, C
Roanoke Park Historic District	V/149	Wake	Listed/A, C
Noland Plumbing Company Building	V/149	Wake	Eligible/A, C
John A. Edwards and Company Building	V/149	Wake	Eligible/C
Glenwood-Brooklyn Historic District	V/149	Wake	Listed/A, C
Seaboard Railway Station	V/149	Wake	Eligible/A, C
Seaboard Railway Warehouses	V/149	Wake	Eligible/A, C
Raleigh Cotton Mills*	V/149	Wake	Eligible/A, C
Pine State Creamery*	V/150	Wake	Listed/A, C
Melrose Knitting Mill	V/150	Wake	Eligible/A, C
Raleigh Electric Company Power House*	V/150	Wake	Listed/A
Carolina Power and Light Company Car Barn and Automobile Garage*	V/150	Wake	Listed/A, C
National Art Interiors	V/150	Wake	Eligible/C
North Carolina School Book Depository	V/151	Wake	Eligible/A
Raleigh Hosiery Company Building	V/151	Wake	Eligible/A
Boylan Heights Historic District*	V/150-151	Wake	Listed/A, B, C
Depot Historic District	V/150	Wake	Listed/A, C

Table 3-32 Historic Architecture Resources in the SEHSR Corridor – North Carolina			
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**
Raleigh and Gaston Railroad Corridor	M-V/29	Franklin, Warren, Vance, Wake	Eligible/A

Source: Mattson, Alexander, and Associates, 2005, 2007, 2009.
* Also a locally-designated historic site.

3.12.2.1 Historical Resources – Virginia

The following discussion identifies the historic architecture resources within the Virginia APE for the SEHSR that are listed in or eligible for the NRHP. They are ordered from north to south through the study corridor.

3.12.2.1.1 Seaboard Air Line Railroad Corridor

The Atlantic Coast Line Railroad and the Seaboard Air Line Railroad are eligible for the NRHP under Criterion A for their association with transportation history and community planning because of their immense ties to the origin and development of the rail system in Virginia. The Atlantic Coast Line Railroad has antecedents back to 1833 and the opening of the Petersburg Railroad. The Richmond & Petersburg Railroad was opened just a few years later, and the two operations relied on one another to transport travelers and goods through central Virginia. The two companies officially merged in 1898 and were part of a larger conglomerate of railroad companies that came together to create the Atlantic Coast Line Railroad. The Seaboard Air Line Railroad was founded in 1900. Running from Richmond, VA, to Florida, the line catered to travelers escaping to warm-weather vacations. The line ran parallel with their competitors, the Atlantic Coast Line Railroad. Despite their relative close proximity and similar destination, the competing railroads had separate tracks, separate depots and separate schedules for 50 years. In 1967, these two competing lines merged to form the Seaboard Coast Line Railroad. Together, the new company owned 9,719 miles of track; 5,573 miles from the Atlantic system and 4,146 miles from Seaboard. In 1971, Amtrak took over passenger traffic on not only the Seaboard Coast Line Railroad, but most of the rail lines across the nation.

3.12.2.1.2 C. & O. & Seaboard Railroad Depot

The Seaboard Air Line & Chesapeake & Ohio Railroad Depot, currently known as Main Street Station and Trainshed, is listed on the NRHP under Criterion A for its association with the Richmond railroad industry and under Criterion C for its notable architectural style. The building was built in 1901 as both the physical and ideological central hub of the Seaboard Air Line Railroad. According to the NRHP nomination, the design of the building was executed by the Philadelphia firm of Wilson, Harris, and Richards. From the day it was opened, the station was regarded as "one of Richmond's most renowned buildings," as well as a prestigious ornament for the city. The station was built when rail travel was at the peak of its importance, and according to Paul Dulaney, the monumental structure "symbolizes the importance of the rail terminal as an entrance gateway to the city." Architecturally, Main Street Station ranks as an excellent example of the influence of the French Ecole des Beaux Arts on American building. Because the building is a

successful adaptation of French Renaissance architecture, its style can be more precisely identified as what Marcus Whiffen termed the Second Renaissance Revival, a mode fostered in America in the 1880's by Richard Morris Hunt.

3.12.2.1.3 Shockoe Valley & Tobacco Row Historic District

The Shockoe Valley and Tobacco Row Historic District in Richmond, VA, was listed on the NRHP in 1983 under Criteria A and C. The district is roughly L-shaped and includes approximately 129 acres. It is composed of over 500 buildings in architectural styles ranging from Federal through 20th-century industrial vernacular. The district is bounded on the west by the Seaboard Coast Line Railroad from Dock Street to Creek Alley, by the east side of 15th Street from Creek Alley to East Broad Street, and by the west side of 16th Street from East Broad Street to East Clay Street. The Shockoe Valley and Tobacco Row Historic District encompasses the area of Richmond's earliest residential, commercial, and manufacturing activity. Founded by Colonel William Byrd in 1737 and incorporated as a town in 1743, Richmond and the James arose in the third quarter of the 18th century as a natural marketplace for the commerce of the Middle Piedmont.

3.12.2.1.4 Shockoe Slip Historic District

The Shockoe Slip Historic District in Richmond, VA, is listed in the NRHP under Criterion A for its association with the growth of Richmond and under Criterion C for the architectural resources within the district. The district consists of approximately 12 irregular blocks of late 19th and early 20th century commercial buildings located at the Southeast edge of Richmond's financial district. When originally placed on the NRHP in 1972, the district included about half the current area, but has expanded because of growing interest in the preservation and rehabilitation of the whole district now well defined on all four sides. Most of the buildings in the present, enlarged district are from two to four stories in height and were erected as wholesale food or tobacco warehouses, with some serving light industry. The buildings generally are modified Italianate in style, somewhat restrained, but many are ornamental with fine cast iron details such as window lintels and shop fronts. The focal point of the district is Shockoe Slip, a small, stone paved, triangular piazza off E. Cary Street in which is located an ornamental, Italian Renaissance-style fountain installed to supply water for the teams of horses that formerly hauled goods through the area.

3.12.2.1.5 James River and Kanawha Canal Historic District

The James River and Kanawha Canal Historic District in Richmond, VA, was listed on the NRHP in 1971 under Criteria A for commerce and transportation and under Criterion C for architecture and engineering. The James River Company was chartered in 1785 with George Washington serving as honorary President for the purpose of improving navigation on the James from Richmond to Botetourt County, a distance of approximately 200 miles. The James River and Kanawha Canal Historic District comprises the present and original sites of the James River and Kanawha Canal and canal towpath including a boundary of twenty-five feet to either side of these two features as located between the intersection of the C. & O. Railroad track and Sleepy Hollow Road extended on the west and the Ship Locks located at the base of Peach Street extended on the east. The canal locks are composed mainly of granite ashlar with a low-relief chiseled surface; the blocks average about sixteen inches high and

range up to seventy-nine inches in length. The capping ranges greatly in length but averages twelve inches high and thirty-six inches deep.

3.12.2.1.6 Atlantic Coast Line Railroad Corridor

The eligibility of the Atlantic Coast Line Railroad Corridor is discussed along with the Seaboard Air Line Railroad Corridor above.

3.12.2.1.7 Manchester Warehouse Historic District

The Manchester Warehouse Historic District in Richmond, VA, was listed in the NRHP in 2000 under Criterion A for its association with industrial history in South Richmond and under Criterion C for its architectural merit. The district is located west of the project area and comprises 42 blocks of industrial development associated with the growth and development of the community of Manchester, an area south of the James River that was once a separate town but later incorporated within the boundaries of the City of Richmond. The district includes a variety of industrial buildings, alleyways, parking lots, and other landscape attributes needed to accommodate the busy warehouse traffic. Most buildings, dating from 1880 until the 1940s, are two or three stories in height and fabricated of brick or timber frame covered with pressed metal sheeting. The district boundary was expanded in 2004.

3.12.2.1.8 Williams Bridge Company

The Williams Bridge Company in Richmond, VA, is eligible for the NRHP under Criteria A because of its immense importance surrounding local, state, and national events related to World War I and the production of war goods and under Criterion C due to the unique architectural properties of the main building. The complex was erected in 1919 by the U.S. Shipping Bureau Emergency Fleet Corporation. Founded in 1917 to help the U.S. government manage their stock of sea vessels, the corporation opened factories across America to create the needed supplies for shipbuilding. The Richmond plant was built to create ship boilers. In addition to the massive central factory building, the corporation constructed an administrative building, power plant, and even apartments for its workers. After the war, the building was purchased by the City of Richmond, who operated it for 20 years as a machine shop. It was taken over by the U.S. government during World War II, only to be returned to private hands in the 1960s when it became a steel operation. Despite numerous sales, it continues to be used for steel and iron products today.

3.12.2.1.9 Lucky Strike/RJ Reynolds Tobacco

The American Tobacco Company in Richmond, VA, is eligible for the NRHP under Criteria A because of its extensive ties with changing development patterns at the local, state, and national level, as well as the continued propagation of the tobacco industry at the local level, and under Criterion C because of the integrity of its design and use. The complex produced Lucky Strikes for over 70 years before merging with R. J. Reynolds in 2004. They used this warehouse complex south of the James River as their subsidiary tobacco storage complex to augment their larger operation in downtown Richmond. Their movement to this area is indicative of the large-scale migration of city businesses

to locales outside of the downtown core, as growing businesses required additional space in a growing metropolis.

3.12.2.1.10 Transmontaigne Product Services, Inc.

The Transmontaigne property in Richmond, VA, was founded in 1928 as Gulf Refinery Company. Since that time, the property has been owned by several large-name oil companies such as Gulf Oil Company, Pure Oil Company, and the Union Oil Company of California (Unocal). However, the parcel has continued to be used to refine, store, ship, and process oil contracts for almost 80 years. Like several surrounding parcels, this oil yard utilized the availability of the adjacent rail tracks as well as the nearby James River in early years and added roadway transportation once the surrounding road system was expanded in the second quarter of the twentieth century. However, this property is relatively unique in this area, as it is still used in its original industrial capacity whereas many of its neighbors have shifted in their use over the years. Because of its continued use in its original purpose and its ties to the emergence of oil as a major Richmond area industry, the property is eligible for the NRHP as an individual resource under Criterion A for its association with the history of area oil production and transport. Due to several structural modifications, this property does not retain its integrity of design, materials, workmanship, or feeling. For this reason, it is not eligible under Criterion C.

3.12.2.1.11 Davee Gardens Historic District

The Davee Gardens Historic District in Richmond, VA, is eligible for the NRHP under Criterion A because of its importance in the history of local, state, and national planning initiatives after World War II and under Criterion C due to the physical and historic integrity of the homes and neighborhood design. The construction of the Davee Gardens subdivision of began in 1947. The neighborhood was a designed, symmetrical neighborhood with curvilinear streets and built-in green space. By 1948, nearly all of the approximately 165 dwellings had been constructed. Interestingly, eight lots located in the center of the circle, between Ryburn and Deerwood Roads, were left undeveloped. The original builders donated these lots to the city to build a park or a communal garden, part of the original community design (thus its name “Davee Gardens”). However, the park/garden feature was never completed. Today, the district appears almost identical to its early years. There is one house per lot and most have a shed located in the back yard.

3.12.2.1.12 Dupont Spruance

The DuPont Spruance Plant in Richmond, VA, is eligible for the NRHP under Criterion A because of its significant role in the development of textiles and plastics in the United States and under Criterion C because of its high degree of physical integrity and the fact that it retains its original location, design, setting, materials, workmanship, and association. The first of several buildings of the plant was constructed in 1929 under the ownership DuPont Rayon Company. DuPont purchased the large plantation from Richmond lawyers in 1929. Ampthill, the dwelling on the property, was dismantled and moved into the City of Richmond. Over several decades, the growing number of employees and demand of new products necessitated the construction of many new buildings including several factories, a gatehouse, and passenger station. The buildings

are excellent examples of Colonial Revival-style commercial buildings constructed in an industrial setting.

3.12.2.1.13 Sheffields; Auburn Chase; Bellwood; Building 42 - DSCR Officer's Club; New Oxford

The property originally known as Bellwood in Chesterfield County, VA, was listed on the NRHP in 1978 under Criterion A as a representative of the changes in the Richmond area economy, from plantation to tenant farm to military depot; under Criterion C for its architectural style; and under Criterion D for its ability to shed light on area history. This property was an agricultural plantation (and later a tenant farm) from the late-eighteenth century through the 1940s. The main dwelling, built in 1790, is a two story, five bay Federal style structure with Greek Revival modifications. During the Civil War, the home served as the headquarters of General P. G. T. Beauregard, and Jefferson Davis visited the dwelling several times. The entire parcel was purchased by the US government in 1941 to function as the central supply depot for the Richmond area during activities associated with World War II. The main house was converted for use as an Officer's Club, and many of the agricultural outbuildings were removed. Despite the change in use, the main house still retains a high degree of integrity.

3.12.2.1.14 USDOD Supply Center Historic District; Bellwood-Richmond Quartermaster Depot Historic District

The US Department of Defense Supply Center Historic District parcel was determined to be eligible for the NRHP in 2004 under Criteria A, B, C, and D. This very large resource encompasses Sheffields/Bellwood resource described above. The compound was established in 1941 as the central depot for Richmond area activities associated with World War II. Numerous structures still remain on the property dating to the depot's heyday in the 1940s. Together, they represent the changing landscape of central Virginia from an agribusiness culture to a military/business operation.

3.12.2.1.15 Richmond & Petersburg Electric Railway

The Richmond & Petersburg Electric Railway is eligible for the NRHP under Criterion A for its association with transportation history in central Virginia. It is a turn-of-the-century electric railway line that extends from Richmond to Petersburg, VA. According to VDHR files, the first car went from Manchester to Petersburg on February 9, 1902. The creation of this line was the direct impetus for large-scale modifications to settlement patterns in central Virginia, as new suburbs became available to those employed within Richmond and Petersburg. Like many similar transportation systems, use of the line greatly diminished after the automobile grabbed the national consciousness, and the line was abandoned in the 1940s. Although the railway is no longer intact, several features associated with this resource still remain extant.

3.12.2.1.16 House at 3619 Thurston Rd

The House at 3619 Thurston Road in Bellwood, VA, is eligible for the NRHP under Criterion C because of its architectural merit as an excellent (and unique) architectural example of the Dutch-influenced Colonial Revival style. This two-story, three-bay residential building was constructed around 1913. Designed in the Colonial Revival style, the home has both Dutch Colonial and Craftsman attributes and is in fair condition. The property is composed of a main dwelling and three subsidiary buildings, including a masonry garage, a framed shed, and a one-story barn that is toward the back of the property. According to a 1979 survey done of the house by Jeffrey O'Dell, this dwelling is only one of two Dutch-influenced Colonial Revival style dwellings that exist in the entire county. In addition to its unique architectural style, the property also exhibits good to excellent integrity, as it retains its original cladding, roof material, and windows.

3.12.2.1.17 Centralia Post Office

The Centralia Post Office is eligible under Criterion A for its association with the founding and operation of the community of Centralia. It was constructed in the first quarter of the twentieth century, likely between 1905 and 1907 during the Tunstall ownership. The building was constructed to face east onto the rail tracks to accommodate rail travelers through this area during the economic boom of the pre-World War I days. It functioned as the literal and figurative core of the community, as a postal center and general store, located in the center of the crossroads.

3.12.2.1.18 Ragland House/4626 Centralia Rd

The Ragland House, located at 4626 Centralia Road, is eligible for the NRHP under Criterion C because it retains much of its historic and physical integrity and for its overall significance. It was constructed during the first quarter of the twentieth century. John F. Ragland, Jr. and his wife Mary moved from Richmond and purchased a 5-acre lot in Centralia in 1908. It is likely that they built the house that would become the Ragland house, shortly thereafter; by 1910 the Ragland family was living in Centralia. According to the current home owner, the house was purchased through a mail-order catalogue and delivered to the site by the Atlantic Coast Line Railroad, which stopped just a few hundred feet away. The house is in excellent condition and still retains its original siding, decorative detailing near the gable peak of the projection on the south elevation, and the pressed tin roof.

3.12.2.1.19 Circle Oaks/4510 Centralia Road

Circle Oaks, located at 4510 Centralia Road, in Chester, VA, is eligible for the NRHP under Criterion C for its architectural merit. It is a two-story, wood frame single-family dwelling located on the north side of Centralia Road. The building dates to the second quarter of the nineteenth century and features a two-story, wrap around veranda. It was owned by several prominent families within the hamlet of Centralia, including the Vaughans and the DuVals. Associated with the resource is a small tenant house (perhaps servant's quarters) and a kitchen. Circle Oaks is the oldest and largest building in the small community of Centralia. The home predates the community itself. Additional research may uncover evidence suggesting that the parcel is also eligible under

Criterion A for its association with the founding of Centralia and under Criterion B for its association with the Vaughans and DuVals.

3.12.2.1.20 Chester Historic District

The Chester Historic District is eligible for the NRHP under Criterion A as a manifestation of a successful planned community in the mid-nineteenth century and under Criterion C for its high number of extant architectural resources within its Period of Significance. The Village of Chester was laid by Charles Stebbins and Joseph Snead in the mid-nineteenth century. It was marketed as being a "pleasant retreat" in a convenient location. Many of the houses have been properly maintained and are in good condition. A study of the homes within the Chester Historic District revealed that the homes were constructed between roughly the 1860s and 2006. The majority of the homes (approximately 80 percent) are 50 years or older. There are examples from nearly all of Chester's long and vibrant history; however, most of the homes that are still extant date to the second quarter of the twentieth century. The period of significance for the Chester Historic District is 1830 to 1958.

3.12.2.1.21 Chester #94 Masonic Lodge

The Chester #94 Masonic Lodge in Chester, VA, is eligible for the NRHP under Criterion A for its importance on the a local level as a historic Masonic lodge that received its charter in 1878 and has been operating out of the same building since 1905. It is also one of the strongest Masonic lodges in the district with membership totaling over 260. The Chester #94 Masonic Lodge was constructed in the early-twentieth century, probably around 1905 according to the building contract. The building was constructed as a meeting place for the growing freemason membership of the area as they outgrew their former building, located at the end of Gill Street near the railroad tracks. The Chester #94 Masonic Lodge has functioned as a freemasonry meeting place for over 100 years. It has changed very little on the exterior since its original construction in 1905. The only major change to the exterior is the replacement of the siding with aluminum cladding. Because of limited access, the Lodge could not be evaluated under Criterion C.

3.12.2.1.22 Pretlow House

The Pretlow House in Chester, VA, is eligible for the NHRP under Criterion B for its association with two notable Chester residents, Joseph Snead and Thomas Pretlow. Joseph Snead was one of the original founders of the Village of Chester around 1856. He owned the land between Gill and Curtis Streets where this house was eventually built. If it were not for him and Charles Stebbins, the Village may have never been founded. The house remained in the Snead family for close to 50 years. Dr. Thomas Pretlow came to own the house in 1923, and he was one of only two physicians in Chester for many years. Although the Pretlow House is a good example of an early vernacular Greek Revival dwelling with early-twentieth century additions, the house has undergone many modifications since its original construction of circa 1850 and is not eligible for the NRHP under Criterion C.

3.12.2.1.23 Eichelberger House

The Eichelberger House in Chester, VA, is eligible for the NRHP under Criterion C for architecture. The architectural style of this house, an eclectic mixture of Eastlake and Queen Anne, makes the building unique in the Village of Chester and surrounding Chesterfield County. It was constructed in the first decade of the twentieth century, likely soon after Harry D. Eichelberger purchased the property in 1900. The house was built in the Village of Chester, which was laid out just 40 years prior. Chester, located at the intersection of two major railroads, offered many conveniences to those eager to build homes in the area. Eichelberger took advantage of this scenario when he purchased an entire block for his family home. This gave him and his family a more rural-like setting while still being within a growing community. More importantly for Eichelberger, a railroad executive, the home was located adjacent to the railroad tracks. He walked to the railroad depot along a serpentine path daily to catch the train to Richmond.

3.12.2.1.24 Ellerslie

The Ellerslie House in Colonial Heights, VA, was listed on the NRHP in 1973 under Criterion A for its association with the development of Colonial Heights and under Criterion C for its architectural style. It is a three-story, three-bay, Italian Villa-style house located on Longhorn Avenue, which is off of East Ellerslie Avenue. The property is situated behind a sub-development of modern construction on land that used to be part of the Ellerslie estate. Access to the property is provided via a paved private gated driveway that is off of Longhorn Avenue. On January 14, 1839, David Dunlop purchased 200 acres off of Ellerslie Avenue to construct his Italian Villa-style estate, which was popular in the mid-nineteenth century. The house itself was not completed until circa 1857. David Dunlop, a native of Great Britain, employed Irish architect Robert Young to build his mansion. In 1910, the mansion underwent extensive modifications. The flat roofs, cornices, and the parapet were removed and replaced with a spreading hipped roof. The porte-cochere on the front entrance was replaced by a veranda that extends across the first floor, with a new porte-cochere being built in front of the veranda's center bay. Despite these modifications, the home is an excellent example of Italianate architecture.

3.12.2.1.25 Battersea

Battersea, located along the south bank of Appomattox River in Petersburg, VA, was listed on the NRHP under Criterion C for its notable design at the national level. It is significant at the state and local levels under Criteria A, B, and D. Battersea is a substantial stuccoed brick house located north of Upper Appomattox Street in the city of Petersburg. Even though the 35.5-acre property is bordered by a 19th-century neighborhood and a light industrial area, it still retains its historic rural character. The house was built in 1768 for Colonel John Banister, the first mayor of Petersburg and a signer of the Articles of Confederation. Battersea was designed and built as a symmetrical five-part Palladian house featuring a two-story central block, one-story wings that act as hyphens, and one-and-a-half story end pavilions. One-story columned porticos mark the entrances on the front, back, and sides of the house. Historic evidence indicates that the south (front) yard comprises the site of an 18th-century formal garden. Evidence also indicates that a stable probably dating to the period of significance (1768-

1847) was once located west of the house. There are six noncontributing outbuildings, two noncontributing sites, and two noncontributing structures. These include a former tenant houses, a number of 20th-century sheds and storage buildings, and an electric power substation.

