3 EXISTING ENVIRONMENT

A condensed format was used for this Final Environmental Impact Statement (EIS), as clarified in the Executive Summary of this report.

The following 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) Richmond to Raleigh Project 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.

All references to "Study Area" and "Project" below pertain to the Richmond to Raleigh Project, unless otherwise noted.

3.1 WATER RESOURCES

Before determinations can be made on the potential of the 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

Much of the existing rail line follows the ridgelines that divide watersheds. Most of the potential impacts are at the headwaters of tributaries.

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 R. Streams in the Study Area range from headwater tributaries with undefined, braided channels to streams with well-defined, steep side slopes. These streams, including some 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.

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

Section	River Basin	Streams (feet)	Wetland (acres)	Other Waters (acres)
Virginia				
AA	James	3,919	2.3	0.7
BB	James	2,078	5.2	0.4
CC	James	2,405	1.2	0.03
	Chowan	0	1.4	0
DD	Chowan	827	2.4	1.7
A	Chowan	3,094	2.8	0.4
B	Chowan	760	0.6	0
C	Chowan	2,803	2.2	0
D	Chowan	1,998	2	0.2
E	Chowan	860	1.2	0.01
F	Chowan	1,004	0.6	0
G	Chowan	510	0.3	0
H	Chowan	2,808	0.4	0.06
I	Chowan	0	0.001	0
	Roanoke	22	0	0
J	Roanoke	420	0.2	0
K	Roanoke	1,419	0.9	0.1
L	Roanoke	497	0.0002	0.3
	Virginia Total	**25,182**	**23.70**	**3.90**
North Carolina				
L	Roanoke	2,005	0.7	1.3
M	Roanoke	442	0	0
	Tar-Pamlico	0	0	0
N	Roanoke	42	0	0
	Tar-Pamlico	344	1.2	0
O	Roanoke	53	0	0.2
	Tar-Pamlico	3,049	0.3	0
P	Roanoke	777	0.5	0.03
	Tar-Pamlico	755	0.4	0.001
Q	Tar-Pamlico	1,127	0.03	0
R	Tar-Pamlico	438	0	0.002
S	Tar-Pamlico	1,620	0.5	0.01
T	Tar-Pamlico	0	0	0

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

Section	River Basin	Streams (feet)	Wetland (acres)	Other Waters (acres)
	Neuse	415	0.1	0
U	Neuse	3,394	0.4	0.2
V	Neuse	1,036	0.1	0
North Carolina Total		**15,497**	**4.23**	**1.74**
Study Area Total		**40,679**	**27.93**	**5.64**

The Virginia Department of Environmental Quality (VDEQ) and the North Carolina Division of Water Resources (NCDWR) use different conventions for identifying streams. Appendix H lists streams in the Study Area by name, river basin, hydrologic unit code, and regulatory classification. More detailed identification of the nature of affected streams (e.g. perennial/intermittent classification) will take place during Section 401 Water Quality Certification and Section 404 permitting required by of the Clean Water Act (CWA) (33 USC 1344).

The determination of compensation ratios for stream mitigation has varied by state, and USACE District. In addition these ratios have changed over the duration of the SEHSR Tier-I EIS and Richmond-Raleigh Project Tier-II DEIS and FEIS. Federal and state protocols for quantifying stream impacts and mitigation for Section 404/401 purposes are still in flux; therefore, it is premature to base NEPA stream impact avoidance decisions on anything other than the basic dimension of the resource (length). Impact minimization and mitigation for NEPA decisions regarding streams are similarly limited by the recent and continuing changes in regulatory approach, which will be refined during the permitting process.

3.1.1.1 *DRAINAGE BASINS*

One way to study a river system is to look at the area drained by the water body. 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 Study Area.

The Study Area lies within the James, Chowan, and Roanoke River Basins of VA and the Roanoke, Tar-Pamlico, and Neuse River Basins of NC.

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 Study Area. The percentage of the river basins within the Study Area was determined using a geographic information system (GIS) analysis.