3.12.2.1.26 North Battersea/Pride's Field Historic District

The North Battersea/Pride's Field Historic District in Petersburg, VA, was listed on the NRHP in 2005 under Criterion C for architecture as a distinctive example of the evolution a late-nineteenth-century Petersburg neighborhood that retains much of its original fabric. The North district is a mid-to-late nineteenth and early twentieth century middle and working class neighborhood. It encompasses a 12-block area that largely lies between the Southside Railroad (now Norfolk Southern) that runs along the Appomattox River on the north, the site of the Upper Appomattox Canal (now a railroad bed) on the south, Battersea on the west, and the old Seaboard Coastline viaduct corridor on the east. Its domestic architecture ranges from small and plain cottages to the larger dwellings with Italianate, Gothic Revival, and Colonial Revival styles. This historic district is predominantly residential in nature but also contains three churches, a small neighborhood store, and one warehouse that is a vestige of earlier warehouses around the canal basin. This cohesive neighborhood, visually separated from the rest of Petersburg by the canal bed and railroads, retains most of its historic fabric and conveys the sense of a nineteenth and early twentieth century architecture and community.

3.12.2.1.27 Defense Road

Defense Road is eligible for the NRHP under Criterion A for its association with a nationwide effort to beautify the countries natural resources during a dark time for the United States and under Criterion C for its architectural merit as an intact, 1930s parkway. From its inception in the 1920s, Defense Road was an innovative way to provide transportation routes for tourists visiting the numerous Petersburg area Civil War earthworks and forts. Work began in the 1930s and connected Battery 45 (Fort Lee) on the west to Battery Pegram on the east while maneuvering along a trench line known as the Dimmock Line. This route was chosen so visitors could see the entire area of Confederate operations. Documents and photographs of the road construction show that the Defense Road was built to be a 1.8 mile, two-lane road with the purpose of taking travelers past the earthworks constructed during the Confederate occupation of Petersburg. The road was built with exposed aggregate concrete surface made of white/grey paving tempered with a white/grey pea-gravel. Today, the road retains much of its original pavement with the sporadic modern patch of asphalt.

3.12.2.1.28 Dimmock Line/Earthworks

The Dimmock Line/Earthworks is eligible for the NRHP under Criterion A for its significant association with the Confederate occupation and defense of Petersburg, VA, during the Civil War, under Criterion B for its association with Captain Dimmock (as one of the few segments of earthworks remaining related to his engineering efforts), and under Criterion C as an excellent physical example of Civil War earthworks. The Dimmock Line trench line is a series of Confederate defenses around Petersburg. Construction began in 1862 and was primarily built with slave labor under the guidance of Captain Charles Dimmock. Erected in the shape similar to a horseshoe, the line

begins at the Appomattox River to the west of Petersburg and hooks around to end at the Appomattox on the east side of Petersburg. These defensive works are a great example of a trench line used throughout the Civil War, and the portion of the line present in the project area is in excellent condition.

3.12.2.1.29 Bridge over Defense Road

The bridge over Defense Road was determined to be eligible for the NRHP in 1998 under Criteria A and C based on the recommendation of historians and architectural historians completing the Virginia Department of Transportation (VDOT) state-wide bridge survey. Bridge #8018/Atlantic Coast Line Railroad overpass was constructed in 1936 as part of the larger Defense Road parkway project (see full description of Defense Road above). It is a single-span, three-lane, segmental arch bridge. Although the base of the bridge is formed of concrete covered with brick veneer, the parapets have a brick structural system.

3.12.2.1.30 Evergreen

Evergreen, located along the southern side of Boydton Plank Road approximately three miles north of the community of Dinwiddie, VA, is eligible for listing on the NRHP under Criterion C for architecture. Evergreen encompasses a circa 1790 house and twentieth-century outbuildings. Based upon its Federal architectural style and local tradition, Evergreen was probably built in 1790. The Butler family, who settled extensive areas of Dinwiddie County prior to the Revolutionary War, erected the house. The house features a two-story, five-bay-wide, gable-roofed central section, with a one-and-one-half-story wing and attached porte-cochere on its east and a one-story screen porch on its west. Despite its slight alteration, Evergreen is an outstanding example of a Federal-era dwelling and retains its original windows, mantels, stair hall, and floor plan.

3.12.2.1.31 Courtworth

Courtworth in Dinwiddie County, VA, is eligible for listing on the NRHP under Criterion C for architecture as a good example of a late nineteenth-century vernacular dwelling incorporating Victorian motifs. Courtworth consists of a two-story, gable-roofed dwelling forming an overall T-plan set at the end of a dirt and gravel drive flanked by a formal allee of cedar and pine trees. The property also contains two sheds used as dog houses, a small equipment shed, a hay barn, a tractor shed, a large equipment shed, two barns, and a cemetery. One of the house's residents, Mrs. Mack Butterworth, stated that the dates "1878" and "1884" were incised into bricks on two of the principal chimneys. A house belonging to "W. Butterworth" appears in the vicinity of the present house on an 1878 map of the county. Construction of the four-bay southern portion of the house could have occurred in 1878 or shortly before, with the northern ell-shaped addition added around 1884. Mrs. Butterworth also reported that the Butterworth post office once stood at the northern end of their lane along Boydton Plank Road.

3.12.2.1.32 Bowen House

The Bowen House in Dinwiddie County, VA, is eligible for the NRHP under Criterion C for architecture as an excellent example of late Victorian domestic vernacular architecture and ornament possessing good integrity of materials, workmanship, setting,

feeling, location, and design. The Bowen House is an elaborate, two-story, late Victorian dwelling with diamond-patterned slate shingle gable roofs and ornamented hipped roof porches wrapping around its northeastern, northwestern and southwestern elevations. The two-story structure consists of an overall T-plan. The Bowen House contains three major periods of construction. In all likelihood, the two-story portion of the center hall plan was built first, possibly prior to 1878. A building belonging to "J. Kirkham" appears near the location of the present structure on an 1878 map of the county. Howard Keen Butterworth acquired a 100-acre farm, including the Bowen House, prior to 1925. The property stayed in the Butterworth family until 1987.

3.12.2.1.33 W. Boisseau's Store, Warehouse, Dwelling

The Boisseau Store, Warehouse, and Dwelling in Dinwiddie County, VA, are eligible for the NRHP under Criterion C, the embodiment of the noteworthy characteristics of a style, method, or period of construction, and under Criterion A, associations with broad patterns of history, as excellent examples of rural commercial/domestic complexes of the early twentieth century in southern Virginia. This complex consists of a store, warehouse, dwelling, and various secondary resources. Boisseau's Store consists of a one-story, rectangular-frame building with an asphalt-shingled gable roof and a frame parapet on its north façade. The warehouse consists of a one-story, gable-front structure with standing seam metal roofing, weatherboard siding, and a metal foundation skirt, while the house is two-story, hipped-roof L-shaped dwelling facing McKenney Avenue. Probably built around 1900 during the village of DeWitt's growth spurt following the completion of the railroad completion, the Boisseau Store, Warehouse, and Dwelling are excellent examples of an early twentieth-century rural store and domestic complex possessing good integrity of location, setting, materials, workmanship, design, and feeling.

3.12.2.1.34 Bank Building

The Bank Building in McKenney, VA, is potentially eligible for the NRHP under Criterion C for its architectural merit as a good example of a small-town banking institution. Shortly after construction of the Seaboard railroad through the town of McKenney, VA, local entrepreneurs established a bank on Railroad Street to serve the growing town's financial needs. The bank features stretcher bond brick walls, corbelled parapets on its northwestern and southeastern gable ends, a slender corbelled brick chimney, and a canted recessed entrance in its northern corner. The bank displays three bays (including the canted entrance) across its main elevation facing Railroad Street and five bays (including the canted entrance) on its side elevation along Rives Avenue.

3.12.2.1.35 Mayton House

The Mayton House in McKenney, VA, is eligible for the NRHP under Criterion C for its architectural merit. It consists of a one-story, L-plan frame dwelling with standing seam metal hipped roof, stuccoed stone foundation, weatherboard siding, and corbelled brick interior chimneys. A full-width hipped-roof porch shades the symmetrical three bays penetrating the house's main northwestern elevation facing Zehmer Road. Deed transactions indicate that construction of the Mayton House probably occurred around 1905, the year C. G. Zehmer sold the current property to Minnie Fowler. The Mayton

House is a good example of early twentieth-century vernacular Colonial Revival domestic architecture.

3.12.2.1.36 Honeymoon Hill Farm

Honeymoon Hill Farm House in McKenney, VA, is eligible for the NRHP under Criterion C, embodiment of an architectural style, as a good example of a late nineteenth-century vernacular dwelling. Honeymoon Hill Farm consists of a dwelling and 17 domestic and agricultural outbuildings. Deed transactions indicate that the Zehmer family owned the Honeymoon Hill Farm property for much of the twentieth century. The Honeymoon Hill Farm house consists of a one-story L-plan with a hipped roof covered with standing seam metal, weatherboard siding, and a brick foundation. While the main house is in good condition, the surrounding outbuildings are in varying states of disrepair. They include a pump house, a smoke house, a wood shed, three silos, three tobacco barns, two sheds, an equipment shed, a feed trough, a storage building, a dairy, a farm office, and a gambrel-roofed barn. Two log tobacco barns stand in a wooded hillside area approximately 100 yards southeast of the house near the south side of Zehmer Road.

3.12.2.1.37 Wynnhurst

The Wynnhurst house in Brunswick County, VA, is eligible for listing on the NRHP under Criterion C for architecture as a sophisticated example of an early twentieth-century Dutch Colonial dwelling. Significant architectural details on the house characteristic of the Dutch Colonial Revival include the gambrel roof, round arch hood, and elliptical fanlight and sidelights. R.P. and Annie Baird built Wynnhurst in 1925. The home, a two-story gambrel-roofed dwelling, stands on an approximately 18-acre parcel located on the northeastern side of Rawlings Road. Wynnhurst features a slate-clad roof, clapboard siding, and a concrete foundation. The three-bay main (southwestern) elevation has an arch hood supported by paired wood posts over the front door.

3.12.2.1.38 Blick's Store

The Blick’s Store in Brunswick County, VA, is eligible for the NRHP under Criterion C for its architectural style, as it is a good example of an early-twentieth century crossroads store that retains many of its original attributes. The property contains an abandoned two-story frame store and three frame outbuildings. The three-bay main (eastern) elevation of the store has a two-tiered, full-width front porch crowned by a false front parapet.

3.12.2.1.39 Tourist Guest House

The Tourist Guest House in Brunswick County, VA, is eligible for the NRHP under Criterion C as an excellent example of a Craftsman style home. According to the current occupant, the house was built in 1926 as a tourist guest house. The growing popularity of the automobile resulted in a nationwide interest in traveling, and it was during the early twentieth century that motor courts, tourist camps, and guest houses were established along well-traveled roadways. The location of the house along the Old Petersburg-Boydton Plank Road was an ideal location for capturing business. The 1.5 story house, built in the Craftsman style, has a concrete foundation and wood siding. Although somewhat modified by accommodations to more modern living, the tourist

guest house's interior remains mostly in intact. Opposite the front door is a doorway the leads to a center hall that extends the remaining length of the house. The hallway contains an open stairway with a square, Craftsman-style newel post.

3.12.2.1.40 Oak Shades

Oak Shades in Brunswick County, VA, is eligible for listing in the NRHP under Criterion C as a rural interpretation of the Federal style that was popular in the early nineteenth century. David Meredith built Oak Shades in 1812 on a plantation that once totaled 1,000 acres and stretched far across Old Indian Road and present-day U.S. Route 1. The Meredith family, including David's son, William, and grandson, David, farmed the land and operated a store until after the Civil War. In 1820, Oak Shades was licensed as an ordinary (i.e., an inn providing meals regularly at a fixed price). Oak Shades is a two-story, L-shaped dwelling featuring features a center-hall plan, a hipped roof clad in standing seam metal, clapboard siding, and a brick foundation and exterior-end chimneys.

3.12.2.1.41 Evans House

The Evans House in Mecklenburg County, VA, is eligible for the NRHP under Criterion C for architecture a well-preserved example of early twentieth century domestic design. Built in 1930 by Clarence Evans, the Evans House remained in the Evans family until purchased by its current owners in 1994. The home is an ornate example of an American Foursquare dwelling with very good integrity, including a pyramidal-hipped roof clad in asphalt shingles, stucco siding, and a brick foundation. The house's interior retains its original side-hall floor plan and many of its original architectural details. In the entry hall an open staircase with a square newel post wraps around the northwestern and southwestern walls. The property also includes a frame wash house, a frame smoke house, a frame garage, and a frame shed protecting the house's electrical system. The dwelling is rich in architectural detail, including the pedimented portico, porte cochere, and corbelled chimneys.

3.12.2.1.42 Smelley House

The Smelley House, located just outside La Crosse, VA, eligible for listing in the NRHP under Criterion C as a largely intact, rural, Victorian-era dwelling. The house is a two-story vernacular frame T-plan dwelling built in 1880. This Victorian-era house represents a rural interpretation of the highly ornate Queen Anne style that was popular during the late nineteenth century. Sometimes called Folk Victorian, this style of house is associated with the rise of readily available and inexpensive milled lumber, including pre-cut details such as the cornice details and spindlework found on this house. Although the dwelling is still abandoned, it remains eligible for the NRHP.

3.12.2.1.43 La Crosse Commercial Historic District

The La Crosse Commercial Historic District is eligible for the NRHP under Criterion A for its association with the notable spread of the railroad industry and associated development and under Criterion C for its architectural merit. The area that became La Crosse, VA, was first inhabited in the early 1800s and was known as Piney Pond. In 1863, the settlement's name changed to Cleaton's Store after a store that became the

central trading post for the surrounding community. The Atlantic and Danville Railway arrived in the community in 1888. By 1890, the small town had a large enough population to acquire a post office. In 1900, the Seaboard Air Line Railway was completed, crossing the tracks of the Atlantic and Danville Railway. The La Crosse Commercial Historic District encompasses most of the commercial buildings fronting Main Street and facing the abandoned Seaboard Air Line railroad tracks, in addition to the former railroad depot. The commercial buildings consist of one- and two-story brick structures with storefront facades. One exception is the two-story bank building with a masonry façade. The commercial buildings are demonstrative examples of twentieth-century commercial architecture and retain integrity of design, materials, workmanship, feeling, and association.

3.12.2.1.44 Wright Farmstead

The Wright Farmstead in Mecklenburg County, VA, is potentially eligible for the NRHP under Criterion A for its association with the history of agriculture in this area, particularly the late-nineteenth/early-twentieth century change in the meat-smoking industry, and under Criterion C for its architectural merit. It includes a main house, four outbuildings, and an archaeological site. The principle building is a two-story, three-bay, single family dwelling. A brief architectural investigation suggests that the southern two bays are the original portion of the house, and the northern bay was added after the Civil War, along with the central peak gable, to create a symmetrical I-house configuration. Two one-story log smokehouses are located southwest of the main dwelling. Although the main house at the Wright Farmstead is in fair to poor condition, the majority of the outbuildings are in very good condition. In addition to exterior integrity, the two smokehouses still retain their interior configuration and equipment. Each originally operated using an open, central hearth and was later converted for stove and pipe use. The buildings are a unique reminder of both an important and widespread activity and the conversion of a building to accommodate new technologies.

3.12.2.1.45 Sardis Methodist Church

Sardis Methodist Church in Mecklenburg County, VA, is eligible for the NRHP under Criterion C as an excellent example of a vernacular early-twentieth century ecclesiastic structure. The present church was built in 1911, replacing an earlier frame church erected in 1851. W.B. Cleaton deeded 2 acres of land to the trustees of Sardis Church for the new church, and M.W. Tanner donated the lumber for building the church. Although clad in vinyl siding, the Sardis Methodist Church is an ornate example of a rural church and embodies the distinctive character of its period (twentieth century), type (religious building), and construction (frame). The church's interior retains its original floor plan. The sanctuary space features its original pews, wood floors, chair rail and wainscoting.

3.12.2.1.46 Bracey Historic District

The Bracey Historic District is eligible for the NRHP under Criterion A as a well preserved example of a small community created by the construction of the railroad that brought economic expansion to the region, and under Criterion C as a distinctive architectural example of a railroad community established in the late nineteenth and early twentieth centuries in rural Virginia. The Bracey community developed along the

Seaboard Air Line railroad during the late nineteenth and early twentieth centuries, and now consists of commercial buildings, a railroad depot, and several dwellings. The town was named for Altamont Hart Bracey, a Civil War veteran who owned a nearby ferry over the Roanoke River, and was a farmer and storekeeper. The town was laid out at a junction of the Southern Railroad with Bracey Drive on land owned by George D. Lambert. As the community grew, several Queen Anne-style dwellings were built along Bracey Drive and Nellie Jones Road. The district encompasses five community-related structures, including the former Bracey depot, a former wagon wheel factory, a post office, and seven residential structures. Immediately adjacent to the rail bed is the original Bracey Depot.

3.12.2.1.47 Granite Hall/Fitts House

Granite Hall, located on the northern side of Paschall Road just north of the North Carolina border, is eligible for the NRHP under Criterion C for its architectural character. Granite Hall is an excellent example of early twentieth century Classical Revival architecture and appears to possess good integrity. Unfortunately, access was not granted during the SEHSR fieldwork; thus, additional historic and architectural details were not obtained. However, the resource was previously surveyed in 1972 and was determined to be eligible for the NRHP at that time.

3.12.2.2 Battlefields – Virginia

The following discussion identifies the 10 Civil War battlefields within the Virginia APE for the SEHSR that are listed on or eligible for the NRHP. They are ordered from north to south through the study corridor. The battlefield boundaries described here are those adopted by the VDHR.

3.12.2.2.1 Proctor's Creek

The Proctor's Creek Battlefield is eligible for the NRHP under Criterion A for its association with Civil War-era events. It is located in central Chesterfield County, VA, and includes approximately 4,700 acres. On May 9, 1864, Union Major General Benjamin Butler withdrew to his entrenchments at Bermuda Hundred after being repulsed at Swift Creek. While Butler was situated in his entrenchments the Confederates were forming an army of men under the command of General P.G.T. Beauregard to confront Butler's forces. On May 12, 1864, Butler made an attempt to attack the Confederate line but opted for a more defensive position when he learned that his front was not supported by gunboats. The next day the Union army attacked the right flank of the Confederate line. However, this successful attack would not aid in a Union victory. Beauregard regained his forces and attacked Butler's right flank, ultimately resulting in Butler's withdrawal from the battle, resulting in a Confederate victory and putting a stop to Butler's offensive against Richmond, VA.

3.12.2.2.2 Port Walthall Junction

The Port Walthall Junction Battlefield is potentially eligible for the NRHP under Criterion A for its association with Civil War-era events. It encompasses 880 acres straddling the I-95 corridor. Between May 6th and 7th of 1864, men under Union Major General Benjamin Butler and Confederate Brigadier General Johnson Hagood were engaged in a

brief battle, which resulted in a Union victory. The Union army left Bermuda Hundred on May 5th and headed towards the Richmond-Petersburg Railroad. The next day Hagood's brigade stopped the initial Union advance at Port Walthall Junction, but on May 7th the Union army cut the railroad at Fort Walthall and, as a result, the Confederates retired behind Swift Run Creek to await reinforcements, resulting in a victory for the Union forces.

3.12.2.2.3 Swift Creek/Arrowfield Church

The Swift Creek Battlefield is potentially eligible for the NRHP under Criterion A for its association with Civil War-era events. Situated roughly east-west, the 3,800 acre battlefield is south of Port Walthall Battlefield and partially within the City of Colonial Heights, VA. On May 9, 1864, Union Major General Benjamin Butler attempted an advance toward Petersburg, VA, but was met by a Confederate division at Arrowfield Church where the Confederates prematurely attacked and were driven back. Instead of continuing the fighting, Butler tore up the railroad tracks and did not advance on the Confederates. At the same time, five Federal gunboats were on their way up the Appomattox River toward Fort Clinton with the intention of bombarding the fortification; however, the gunboats were driven off and never made it to their destination resulting in an abandonment of the Union attack and inconclusive end to the battle.

3.12.2.2.4 Petersburg III/The Breakthrough

The Petersburg III Battlefield is potentially eligible for the NRHP under Criterion A for its association with Civil War-era events. It encompasses almost 11,000 acres just south and west of downtown Richmond, VA. After the Union victory at the Battle of Five Forks on April 1, 1865, Grant ordered an attack against the Petersburg, VA, lines the next day. The Federals were stopped from entering the city by a gallant defense of Fort Gregg which housed only a few Confederates. However, that night, General Lee ordered the evacuation of Petersburg and Richmond, resulting in a major military victory for Grant. The capture of Petersburg led to the fall of Richmond, the Confederate Capitol.

3.12.2.2.5 Weldon Railroad/Globe Tavern

The Weldon Railroad Battlefield is potentially eligible for the NRHP under Criterion A for its association with Civil War-era events. It overlaps a large portion of the Petersburg III Battlefield. On June 21, 1864, after Wilson's cavalry began destroying the tracks of Weldon Railroad, the Union II Corps, aided by the VI Corps, attempted to cut the railroad, a significant supply line into Petersburg, VA. On June 22, 1864, General A.P. Hill's corps forced the Union II Corps away from the railroad to Jerusalem Plank Road. However, even though the Union army was forced from their advanced positions, they managed to extend their siege line farther to the west, resulting in a tactical Union victory by June 24, 1864.

3.12.2.2.6 Peebles Farm

The Peebles Farm Battlefield is potentially eligible for the NRHP under Criterion A for its association with Civil War-era events. The 2,800-acre battlefield includes two bounded areas. In an effort to cut Confederate lines of communication, Lieutenant General Ulysses S. Grant extended his left flank southwest of Petersburg, VA. On September

30, 1864, the Federals marched to Squirrel Level and Vaughn roads and attacked, successfully overrunning Fort Archer and routing the Confederates out of their Squirrel Level Road Line. Later that day, Confederate reinforcements arrived, slowing the Federals but not defeating them. The Federals were reinforced October 1, 1864, and eventually captured Fort MacRae and extended their left flank to the vicinity of Peebles' and Pegram's Farms by the next day.