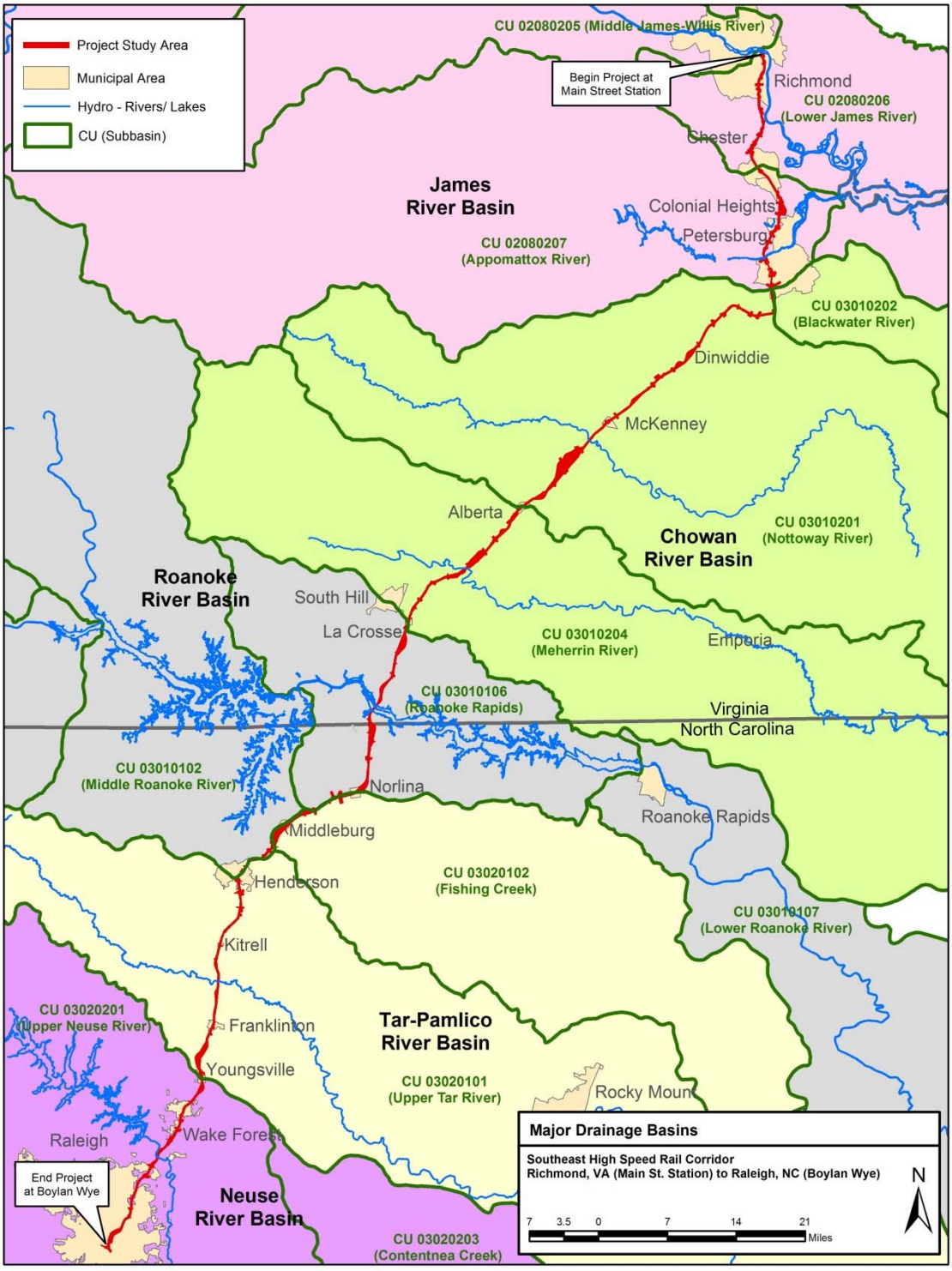
Drainage basins within the Study Area ultimately flow into coastal bays and sounds that outlet into the Atlantic Ocean. A discussion of these basins is included below.

Table 3-2
Major River Basins in the Study Area

Major River Basins	Drainage Area of Entire Basin (sq. mi.)	Subbasins within Study Area	Percent of Study Area
James	10,265	Appomattox River Lower James Middle James-Willis River	16%
Chowan	4,908	Blackwater River Meherrin River Nottoway River	35%
Roanoke	6,981	Middle Roanoke River Roanoke Rapids	16%
Tar-Pamlico	6,417	Fishing Creek Upper Tar River	22%
Neuse	6,062	Upper Neuse River	11%

Source: NCDOT and Virginia DRPT, 2004a, 2008

Figure 3-1


Project Study Area
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

3.1.1.1.1 JAMES RIVER BASIN

The James River Basin is Virginia's largest river basin, covering approximately 25% of the state's land area. The James River originates in the Allegheny Mountains, along the Virginia/West Virginia state line. The basin continues southeast through the state towards Hampton Roads and ultimately the Chesapeake Bay. The Study Area includes approximately 28 acres in the Middle James-Willis River (CU 02080205), 2,293 acres in the Lower James River (CU 02080206), and 3,034 acres in the Appomattox River (CU 02080207) subbasins.

The Study Area includes approximately 28 acres in the Middle James-Willis River, 2,293 acres in the Lower James River, and 3,034 acres in the Appomattox River 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 with waters that drain into the Chesapeake Bay. In the vicinity of the Project, the cities of Richmond, Colonial Heights, and Petersburg, as well as Chesterfield County are considered 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 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% of the drainage basin lies in Virginia and the remainder lies in North Carolina. The Study Area includes approximately 156 acres in the Blackwater River (CU 03010202), 8,171 acres in the Nottoway River (CU 03010201), and 3,573 acres in the Meherrin River (CU 03010204) subbasins.

The Study Area includes approximately 156 acres in the Blackwater River, 8,171 acres in the Nottoway River, and 3,573 acres in the Meherrin River 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% of the state. The Study Area includes approximately 4,341 acres in the Roanoke Rapids (CU 03010106) and 584 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 Virginia/North Carolina state line. The Roanoke River continues southeastward through North Carolina towards the Albemarle Sound.

The Study Area includes approximately 4,341 acres in the Roanoke Rapids and 584 acres in the Middle Roanoke River subbasins.

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 Study Area includes approximately 4,069 acres in the Upper Tar River (CU 03020101) and 2,398 acres in the Fishing Creek (CU

The Study Area includes approximately 4,069 acres in the Upper Tar River and 2,398 acres in the Fishing Creek subbasins.

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 Study Area includes approximately 3,568 acres in the Upper Neuse River subbasin.

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 Study Area includes approximately 3,568 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
- Anti-degradation 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 (United States Environmental Protection Agency (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).

Sensitive surface waters include those used for water supplies and those listed as impaired under Section 303(d) of the Clean Water Act.

Surface waters that could be especially sensitive to impacts by the proposed 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). In the Richmond to Raleigh Project Tier II DEIS, Section 303(d) waters for Virginia were from the state's 2008 list and waters for North Carolina were from the state's 2006.

Since the publication of the Richmond to Raleigh Project Tier II DEIS, the following waterbodies in the Study Area have been added to the Virginia CWA Section 303(d) list: No Name Creek, Ashton Creek, Timsbury Creek, Blackwater River (Second Swamp), Unnamed Tributary (UT) to Buckskin Creek, Nottoway River, Meherrin River, Taylors Creek, Evans Creek, and Little Genito Creek. The following waterbodies in the Study Area have been added to the North Carolina CWA Section 303(d) list since publication of the Richmond to Raleigh Project Tier II DEIS: Fishing Creek, Tar River, and Smith Creek (in the Neuse River Basin). Additionally, Perry Creek is no longer included in the North Carolina Clean Water Act Section 303(d) list.

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

Table 3-3 Water Supply Surface Waters within Study Area			
State	**Stream Name**	**Basin**	**Classifications**
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	Goode Creek	James
VA	Broad Rock Creek	James
VA	No Name Creek	James
VA	Kingsland Creek	James
VA	Proctors Creek	James
VA	Ashton Creek	James
VA	Timsbury Creek	James
VA	Oldtown Creek	James
VA	Appomattox River	James
VA	Rohoic Creek	James
VA	Lieutenant Run	James
VA	Second Swamp	Chowan
VA	Rowanty Creek and Tributaries	Chowan
VA	Arthur Swamp	Chowan
VA	Buckskin Creek	Chowan
VA	Hatcher Run	Chowan
VA	Nottoway River	Chowan
VA	Roses Creek	Chowan
VA	Great Creek	Chowan
VA	Briery Branch	Chowan
VA	Meherrin River	Chowan
VA	Taylors Creek	Chowan
VA	Shining Creek	Chowan
VA	Little Genito Creek	Chowan
NC	Fishing Creek	Tar
NC	Tar River	Tar
NC	Perry Creek (Greshams Lake)	Neuse
NC	Marsh Creek	Neuse
NC	Crabtree Creek	Neuse

Table 3-4 CWA 303(d) List of Impaired Surface Waters within Study Area		
State	**Stream Name**	**Basin**
NC	Pigeon House Branch	Neuse

Sources: North Carolina Department of Environment and Natural Resources, 2012;
Virginia Department of Environmental Quality, 2010
The 303(d)-listed streams are also described below, including the type of impairment.

The 303(d)-listed streams in the Study Area 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 Goode Creek (cause of impairment: *Escherichia coli (E. Coli)*), Broad Rock Creek (*E. coli*), No Name Creek (*E. Coli*), Kingsland Creek (*E. coli* and pH), Proctors Creek (E. coli and benthic macroinvertebrates), Ashton Creek (E. Coli), and Timsbury Creek (pH). Notable streams in the Appomattox River subbasin that are on Virginia's 303(d) list of impaired streams include Oldtown Creek (benthic macroinvertebrates and fecal coliform), the Appomattox River (fecal coliform and PCB in fish tissue), Rohoic Creek (*E. coli*), and Lieutenant Run (*E. coli)*.

3.1.1.2.2 CHOWAN RIVER BASIN

Thirty streams in the SEHSR study area are on the NC or VA 303(d) list of impaired waters. High *E. coli* levels were the leading cause of impairment.

Second Swamp in the Blackwater River subbasin is listed on the Virginia 303(d) list of impaired streams due to *E. coli*, dissolved oxygen, and mercury in fish tissue. Streams in the Meherrin River subbasin on Virginia's 303(d) list include Taylor's Creek (*E. coli*), Shining Creek (*E. coli*), Briery Branch (*E. coli*), Little Genito Creek (benthic macro-invertebrates), Great Creek (*E. coli*), Roses Creek (*E. coli*), and the Meherrin River (*E. coli*). Streams in the Nottoway River subbasin that are on Virginia's 303(d) list of impaired streams include the Nottoway River (*E. coli*), Buckskin Creek (*E. coli*), Arthur Swamp (dissolved oxygen, mercury in fish tissue), Rowanty Creek and tributaries (dissolved oxygen), and Hatcher Run (dissolved oxygen, mercury in fish tissue).

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 TAR-PAMLICO RIVER BASIN

Fishing Creek, south of Middleburg, is listed as imparired for aquatic life due to low dissolved oxygen. The Tar River is listed as impaired due to turbidity.

3.1.1.2.5 NEUSE RIVER BASIN

The southernmost section of the Study Area lies within Raleigh, NC in the Upper Neuse River and Crabtree Creek watershed. Streams in and around Raleigh have been severely impacted by

urbanization. These streams, which have impaired biological integrity, include Perry Creek (Gresham's Lake) and Crabtree Creek, Pigeon House Branch, 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, from March 2007 to May 2007, and in October and November 2012. 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).

474 wetland systems were identified within the Study Area, with 425 located in VA and 49 in NC.

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. Wetlands subject to potential impact from the Project are listed in Appendix I and depicted on the maps included in Appendix R. A total of 810.5 acres of wetlands (760.8 acres in Virginia and 49.7 acres in North Carolina) were delineated within the Study Area. Jurisdictional wetland determinations were approved by USACE for application of impact avoidance and minimization protocols and field verified in 2013 for the preferred alternative.

810.5 acres of wetlands (760.8 acres in VA and 49.7 acres in NC) were delineated within the Study Area.

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. Also, many wetlands within the Study Area that were delineated in the field were not depicted on the NWI maps and did 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 Virginia DRPT, 2004a, 2008). A summary of wetlands delineated within the Study Area by section and state is provided in Table 3-1.

The need for specific identification of wetland functions or quality (beyond that established during the jurisdictional determination process) will be resolved during the Section 404 permitting process. If USACE determines the need for impacted wetland functional/quality analysis in order to evaluate mitigation options, then an appropriate method will be applied. Similar to the stream assessment approach (Section 3.1.1), determination of wetland impact avoidance, minimization, and mitigation for the purposes of NEPA decision-making is most efficiently approached by applying the basic dimension of the resource (area). More detailed approaches (such as the NC Wetland Assessment Methodology, NCWAM) to determine wetland function, quality, and value may be applied during the Clean Water Act Section 404 and 401 permitting processes in order to refine the mitigation requirement. This assessment has no bearing on the selection of the preferred alternative.