3.12.2.2.7 Boydton Plank Road

The Boydton Plank Road Battlefield is potentially eligible for the NRHP under Criterion A for its association with Civil War-era events. The battlefield is very large (over 10,000 acres) and straddles the I-85 corridor in Dinwiddie County, VA. On October 27, 1864, Union divisions, numbering 30,000 men, under Major General Winfield Scott Hancock withdrew from the Petersburg, VA, line with support from Gregg's cavalry division and moved west to capture the Boydton Plank Road, a major strategic objective. The initial advance succeeded in taking the road, but a counteroffensive led by Major General Henry Heth's division with support from Major General Wade Hampton's cavalry in the afternoon forced the Union troops to retreat. This action resulted in a Confederate victory and led to the Confederated retention of Boydton Plank Road through the rest of the winter.

3.12.2.2.8 Hatcher's Run

The Hatcher's Run Battlefield is eligible for the NRHP under Criterion A for its association with Civil War-era events. The 6,200-acre battlefield is located in Dinwiddie County, VA, between I-85 on the west and Halifax Road on the east. The Battle of Hatcher's Run began on February 5, 1865, with Brigadier General David Gregg's cavalry, assisted by Major General G.K. Warren and Major General A.A. Humphreys, attempting to intercept Confederate supply trains. The next day Gregg returned to Vaughan Road, unsuccessful in his attempt to intercept the supply trains and was attacked by portions of Brigadier General John Pegram's Confederate division. Pegram was killed in the fighting that took place and the Union forces were able to extend their line, resulting in a Union victory.

3.12.2.2.9 Lewis Farm

The Lewis Farm Battlefield is eligible for the NRHP under Criterion A for its association with Civil War-era events. The battlefield is located between Route 1 on the west and I-85 on the east, straddling Route 660 and the railroad corridor in central Dinwiddie County, VA. It comprises over 900 acres. The action at Lewis's Farm was an episode in the initial phase of Grant's final drive to outflank Lee's Petersburg force. The Union V Corps and II Corps were assigned to join Sheridan's cavalry corps in extending the left flank of the Union army westward. The 1st and 2nd Divisions of V Corps spearheaded the movement of the Union infantry. These two divisions met substantial opposition in their advance after crossing Gravelly Run at Quaker Road from Anderson's division of Confederates. A series of counterattacks by both sides developed, which resulted with the Southerners being driven back and the Union troops entrenching along the Boydton Plank Road.

3.12.2.2.10 Dinwiddie Courthouse

The Dinwiddie Courthouse Battlefield is eligible for the NRHP under Criterion A for its association with Civil War-era events. The fighting at Dinwiddie Courthouse on March 31, 1865, was an episode in the final Union effort to outflank the west or right end of the Confederate line that had commenced on March 29, 1865. Sheridan's cavalry corps of three divisions formed the most advanced or westerly element in the Union force. Anticipating such a move, Lee sent General George Pickett with his own infantry division and W. H. Fitzhugh Lee's cavalry to head off the Union flanking movement. On March 31, 1865, Pickett struck Sheridan's force on its left flank, about three miles north of Dinwiddie Courthouse, and succeeded in gradually driving the Union troops most of the way back to the courthouse village. The day resulted in a limited success for the Confederates, but Pickett's force was stretched too thin to cover such an extensive section of unfortified line. Pickett withdrew during the night to Five Forks, setting the stage for Sheridan's victory on April 1, 1865, which in turn enabled the Union breakthrough of April 2, 1865.

In July 2009, subsequent to resource eligibility coordination on the SEHSR project, the American Battlefield Protection Program (ABPP) proposed new National Register-eligible boundaries for the 10 project battlefields (see Figures 3-11 and 3-12). Although there are differences between the individual VDHR and ABPP battlefield boundaries, when considered in total, the two sets of boundaries almost completely overlap within the project APE. There are seven exceptions where the ABPP battlefield boundaries within the project APE are not included in the VDHR boundaries:

- Just south of Highway 288 in Chester, VA – the ABPP boundary for the Proctor's Creek battlefield extends just south and east of the VDHR boundary
- Vicinity of Walthall Industrial Parkway just north of Colonial Heights, VA – the ABPP boundaries for the Proctor's Creek, Port Walthall Junction, and Swift Creek battlefields include an area south of Woods Creek Road and north of Pine Forest Drive that is not included in the VDHR battlefield boundaries
- Vaughn Road near the Burgess Connector – the ABPP boundary for the Petersburg III battlefield includes an area near Vaughn Road that is not included in the VDHR battlefield boundaries
- Carson Road near the Dinwiddie Courthouse community – the ABPP boundary for the Hatcher's Run battlefield includes an area near Carson Road that is not included in the VDHR battlefield boundaries
- Courthouse Road near the Dinwiddie Courthouse community – the ABPP boundary for the Hatcher's Run battlefield includes an area near Courthouse Road that is not included in the VDHR battlefield boundaries
- Gatewood Road south of the Dinwiddie Courthouse community – the ABPP boundary for the Hatcher's Run battlefield includes an area near Gatewood Road that is not included in the VDHR battlefield boundaries
- Keelers Mill Road south of the Dinwiddie Courthouse community – the ABPP boundary for the Hatcher's Run battlefield includes an area near Keelers Mill Road that is not included in the VDHR battlefield boundaries

Figure 3-11

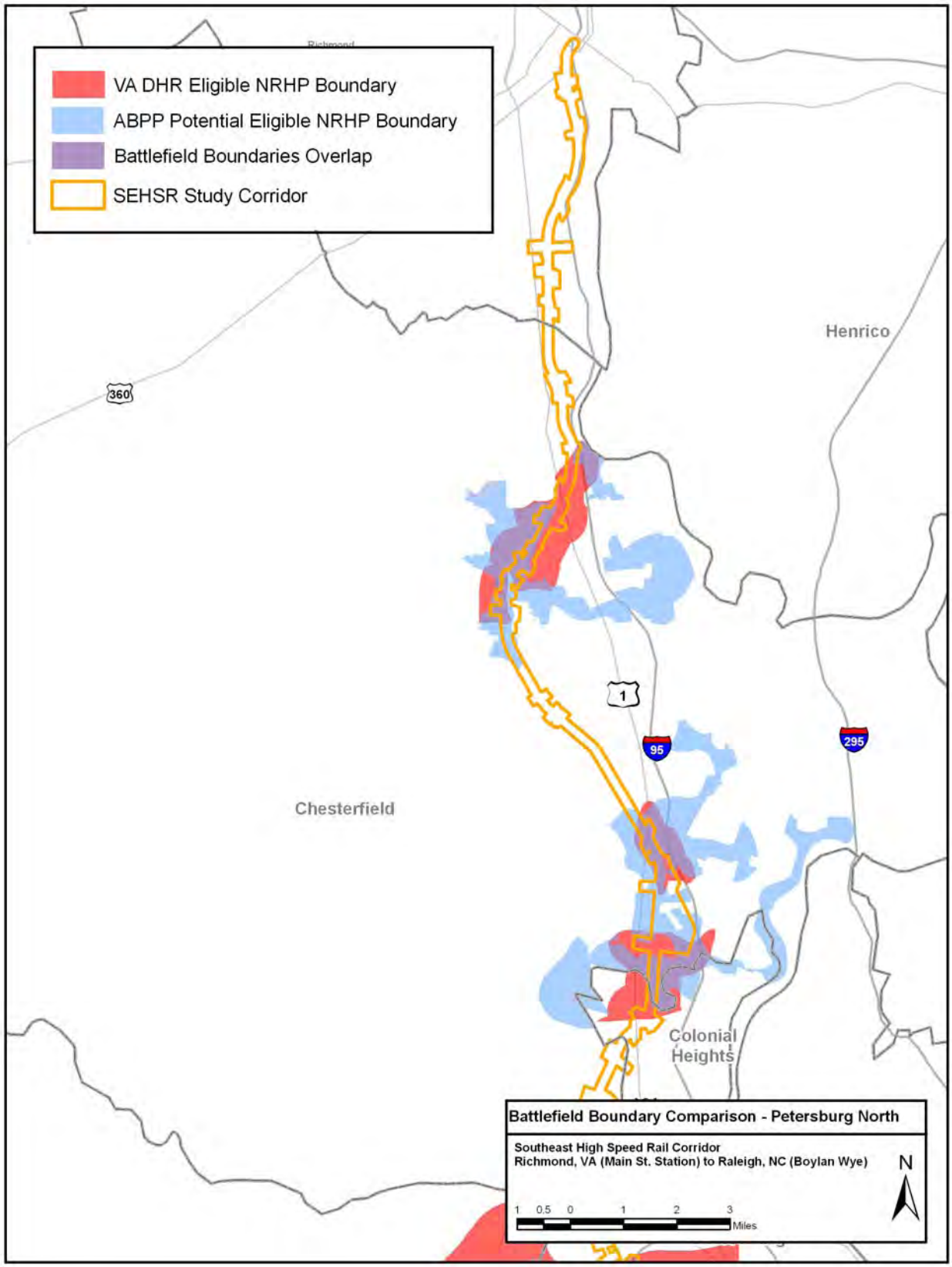
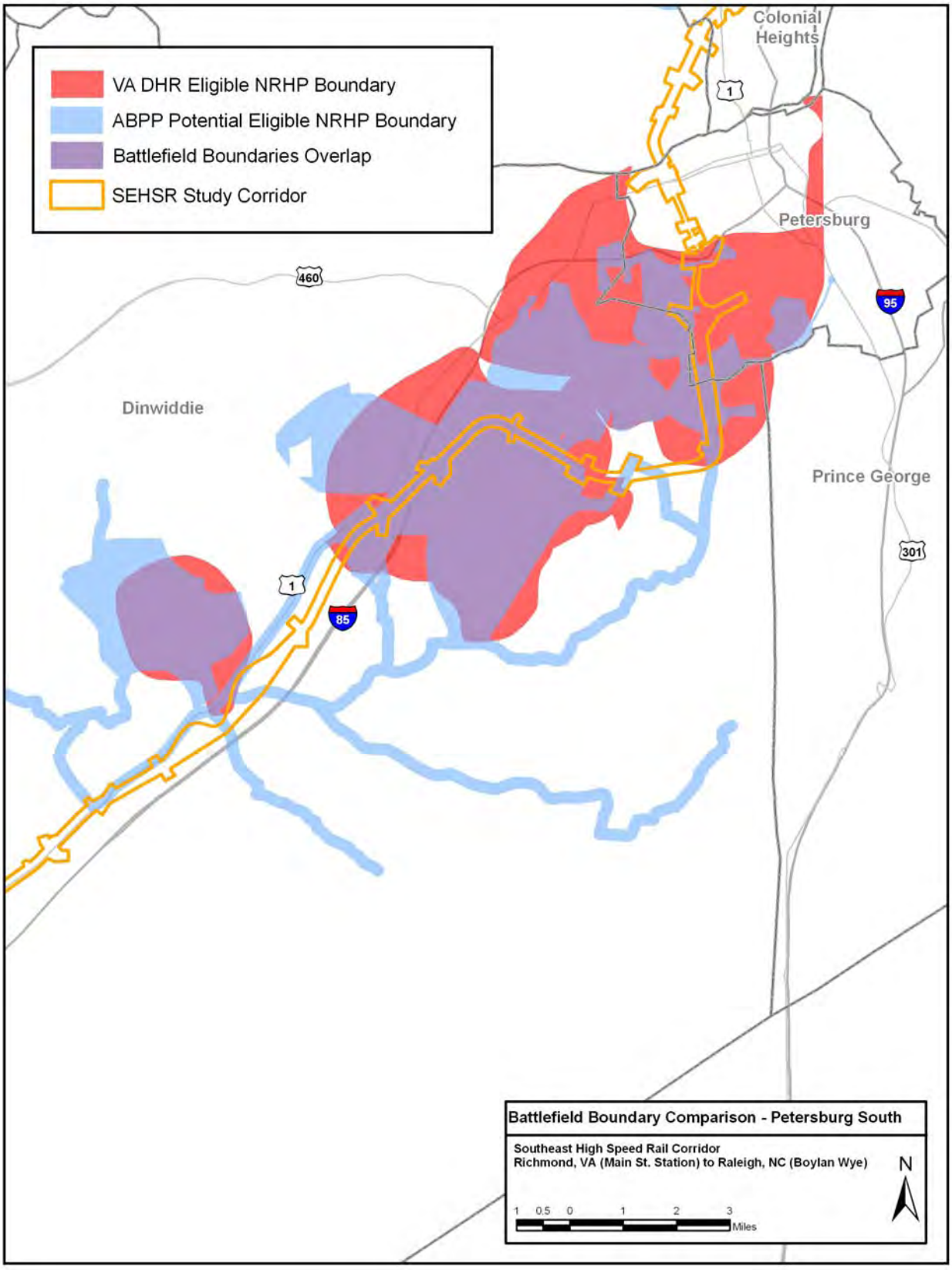

VA DHR Eligible NRHP Boundary
ABPP Potential Eligible NRHP Boundary
Battlefield Boundaries Overlap
SEHSR Study Corridor
Henrico
Chesterfield
Colonial Heights
360
1
95
295
Battlefield Boundary Comparison - Petersburg North
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
1 0.5 0 1 2 3
Miles

Figure 3-12


VA DHR Eligible NRHP Boundary
ABPP Potential Eligible NRHP Boundary
Battlefield Boundaries Overlap
SEHSR Study Corridor
Colonial Heights
Petersburg
Dinwiddie
Prince George
460
1
95
85
301
Battlefield Boundary Comparison - Petersburg South
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
1 0.5 0 1 2 3
Miles

3.12.2.3 Historical Resources – North Carolina

The following discussion identifies the historic architecture resources within the North Carolina APE for the SEHSR that are listed in or eligible for the NRHP. They are ordered from north to south through the study corridor.

3.12.2.3.1 Warren County Training School

The Warren County Training School on the east side of Paschall Station Road near Wise, NC, is eligible for the NRHP under Criterion A for ethnic heritage (African American) and education, as well as under Criterion C for architecture. Built in 1922 as the first and only high school for African Americans in the county, the Warren County Training School is an especially large and architecturally sophisticated example of the rural schools built for black communities in the early twentieth century under the auspices of the Rosenwald Foundation of Chicago. The eligible boundaries follow the semi-circular driveway that forms an arc from Paschall Station Road behind the school and principal's house and include the 1920s brick school and the principal's house.

3.12.2.3.2 Wise School

The Wise School on the north side of S.R. 1305 at its junction with US 1 is eligible for the NRHP under Criterion A for education and under Criterion C for architecture. The main, two story school building is an especially imposing and rare surviving example of the rural public schools constructed in Warren County and North Carolina in the early twentieth century. The 1904 Wise School thus stands out in its relatively grand scale and stylish architectural treatment. The nearby 1920s classroom building reflects the era of school consolidation in North Carolina, which began in the 1920s and led to the construction or expansion of numerous rural and urban schools statewide.

3.12.2.3.3 House (East side of US 1, Wise, NC)

The house on the east side of US 1 just south of Michael Quarry Road in Wise, NC, is eligible for the NRHP under Criterion C for architecture. Although vacant and in poor condition, the house stands intact as an especially stylish expression of a common regional design in rural Warren County.

3.12.2.3.4 Holtzmann Farm

The Holtzmann Farm in Ridgeway, NC, is eligible for the NRHP under Criterion A for agriculture. The tree shaded Holtzmann farm complex retains a complete and orderly arrangement of well-preserved outbuildings surrounding the neat farmhouse which is clearly the centerpiece of the property. Typical of farms in the Ridgeway community from the late nineteenth and early twentieth centuries, the Holtzmann Farm took shape as a tobacco and melon farm, while also raising grains and livestock. The farmstead's significant complement of outbuildings clearly illustrates the agricultural practices and self-sufficiency of a middling Ridgeway farmer in this period. The farm was developed by the Holtzmann family of Alsace-Lorraine and embodies the German migration to Ridgeway that defined the community's early agricultural development and prosperity.

Although many of the outbuildings have later metal siding and the house has replacement asbestos shingles, the original building forms survive intact, and no modern intrusions interfere with the integrity of the setting. Few farmsteads in the Ridgeway community survive with such a large and clearly displayed array of early twentieth century agricultural outbuildings.

3.12.2.3.5 Chapel of the Good Shepherd

The Chapel of the Good Shepherd in the vicinity of Ridgeway, NC, is listed in and remains eligible for the NRHP under Criterion A for religion and Criterion C for architecture. Funded primarily by Dr. William Hawkins, president of the Raleigh and Gaston Railroad, this handsome, rural church is a landmark in Warren County's Ridgeway community. The stylish, red brick, Gothic Revival chapel was built in 1871 and remains well preserved. The gable front edifice features a framed entrance tower (now vinyl sided) capped by a flared, pyramidal steeple, pointed arched windows and doorways trimmed with granite, and decorative bargeboards. A small, stone walled cemetery also stands on the tract.

3.12.2.3.6 Dr. Thomas B. Williams House and Office

The 1890s Dr. Thomas B. Williams House and Office on the west side of US 1 in Ridgeway, NC, is eligible for the NRHP under Criterion C for architecture. Dr. Williams was one of two physicians practicing in Ridgeway during the 1890s. The residence and adjacent office were constructed at the north end of the community beside a general store (now gone). The house's size and architectural embellishments reflected the wealth and status of the Williams family in Warren County. The Williams family had large landholdings in the county and commissioned the construction of this house for Thomas Barker Williams.

3.12.2.3.7 William J. Hawkins House

The William J. Hawkins House (Oakley Hall) is listed in the NRHP under Criterion A for commerce, under Criterion B for its associations with Dr. William J. Hawkins, and under Criterion C for architecture. Under Criterion A, the imposing plantation seat is a good illustration of the prosperous plantation society that flourished in Warren County during the antebellum period. The property is also associated with the development of the early rail community of Ridgeway.

Under Criterion B, Oakley Hall was the home of Dr. Hawkins, a prominent businessman, planter, physician, and long-term president of the Raleigh and Gaston Railroad, one of the earliest rail ventures in North Carolina. Hawkins, in conjunction with several other businessmen, also organized the Ridgeway Company, a land development scheme to encourage settlement in the area after the Civil War.

Built in the 1850s, this grand, two story residence, designed with both Greek Revival and Italianate elements, was probably constructed by noted Warrenton builder, Jacob W. Holt. Combining the symmetry and cubic massing of the Greek Revival with ornate Italianate detailing, Oakley Hall stands as one of the most sophisticated examples of the Holt's numerous fashionable residences of the period. The house retains its architectural integrity. It is well-preserved, and its tree-shaded setting at the end of a

long lane remains intact. Furthermore, the house fronts on the former Raleigh and Gaston Railroad, with which it was historically associated, and the relationship of house and railroad remain evident.

3.12.2.3.8 Middleburg Community House (Middleburg Steakhouse)

The Middleburg Community House on the south side of Washington Avenue at its junction with US 158 in Middleburg, NC, is eligible for the NRHP under Criterion A for social history and Criterion C for architecture. The log building was financed by the Civil Works Administration and is a rare surviving example of federal relief projects in Vance County. The building is also an informal example of the rustic style for Depression era projects of the 1930s.

3.12.2.3.9 House (Allison Cooper Rd, Middleburg vicinity)

The house at 2569 Allison Cooper Road near Middleburg, NC, is eligible for the NRHP under Criterion C for architecture. The circa 1880 house is a good example of the traditional, two-story, single pile form with restrained, late Greek Revival elements as well as picturesque detailing. Substantially intact, the house exemplifies both the conservativism of domestic architecture in late nineteenth century Vance County and the growing popularity of the national picturesque styles. The NRHP eligible boundaries include the house, twentieth century corncrib, and the yard that defines their setting.

3.12.2.3.10 Holloway Farm

The Holloway Farm on the east side of US 158 near Middleburg, NC, is eligible for the NRHP under Criterion A for agriculture and Criterion C for architecture. The property is a well-preserved tobacco farm with a full array of farm outbuildings that illustrate the rise of bright leaf tobacco cultivation in Vance County in the nineteenth century. The farmhouse and outbuildings are well-preserved examples of traditional domestic and agricultural buildings of the period in the county.

3.12.2.3.11 William Haywood Harris Farm

The William Haywood Harris Farm on the west side of US 158 near Middleburg, NC, is eligible for the NRHP under Criterion A for agriculture and Criterion C for architecture. The unusually intact farm of 63 acres comprises a full range of nineteenth and early twentieth century agricultural outbuildings, including a slave house and detached kitchen and structures related to tobacco cultivation. The house is a fine and intact example of Greek Revival architecture in Vance County, while the outbuildings are rare surviving property types from the nineteenth century.

3.12.2.3.12 Forrest Ellington Farm

The Forrest Ellington Farm near Middleburg, NC, is eligible for the NRHP under Criterion A for agriculture. Also known as Belle-Hight Farm, the property is a fine example of a successful, mid-twentieth century farmstead in Vance County. The farm retains the 1948 Colonial Revival residence, a full collection of outbuildings, and farmland. The plaster Black Angus bull is a contributing object. Although a row of metal bulk barns is located north of the house and a mobile home is located to the south, these modern

resources do not detract significantly from the mid-century agrarian character of the property. The numerous other outbuildings were built primarily between the late 1920s and 1950s when Ellington purchased, expanded, and developed the tract.

3.12.2.3.13 R. B. Carter House

The R. B. Carter House at 717 North William Street in Henderson, NC, is eligible for the NRHP under Criterion C for architecture as one of the finest examples of architecture in Henderson. The house illustrates the conservative adaptation of up-to-date picturesque architecture to traditional forms and was designed by a local architect in 1892.