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% 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 (United States Department of Interior (US DOI) 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 Study Area. All of the FEMA floodplain crossings identified in the Study Area 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 data for Virginia were obtained from the FEMA Map Service Center (USDOI, 2013). The floodplain data

for North Carolina were obtained from the North Carolina interactive mapping site (North Carolina Floodplain Mapping Program, 2008).

Figure 3-2

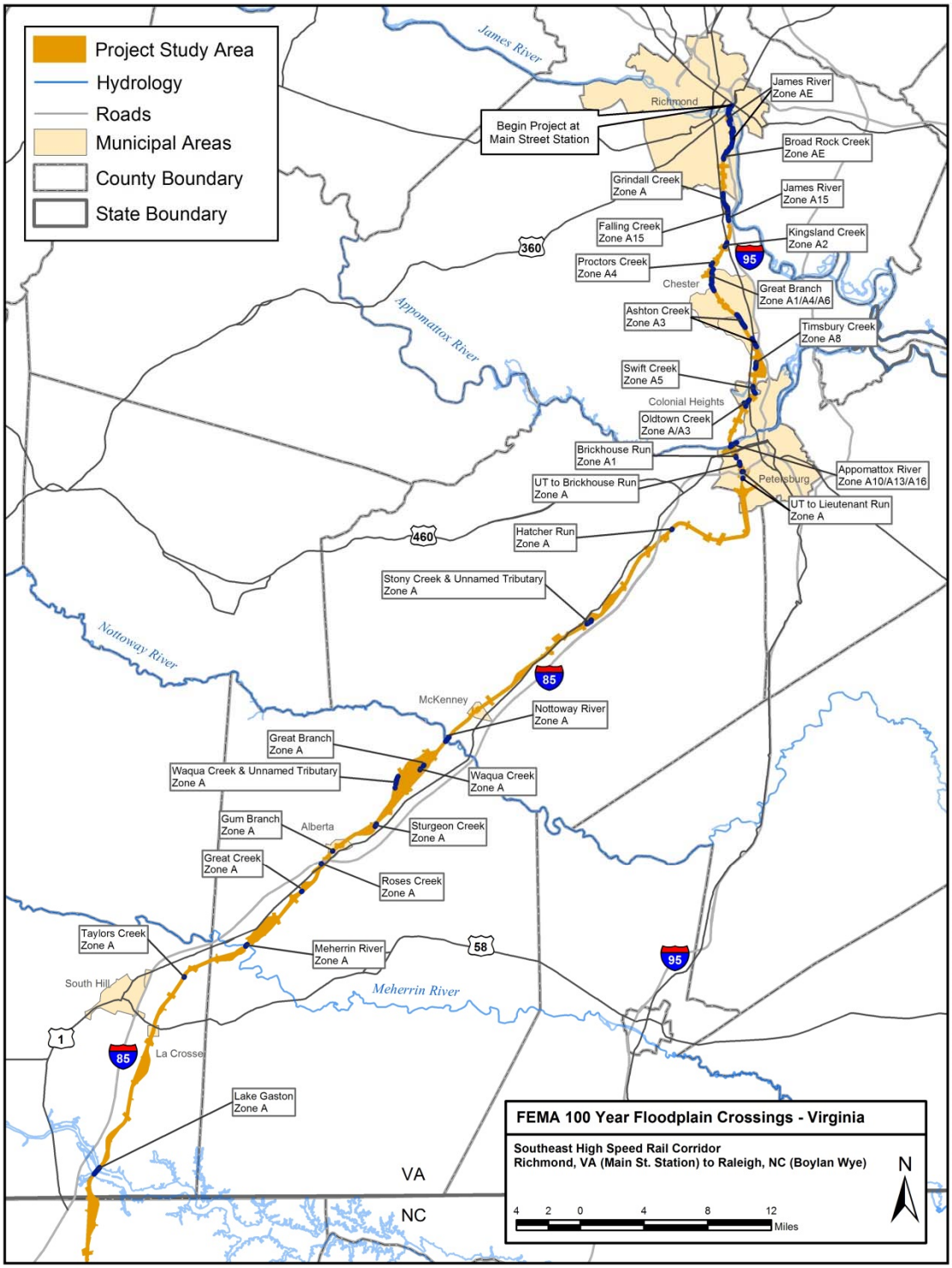
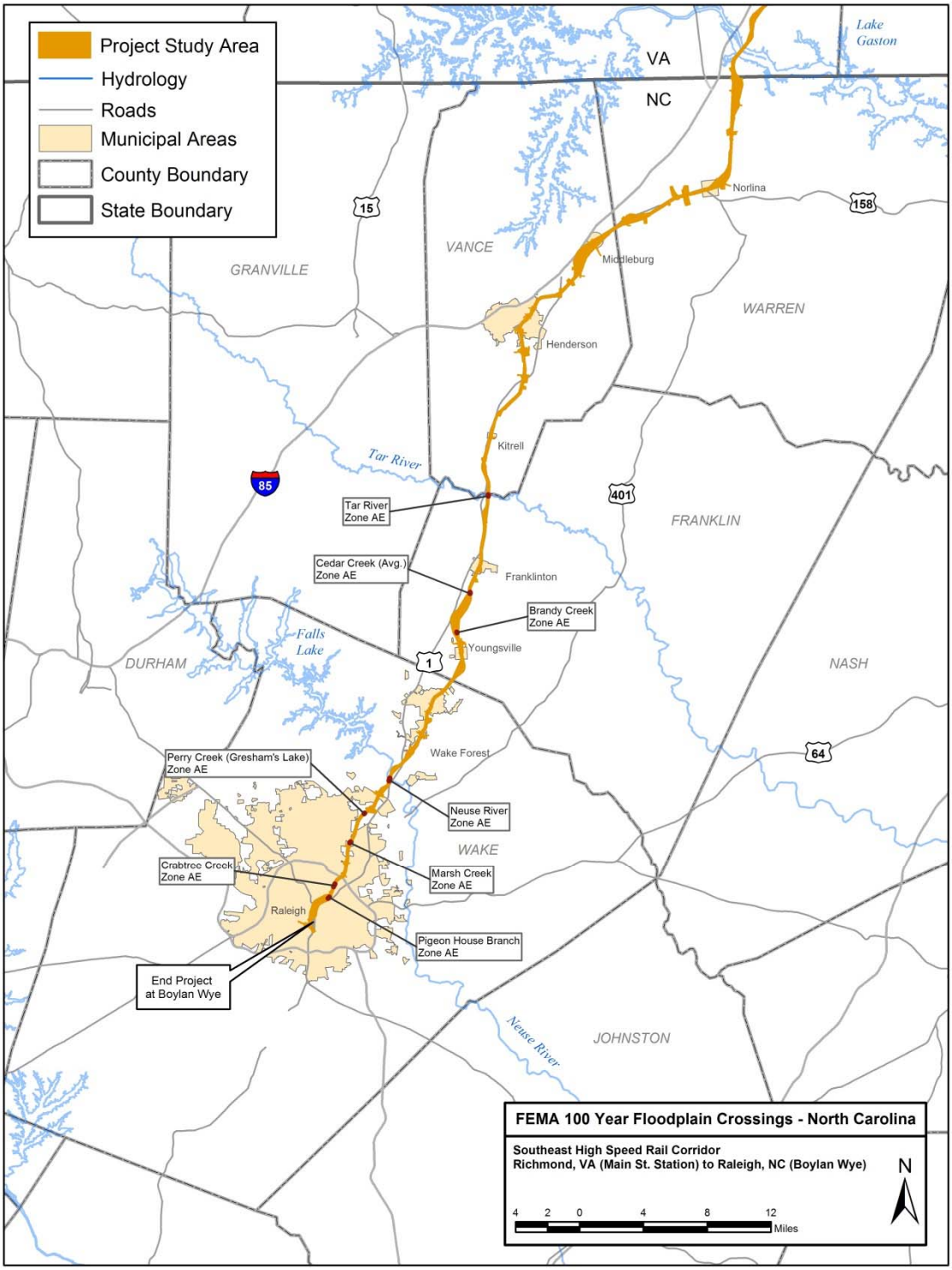

Project Study Area
Hydrology
Roads
Municipal Areas
County Boundary
State Boundary
James River
Appomattox River
Nottoway River
Meherrin River
Richmond
Chester
Colonial Heights
Petersburg
McKenney
Alberta
South Hill
La Crosse
Begin Project at Main Street Station
James River Zone AE
Broad Rock Creek Zone AE
Grindall Creek Zone A
James River Zone A15
Falling Creek Zone A15
Kingsland Creek Zone A2
Proctors Creek Zone A4
Great Branch Zone A1/A4/A6
Ashton Creek Zone A3
Timsbury Creek Zone A8
Swift Creek Zone A5
Oldtown Creek Zone A/A3
Brickhouse Run Zone A1
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
Nottoway River Zone A
Great Branch Zone A
Waqua Creek & Unnamed Tributary Zone A
Waqua Creek Zone A
Gum Branch Zone A
Sturgeon Creek Zone A
Great Creek Zone A
Roses Creek Zone A
Taylors Creek Zone A
Meherrin River Zone A
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


Project Study Area
Hydrology
Roads
Municipal Areas
County Boundary
State Boundary
VA
NC
Lake Gaston
Norlina
Middleburg
Henderson
Kitrell
Franklinton
Youngsville
Wake Forest
Raleigh
GRANVILLE
VANCE
WARREN
FRANKLIN
DURHAM
WAKE
NASH
JOHNSTON
Tar River
Falls Lake
Neuse River
15
85
1
401
158
64
Tar River Zone AE
Cedar Creek (Avg.) Zone AE
Brandy Creek Zone AE
Perry Creek (Gresham's Lake) Zone AE
Neuse River Zone AE
Crabtree Creek Zone AE
Marsh Creek Zone AE
Pigeon House Branch Zone AE
End Project at Boylan Wye
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.

Four rivers in the Nationwide Rivers Inventory (NRI) are also designated as Virginia Scenic Rivers in the Study Area. The James River (Historic Falls of the James) segments that are on the NRI are outside the Study Area. Tributaries to Lake Gaston (the Dan River, Bannister River, and Staunton River) are listed as Virginia Scenic Rivers upstream

There are four rivers in the NRI that are also designated as Virginia Scenic Rivers in the Study Area (see Table 3-5). However, the James River (Historic Falls of the James) segments that are listed on the NRI are outside the Study Area. Tributaries to Lake Gaston (the Dan River, Bannister River, and Staunton River) are listed as Virginia Scenic Rivers upstream of the Study Area. It should be noted that the Virginia Scenic River designation does not "preclude the Commonwealth or a local government body from constructing, reconstructing, operating, or performing necessary maintenance on any road or bridge project."

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 Study 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
James River	Big Island to Gladstone Railyard; east of Glasgow to east of Buchanan; Mogarts Beach to Hopewell; west of Buchanan to Eagle Rock, Above Bosher dam to Bremo Bluff;	S, G, R, H, O	Cliffs, diverse scenery, undeveloped reaches west of Richmond, historic sites at Bremo and Midway Mill, rare plant communities
Appomattox River	Headwaters to Lake Chesdin (outside of the Study Area)	H,O	Wild river (longest, largest, least developed river in the Upper Piedmont of Virginia, passes through Appomattox Court House and Wigwam Historic Sites
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
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,2013
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 C.F.R. 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.