3.12.2.3.14 Henderson Historic District and Proposed Boundary Expansion

The Henderson Historic District is listed in and remains eligible for the NRHP under Criterion A for community planning and development and for education. It is also eligible under Criterion C for architecture. The district developed along the Raleigh and Gaston Railroad line as a tobacco market and regional industrial center. Many of Henderson's notable houses and residential streets found within the existing and proposed boundaries reflect the town's prosperity in the late nineteenth and early twentieth centuries; many of the houses display a range of the national design and style trends in domestic architecture of the period. The existing NRHP boundary compasses the nineteenth century and early twentieth century business district with Garnett Street and the parallel railroad corridor forming the key arteries. The proposed expansion to the south end of the district encompasses several circa 1900, brick industrial buildings along the west side of the railroad tracks; two substantial bungalows situated on Young Avenue, east of Garnett Street and west of the railroad tracks; and Mistletoe Villa, which is listed in the NRHP. The eastern boundary extension includes areas east of the rail corridor to encompass the town’s notable neighborhoods that took shape in the late nineteenth and early twentieth centuries.

3.12.2.3.15 Houses (2 bungalows on E Young Ave)

The two substantial bungalows situated on East Young Avenue in Henderson, NC, are contributing elements to Henderson Historic District, which is listed in the NRHP under Criterion A for community planning and development and under Criterion C for architecture. The side gable bungalows have shed roofed dormers and engaged porches supported by battered piers on stone or brick pedestals.

3.12.2.3.16 Mistletoe Villa

Mistletoe Villa, located within the Henderson Historic District, is listed in and remains eligible for the NRHP under Criterion C for architecture. The 1885 home is a grand Queen Anne pile designed by Samuel Sloan, the renowned Philadelphia architect who designed the Executive Mansion in Raleigh, NC. Mistletoe Villa epitomizes Henderson’s wealth and style-conscious residential growth in the late nineteenth century.

3.12.2.3.17 South Henderson Industrial Historic District

The South Henderson Industrial Historic District is eligible for the NRHP under Criterion A for industry and commerce and under Criterion C for architecture. The district

encompasses approximately 12 blocks of small-scale commercial buildings, workers dwellings, and three notable and intact industrial complexes: the Carolina Bagging Company; the Vance Flour Mill, and the India Bagging Company. The district illustrates Henderson's rail-oriented industrial development in the late nineteenth and early twentieth centuries. The boundaries of the South Henderson Industrial Historic District are loosely bounded by Davis, Maple, Nicholas, and Rose Streets, Epson Road, and railroad tracks.

3.12.2.3.18 Vance Flour Mill (Sanford Milling Co.)

The Vance Flour Mill is a contributing element to the South Henderson Industrial Historic District, which is eligible for the NRHP under Criterion A for industry and commerce and under Criterion C for architecture. The Vance Flour Mill (now Sanford Milling Company) opened about 1920. It consists of a distinctive, multiple story, brick and concrete factory, a detached office building with a stuccoed exterior, and tall, concrete grain elevators. With its flat slab concrete construction expressed on the exterior and banks of steel sash windows, the tall factory building is a particularly well-preserved example of an early twentieth century innovation in industrial construction.

3.12.2.3.19 Houses (5 worker houses on 1400 block of Nicholas St)

The five worker houses on the 1400 block of Nicholas Street in Henderson, NC, are contributing elements to the South Henderson Industrial Historic District, which is eligible for the NRHP under Criterion A for industry and commerce and under Criterion C for architecture. The dwellings were constructed for use by workers during Henderson's industrial heyday in the late nineteenth and early twentieth centuries.

3.12.2.3.20 Houses (3 side gable houses on 1500 block of Nicholas St)

The three side gable houses on the 1500 block of Nicholas Street in Henderson, NC, are contributing elements to the South Henderson Industrial Historic District, which is eligible for the NRHP under Criterion A for industry and commerce and under Criterion C for architecture. The dwellings were constructed for use by workers during Henderson's industrial heyday in the late nineteenth and early twentieth centuries.

3.12.2.3.21 Esso Gasoline Station

The 1930s Esso Gasoline Station located on the west side of US 1 at its junction with Bear Pond Road in Henderson, NC, is eligible for the NRHP under Criterion A for commerce and transportation and Criterion C for architecture. The well-preserved gasoline station with its Spanish Colonial Revival motifs illustrates a common Esso design of the period. The property is the finest remaining pre-World War II gasoline station in Henderson and a rare surviving example of a type that was once common nationally during the period.

3.12.2.3.22 Confederate Cemetery

The Confederate Cemetery in Vance County is eligible for the NRHP under Criterion A for military history and Criteria Consideration F, as one of the few Confederate cemeteries in North Carolina. The property is evocative and a rare vestige of Civil War

activities in Vance County and commemorates the soldiers who died at the Confederate Hospital in Kittrell, NC. Moreover, the cemetery remains as the only tangible reminder of a war-related event that took place here.

3.12.2.3.23 Saint James Episcopal Church

Saint James Episcopal Church, located at the northeast corner of Main Street and Williams Street in Kittrell, NC, is listed in and remains eligible for the NRHP under Criterion C for architecture. The church is a fine example of the Carpenter Gothic style, a design popular for Episcopal churches during the middle decades of the nineteenth century. The simple, front gable church has a projecting front gable entrance, board and batten exterior, and a pyramidal roofed bell tower.

3.12.2.3.24 Hedgepetch and Finch Store

The Hedgepetch and Finch Store on Main Street in Kittrell, NC, is eligible for the NRHP under Criterion A for commerce and Criterion C for architecture. The Hedgepetch and Finch Store stands as the most intact of the surviving commercial buildings in Kittrell, NC, and among the finest late nineteenth century general merchandise stores in rural Vance County.

3.12.2.3.25 Person-McGhee Farm

The Person-McGhee Farm is listed in and remains eligible for the NRHP under Criterion A for agriculture and Criterion C for architecture. The Person-McGhee Farm is an especially expansive and well-preserved farmstead established in a valley of the Tar River beginning in the 1830s. The centerpiece of the farm is a large and unusually elaborate Queen Anne dwelling surrounded by an array of outbuildings. This house includes a Federal-style rear section built for the Person family. The present 500-acre working farm tract is both historically and visually significant with clearly defined natural boundaries of streams and hills, and manmade boundaries of farm roads and railroad tracks.

3.12.2.3.26 Raleigh and Gaston Railroad Bridge Piers (Tar River)

The Raleigh and Gaston Railroad Bridge Piers over the Tar River, 0.2 miles east of US 1 near Franklinton, NC, are eligible for the NRHP under Criterion A for transportation and Criterion C for engineering. Although the wooden railroad bridge over the Tar River no longer remains, these circa 1840 railroad piers survive as the oldest railroad structures in the state and are tangible reminders of the Raleigh and Gaston Railroad, chartered in 1835. The piers illustrate the design, material, and method of construction employed in building the state's principal railroad piers before the Civil War.

3.12.2.3.27 Franklinton Historic District (Includes Sterling Mill Historic District)

The Franklinton Historic District includes Sterling Cotton Mill, which is listed in the NRHP, and the Sterling Mill Historic District. The district is eligible under Criterion A for community development and planning, industry, education, and commerce, and under

Criterion C for architecture. The remarkably well-preserved district encompasses much of the town's historical core, which developed along the Raleigh and Gaston Railroad. The district is notable for its range of residential, religious, commercial, civic, and industrial architecture epitomizing the development of a Piedmont railroad town and remaining one of the most intact, small railroad towns in the Piedmont. The Franklinton Historic District is loosely bounded by College Street, Cheatham Street, N Hillsborough Street, Pearce Street, Chavis Street, Mason Street, Tanyard Street, and Green Street.

3.12.2.3.28 Church

The church at the intersection of Green Street and Main Street in Henderson, NC, is a contributing element to the Franklinton Historic District, which is eligible for the NRHP under Criterion A for community development and planning, industry, education, and commerce, and under Criterion C for architecture. The Gothic Revival, brick church features a corner, pyramidal roofed entrance tower, a cross gable roof, and pointed and rounded arched windows.

3.12.2.3.29 Sterling Cotton Mill

The Sterling Cotton Mill, located within the Franklinton Historic District, is listed in and remains eligible for the NRHP under Criterion A for industry and under Criterion C for architecture. The two-story, simplified Italianate mill opened along the Raleigh and Gaston Railroad at the south end of town in 1895. Owned by Franklinton merchant, S.C. Vann, this yarn mill was the largest textile operation in Franklin County. By the early twentieth century, the mill included a complex of brick spinning, looming, and carding rooms and adjacent cotton warehouses surrounded by worker housing for some 400 operatives. The mill's expansive mill village was constructed trackside beside the mill and extended northward to form a cluster of worker housing on the east side of the tracks near the business district.

3.12.2.3.30 Cedar Creek Railroad Bridge Piers

The Cedar Creek Railroad Bridge Piers near Franklinton, NC, are contributing elements to the Raleigh and Gaston Railroad Corridor, which is eligible for the NRHP under Criterion A for transportation. The granite bridge piers supported timber deck truss spans built along the Raleigh and Gaston Railroad during the nineteenth century. Although the trusses are no longer in existence, the rock-faced ashlar piers survive at Cedar Creek. The piers illustrate the design, material, and method of construction employed in building the state's principal railroad piers before the Civil War.

3.12.2.3.31 Youngsville Historic District

Placed on the North Carolina Study List in 2007, the Youngsville Historic District is considered eligible for the NRHP under Criterion A for commerce and under Criterion C for architecture. The district contains the town's most intact concentration of significant commercial, civic, and residential buildings from the late nineteenth and early twentieth centuries when Youngsville thrived as a tobacco market town. The historic architecture in the district not only represents common commercial and residential building types of the period that are now rare, but also includes a notable, stone veneered Home

Demonstration Club from the late 1930s and several fine, Queen Anne residences on sizeable, tree shaded lots.

3.12.2.3.32 J. B. Perry House

The J. B. Perry House at 123 Railroad Street in Youngsville, NC, is eligible for the NRHP under Criterion C for architecture. Although little is known about the house, it stands as an outstanding example of the Queen Anne style as it emerged in the region's small railroad towns in the early twentieth century.

3.12.2.3.33 Glen Royall Mill Village Historic District

The Glen Royall Mill Village Historic District in Wake Forest, NC, is listed in and remains eligible for the NRHP under Criterion A for industry and commerce and under Criterion C for architecture. Established in 1900 next to the town of Wake Forest, NC, the village provided housing for workers at the Royall Cotton Mill. Largely intact, the village encompasses detached, single family houses and duplexes designed as pyramidal roofed cottages, shotgun plans, and Triple A dwellings. The district includes a company commissary, additional stores, churches, and schools. The worker houses date primarily to the first decade of the twentieth century, but the district also includes the Powell-White House, designed in the Queen Anne/Colonial Revival style, and several modern dwellings. The village reached its final shape in the 1920s during the height of the textile boom in North Carolina. Although the Depression caused hardships for the company and community, the mill survived until 1976, but in 1977, the mill village was annexed to Wake Forest.

3.12.2.3.34 Wake Forest Historic District

The Wake Forest Historic District is listed in and remains eligible for the NRHP under Criterion A for both community development and planning and for education and under Criterion C for architecture. The district encompasses the original campus of Wake Forest College, founded in 1834 as the oldest denominational college in North Carolina. The intact and landscaped campus, which now houses a theological seminary, includes brick, Colonial Revival buildings from the 1880s through the postwar period, and neighborhoods that emerged to surround the campus. North of the college are the fashionable Greek Revival, Italianate, Queen Anne, and Classical Revival residences of faculty, while south and west are streets of period dwellings that housed the town's merchants.

The historic district meets Criterion C for architecture as a cohesive and illustrative collection of houses, college buildings, churches, and commercial buildings, executed in both traditional and nationally popular designs. The South Brick House, a Greek Revival style survivor is one of three original college buildings dating to the 1830s. The oldest house is the Federal style Calvin Jones House a circa 1820 plantation house that once stood on the farm purchased as the site for the college. Also within the historic district are Italianate dwellings for faculty during the period between 1870 and 1890, Queen Anne houses, the substantial, Colonial Revival homes of local textile mill owners, a stone, Tudor Revival residence, a brick, circa 1900 store, a Works Progress Administration funded community building, and four buildings by noted Raleigh architect, W. H. Deitrick.

3.12.2.3.35 Downtown Wake Forest Historic District

The Downtown Wake Forest Historic District is listed in and remains eligible for the NRHP under Criterion A for commerce. The district epitomizes the small, rail-oriented business districts that emerged in North Carolina during the late nineteenth and early twentieth centuries. The district features contiguous rows of one story and two story, brick, commercial buildings with simple Colonial Revival, Moderne, and Art Deco elements.

3.12.2.3.36 Powell House

The Powell House near Wake Forest, NC, is listed in and remains eligible for the NRHP under Criterion A for education and Criterion C for architecture. The house was built at the turn of the nineteenth century as the centerpiece of a large plantation owned by prominent planter, Jesse Powell. Well-sited amidst mature trees and boxwoods, the two story, Federal house has a hip roof, nine-over-nine windows, a three bay facade, and a pedimented, two tiered porch, which was added circa 1940. The rear ell is an earlier, circa 1790 house. The property includes pastures and outbuildings. Under Criterion C, the house is distinctive for its large scale and intact, vernacular interior detailing and is one of the most imposing and earliest dwellings remaining in Wake County.

The property was originally part of an 880-acre parcel straddling the Neuse River that belonged to Dempsey Powell, a lieutenant in the Wake County militia in the years just before the American Revolution. At his death in 1793, one of his sons, Jesse, received a 318-acre tract on the north side of the Neuse to which he added 585 acres. Powell was a supporter of the nearby Wake Forest Pleasant Grove Academy and was also involved in local politics.

3.12.2.3.37 Neuse Railroad Station

The Neuse Station at the Neuse Crossroads in Wake County is eligible for the NRHP under Criterion A for transportation and Criterion C for architecture. Probably built in the early 1900s, this small, frame rail depot is typical of the railway stations erected during this period in rural North Carolina and in small towns and hamlets across the country. This station was constructed along the Raleigh and Gaston Railroad as part of the Seaboard Air Line System, which was organized in 1893. The building has a gable roof, broad eaves, German siding, six-over-six windows, a bracketed canopy, and a double-leaf loading door. Now used for general storage by a construction company, it appears to have been moved roughly thirty feet back from the railroad tracks. A later addition extends from the rear.

3.12.2.3.38 Crabtree Creek Railroad Bridge Pier

The Crabtree Creek Railroad Bridge Pier near Raleigh, NC, is a contributing element to the Raleigh and Gaston Railroad Corridor, which is eligible for the NRHP under Criterion A for transportation. The granite bridge piers supported timber deck truss spans built along the Raleigh and Gaston Railroad during the nineteenth century. Although the trusses are no longer in existence, one rock-faced ashlar pier survives along the south bank of Crabtree Creek. The pier illustrates the design, material, and method of construction employed in building the state's principal railroad piers before the Civil War.

3.12.2.3.39 Raleigh Bonded Warehouse

The Raleigh Bonded Warehouse in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for commerce and Criterion C for architecture. Constructed alongside the Norfolk-Southern Railway in 1923, the expansive Raleigh Bonded Warehouse was owned and operated by cotton distributor, Norman Edward Edgerton. With a million cubic feet of storage space, the principal building is a long, one-story, brick and reinforced concrete structure with series of twelve bays and rows of steel sash factory windows. The site also includes several other storage and auxiliary buildings. The facility was initially conceived as a cotton warehouse strategically located between the cotton growers of the Coastal Plain and the textile mills in the Piedmont with plans to add a cotton compress as business grew. However, the warehouse never handled the projected volumes of cotton, and by the 1930s, the business was diversified to include storage for a wide range of goods. The facility is now used for retail as well as storage space.

3.12.2.3.40 Mordecai Place Historic District

The Mordecai Place Historic District in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for community planning and development and Criterion C for architecture. The district encompasses an early twentieth century residential development on the former Mordecai family plantation, and Mordecai House (listed in the NRHP), the late eighteenth and early nineteenth century plantation seat, is located within the historic district. Similar to Raleigh neighborhoods as Boylan Heights, Cameron Park, and Glenwood, this tree-shaded residential enclave reflects the early twentieth century subdivision of the plantations that once encircled Raleigh. Residential development began in 1916, and the array of nationally popular and architect-designed houses reflect popular tastes of the interwar period. Planned in two stages, the Mordecai Place neighborhood is characterized by a variety of revival style dwellings, bungalows, and minimal traditional domestic designs.

3.12.2.3.41 Pilot Mill

Pilot Mill in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for industry and Criterion C for architecture. In addition, the mill has been designated as a local landmark. Constructed in 1892 along the Raleigh and Gaston Railroad, Pilot Mill clearly illustrates the emergence of the Piedmont textile industry during the New South era of the late nineteenth and early twentieth centuries. The mill was founded by James N. and W.H. Williamson of Alamance County and the Holt family textile dynasty there. While other North Carolina cities and towns developed extensive manufacturing sectors, Raleigh had only a small industrial base, and Pilot Mill is one of the few Raleigh textile mills to survive. The mill is also significant architecturally as an example of the simple, brick buildings, with long, rectangular plans and limited ornamentation that were commonly built for the textile industry. Originally, Pilot Mill included worker housing, but the housing was demolished circa 1980, and the mill closed two years later. Since its 1989 NRHP listing, fire has destroyed much of the once extensive (5.7 acres) Pilot Mill complex, but the mill has been rebuilt in recent years as part of a certified rehabilitation project.

3.12.2.3.42 Roanoke Park Historic District

The Roanoke Park Historic District is listed in and remains eligible for the NRHP under Criterion A for community planning and development and Criterion C for architecture. The roughly 107-acre district took shape as a residential neighborhood in the early twentieth century. The area consists of six separate plats that were filed between 1913 and 1926. Consisting primarily of single family dwellings sited closely together, the district is marked by an irregular street pattern that follows the sloping contours of the rolling eastern Piedmont landscape. Houses typically occupy small, tree shaded lots and reflect the mainstream architectural styles of the early and middle decades of the twentieth century: Colonial Revival, American Foursquare, Dutch Colonial, Tudor Revival, Minimal Traditional, Period Cottage, and ranch. The district also contains some traditional house types of the early twentieth century including shotgun houses and single pile, Triple A cottages. Bickett Boulevard is lined with weather-boarded and brick veneered cottages from the immediate postwar period.

3.12.2.3.43 Noland Plumbing Company Building

The Noland Plumbing Company Building in Raleigh, NC, is eligible for the NRHP under Criterion A for commerce and under Criterion C for architecture. Under Criterion A, the building clearly represents the wave of wholesale distribution companies established in north Raleigh during the booming postwar years when such suppliers built facilities near their customers in the new subdivisions on the city's periphery. By the late 1950s, the most up-to-date commercial warehouses, such as Noland Plumbing, included stylish offices and showrooms. The building is also eligible under Criterion C for architecture, ranking among the finest modernist warehouses in the city and neatly illustrating the postwar modernist movement in its linear, geometric design and sleek elevations devoid of historically derived decoration.

3.12.2.3.44 John A. Edwards and Company Building

The John A. Edwards and Company Building in Raleigh, NC, is eligible for the NRHP under Criterion C for architecture. Occupying a landscaped setting along Wade Avenue, the bold design of the John A. Edwards and Company Building is an exceptionally well-preserved and rare surviving example of postwar commercial modernism in Wake County. In addition to its unaltered interior, its asymmetrical, intersecting geometry, mosaic tile exterior, and graphic signage make the building an especially fine example of the modernist professional office buildings erected in suburban Raleigh after World War II.

3.12.2.3.45 Glenwood-Brooklyn Historic District

The Glenwood-Brooklyn Historic District in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for community planning and development and under Criterion C for architecture. The Glenwood and Brooklyn neighborhoods began with the incorporation of the Glenwood Land Company in 1905. This area was the first of a series of suburban neighborhoods that launched Raleigh's western and northern expansion in the early twentieth century. The residential streets of the historic district include well-preserved examples of the Queen Anne, Craftsman, Tudor Revival, and Colonial Revival styles. A small commercial zone of early twentieth century storefronts

stands at the south end of the district along Glenwood Avenue. The historic district encompasses 362 resources on approximately eighty acres.

3.12.2.3.46 Seaboard Railway Station

The Seaboard Railway Station is eligible for the NRHP under Criteria A and C. Along with the Seaboard Railway Warehouses, the complex represents the important role of rail transportation in the mid-twentieth century and the role of truck transport. In addition, the station is a fine example of a colonial revival railroad station.

3.12.2.3.47 Seaboard Railway Warehouses

The Seaboard Railway Warehouses and adjoining streets are eligible for the NRHP under Criteria A and C. Along with the Seaboard Railway Station, the complex represents the important role of rail transportation in the mid-twentieth century and the role of truck transport. In addition, the warehouses are representative of planned warehousing in Raleigh, NC.

3.12.2.3.48 Raleigh Cotton Mills

The Raleigh Cotton Mills in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for industry and Criterion C for architecture. The mill is also a designated local landmark. Constructed along the Raleigh and Gaston Railroad in 1890, the mill illustrates the rise of the textile industry in Raleigh and the region. Although Raleigh was never a major manufacturing city, the years around the turn of the twentieth century saw the emergence of small-scale textile factories beside the railroad tracks. The mill's utilitarian, thick brick walls, bracketed gable roof, banks of arched windows, and heavy wood beams and rafters typifies the small-scale textile mills of the period. Such features illustrate slow burning mill construction that distinguished textile plants of this era.

3.12.2.3.49 Pine State Creamery

The Pine State Creamery in Raleigh, NC, is listed on and remains eligible for the NRHP under Criterion A for industry and Criterion C for architecture. The Pine State Creamery was constructed in 1928 at the encouragement of the State College Agricultural Extension Service as a dairy farmers' cooperative. The two-story, Art Moderne building has an exterior of cream-colored brick and features a three-story corner tower. There is a large 1940s addition on the south side and a pair of 1960s wings. The creamery closed in 1996 and subsequently underwent a certified rehabilitation for mixed commercial use. The Pine State Creamery is also a designated local landmark.