The Project crossing of the James River in Richmond is the only waterway in the Study Area subject to USCG jurisdiction.

In a letter dated November 5, 2009, the USCG determined that the Project crossing of the James River in Richmond is the only waterway in the Study Area subject to USCG jurisdiction (Richmond

to Raleigh Project Tier II DEIS Appendix A). The 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) 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 these locations.

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 (Purdue University, 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%.

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 (United States Department of Agriculture (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 was published in 2009 (NRCS, 2009). However, as stated in the Richmond to Raleigh Project Tier II DEIS, communication with NRCS revealed that USDA no longer maps soil associations, therefore 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 Project's Natural Resource Technical Report (NRTR) (NCDOT and Virginia 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
		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	

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
Dinwiddie	VA	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
		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

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

County	State	Most Common Soil Association	Description	Drainage	Comments
Warren	NC	Pacolet-Cecil	Sandy loam or loam surface, clayey subsurface; Moderate permeability	Well drained	Low shrink swell potential
		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	
		Cecil-Pacolet	Loamy surface, clayey subsoil; 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
		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

Prime farmland" is defined as soils best suited for producing food, feed, fiber, forage, and oil seed crops.

"Unique farmlands" are used for production and specific high-value food or fiber crops.

"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.

The Farmland Protection Policy Act (FPPA) of 1981 (7 U.S.C. 4202(a)) 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. 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 considered prime farmland. 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 Project counties and GIS analyses were used to identify FPPA soils. 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 although areas of water, or urban or built-up land uses are not considered prime farmland by definition, NRCS does not spell out exactly the manner in which they determine these areas. Therefore, there is the potential that Table 3-7 overstates the amounts of prime farmland soils in the Study Area.

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
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	2,464	0	0	0	641	0
Vance County, NC	2,393	0	0	0	514	0
Franklin County, NC	1,304	0	49	0	486	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
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

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 $1.13 billion in 2008 and the estimated value for North Carolina in 2009 was $846 million. In 2008, Virginia ranked twenty-first among the 50 states in total non-fuel mineral production value and North Carolina ranked twenty-fourth in 2009(USGS, 2012; USGS, 2013).

Crushed stone is, by value, the leading non-fuel mineral in both Virginia and North Carolina

Crushed stone is, by value, the leading non-fuel mineral in both Virginia and North Carolina, accounting for about 59% of Virginia's total non-fuel mineral production value and about 69% of that of North Carolina. Construction gravel and sand was the second leading non-fuel mineral, followed by Portland cement, lime, and zirconium concentrates. These five mineral commodities represented 87% of the State's total nonfuel mineral value (USGS, 2012). In North Carolina, phosphate rock was second based on value, followed by construction sand and gravel and industrial sand and gravel, dimension stone, and feldspar (USGS, 2012, and USGS, 2013).

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 Study Area. 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" 42 U.S.C. §§6901-6992k.

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 Study Area. The following Federal databases included information on sites within the Study Area:

- Federal Insecticide, Fungicide, and 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 Study Area:

- 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 of the Richmond to Raleigh Project Tier II DEIS. Sites were included if they were located within American Society for Testing and Materials (ASTM) recommended distances to the Study Area. This distance extends 2,000 feet from the Study Area. There were 254 sites within Virginia and 809 in North Carolina. A vast majority of the sites were located 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 (Appendix J, SEHSR Richmond to Raleigh Project Tier II DEIS) (EDR, 2004, 2008).

254 potentially hazardous sites in Virginia and 809 in North Carolina are within 2,000 feet of the SEHSR corridor. A vast majority of the sites were concentrated between Richmond and Petersburg in VA and in Wake County, NC.

In September 2010, Mallinckrodt, Inc., doing business as Covidien, informed NCDOT that one of its facilities is located in the Study Area. The site, located in Wake County at the intersection of Capital Boulevard and Durant Road, has operations on each side of the existing CSX S-Line, but was not identified during development of the Richmond to Raleigh Project Tier II DEIS. The parcels on which the site is located are large, and the georeferenced coordinates for the site were outside the boundary of the Study Area. The portion of the Covidien site within the Study Area includes transfer material lines, application fields, monitoring wells, stormwater retention basins, and fencing, impacts to this site are discussed in Chapter 4, Section 5 of this FEIS.

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 Project construction and operation to impact these sites.

3.6 AIR QUALITY

Transportation sources generate varying amounts of ozone (O3) and its precursors; nitrogen oxides (NOX); 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. 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 NO2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO). NOX plays a major role with VOCs to produce O3. The two major emissions sources are transportation and stationary fuel combustion sources, such as electric utilities and industrial boilers.

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 (PM10) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter (PM2.5) are referred to as "fine" particles and are believed to pose the largest health risks. 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).

3.6.1 REGULATORY SETTING

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

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.

Table 3-8
National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		Primary and Secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9.2010] [61 FR 52852, Oct 8, 1996]		Primary	1-hour	100 µg/m^3	98th percentile, averaged over 3 years
		Primary and Secondary	Annual	53 ppb (2)	Annual mean
Ozone [73 FR 16436, Mar 27, 2008]		Primary and Secondary	8-hour	0.075-hour (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution Dec 14, 2012	$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years

Table 3-8
National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
		Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per years on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		Primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA; December 14, 2012
(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
(2) The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

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 North Carolina Department of Environment and Natural Resources (NCDENR) 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 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 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, and include "Planning and technical studies." Because the Project is currently funded only at the planning level and does not have a dedicated funding source for construction, it falls under the exempt status.