3.12.2.3.50 Melrose Knitting Mill

The Melrose Knitting Mill in Raleigh, NC, is eligible for the NRHP under Criterion A for industry and Criterion C for architecture. The mill clearly illustrates the rise of rail-oriented manufacturing in the city during the late nineteenth and early twentieth centuries. Although the capital city was never a major manufacturing hub, this period saw the development of small-scale textile factories beside the railroad tracks. The mill's utilitarian, thick brick walls, bracketed gable roof, banks of arched windows, and

heavy wood beams and rafters typifies the small-scale textile mills of the period. Such features illustrate slow burning mill construction that distinguished textile plants of this era.

3.12.2.3.51 Raleigh Electric Company Power House

The Raleigh Electric Company Power House is listed in and remains eligible for the NRHP under Criterion A for industry. Built in 1910 primarily to power the city's electric streetcar system, the power house is now partially sided in corrugated metal, but the brick elevation along West Jones Street features a series of corbelled gables. Along with the Carolina Power and Light Company Car Barn and Automobile Garage, this building has been renovated for commercial purposes in recent years using federal and state preservation tax credits. The Power House is also a designated local landmark.

3.12.2.3.52 Carolina Power and Light Company Car Barn and Automobile Garage

The Carolina Power and Light Company Car Barn and Automobile Garage is listed in and remains eligible for the NRHP under Criterion A for transportation and Criterion C for architecture. Built in 1925, the Carolina Power and Light Company Car Barn and Automobile Garage was constructed in the Art Deco style to house and repair the company's streetcars and service vehicles. Along with the Raleigh Electric Company Power House, this building has been renovated for commercial purposes in recent years using federal and state preservation tax credits. The Carolina Power and Light Company Car Barn and Automobile Garage is also a designated local landmark.

3.12.2.3.53 National Art Interiors

National Art Interiors on Hillsboro Street in Raleigh, NC, is eligible for the NRHP under Criterion C for architecture. The two-story, brick commercial building was built circa 1915 at the corner of Glenwood Avenue and Hillsborough Street. Standing at the corner of a busy intersection, the store features moderne, large display windows that stretch across the façade, while the second story displays traditional fenestration, coupled with a classically-inspired cornice atop the parapet wall. It is significant because it is a large, intact example of early twentieth century commercial architecture dating from a period of extensive growth out from Raleigh's center toward the new streetcar suburbs.

3.12.2.3.54 North Carolina School Book Depository

The North Carolina School Book Depository in Raleigh, NC, is eligible for the NRHP under Criterion A for industry. This simple, brick warehouse was built circa 1940 for storing schoolbooks before their distribution to public schools throughout the state. Typical of the small warehouses built during the early to mid-twentieth century, the depository exemplifies the auxiliary buildings erected to serve the expanding statewide public school system during the school construction campaigns of the early to mid-twentieth century. During this era, school supply buildings arose in urban warehousing districts throughout the state.

3.12.2.3.55 Raleigh Hosiery Company Building

The Raleigh Hosiery Company Building in Raleigh, NC, is eligible for the NRHP under Criterion A for industry. Built along the Seaboard rail line, this three story, brick hosiery mill dates to the early twentieth century. Despite its conversion for use by a non-profit organization, the former mill continues to illustrate the small-scale industrial and warehousing properties built along the rail lines of the city during the New South era of the late nineteenth and early twentieth centuries. The well-preserved, utilitarian building has a flat roof, banks of steel-sash windows, and a simple rectangular shape.

3.12.2.3.56 Boylan Heights Historic District

The Boylan Heights Historic District in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for community planning and education, under Criterion B for its associations with prominent Raleigh developers and civic leaders, Frank Ellington and J. Stanhope Wynne, and under Criterion C for architecture. In addition, Boylan Heights has been designated as a local historic district. Under Criterion A, Boylan Heights survives as one of Raleigh's first twentieth century suburbs and in its layout and architecture exemplifies early twentieth century suburban development in the emerging urban centers of the state.

The neighborhood had its beginnings in 1907 when the heirs of Williams Montfort Boylan sold the 1858 Italianate villa, Montford Hall (listed in the NRHP), and its surrounding 180 acres to the Greater Raleigh Land Company, owned by Frank Ellington and J. Stanhope Wynne. The syndicate hired the firm of Kelsey and Guild of Boston to develop the hilly site as a residential suburb. With the city's expanding middle class in need of housing, Boylan Heights was quickly successful, and by 1915 all lots had been sold. With numerous young families in the neighborhood, a public elementary school was built on Boylan Avenue in 1926. Boylan Heights has survived remarkably intact, and the substantial Colonial Revival, Neo-Classical Revival, and picturesque dwellings lining Boylan Avenue near Montfort Hall and the smaller bungalows and cottages found on the periphery illustrate mainstream domestic designs of the period.

3.12.2.3.57 Depot Historic District

The Depot Historic District in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for industry, transportation, and commerce and Criterion C for architecture. The district illustrates the transformation of a downtown neighborhood into a specialized industrial zone and transportation center between the 1880s and 1952. The district is also listed in the NRHP for its distinctive industrial, commercial, and transportation-related architecture. In addition, the district has significance in the area of community planning and development for its 1940 Works Progress Administration design for Nash Square.

Located west of the central business district, the four block area comprises Raleigh's only important collection of rail-related, industrial, and warehouse buildings, including the 1912 (Former) Southern Railway Freight Depot, the 1891 Romanesque Revival Union Depot, and the 1949 Colonial Revival Southern Railway station as well as an array of brick, wholesale warehouses, processing facilities, and distributors such as the U.S. Rubber Company Building, the Raleigh Blue Printers Building, and the Art Moderne

Firestone Tire and Rubber Company building. Remnants of the hotels and restaurants that once served the workmen and travelers working in or passing through the area also remain. The district includes both the eight story Professional Building (listed in the NRHP), oriented to the business district to the east, and Nash Square, the southwest square in Raleigh's eighteenth century city plan and, with Moore Square, the last to remain.

3.12.2.3.58 Raleigh and Gaston Railroad Corridor

The nearly 60-mile Raleigh and Gaston Railroad Corridor between Raleigh, NC, and Norlina, NC, is eligible for the NRHP under Criterion A for transportation. As one of the state's first two railroads and as a core element in what grew to become one of the major rail lines in the southeastern United States, the historic significance of the Raleigh and Gaston Railroad is undisputed and still reflected in its corridor between Raleigh and Norlina, NC.

The intact railroad alignment and grade and the remaining rail-related features between Raleigh and Norlina, NC, are considered contributing elements to the significance and integrity of the rail corridor. These include several resources listed in or previously determined eligible for the NRHP: Seaboard Railway Station and Warehouses (Raleigh, NC); Neuse Railroad Station; Seaboard Railway Passenger Station (Wake Forest, NC); Raleigh and Gaston Passenger Station (Franklinton, NC); Seaboard Maintenance Building (Franklinton, NC); Raleigh and Gaston Bridge Railroad Piers (Tar River); Seaboard Freight Station (Henderson, NC); and the William J. Hawkins House (Ridgeway, NC). Also included are the Raleigh and Gaston Turntable (Raleigh, NC); granite bridge piers at Crabtree Creek and Cedar Creek; several stone-lined culverts; the steel deck girder span at Cedar Creek (in the vicinity of Franklinton, NC); a 1940s shed that housed defect and dragging equipment (just north of Cedar Creek); a section house near the community of Mason in Warren County; several reinforced concrete bridges erected during the 1920s (in particular, within Wake Forest, Franklinton, and Norlina, NC); and a repeater tower used for radio dispatch (Norlina, NC).

3.13 Parklands, Recreational Areas, and Refuges

This section documents federal, state and local parklands, public recreational areas and wildlife refuges located within the vicinity of the study area. Figures 3-13 and 3-14 show the locations of these areas. A Community Profile Report, including a detailed discussion of parklands, recreational areas, and refuges within the SEHSR study area, was prepared in January 2004 (NCDOT and VA DRPT, 2004d); the data from this report have been updated to reflect changes to the project study area and newly available materials. The following subsections document each resource by jurisdiction (federal, state, or local) and location.

3.13.1 Federal Parklands

Petersburg National Battlefield is the only National Park located within the study area. The existing active rail corridor passes through both the Confederate defense and Union siege lines south of the city along a route parallel with the old Petersburg and Weldon Railroad of the Civil War era. Fort Wadsworth and the site of the Battle of the Weldon Railroad are part of the Petersburg National Battlefield Fort Wadsworth Unit, which is managed by the National Park Service and located directly adjacent to the rail corridor near Collier rail yard.

Figure 3-13

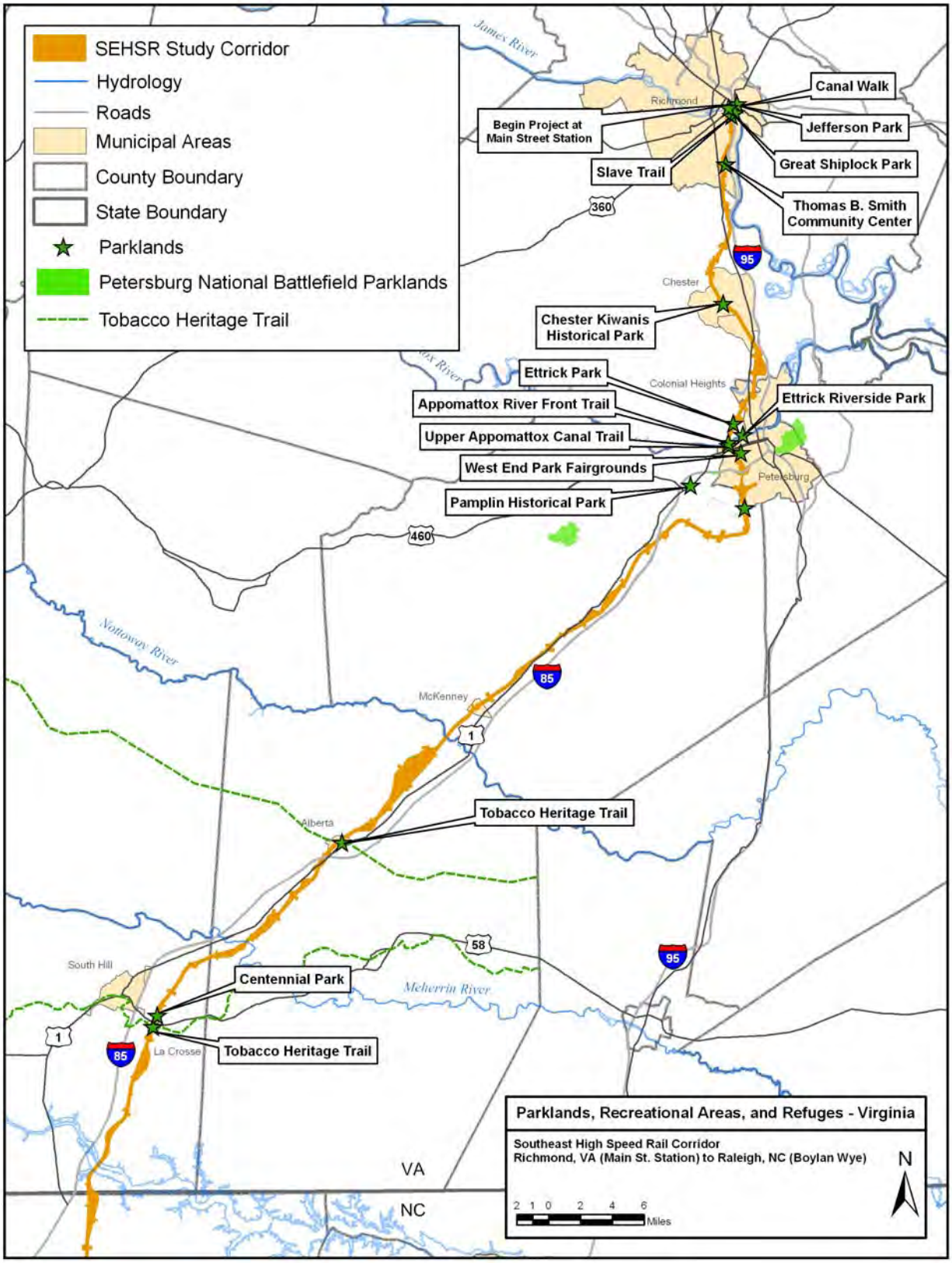
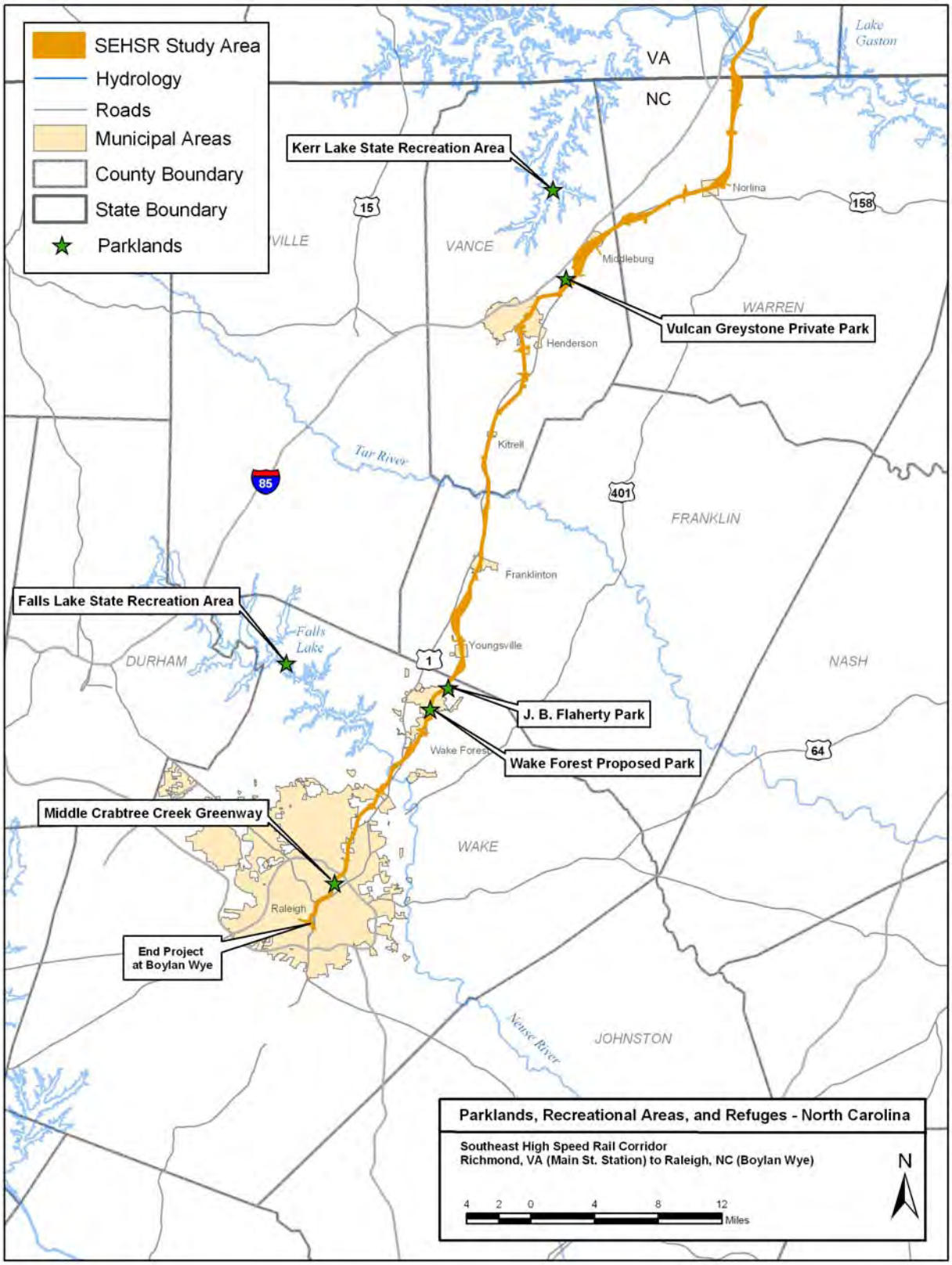

SEHSR Study Corridor
Hydrology
Roads
Municipal Areas
County Boundary
State Boundary
Parklands
Petersburg National Battlefield Parklands
Tobacco Heritage Trail
James River
Richmond
Canal Walk
Begin Project at Main Street Station
Jefferson Park
Slave Trail
Great Shiplock Park
Thomas B. Smith Community Center
360
95
Chester
Chester Kiwanis Historical Park
Ettrick Park
Appomattox River
Colonial Heights
Ettrick Riverside Park
Appomattox River Front Trail
Upper Appomattox Canal Trail
West End Park Fairgrounds
Petersburg
Pamplin Historical Park
460
Nottoway River
85
McKenney
1
Tobacco Heritage Trail
Alberta
58
South Hill
Centennial Park
Meherrin River
La Crosse
Tobacco Heritage Trail
VA
NC
Parklands, Recreational Areas, and Refuges - Virginia
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
2 1 0 2 4 6
Miles

Figure 3-14


SEHSR Study Area
Hydrology
Roads
Municipal Areas
County Boundary
State Boundary
Parklands
Kerr Lake State Recreation Area
Vulcan Greystone Private Park
Falls Lake State Recreation Area
J. B. Flaherty Park
Wake Forest Proposed Park
Middle Crabtree Creek Greenway
End Project at Boylan Wye
Lake Gaston
VA
NC
Norlina
Middleburg
Henderson
Kitrell
Franklinton
Youngsville
Wake Forest
Raleigh
Tar River
Falls Lake
Neuse River
VANCE
WARREN
FRANKLIN
DURHAM
WAKE
JOHNSTON
NASH
15
85
401
1
64
158
Parklands, Recreational Areas, and Refuges - North Carolina
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
4 2 0 4 8 12
Miles

The Petersburg Breakthrough Battlefield at Pamplin Historical Park, located several miles west of the study area, is also a National Historic Landmark.

No National Forests or Wildlife Refuges are located within the study area.

3.13.2 State Parklands and Recreation Areas

No Virginia or North Carolina state parks, natural area preserves, forests or recreation areas are located within the study area. The nearest state parks to the study area are discussed below.

3.13.2.1 Virginia

- Staunton River State Park is one of the six original state parks in Virginia that opened in June 1936. It is located on approximately 1,600 acres of shoreline along of the John H. Kerr Reservoir, the Dan River and the Staunton River (Virginia Department of Conservation and Recreation, 2004b).

3.13.2.2 North Carolina

- Kerr Lake State Recreation Area is located along the John H, Kerr Reservoir. The recreation area's headquarters are located north of Henderson, NC, at Satterwhite Point (North Carolina Division of Parks and Recreation, 2004a).
- Falls Lake State Recreation Area covers an area of over 12,400 acres. The manmade reservoir is located adjacent to the Raleigh-Durham-Chapel Hill area. Falls Dam is located in the upper Neuse River basin, approximately 200 miles upstream from New Bern, NC, 47 miles above Smithfield, NC, and about 10 miles north of Raleigh, NC. The main body of the lake is in Wake and Durham counties, but some of the embayments extend into Granville County (North Carolina, Division of Parks and Recreation, 2004b).

3.13.3 County/City Parklands

There are several county and city parks within or in the immediate vicinity of the study area.

3.13.3.1 Virginia

The City of Richmond's Canal Walk is located between 5th and 17th Streets along the James River and the Kanawha and Haxall Canals on the north side of the James River. The James River Park System within City of Richmond includes the Slave Trail along the south bank of the James River. The City also operates the Thomas B. Smith Community Center near the existing Ruffin Road at-grade crossing. Both resources are located within the study area. The City's Jefferson Park on Jefferson Avenue and Great Shiplock Park along the north bank of the James River are both located just east of the study area.

Chesterfield County is currently planning the Chester Kiwanis Historical Park along Curtis and Richmond Streets within the study area. The County's Ettrick Park on Laurel Road is located within the study area and the County's Ettrick Riverfront Park is located along the Appomattox River just east of the study area. In Ettrick, the County also operates the Ettrick Park and Mayes-Colbert Ettrick Community Building. In addition, the County is planning the Appomattox Riverfront Trail, which will extend for 1.8 miles along the Appomattox riverfront between Virginia State University (VSU) and the Village of Ettrick.

The Upper Appomattox Canal Trail associated with Appomattox Riverside Park is located on the south bank of the Appomattox River in Petersburg within the study area. West End Park Fairgrounds in Petersburg is adjacent to the study area.

Dinwiddie County is home to the privately-owned Pamplin Historical Park, which is located at the site of the Petersburg Breakthrough Battle and includes the Museum of the Civil War Soldier. The park is located approximately three miles west of the study area along a rail alternative that was considered, but not carried forward (see Section 2.2.2).

The Tobacco Heritage Trail, a rails-to-trails corridor along an abandoned Norfolk-Southern rail corridor, intersects the study area in Alberta and La Crosse, VA. The Tobacco Heritage Trail will connect existing trail segments and create new trail within five Virginia counties: Brunswick, Mecklenburg, Halifax, Charlotte, and Lunenburg, with a potential spur trail connection to Dinwiddie County.

La Crosse is home to Centennial Park on South Main Street. The park includes a railroad caboose and is located within the study area.

3.13.3.2 North Carolina

Vulcan Greystone Mining Operations in Henderson, NC, operate a privately-owned park facility adjacent to their mining operations and the existing rail line within the study area.

The Town of Wake Forest, NC, has set aside approximately one acre of land at the intersection of South White Street and East Holding Avenue within the study area for development as a park. The park will serve persons with disabilities and will include playground pieces, an amphitheatre, restrooms, and gardens for aesthetic appeal. The property, approximately one acre, belongs to the town but has been set aside for this purpose. Conceptual drawings of the park have been completed, and the Association is working on a fundraising plan.

J.B. Flaherty Park is located in the Town of Wake Forest, NC, and is approximately a quarter mile south of the SEHSR study area. This 100-acre park currently houses three lighted fields for baseball and softball, a restroom /storage and picnic shelter facility, two ponds, four lighted tennis courts, and a community center. The center has a regulation high school gymnasium, arts & crafts room, game room, and a meeting room with a small kitchen (Town of Wake Forest, Department of Parks and Recreation, 2004).

The City of Raleigh's Middle Crabtree Creek greenway also intersects the study area.

3.13.4 Wildlife Refuges

There are no wildlife refuges in the immediate vicinity of the SEHSR study area in either Virginia or North Carolina.

3.13.5 Section 4(f)/Section 6(f) Resources

Several federal laws protect parklands and other natural and recreational areas described above, as well as public recreation areas associated with schools described in Section 3.11.5.1. This section does not discuss the application of Section 4(f) to historic properties.

Please refer to Section 3.12 and Chapter 5 for more information about historic and cultural resources and the assessment of potential impacts to these resources.

3.13.5.1 Section 4(f) Requirements

Section 4(f) of the Department of Transportation Act of 1996 (49 USC § 1653, now 49 USC § 303) requires that a special effort be made to preserve the natural beauty of the countryside, including public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Section 4(f) prohibits the Secretary of Transportation from approving projects that require the direct or indirect use of publicly owned parks, recreation areas, wildlife and waterfowl refuges, or any significant historic sites protected under Section 4(f) unless a determination is made that there is no feasible and prudent alternative to such use, and that the projects include all possible planning to minimize harm to the properties.

3.13.5.2 Section 6(f) Requirements

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act (Public Law 88-578) requires that recreation land acquired or developed with assistance under this section remain in use exclusively for public outdoor recreation. State and local governments can obtain federal grants through the LWCF to improve parks and recreational areas. Section 6 (f) prohibits the conversion of these lands to non-recreational use without the approval of the USDOI National Parks Service and, as appropriate, other departments. Under Section 6(f), USDOI is directed to assure that replacement lands are of equal value and location. Regardless of the mitigation proposed, the Section 6(f) evaluation should document the National Park Service's position relative to the Section 6(f) conversion.

3.13.5.3 Section 4(f) and 6(f) Resources

Section 4(f) resources were identified through a search of databases for federal, state, county, and locally owned park sites and recreational facilities, and publicly owned lands. This information was supplemented with information obtained from municipal and county planning documents, as well as meetings with local officials.

The following is a list of Section 4(f) resources located within the project study area:

- Canal Walk, Richmond, VA
- Slave Trail (James River Park System), Richmond, VA
- Thomas B. Smith Community Center, Richmond, VA
- Chester Kiwanis Historical Park (Planned), Chester, VA
- Ettrick Park & Mayes-Colbert Ettrick Community Building, Ettrick, VA
- Appomattox Riverfront Trail (Planned), Ettrick, VA
- Upper Appomattox Canal Trail (Appomattox Riverside Park), Petersburg, VA
- Petersburg National Battlefield (Fort Wadsworth Unit), Petersburg, VA
- Tobacco Heritage Trail, Alberta, VA, and La Crosse, VA
- Centennial Park, La Crosse, VA
- Franklinton Elementary School, Franklinton, NC
- Middle Crabtree Creek Greenway, Raleigh, NC

There are several other recreational resources described in the above sections that are located outside the project study area and, therefore, are not included in the Section 4(f) evaluation in Chapter 5.

Section 6(f) properties were identified through a search of the LWCF website, which listed two potential Section 6(f) resources in the vicinity of the SESHR project: Appomattox River City Park (grant ID 89; approved 1973) and James River Park (grant IDs 31, 54, and 59; approved 1968, 1970, and 1972). A scoping letter was sent to the Virginia Department of Conservation and Recreation to determine if these Section 6(f) resources are potentially impacted by the SEHSR project alternatives. Subsequent coordination determined that the SEHSR project alternatives will not require ROW or otherwise impact these Section 6(f) resources.

At the time of publication of this document, the Roanoke River Rails-to-Trails, Inc (RRRT) was in the process of applying for LWCF funds for the Tobacco Heritage Trail in Alberta, VA. The RRRT has communicated to the SEHSR project team that LWCF funds will not be used for any of the ROW potentially required for the SEHSR project.

3.14 Roads

There are numerous transportation facilities within the study corridor, including many that cross the rail ROW within the study corridor. Low-volume, two-lane roads are the most common type; although facilities range from Interstate highways to the US Bicycle Highway 1; from small town main streets to city-center, transit-oriented developments; and from rural roads to private access roads.

This section highlights major road facilities that cross the rail ROW within the study corridor, with average daily traffic counts (2002) greater than 1,000 vehicles per day.

3.14.1 City of Richmond, VA

Within the City Richmond, VA, the study corridor is centered along the active CSX S-line, which crosses under, then loosely parallels I-95. The largest volume of north/south traffic through Richmond is carried on I-95. Jefferson Davis Highway/US 1 also parallels the study corridor, crossing the James River west of the study corridor, and serves local north/south traffic. Within the downtown area, most of the roads that cross the CSX S-line are on a bridges or underpasses.

Major public road facilities that cross the CSX S-line are listed from north to south:

- East Main Street, existing underpass
- I-95, existing bridge
- I-195 Powhite Expressway, existing bridge
- Maury Street, crosses at grade
- I-95 exit ramp at Maury Street, existing bridge
- East Commerce, crosses at grade
- Ruffin Road, crosses at grade
- West Bells Road, crosses at grade

3.14.2 Chesterfield County, VA

Within Chesterfield County, Major north/south traffic near the study corridor is served by I-95 and Jefferson Davis Highway. The major east/west traffic is carried on Chippenham Parkway, Hwy 288, and West Hundred Road. In Chesterfield County, the study corridor is

centered around the active CSX S-line until reaching Centralia, where it begins to follow the active CSX A-line.

Major public road facilities that cross the active CSX S-line and A-line are listed from north to south:

- Chippenham Parkway, existing bridge
- Station Road, crosses at grade
- Jefferson Davis Highway, existing bridge
- Kingsland Road, crosses at grade
- Brinkley Road, crosses at grade
- Highway 288, existing bridge
- Old Lane, crosses at grade
- Centralia Road, crosses at grade
- West Hundred Road, existing bridge
- Curtis Street, crosses at grade
- Jefferson Davis Highway, existing underpass
- Ruffin Mill Road, existing bridge
- Woods Edge Road, crosses at grade
- Pine Forest Drive, crosses at grade
- Branders Bridge Road, crosses at grade
- River Road, existing bridge

3.14.3 City of Colonial Heights, VA

Major north/south traffic in Colonial Heights, VA, is served by I-95 and Jefferson Davis Highway. The major east/west traffic is carried on East Ellerslie Avenue and Temple Avenue. Major public road facilities that cross the CSX A-line are listed from north to south:

- East Ellerslie Avenue, existing bridge
- Boulevard, existing underpass.

3.14.4 City of Petersburg, VA

I-95 and I-85 carry the largest volume of north/south traffic through the City of Petersburg, VA; I-85 additionally serves some east/west traffic after splitting from I-95 in south Petersburg. Local north/south traffic is served by 2nd street, and Fleet Street which cross the Appomattox River to the west of I-95, as well as Crater Road, well to the east of the study corridor. The largest east/west traffic volume is carried by Boydton Plank Road and Washington Street. Within Petersburg the study corridor follows the active CSX A-line.

Major public road facilities that cross the CSX A-line are listed from north to south:

- Washington Street, existing underpass
- Farmer Street, existing underpass
- Halifax Street, existing bridge
- I-85, existing bridge
- Defense Road, existing underpass
- Halifax Road, existing bridge

3.14.5 Dinwiddie County, VA

The largest volume of north/south traffic in Dinwiddie County is carried by I-85 and US 1/Boydton Plank Road; both roads closely parallel as well as cross the CSX S-line ROW and the study corridor. VA 703/Carson Road carries the greatest east/west traffic volume across the study corridor in the northern part of the county, while VA 40/Doyle Boulevard which passes through the Town of McKenney, serves as the major east/west corridor in southern Dinwiddie county. The study corridor follows the inactive Burgess Connector and the inactive CSX S-line. No major public roads cross the Burgess Connector.

Major public road facilities that cross the CSX S-line are listed from north to south:

- I-85, existing bridge
- VA 703/Carson Road (community of Dinwiddie), existing bridge
- Courthouse Road (community of Dinwiddie), existing bridge
- US 1/Boydton Plank Road (south of community of Dinwiddie), existing bridge
- VA 40/Doyle Boulevard (McKenney), crosses at grade

3.14.6 Brunswick County, VA

Within Brunswick County, the largest volume of north/south traffic is carried by I-85 and US 1/Boydton Plank Road; both roads closely parallel as well as cross the CSX S-line ROW and the study corridor. In the Town of Alberta, Main Street runs north/south, and carries the largest volume of traffic through the town.

Major public road facilities that cross the CSX S-line are listed from north to south:

- Main Street (Alberta), crosses at grade
- I-85 (south of Alberta), existing bridge
- Boydton Plank Road/US 1 (south of Alberta), existing bridge
- Christianna Highway/Rte 46 (south of Alberta), existing bridge

3.14.7 Mecklenburg County, VA

In Mecklenburg County, I-85 and US 1 continue to loosely parallel the study corridor, but remain on the west side; these two highways carry the heaviest volume of north/south traffic through the county, with US 1 serving more local traffic. US 58 bears the largest east/west traffic load, crossing the study corridor in the Town of La Crosse. Main Street in La Crosse carries the bulk of the local north/south traffic.

Major public road facilities that cross the CSX S-line are listed from north to south:

- US 58 (La Crosse), existing bridge
- St. Tammany Street(La Crosse), crosses at grade
- Main Street (La Crosse), crosses at grade
- Morris Town Circle (La Crosse), crosses at grade
- Route 903 (Bracey community), existing bridge

3.14.8 Warren County, NC

Within Warren County, I-85 carries the largest volume of north/south through traffic, while US 1 serves more local north/south traffic. The CSX S-line closely parallels US 1, which

curves to the east away from I-85. US 158 provides east/west access through the county, and crosses under the CSX S-line by way of an underpass in the center of Norlina, NC, where the S-line becomes an active freight railroad.

Major public road facilities that cross the CSX S-line are listed from north to south:

- Wise Five Forks Road, crosses at grade
- Warren Plains Road(Norlina), crosses at grade
- US 158 (Norlina), existing underpass
- Ridgeway Road SR 1107 (south of Norlina), crosses at grade

3.14.9 Vance County, NC

Within Vance County, I-85 continues to carry the bulk of north/south through traffic while US 1 provides local north/south access. I-85, US 1, and the study corridor briefly come together near Middleburg, NC; however, at this location I-85 diverges from the study corridor, and remains well to the west throughout the remainder of the corridor. US 158 provides east/west access through the Henderson, NC area, but does not cross the railroad, while Andrews Avenue/NC39 provides a connection from US1 to the east. There are many public roads that cross the active CSX S-line at grade as it moves through the central areas of Middleburg, Henderson and Kittrell, NC.

Major public road facilities that cross the CSX S-line are listed from north to south:

- US 1 Bypass (north of Henderson), existing bridge
- Warrenton Road (north of Henderson), existing bridge
- Old Norlina Road (Henderson), crosses at grade
- Main Street (Henderson), crosses at grade
- Unnamed crossover (Henderson), crosses at grade
- Rock Spring Road (Henderson), crosses at grade
- Andrews Avenue/NC39 (Henderson), crosses at grade
- Charles Street (Henderson) existing bridge
- Montgomery Street (Henderson), crosses at grade
- E. Winder Street (Henderson), crosses at grade
- Orange Street (Henderson), crosses at grade
- Chavasse Avenue (Henderson), crosses at grade with
- Nicholas Street/St. Matthews Street (Henderson), crosses at grade
- Welcome Avenue/Belmont Drive (south of Henderson), crosses at grade
- JP Taylor Road (south of Henderson), crosses at grade
- Bearpond Road (south of Henderson), crosses at grade
- US 1 Bypass (south of Henderson), existing bridge
- Peter Gill Road (north of Kittrell) – at grade with both NC1 and NC2
- Chavis Road (north of Kittrell) – at grade with both NC1 and NC2
- Main Street (Kittrell) – at grade with both NC1 and NC2

3.14.10 Franklin County, NC

Within Franklin County, US 1 carries the highest volume of north/south traffic near the corridor, while NC 56, which crosses the study corridor in Franklinton, provides primary east/west access. In the towns of Franklinton and Youngsville, many low traffic volume public roads cross the CSX S-line at grade.

Major public road facilities that cross the CSX S-line are listed from north to south:

- Eric Medlin Road (north of Franklinton), crosses at grade
- Mason Street (Franklinton), crosses at grade
- Green Street/NC 56 (Franklinton), existing underpass
- College Street (Franklinton), crosses at grade
- Main Street/NC 96 (Youngsville), crosses at grade

3.14.11 Wake County, NC

In Wake County, the study corridor continues to follow the active CSX S-line along the busy US 1 corridor. US 1, US 401 to the east, and NC 50 to the west carry the bulk of north/south through traffic near the corridor. Many roads provide a network of east/west access across the county, including the NC 98 Bypass in Wake Forest, the I-540 beltline in north Raleigh, and the I-440 beltline around downtown Raleigh. Within downtown Raleigh the study corridor includes the NS-line between Capital Boulevard/US 1 and Jones Street.

Major public road facilities that cross the CSX S-line are listed from north to south:

- Roosevelt Avenue (Wake Forest), existing bridge
- Elm Avenue (Wake Forest), crosses at grade
- Holding Avenue (Wake Forest), crosses at grade
- NC 98 Bypass (Wake Forest), existing bridge
- Rogers Road (Wake Forest), crosses at grade
- Ligon Mill Road (Wake Forest), crosses at grade
- Capitol Boulevard/US1 (north of Raleigh) existing bridge
- Durant Road (Raleigh), crosses at grade
- Gresham Lake Road (Raleigh), crosses at grade
- I-540 Outer Beltline (Raleigh), existing bridge
- Old Wake Forest Road (Raleigh), existing bridge
- Spring Forest Road (Raleigh), existing underpass
- Atlantic Avenue (Raleigh), existing bridge
- Millbrook Road (Raleigh), crosses at grade
- New Hope Church Road (Raleigh), crosses at grade
- Wolfpack Lane (Raleigh), crosses at grade
- I-440 Beltline(Raleigh), existing bridge
- Six Forks Road (Raleigh), existing underpass
- Hodges Street (Raleigh), existing underpass
- Whitaker Mill Road (Raleigh), crosses at grade
- Capitol Boulevard/US 1 (Raleigh), existing underpass
- Peace Street (Raleigh), existing underpass
- Capital Boulevard/US 1 (Raleigh), existing underpass
- Harrington Street (Raleigh), crosses at grade
- West Street (Raleigh), crosses at grade
- Jones Street (Raleigh), crosses at grade
- Hillsborough Street (Raleigh), existing bridge
- Morgan Street (Raleigh), existing bridge
- Boylan Avenue (Raleigh), existing bridge

Major public road facilities that cross the NS-line are listed from north to south:

- Fairview Road (Raleigh), crosses at grade
- Wade Avenue (Raleigh), existing underpass
- Peace Street (Raleigh), existing underpass
- W. Johnson Street (Raleigh), existing underpass
- Tucker Street (Raleigh), existing underpass
- North Street (Raleigh), existing underpass
- Jones Street (Raleigh), crosses at grade.

3.15 Traffic Conditions

Locations where the SEHSR corridor crosses existing or planned roadways were reviewed to identify locations requiring a traffic analysis screening to determine the effects of the rail crossing closures and consolidations. Determination of select locations for the traffic analysis screening was based on annual average daily traffic (AADT), roadway classification, thoroughfare plan projections, Strategic Highway Corridor inclusion, connectivity and presence of Transportation Improvement Program (TIP) projects. In addition, specific locations requested by the design team or stakeholders were also analyzed.

Where available, existing traffic count data from VDOT and NCDOT were used to analyze traffic conditions at intersections meeting the selection criteria. For locations where existing count data was not available, peak-hour (between 7-9 AM and 4-6 PM) turning movement counts were performed. The traffic models Synchro (for signalized and un-signalized intersections) and HCS (for un-signalized intersections) were then used to determine the existing and future (with and without project) level of service (LOS) and delay. LOS is a system that stratifies travelers' perceptions of the quality of service provided by a roadway. The system uses the letters A through F, where A is free flowing traffic, B is reasonably free flowing, C is stable flow, D is approaching unstable flow, E is unstable flow, and F is forced or breakdown flow. LOS is not reported where a movement does not experience delay, such as a through movement with no stop condition, or a right turn with no stop.

More detailed information on the methodology is located in the SEHSR Draft Traffic Review prepared for the project (Gibson Engineers, 2009).

3.15.1 Richmond, VA

The traffic analysis followed a general screening procedure that eliminated traffic analysis in places where the design caused little or no change in the existing travel pattern, rerouted only a minimal amount of traffic, or relocated an existing connection in a way that was not assumed to affect the system. Based on this screening, there are to be no sections within the City of Richmond that warranted detail study.

3.15.2 Chesterfield County, VA

3.15.2.1 Perrymont Road – Bellwood Area

The intersection of Perrymont Road and Chester Road/Driveway is a stop controlled intersection with a stop condition at both the eastbound and westbound approaches. Each approach at this intersection is currently configured as a shared left, through, and right-

turn lane. The eastbound movement currently operates at LOS C. All other movements operate at LOS A or B.

The intersection of Norcliff Road and Perrymont Road/church parking lot access is a stop controlled intersection with a stop condition for both the eastbound and westbound approaches. Each approach at this intersection is currently configured as a shared left, through, and right-turn lane. All movements at the Norcliff Road and Perrymont Road intersection currently operate at LOS A.

3.15.3 Chester, VA

3.15.3.1 Chester Road – Bellwood Area

The intersection of Kingsdale Road and Chester Road is located approximately one quarter mile north of the intersection of Park Road and Chester Road, and is a signalized "T" intersection. The northbound approach has a through lane and a separate right-turn lane with 150 feet of storage. The southbound approach has a through lane and a separate left-turn lane with 100 feet of storage. The westbound approach has a separate right-turn lane and a separate left-turn lane with 75 feet of storage. The westbound movement currently operates at LOS C. All other movements operate at LOS A or B.

The intersection of Park Road and Chester Road is a stop controlled intersection, with a stop condition for the east and westbound approaches. The northbound approach has a separate left-turn lane with 150 feet of storage, two through lanes (which narrows down to one through lane approximately 300 feet downstream of the intersection) and a separate right-turn lane with a 90-foot taper. The southbound approach has a separate left-turn lane with 75 feet of storage, a through lane, and a shared through and left-turn lane which is 100 feet in length. The westbound approach has a shared left, through, and right-turn lane. The eastbound approach is a driveway and has a shared left, through, and right-turn lane. A fire station is located 300 feet north of the intersection. There is an emergency access signal at the intersection of the fire station driveway and Chester Road to facilitate egress from the fire station onto Chester Road. The southeast-bound and northeast-bound movements currently operate at LOS E and F in the PM peak-hour. All other movements operate at LOS A.

3.15.3.2 Centralia Road and Chester Road

The existing intersection of Centralia Road and Chester Road is signalized. The eastbound approach has a separate left-turn lane, a shared through and left-turn lane, and a separate right-turn. The westbound approach has a shared left and through movement and a separate right-turn lane. The northbound approach has a separate left-turn lane, one through lane, and one shared through and right-turn lane. The southbound approach has a separate left-turn lane, two through lanes and a separate right-turn lane. The southbound movement currently operates at LOS C. All other movements operate at LOS D.

3.15.4 La Crosse, VA

3.15.4.1 Main Street and Pine Street

The intersection of US 58 and Main Street is a signalized intersection. The eastbound approach has a separate left-turn lane with 125 feet of storage, two through lanes, and one separate right-turn lane with 150 feet of storage. The westbound approach has a separate left-turn lane with 150 feet of storage, two through lanes, and one separate right-turn lane with 150 feet of storage. The northbound approach has a shared left, through, and right-turn lane. The southbound approach has a shared left, through, and right-turn lane. All movements currently operate at LOS B.

The intersection of Main Street and Pine Street is a stop controlled intersection with a stop condition for the eastbound and westbound approaches. Each approach provides a shared left, through, and right-turn lane. All movements currently operate at LOS A or B.

The intersection of Carter Street and Pine Street is a stop controlled intersection with a stop condition for the eastbound and westbound approaches. Each approach provides a shared left, through, and right-turn lane. All movements currently operate at LOS A.

3.15.5 Norlina, NC

3.15.5.1 Warren Plains Road and Yancey Road

The existing intersection of Warren Plains Road and Yancey Road is a "T" intersection, with a shared eastbound through and right-turn lane, shared westbound through and left-turn lane, and a shared northbound left and right-turn lane. The northbound direction operates under stop control. Currently, the land surrounding the intersection is agricultural and residential in nature. All movements currently operate at LOS A.

3.15.5.2 Warren Plains Road, Hyco Street, and Liberty Street

The existing intersection of Warren Plains Road and Hyco Street is a "T" intersection, with a shared eastbound through and right-turn lane, shared westbound through and left-turn lane, and a shared northbound left and right-turn lane. The northbound direction operates under stop control. Hyco Street is bordered on the north side by the Downtown Norlina Business District and on the south side by the rail line. There is a small museum in the southwest corner of the intersection, and unpaved parking in the southeast corner. The existing intersection at Main Street and US 401/158 is a stop controlled intersection with a stop condition for both the eastbound and westbound approaches. Each approach is a shared left, through and right turn movement. There are houses located in close proximity to each corner of the intersection. All movements currently operate at LOS A.

The existing intersection of Liberty Street and US 401 / US 158 is currently a "T" intersection with a shared northbound through-right turn lane, shared southbound through-left turn lane, and a westbound shared left-right turn lane that operate under stop control. Liberty is a narrow street, with poor shoulder conditions, no pavement markings, and poor sight distance. Both movements currently operate at LOS A or B.