The conformity regulations apply to Federal actions occurring in air basins designated as nonattainment areas for pollutants in the NAAQS (Table 3-8) 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 Project is currently funded only at the planning level and does not 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 nonroad diesel fuel that will decrease the allowable levels of sulfur in fuel used in locomotives by 99%. 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 15 ppm in 2014.

3.6.1.6 *MOBILE SOURCE AIR TOXICS (MSATS) RULE*

In February 2007, USEPA finalized a rule to reduce hazardous air pollutants from mobile sources (Control of Hazardous Air Pollutants from Mobile Sources, February 26, 2007). The rule limited the benzene content of gasoline and reduced toxic emissions from passenger vehicles and gas cans. At that time, USEPA estimated that in 2030 this rule would reduce

total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and $PM_{2.5}$) by over 1 million tons.

USEPA has adopted many mobile source emission control programs that, in addition to controlling pollutants such as hydrocarbons, particulate matter, and nitrogen oxides, will also result in large air toxic reductions. Examples of these control programs include the following:

- Heavy-duty Onboard Diagnostic Rule (PDF) (74 FR 8310, 119 pp, 825K, published February 24, 2009)
- Small SI and Marine SI Engine Rule (PDF) (73 FR 59034, 347 pp, 3.69MB, October 8, 2008)
- Locomotive and Commercial Marine Rule (PDF) (73 FR 25098, 255 pp, 2.08MB, published May 6, 2008)
- Clean Air Nonroad Diesel Rule (PDF) (69 FR 38957, 316 pp, 1,87K, published June 29, 2004)
- Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (PDF) (66 FR 5002, 192pp, 1.71MB, published January 18, 2001)
- Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements (PDF) (65 FR 6698, 173 pp, 1.14MB, published February 10, 2000)

USEPA has developed additional diesel-related programs to reduce diesel particulate matter under the National Clean Diesel Campaign, which encompasses a variety of programs to reduce diesel emissions.

3.6.1.6.1 LOCOMOTIVE AND COMMERCIAL MARINE RULE

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% of mobile source NO_X emissions and 25% 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%, 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%, respectively. The reduction in NO_X for range year Tiers 0 through 4 will be approximately 20, 20, 20, 20, and 80%, respectively. All Tier idle emissions are predicted to be reduced by 50% 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. The USEPA published a final rule on January 15, 2013 (effective March 13, 2013), making revisions to $PM_{2.5}$ standards. The annual standard was lowered from 15.0 micrograms per cubic meter to 12.0. Corresponding revisions were also made to the data handling conventions and to the ambient air monitoring, reporting and network design requirements.

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 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 (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 Project corridor and at specific locations are identified.

3.6.2.1 *AMBIENT AIR QUALITY IN THE STUDY AREA*

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 (http://www.epa.gov/ttn/airs/airsaqs/). There are no ambient monitoring stations in the Virginia section of the Study Area. However, there are two stations in Chesterfield County that monitor various pollutants west of the Study Area. There is a PM2.5 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, at the Science Museum of Virginia at the intersection of DMV Drive and W Leigh Street. Within the North Carolina section of the 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. The Franklin County station is located on South Hillsborough Street.

In the following section, AQS data for the transportation-related pollutants from 2012 (the last available full year) are presented and compared to the air quality standards in Table 3-8. The pollutants relevant to the 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*

From 1980 to 2010, there was a 28% decrease in the 8-hour design value O_3 concentrations in the United States. A design value is a statistic that describes the air quality status of a

In the project area, both VA and NC are listed as maintenance areas for the ozone standard. In 2012, the 8-hour O3 standard was exceeded 3 days in Chesterfield County, VA, 1 day in Franklin County, NC, and 3 days in Wake County, NC

given area relative to the level of the National Ambient Air Quality Standards (NAAQS).

In the Project area, both Virginia (Richmond-Petersburg) and North Carolina (Raleigh-Durham-Chapel Hill) are listed as maintenance areas for the ozone standard.

The 8-hour standard was exceeded 3 days in 2012 at the intersection of County Roads 655 and 654 in Chesterfield County, VA.

The 8-hour standard was exceeded 3 days in 2012 at the Spring Forest Road station in Raleigh, NC, in Wake County.

The 8-hour standard was exceeded 1 day in 2012 at the South Hillsborough Street station in Franklin County, NC.

3.6.2.1.1.2 *CARBON MONOXIDE*

From 2000 to 2010, there was an 82% decrease in the annual 2nd maximum 8-hour average, which is the second highest 8-hour average concentration of CO in a year. Currently, there are no nonattainment areas in the United States.

The Project is in areas currently designated as being in attainment of the standard in VA and are in areas designated as maintenance for Wake and Franklin counties in NC.

The Project is in areas that are currently designated as being in attainment of the standard in Virginia and are in areas designated as maintenance 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 2012 and there are currently no nonattainment areas in the United States.

3.6.2.1.1.3 *NITROGEN DIOXIDE*

From 1980 to 2010, there was a 52% decrease in the annual NO_2 average (i.e., arithmetic mean) in the United States.

The Project is in areas that are 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*

From 1990 to 2010, there was a 38% decrease in the design value PM10 concentration averages. From 2000 to 2010, there was a 27% decrease in the design value PM2.5 concentration averages in the United States.

The Project is in areas that are 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 2012.

The Project is in areas that are currently designated as being in attainment of the $PM_{2.5}$ standards. These standards were not exceeded at any of the Study Area monitoring stations during 2012.

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. 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." Within this range, air quality is considered satisfactory, and air pollution poses little or no risk. Values between 51 and 100 are considered "moderate." "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 3 AQI monitoring stations in the Study Area. All 3 stations were rated good more than 85% of the time.

There are three AQI monitoring stations in the Study Area. AQI summaries for 2012 for these stations are presented in Table 3-9.