3.15.5.3 Axtell-Ridgeway Road and St Tammany Road

Currently, the intersection of US 1 and Axtell Ridgeway Road is a "T" intersection, with a shared eastbound through and right-turn lane, shared westbound through and left-turn lane, and a shared northbound left and right-turn lane. The northbound direction operates under stop control. There is a private drive that forms the northern leg of the intersection. The rail line runs parallel to US 1 at this location, and thus Axtell Ridgeway Road crosses the rail line in close proximity to the intersection of Axtell Ridgeway Road and US 1. The area surrounding the intersection is rural-agricultural in nature, with low density sporadic development. All movements currently operate at LOS A or B.

The intersection of St Tammany Road and US 1 is a "T" intersection with a stop controlled approach on the southbound approach of the intersection with a shared left and right-turn movement. The eastbound approach of the intersection has a shared left and through lane. The westbound approach has a shared through and right-turn lane. The area surrounding the intersection is rural-agricultural in nature, with low density sporadic development. All movements currently operate at LOS A or B.

3.15.5.4 Soul City Blvd and US 1

Currently, the intersection of US 1 and Soul City Blvd is a "T" intersection, with an eastbound through lane, short right-turn flare, shared westbound through-left turn lane, and a shared northbound left and right-turn lane. The northbound direction operates under stop control. There is also a small raised median on the northbound approach to the intersection. The area around the intersection is undeveloped. All movements currently operate at LOS A or B.

3.15.6 Middleburg, NC

3.15.6.1 Carol Street and US 1

The current intersection of South Carol Street and US 1 is an un-signalized "T" intersection with a left and right-turn lane for the northbound approach. The westbound approach has a shared through and left-turn movement. The eastbound approach has a shared through and right-turn movement. The area around the intersection is rural, agricultural land and a house is located directly across from the "T" intersection. All movements currently operate at LOS A or B.

3.15.7 Henderson, NC

3.15.7.1 Beckford Drive/Main Street and US 1 Business (Garnett Street)/Chestnut Street

The existing signalized intersection of US 1 Business (Garnett Street)/Chestnut Street and Beckford Drive is a four-leg off-set intersection. The US 1 Business (Garnett Street) northbound approach is a slip lane. The lane configuration for the eastbound approach for Beckford Drive is a shared through and right-turn lane and a shared through and left-turn lane. The westbound approach on Beckford Drive is a separate left-turn lane and a separate through lane. The lane configuration for the north and southbound approaches on Chestnut are a separate left-turn lane and separate through lane and a shared through

and right-turn lane. The northbound and southbound movements currently operate at LOS B, while the eastbound and westbound movements operate at LOS C or D.

3.15.7.2 US 1 Business (Garnett Street) and NC 39 (Andrews Avenue)

The intersection of Garnett Street and NC 39 is currently signalized. The northbound approach has an exclusive left-turn lane with 390 feet of storage and a shared through and right-turn lane. The southbound approach has an exclusive left-turn lane with 100 feet of storage and a shared through and right-turn lane. The eastbound approach has an exclusive left-turn lane with 100 feet of storage and a shared through and right-turn lane, and the westbound approach has an exclusive left-turn lane with 50 feet of storage and a shared through and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The eastbound and westbound movements operate at LOS C, while the northbound and southbound movements operate at LOS D.

The intersection of Chestnut Street and NC 39 is currently signalized with protected/permitted phasing for the westbound and northbound left-turn lanes. All approaches have the same lane configuration, with an exclusive left-turn lane and one shared through-right lane. Structures or parking lots exist on all four corners of the intersection, as well as along each roadway. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The westbound movement operates at LOS C, the eastbound and northbound movements operate at LOS D, and the southbound movement operates at LOS E.

The intersection of Montgomery Street and Garnett Street is currently signalized. The lane configuration for the eastbound and westbound approaches is a shared left, through and right-turn lane. The lane configuration for the northbound and southbound approaches is an exclusive left-turn lane and a shared through and right-turn lane. Parking is located on both sides of Garnett Street. Pedestrian crossings are located at each approach. Structures or parking lots exist on all four corners of the intersection, as well as along each roadway. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The southbound movement operates at LOS A, the northbound movement operates at LOS B, the eastbound movement operates at LOS C, and the westbound movement operates at LOS D.

The intersection of Montgomery Street and Chestnut Street is currently signalized. The lane configuration for the north and southbound lanes is a separate left-turn lane and a shared through and right-turn lane. The east and westbound lanes have a shared left, through and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The southbound movement operates at LOS A, the westbound and northbound movements operate at LOS C, and the eastbound movement operates at LOS D.

3.15.7.3 William Street and Chavasse Avenue

The intersection of William Street and Chavasse Avenue currently provides an exclusive left-turn lane and a shared through and right turn lane for the eastbound, southbound, and westbound approaches. The northbound approach has a shared right, through, and left-turn lane. The intersection operates under signal control, with all left turns phased as permitted with the exception of a protected phase for the eastbound left-turn movement.

Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The southbound movement operates at LOS B, the eastbound and northbound movements operate at LOS C, and the westbound movement operates at LOS D.

The intersection of Dabney Drive and US 1 Business (Raleigh Road) is currently signalized. The eastbound approach has a shared through and right-turn lane and one right-turn lane. The westbound approach has one left-turn lane and one shared and right –turn lane. The northbound approach has one left-turn lane and one shared through and right-turn lane. The southbound approach has one left-turn lane, one through lane and one right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The northbound movement operates at LOS B, while the remaining movements operate at LOS C.

3.15.7.4 Belmont Drive and Welcome Avenue

The intersection of US 1 Business (Raleigh Road) and Belmont Drive is a stop controlled intersection with the eastbound movement having the stop condition. The eastbound approach has a shared left and right-turn lane. The northbound approach has a separate left-turn lane and a shared through and right-turn lane. The southbound approach has a shared through and right-turn lane. The northbound movement currently operates at LOS F, while the eastbound movement operates at LOS B or better.

Approximately 100 feet north of Belmont Drive, Welcome Drive intersects US 1 Business from the east. The lane configuration of this intersection is a separate left-turn lane and a shared through and right-turn lane for the southbound approach. The northbound approach is a shared through and right-turn lane. The westbound leg is a shared left and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The southbound movement operates at LOS D, while the westbound movement operates at LOS A.

The intersection of JP Taylor Road and US 1 Business is located about 1,800 feet south of Welcome Drive. The intersection is stop controlled with the westbound movement having the stop condition. The northbound approach has separate through and right-turn lanes. The southbound approach has separate through and left-turn lanes. The westbound approach is a shared left and right-turn lane. Currently, LOS is worse in the AM peak-hour than the PM peak-hour. The westbound movement operates at LOS C, while the southbound movement operates at LOS B or better.

3.15.7.5 US 1 Business (Raleigh Road) and Bearpond Road

The intersection of Bearpond Road and US 1 Business (Raleigh Road) is signalized. The eastbound approach has a shared left, through and right-turn movement. The westbound approach has a shared left, through and right-turn movement. The northbound approach has a separate left-turn lane with feet 100 feet of storage, a shared through and right-turn lane and the southbound approach has a separate left-turn lane with 125 feet of storage and a shared through and right-turn lane. Buildings are located in the southeast, northeast and northwest quadrants of the intersection. The southwest quadrant is currently undeveloped and wooded. Currently, LOS is worse in the AM peak-hour than the PM peak-hour. The westbound movement operates at LOS D, the eastbound and northbound movements operate at LOS C, and the southbound movement operates at LOS B.

3.15.7.6 US 1 Business (Raleigh Road) and Peter Gill Road

The "T" configuration for Peter Gill Road and US 1 Business (Raleigh Road) has a northbound shared through and right-turn movement, a southbound shared through and left-turn movement, and a westbound shared left and right-turn movement. Currently, LOS is worse in the AM peak-hour than the PM peak-hour. The westbound movement operates at LOS D, the eastbound movement operates at LOS C, and the northbound and southbound movements operate at LOS A.

3.15.7.7 US 1 Business (Raleigh Rd) and Chavis Road

Chavis Road currently intersects US 1 Business at an angled "T" intersection located north of the US 1 Business connection to US 1. The northbound and southbound approaches are comprised of a shared through and turn lane. The northwest approach of Chavis Road has a shared left and right-turn lane. The area around the intersection is a mix of low density residential use and open land. The southbound and northwest movements currently operate at LOS A.

Edwards Road and US 1 Business is a stop controlled intersection with a stop condition on the eastbound approach (Edwards Road). The eastbound approach has a shared left and right-turn lane. The northbound approach has a shared through and left-turn movement and the southbound approach has a shared through and right-turn movement. The eastbound and northbound movements currently operate at LOS A.

3.15.8 Kittrell, NC

3.15.8.1 US 1 (Capital Boulevard) and Kittrell College Road

Currently, the intersection of Kittrell College Road/College Street and US 1 (Capital Boulevard) is stop controlled intersection with a stop condition for the eastbound and westbound legs. The eastbound approach has a separate left-turn movement with 50 feet of storage, and a shared through and right-turn lane. The westbound approach has a shared left, through and right-turn movement, the northbound approach has a separate left-turn lane with 150 feet of storage, and a separate through lane and a shared through and right-turn lane. The southbound approach has a separate left-turn lane with 175 feet of storage, two through lanes and one separate right-turn lane with 200 feet of storage. The area is a mix of low density residential development with sporadic commercial uses. Currently, the eastbound and westbound movements operate at LOS C, while the northbound and southbound movements operate at LOS A.

3.15.9 Franklinton, NC

3.15.9.1 Main Street and Green Street (NC 56)

The intersection of NC 56 and Main Street is currently signalized with an exclusive left-turn lane and shared through and right turn lane for the eastbound approach; an exclusive left-turn lane and shared through and right turn lane for the westbound approach; a shared left, through, and right-turn lane for the northbound approach; and a shared through and left lane and exclusive right-turn lane for the southbound approach. All turn movements are permitted turns. Additionally, structures exist on all four corners of the intersection, as

it is located in a downtown business area. The rail line crosses NC 56 just west of the intersection of NC 56 and Main Street via an overhead grade separated crossing. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The northbound movement operates at LOS C, the southbound movement operates at LOS B, and the eastbound and westbound movements operate at LOS A.

3.15.9.2 Main Street (US 1 Business) and Cedar Creek Road

Currently, Cedar Creek Road intersects US 1 at a skewed angle, south of the US 1 intersection with Wilde Road. The intersection of Cedar Creek Road and US 1 is a stop controlled intersection with a stop condition for the east leg (Cedar Creek Road) of the intersection. The westbound approach has a shared left and right-turn movement. The northbound approach has a shared through and right-turn movement. The southbound approach has a shared through and left-turn movement. Land use along Cedar Creek Road is mostly open space, with sporadic residential units. The southbound and westbound movements currently operate at LOS B or better.

3.15.10 Raleigh, NC

3.15.10.1 Atlantic Avenue and Wolfpack Lane/Highwoods Avenue

The traffic analysis considered several intersections in the vicinity of the crossing of Wolfpack Lane and the CSX rail line in Raleigh, NC.

The intersection of New Hope Church Road and Wake Forest Road is currently signalized. The eastbound approach has one exclusive left-turn lane, one through lane, and one exclusive right-turn lane. The westbound approach has two exclusive left-turn lanes, one through lane, and one exclusive right-turn lane. The northbound approach has one exclusive left-turn lane, two through lanes, and one shared through and right-turn lane. The southbound approach has one exclusive left-turn lane, two exclusive through lanes, and one shared through and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The eastbound, westbound, and northbound movements operate at LOS F and the southbound movement operates at LOS D.

The intersection of Bland Road and Wake Forest Road is currently stop controlled with a stop condition at the Bland Road approach. The westbound approach has one exclusive left-turn lane and one exclusive right-turn lane. The northbound approach has three exclusive through lanes and one shared through and right-turn lane. The southbound approach has one shared through and left-turn lane and two exclusive through lanes. Currently, the westbound movement operates at LOS F, while the southbound movement operates at LOS A.

The intersection of Saint Albans Drive and Wake Forest Road is currently signalized. The eastbound approach has one exclusive left-turn lane with 200 feet of storage and one shared through and right-turn lane. The westbound approach has two exclusive left-turn lanes, one through lane, and one exclusive right-turn lane. The northbound approach has one exclusive left-turn lane, three exclusive through lanes, and one exclusive right-turn lane. The southbound approach has one exclusive left-turn lane, two exclusive through lanes, and one shared through and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The eastbound and westbound movements operate at

LOS F, the northbound movement operates at LOS C, and the southbound movement operates at LOS C.

The intersection of Navaho Drive and Wake Forest Road is currently signalized. The eastbound approach has one shared left, through, and right-turn lane, and one exclusive right-turn lane. The westbound approach has one shared through and left-turn lane and one exclusive right-turn lane. The northbound approach has one exclusive left-turn lane with 200 feet of storage, two exclusive through lanes, and one shared through and right-turn lane. The southbound approach has one exclusive left-turn lane, three exclusive through lanes, and one shared through and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The eastbound movement operates at LOS F, while the northbound and southbound movements operate at LOS A.

The intersection of Wolfpack Lane and Bush Street is three-legged, stop controlled with the stop condition on Wolfpack Lane. The westbound approach has one shared left and right-turn lane. The northbound approach has one shared through and right-turn lane. The southbound approach has one shared through and left-turn lane. Currently, the westbound movement operates at LOS B and the southbound movement operates at LOS A.

The intersection of Saint Albans Drive and Tarheel Drive is stop controlled with the stop condition at Tarheel Drive. The eastbound approach has one shared through and right-turn lane. The westbound approach has one shared through and left-turn lane. The northbound approach has one shared left and right-turn lane. Currently, the northbound movement operates at LOS B and the westbound movement operates at LOS A.

The intersection of Wolfpack Lane and Tarheel Drive is a three-legged, stop controlled intersection, with the stop condition on Tarheel Drive. The eastbound approach has one shared through and left-turn lane. The westbound approach has one shared through and right-turn lane. The southbound approach has one shared left and right-turn lane. Currently, the southbound movement operates at LOS B and the eastbound movement operates at LOS A.

The intersection of New Hope Church Road and Saint Albans Drive is a three-legged, stop controlled intersection, with the stop condition on Saint Albans Drive. The eastbound approach has one exclusive through lane and one shared through and right-turn lane. The westbound approach has two exclusive through lanes. The northeast bound approach has one exclusive right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The northeastbound movement operates at LOS E.

The intersection of New Hope Church Road and Atlantic Avenue is currently signalized. The eastbound approach has one exclusive left-turn lane, two exclusive through lanes, and one exclusive right-turn lane. The westbound approach has one exclusive left-turn lane, one exclusive through lane, and one shared through and right-turn lane. The northbound approach has one exclusive left-turn lane with, two exclusive through lanes, and one exclusive right-turn lane. The southbound approach has one exclusive left-turn lane, two exclusive through lanes, and one exclusive right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The eastbound, westbound, and northbound movements operate at LOS F, while the southbound movement operates at LOS D.

The intersection of Wolfpack Lane/ Highwoods Boulevard and Atlantic Avenue is currently signalized. The eastbound approach has one exclusive left-turn lane, one shared through, and one shared through and right turn lane. The westbound approach has one exclusive left-turn lane, one exclusive through lane, and one exclusive right-turn lane. The northbound approach has one exclusive left-turn lane, two exclusive through lanes and one exclusive right-turn lane. The southbound approach has two exclusive left-turn lanes, one exclusive through lane, and one shared through and right-turn lane. Currently, LOS is worse in the PM peak-hour than the AM peak-hour. The eastbound, westbound, and northbound movements operate at LOS F, while the southbound movement operates at LOS D.

3.15.10.2 Downtown Raleigh

The traffic evaluation study area within the City of Raleigh covered a large area, which was broken into three segments: the downtown area; the area north of downtown in the Fairview Road, Capital Boulevard, Whitaker Mill Road, Peace Street, and Glenwood Avenue area; and Whitaker Mill Road between Wake Forest Road and Atlantic Avenue.

The following intersections were evaluated within the study area:

- Glenwood Avenue / North Street (signalized)
- North Street / West Street (unsignalized)
- North Street / Harrington Street (unsignalized)
- Harrington Street / Lane Street (unsignalized)
- Glenwood Avenue / Jones Street (signalized)
- West Street / Jones Street (unsignalized)
- Harrington Street / Jones Street (unsignalized)
- Glenwood Avenue / Hillsborough Street (signalized)
- Edenton Street / West Street (signalized)
- Glenwood Avenue / Morgan Street (signalized)
- Hargett Street / West Street (unsignalized)
- Hargett Street / Harrington Street (unsignalized)
- Fairview Road / Service Road (unsignalized)
- Glenwood Avenue / Harvey Street (signalized)

All signalized intersections and unsignalized movements currently operate at LOS B or better, except for the signalized intersection of Glenwood Avenue and Jones Street, which operates at LOS C in the PM peak period.

3.16 Rail

The two main Class I railroads operating in Virginia and North Carolina are Norfolk Southern (NS) and CSX Transportation (CSX). There are several Class III shortline railroads operating in the two states, and these play an important role in the rail network. A large portion of the rail network is single track, which creates bottlenecks in high traffic areas. Amtrak passenger rail operates within a portion of the study corridor on the private track freight railroad system. The following section describes the active railroads within the study corridor, including rail lines that cross the corridor. Figure 3-15 displays the railroads in Virginia within the study corridor, while Figure 3-16 shows the railroads within the study corridor in North Carolina.

Figure 3-15

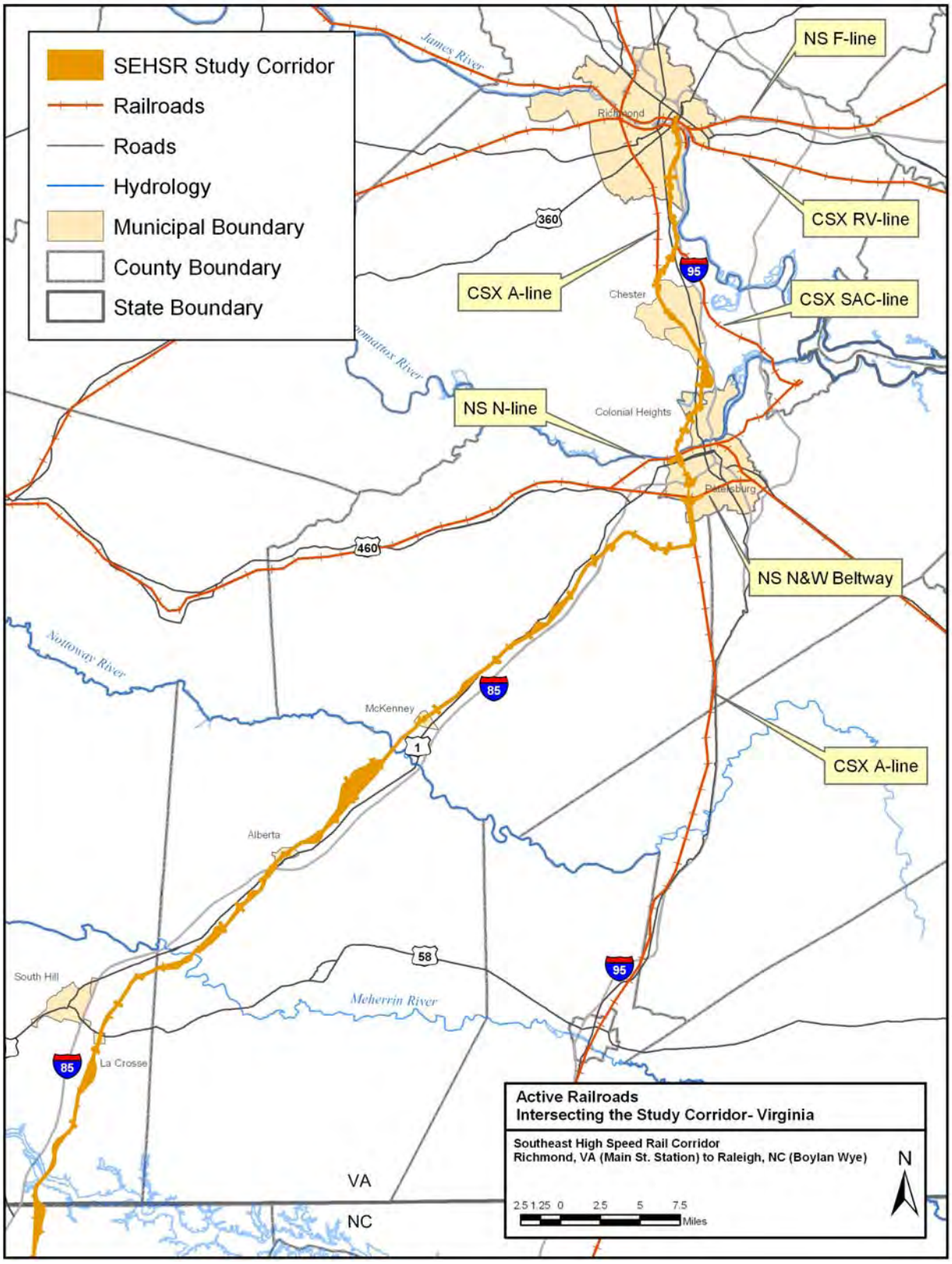
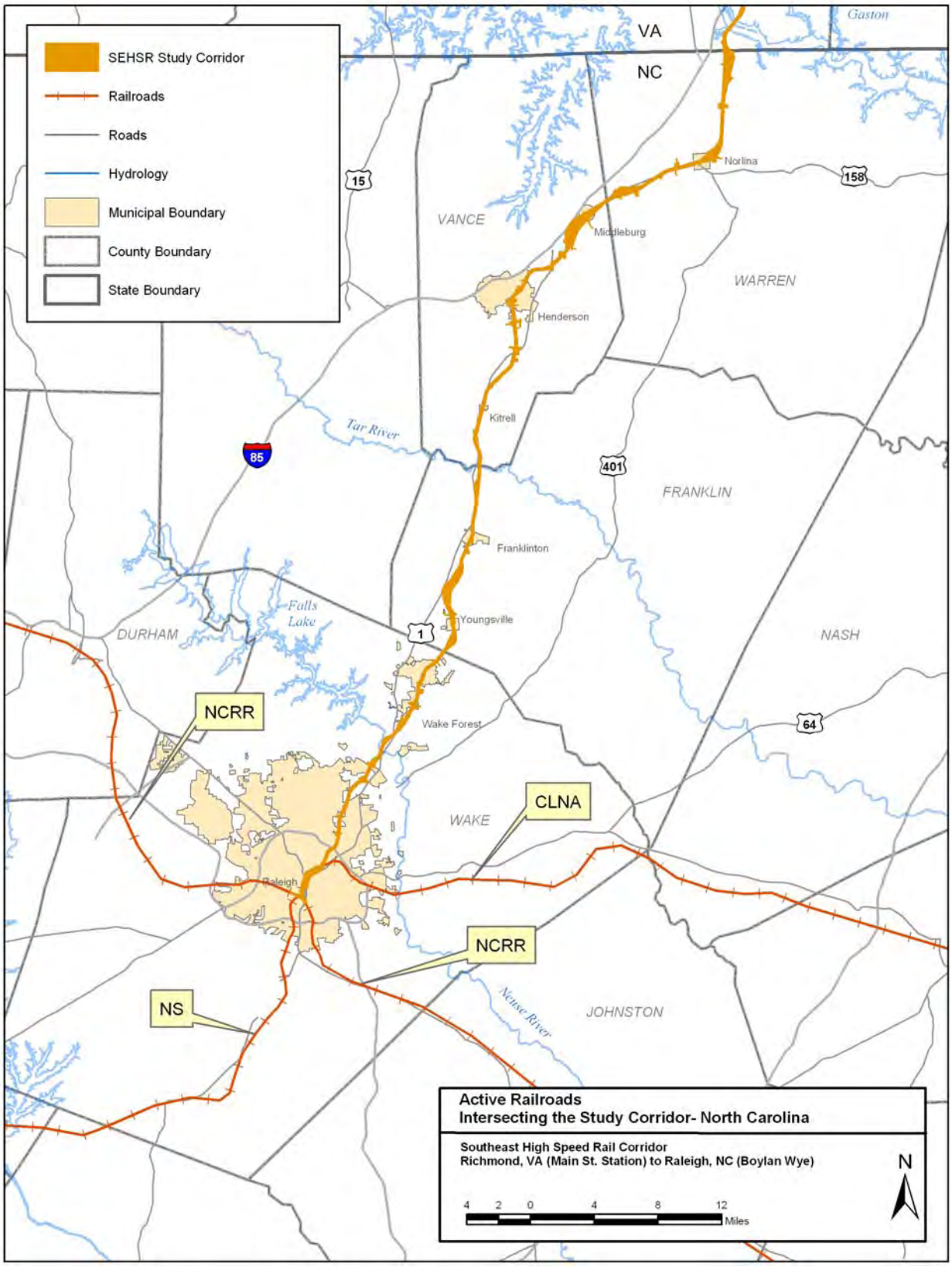

SEHSR Study Corridor
Railroads
Roads
Hydrology
Municipal Boundary
County Boundary
State Boundary
NS F-line
CSX RV-line
CSX A-line
CSX SAC-line
NS N-line
NS N&W Beltway
CSX A-line
James River
Richmond
Chester
Colonial Heights
Petersburg
Nottoway River
McKenney
Alberta
South Hill
La Crosse
Meherrin River
360
95
460
85
1
58
VA
NC
Active Railroads
Intersecting the Study Corridor- Virginia
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
2.5 1.25 0 2.5 5 7.5
Miles

Figure 3-16


SEHSR Study Corridor
Railroads
Roads
Hydrology
Municipal Boundary
County Boundary
State Boundary
VA
NC
Gaston
Norlina
158
15
VANCE
Middleburg
WARREN
Henderson
Kitrell
Tar River
85
401
FRANKLIN
Franklinton
Youngsville
Falls Lake
DURHAM
1
NASH
NCRR
Wake Forest
64
CLNA
WAKE
Raleigh
NCRR
NS
Neuse River
JOHNSTON
Active Railroads
Intersecting the Study Corridor- North Carolina
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
4 2 0 4 8 12
Miles

3.16.1 Virginia

The study corridor begins in Richmond, VA, at Main Street Station, following the CSX S-line south. The S-line is a secondary mainline and carries approximately 12 freight trains daily. Just south of the station, the S-line is on a bridge, and crosses two railroads at the well known "triple crossing" (one of the few places in North America where three Class I railroads cross each other at different levels). The S-line bridge crosses over the NS F-line, and under the CSX Rivanna Subdivision (RV- line). The NS F-line is a freight line serving West Point, VA to the east. The CSX RV-line is part of an important freight corridor serving the port at Newport News, VA (Amtrak passenger service to Newport News, VA also uses this railroad, making a connection from Main Street Station, to the east of the triple crossing). The S-line continues south on structure, crossing the James River on a single track bridge. After crossing the river, the NS F-line intersects the S-line via an interchange track and a rail diamond. The F-line terminates beyond the diamond at the City of Richmond's wastewater treatment facility. The interchange track provides an important link for NS's intermodal freight service to the City of Richmond's Port (CSX currently has direct access between the S-line and the Port). In Chesterfield County at the south end of the Bellwood rail yard, there is a rail wye connection for the CSX SAC-line; this line provides freight service to industries in Hopewell, VA.

At Centralia, VA the study corridor and the CSX S-line join the CSX A-line; this track carries 30 freight trains daily, and the 10 daily Amtrak passenger trains that serve the Staples Mills Station on the northwest side of Richmond. Continuing south into Petersburg, VA the A-line crosses the Appomattox River and the NS N-line on a single track bridge. The N-line parallels the south bank of the Appomattox, and provides important freight service to industries in Hopewell, VA. On the south side of Petersburg, VA (just north of Collier Yard), the A-line crosses the NS N&W Beltway on a bridge. The N&W provides direct access to the port at Norfolk, VA and is part of the Heartland Corridor- NS's primary intermodal train system. This line is undergoing improvements to handle more double-stack intermodal trains. The N&W line is one of two corridors being studied by the Virginia Department of Rail and Public Transportation for high speed passenger rail service Between Richmond and the Hampton Roads/Norfolk area, under the Richmond/Hampton Roads Passenger Rail Project (R2HR).

At the south end of Collier Yard, the A-line continues south, while the study corridor curves westward along the inactive Burgess Connector rail line. The tracks have been removed along the Burgess Connector, and small portions of the ROW have been sold for driveway access.

At Burgess, VA the study corridor curves south, joining again with the CSX S-line ROW. The tracks along this section of the S-line were removed in 1987; however, the ROW remains intact throughout most of the corridor, and portions of it were leased to Verizon for the installation of underground fiber optic cable, which is currently in place and in operation. The study corridor continues along the inactive S-line to the North Carolina border.

3.16.2 North Carolina

In North Carolina, the study corridor continues to follow the inactive S-line to Norlina, NC. Between Norlina, NC and Raleigh, NC the S-line is an active freight railroad that carries approximately 4 local trains daily. There are no active railroads that intersect the study corridor until it reaches Capital Boulevard in downtown Raleigh, NC; at this point the study corridor widens to include both the S-line and the NS-line. At this same location, the Carolina Coastal Railway (CNLA) short line railroad intersects both the NS and CSX lines through at-grade switch connections.

In the downtown area of Raleigh, NC the NS-line carries 8 trains daily, and there are approximately 8 trains operating daily on the S-line between Capital Yard and the Boylan Wye, which is the southern terminus of the project. The North Carolina Railroad (NCRR) intersects the corridor at the Boylan Wye. The NCRR leases trackage rights to both NS and CSX; it is a more heavily used freight and passenger corridor, carrying 16 trains daily. The Southeast High Speed Rail (SEHSR) Tier I EIS identified the NCRR corridor for service between Raleigh, NC and Charlotte, NC. The NS Fuquay Line also intersects the corridor at the Boylan Wye, with a diamond connection at the Boylan Avenue bridge.

3.17 Stations

The five locations identified to have high speed rail stops in the Richmond, VA to Raleigh, NC SEHSR service area are Richmond, VA; Petersburg, VA; La Crosse, VA; Henderson, NC; and Raleigh, NC. Potential station locations for each of the four municipalities are described here in general terms with regard to accessibility to the larger transportation network.

3.17.1 Richmond, VA

Each high speed train will stop at Main Street Station in downtown Richmond, VA, the northern terminus for the project. The alternatives are on common alignment in this location, as shown in Figure 2-4. Main Street Station is not currently operating at capacity; it is served only by the Northeast Regional service with 4 daily trains. From October 2007 through September 2008, 19,360 passengers boarded at Main Street Station (Amtrak, 2008). Currently, most Amtrak routes serve the Richmond area through the Staples Mill Station which is outside the study corridor on the north side of the metropolitan area. The Carolinian, Palmetto, Silver Service and Northeast Regional trains all serve the Staples Mill station (10 trains daily).

Main Street Station is less than a half mile from I-95 and can be accessed via the Downtown Expressway or East Broad Street. The main east/west route through the Richmond area is I-64, which intersects I-95 just over one mile north of the station. The network of local streets provides adequate access to this location.

Public Transportation in Richmond and Chesterfield County is provided by Greater Richmond Transit Company (GRTC). Main Street Station is currently served by three GRTC bus routes.

3.17.2 Petersburg, VA

Each high speed train will stop in Petersburg, VA. Currently, The Carolinian, Palmetto, and Silver Service trains stop in Petersburg, at Ettrick Station (8 trains daily).

There are four potential station locations in the Petersburg area: Dunlop, Ettrick Station (existing), Washington Street, and Collier. The four locations are served by the all project alternatives, which are on common alignment with the active CSX A-line, as shown in Figure 2-5.

The City of Petersburg is constructing a multi-modal transit station at the corner of Washington Street and Union Street in downtown Petersburg. The expected completion date is the end of 2009. This station will serve Petersburg Area Transit (PAT) buses, GRTC express buses (linking Petersburg, VA to Richmond, VA), and Greyhound intercity buses. None of the potential SEHSR station locations is immediately adjacent to the multi-modal transit station. The potential Dunlop site is approximately 4 miles north of the multi-modal station. The existing Ettrick Station is approximately 2 miles north. The potential Washington Street site is approximately 1.5 miles west of the multi-modal transit station; this site provides the most direct access using Washington Street and Wythe Street, which are paired one-way streets. The potential site at Collier is approximately 3 miles south of the multi-modal transit station.

3.17.2.1 Dunlop

The northernmost potential station site in Petersburg is Dunlop, near the A-line bridge over Boulevard/US1. The project alternatives follow the existing rail in this area; the existing straight section of tracks north of Boulevard would accommodate a station platform. Currently there is no station at this location.

The Dunlop location is 1.5 miles west of the I-95 interchange at Temple Avenue. From Temple Avenue, the location is accessed via Boulevard/US1/US 301.

3.17.2.2 Ettrick

The current Amtrak Station at Ettrick is almost two miles west of I-95. It is accessed from the north by way of the I-95 Temple Road exit in Colonial Heights, then through a network of local streets- a distance of approximately 3 miles. From the south, the station is accessed from I-95 at the Washington Street exit on the south side of the Appomattox River, then across the river through a network of local streets- a distance of approximately 3 miles.

3.17.2.3 Washington Street

The potential Washington Street location is south of the Appomattox River on the west side of Petersburg near the intersection of the CSX A-line, S-line, and the Norfolk Southern (NS) N-line. There is no current railroad station at this location. The existing tracks are on a straight section in this area, as they cross the Appomattox River on bridge; coming back to ground level just before reaching Washington Street. The straight alignment in this location would accommodate a station platform. This location is accessed from the I-95 Washington Street exit then through the local street network- a

distance of approximately 2.5 miles. From the south, the location can be accessed from the I-85 exit at US-1/Boydton Plank Road then to Washington Street, a distance of approximately 3 miles; or from the I-85 Youngs Road exit- a distance of 1.5 miles.

3.17.2.4 Collier

The potential station location near Collier Yard is on Halifax Road, south of I-85 and west of I-95. This site is just north of the S-line railroad bridge over the Norfolk Southern (NS) N&W beltline railroad. There is no existing station at this location. The straight alignment in this location would accommodate a station platform. The location could be accessed from the I-85/US 460 Young's Road exit to Halifax Road; a distance of approximately 1.5 miles.

3.17.3 La Crosse, VA

The project alternatives are on common alignment along the inactive S-line ROW through La Crosse, VA. There is no existing station in La Crosse, and the specific location has not been identified. The City will develop plans for the station and conduct the required environmental documentation as appropriate. One daily roundtrip high speed train will stop in La Crosse.

The city is less than two miles from I-85 and is accessed via US 58 (East Atlantic Street), the main east/west route through the area. The town's Main Street crosses the ROW at a skewed crossing.

There are currently no public transportation services in Mecklenburg County, where La Crosse is located.

3.17.4 Henderson, NC

The project alternatives are on common alignment in Henderson, NC. The alternatives pass through the downtown area along a straight section of the active S-line that runs behind the city's main business street. There is no existing station, and the specific location has not yet been identified. The City will develop plans for the station and conduct the required environmental documentation as appropriate. One daily roundtrip high speed train will stop in Henderson.

The city has several intersections along I-85, including Ruin Creek Road (NC 1128), Dabney Drive, NC 39 (William S. Corbett Highway), and US 1. I-85 intersects with NC 158, the main east/west route, north of Henderson. Dabney Drive and NC 39 intersect the proposed SESHR rail corridor approximately one mile from I-85.

Currently there is no local fixed route transit service in Henderson, however Kerr Area Rural Transportation System (KARTS) provides subscription, deviated fixed, and dial-a-ride service throughout the region where Henderson is located.

3.17.5 Raleigh, NC

The southern terminus for this project is the Boylan Wye, in downtown Raleigh, NC. Alternatives NC1, NC2, and NC3 are on different alignments approaching the terminus, but

come together on common alignment along a straight section of the CSX S-line near Jones Street, approximately 3 blocks north of the Boylan Wye.

The existing Amtrak station which serves six daily Amtrak trains, is located south of the Boylan Wye, refer to Figure 2-6. All alternatives could serve the existing station location through the use of a backing movement. The City of Raleigh is conducting planning for a new larger multimodal station north of the Boylan Wye, between Jones Street and Hillsborough Street. All three alternatives have been designed to accommodate platforms to fit with conceptual plans for a station in this location. NC3 would accommodate a center island platform, while NC1 and NC2 would accommodate outside platforms.

Interstate highway access to a potential multi-modal station (south of Jones Street, north of the Boylan Wye,) would be similar to that for the current Amtrak station. The primary east/west route for Raleigh is I-40 and the closest intersections are just over one mile via South Dawson and South Saunders Streets.

The nearest north/south connection through the area is US 1, which is approximately three and a half miles north from the station via Capital Boulevard and North Dawson Street. Local access would potentially be improved when compared to the current Amtrak station since it is closer to the downtown core.

Public Transportation in Raleigh is provided by Capital Area Transit (CAT). The existing Amtrak Station is not directly on any CAT routes, but three nearby routes can be accessed.

3.18 Utilities and Related Services

Utilities are, by definition, a commodity or service provided for public use. The SEHSR study area contains both municipal and interstate utilities ROW. Infrastructure exists for water treatment and supply, sanitary sewer collection and treatment, storm water collection and discharge, electric power generation and distribution, communications facilities and cabling, natural gas storage and distribution, petroleum storage and transportation, solid waste collection and management facilities, and interstate pipelines.

Metropolitan areas, cities, and most towns within the study area maintain and operate water treatment and supply facilities. Some of the rural counties and communities have joined to form regional water authorities that serve the municipal water system function. The infrastructure for water systems varies throughout the study area. Each system may include different combinations of major structures such as treatment plants, pumping stations, and water towers/tanks. Most water systems also include minor structures, e.g., fire hydrants, meters, valves and back-flow preventers. A network of underground pipes integrates these major and minor structures.

As with water treatment and supply, sanitary sewer collection and treatment facilities exist in the metropolitan areas, cities and most towns within the study area. There are also a limited number of regional sewer authorities:

- The City of Richmond Department of Public Utilities (DPU) services more than 500,000 residential and commercial customers in the Richmond metropolitan region
- Chesterfield County Department of Utilities provides wastewater service to approximately 82,600 customers in Chesterfield County

- South Central Wastewater Authority serves the cities of Petersburg and Colonial Heights, and Dinwiddie County
- Roanoke River Public Service Authority serves Mecklenburg County
- Kerr Lake Regional Water Authority serves Warren, Vance and Franklin Counties
- Wake County Public Utilities serves Wake County.

With the exception of treatment plants and certain types of pump stations, most sanitary sewer infrastructure is subsurface. Manholes for system access or air-release provide surface evidence of the sanitary sewer system. Sanitary sewer pipes may be seen at aerial crossings of streams or when attached to bridges crossing natural or man-made features.

Stormwater collection and discharge occurs throughout the SEHSR study area. These underground systems may be as simple as a single pipe carrying drainage underneath the roadbed or as complex as a network of drainage inlet pipes designed to collect and detain drainage from heavily developed areas.

Dominion Virginia Power, Progress Energy, and Duke Energy provide and maintain the majority of the electric generation and distribution systems within the study area. In addition to Virginia Power, Dinwiddie County and Brunswick County are also served by the Southside Electric Co-op and Dominion Electric Co-op and Brunswick County and Mecklenburg County are served by the Mecklenburg Electric Co-op. Additionally, several distribution cooperatives in Virginia purchase a portion of their electricity from Southeastern Power Administration. This power is derived from SEPA's hydro electric generation Kerr and Phillpot Lake projects along the state's border with North Carolina.

In North Carolina, the major providers of electricity are Progress Energy and Duke Energy. Halifax Electric Membership Corporation provides service to parts of Warren County and Wake Electric Membership Corporation provides service to parts of Vance and Wake Counties. Power plants within the study areas are generally located near rivers or bodies of water with generators powered by water, coal, or nuclear energy. The distribution system from these plants include high voltage lines on towers, substations, transmission lines both above and below ground, ground and pole-mounted transformers, and service lines. Virginia Power operates a substation in Dinwiddie County that is within the project area.

Microwave towers for train communications, fiber optics for national telecommunications, and local communication facilities exist throughout the study area. The communications infrastructure includes both freestanding and guyed towers, signal-boosting stations, and both aerial and underground cabling. Verizon currently operates a fiber optic cable that runs the entire length of the corridor. This is the only fully parallel utility in the corridor.

Residences and businesses throughout Virginia and North Carolina use natural gas for cooking, space heating and water heating. The infrastructure that supplies natural gas consists of interstate distribution pipes, compressor stations, underground storage tanks, and distribution pipe systems. Natural Gas is provided by Dominion Gas and the City of Richmond DPU in Richmond, Columbia Gas of Virginia in Petersburg, portions of Dinwiddie County, portions of Mecklenburg County, and portions of Brunswick County. The Public Service Company of North Carolina (PSCNC) provides natural gas to Vance County, Franklin County and Wake County while Frontier Energy serves Warren County.

Based on existing mapping, there are three petroleum pipeline crossings in the study area: south of Butterworth between SR 650 and SR 649 in Virginia, near Meredithville, and SR 644

in Virginia, and south of Forksville between SR 638 and SR 639 in Virginia. There are no known pipelines crossing the alignments in North Carolina.

Municipalities along the SEHSR study area either manage their own solid waste collection program or contract with a private enterprise to manage a program for the municipality. The Central Virginia Waste Management Authority (CVWMA) is a public service authority that implements solid waste management and recycling programs for thirteen local governments, including the cities of Richmond, Colonial Heights, and Petersburg. The Waste and Resource Recovery Division, within the Department of General Services in Chesterfield County, is responsible for handling the county's solid waste collection and disposal. Dinwiddie County ships solid waste to Atlantic Waste Corporation in Sussex County, Brunswick County utilizes the Brunswick Waste Management Facility and Mecklenburg County operates the Mecklenburg County Sanitary Landfill. In North Carolina, Warren County operates a sanitary landfill, Vance County operates the Vance County Landfill, Franklin County has a sanitary landfill, and Wake County utilizes the North Wake County Sanitary Landfill. These programs form a system of private and municipal collection and disposal of solid waste that range from large household trashcans emptied into carts or trucks to facilities for sorting waste into large dumpsters or compactors. Eventually, solid wastes are disposed of in sanitary landfills or sent to a recycling facility.

3.19 Safety and Security

In Virginia, safety measures appropriate to the existing average daily traffic at each crossing are in place along the active rail line between Main Street Station in Richmond, and Collier Yard in south Petersburg. These measures range from: crossbucks only at very low volume and private crossings; to quad gates with signals; to fully grade separated crossings such as bridges or underpasses. In addition, all the trains operating along the CSX S-line and A-line are equipped with on-board horns, which are used to warn vehicular and pedestrian traffic of the approach of trains at every at-grade crossing.

In the areas of Virginia within and south of Petersburg, where the corridor follows inactive or abandoned rail ROW, the safety measures remaining in place are those that have not been removed since the rail line became inactive.

In North Carolina, between the state line and Norlina, where the rail is inactive, the safety measures remaining in place are those that have not been removed since the rail line became inactive.

From Norlina, NC, where the CSX S-line becomes an active freight railroad to the Boylan Wye in Raleigh (including the active NS-line in downtown Raleigh) common safety measures are in place at all active grade crossings. Common safety measures include the appropriate crossing protection for the existing volume of traffic using that crossing on the average day. The safety measures range from crossbucks only at very low volume and private crossings; to quad gates with median barriers and signals at high volume, public locations; to fully grade separated crossings such as bridges or underpasses. The safety measures in place are considered adequate for the current freight service, which operates between 10 and 25 miles per hour (mph). In addition, all the trains operating along the active CSX S-line and the NS-line in Raleigh are equipped with on-board horns, which are used to warn vehicular and pedestrian traffic of the approach of trains at every at-grade crossing.

In the current security climate, rail line security continues to be a prominent concern. Access points are of particular concern. The entire corridor is accessible from many miles of arterial and secondary roadways where no security measures are practicable. Standard rail security practices are in place in at all rail yards throughout the corridor.