Table 3-9
2012 Air Quality Index Summary

County	Percent of Days			
	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy
Chesterfield County, VA	89%	10%	1%	0%
Franklin County, NC	90%	10%	<0.5%	0%
Wake County, NC	85%	14%	1%	0%

Source: USEPA, 2012 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 Study Area. 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.

$PM_{2.5}$ analysis was not performed since the Project is in areas that are in attainment of the standard.

In VA and NC, the 1-hour and 8-hour ppm CO standards were not exceeded in the Project area for 2012.

3.6.2.2.1 CARBON MONOXIDE

In Virginia and North Carolina, the 1-hour and 8-hour ppm CO standards (35 and 9 ppm, respectively) were not exceeded in the Project area for 2012.

Microscale CO analyses are 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) and predicted traffic volumes. 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. In the Virginia portion of the Project, the worst-case intersection is Centralia Road and Chester Road in Chesterfield County.

Microscale CO concentrations were predicted with the USEPA approved MOVES and CAL3QHCR computer models for the peak 1-hour and 8-hour time periods, corresponding to the averaging periods of the NAAQS.

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 areas that are currently designated as being in attainment of the PM standards. These standards were not exceeded at any of the Study Area monitoring stations during 2012. Therefore, based on this information, no PM hot-spot analysis is required.

The Project is in areas that are currently designated as being in attainment of the PM standards. These standards were not exceeded at any of the Study Area monitoring stations during 2012. Therefore, no PM hot-spot analysis is required.

3.7 NOISE AND VIBRATION

This section describes the basic terminologies of noise and vibration used in this report, which is consistent with the Federal Transit Administration's Transit Noise and Impact Assessment (FTA, 2006) methodology. 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.

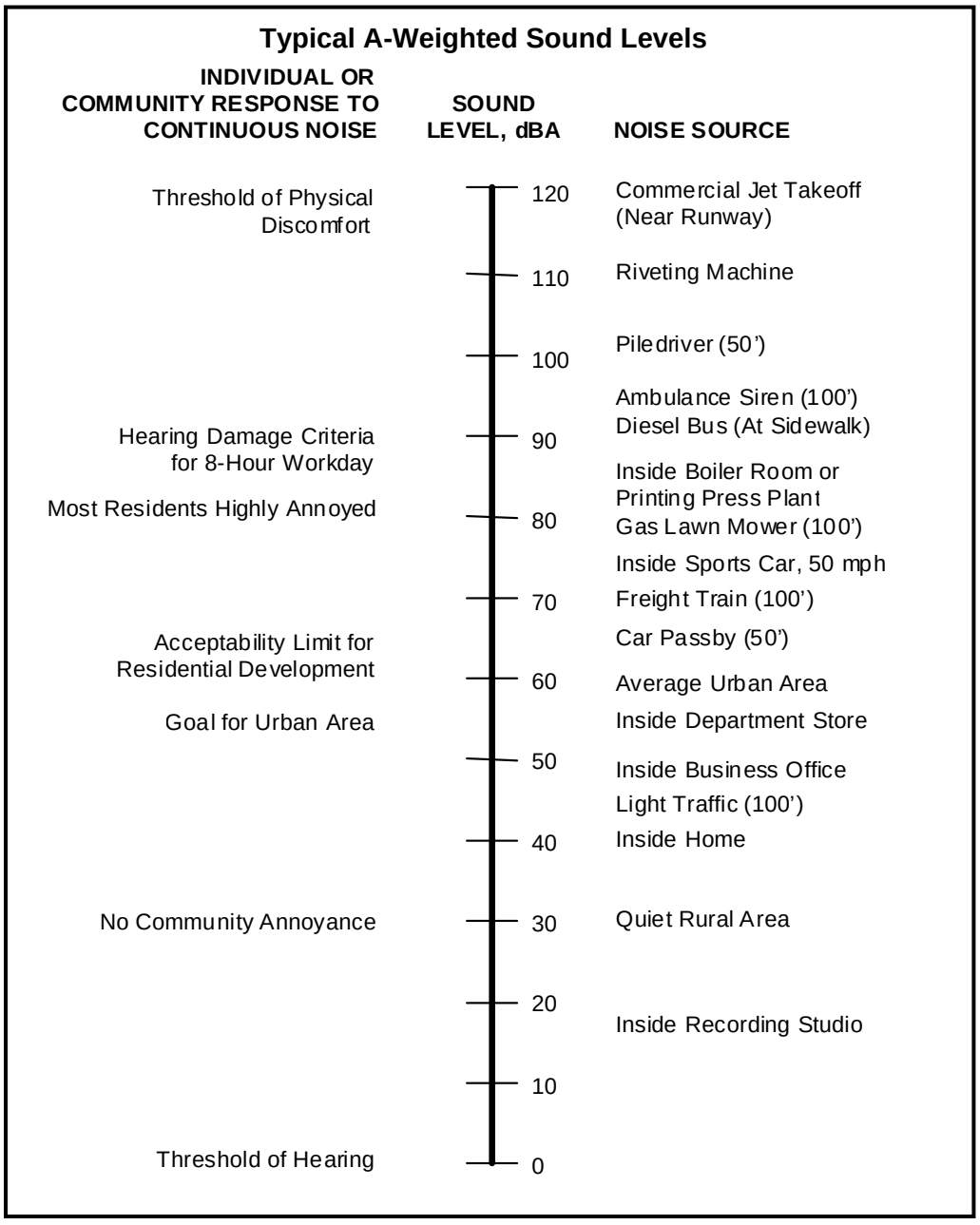
The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in sound pressure amplitude. When describing sound and its effect on a human population, A-weighted (dBA) sound pressure levels are typically used to account for the response 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. (FRA, 2012)

Figure 3-4



Source: Parsons

3.7.2 VIBRATION DESCRIPTORS

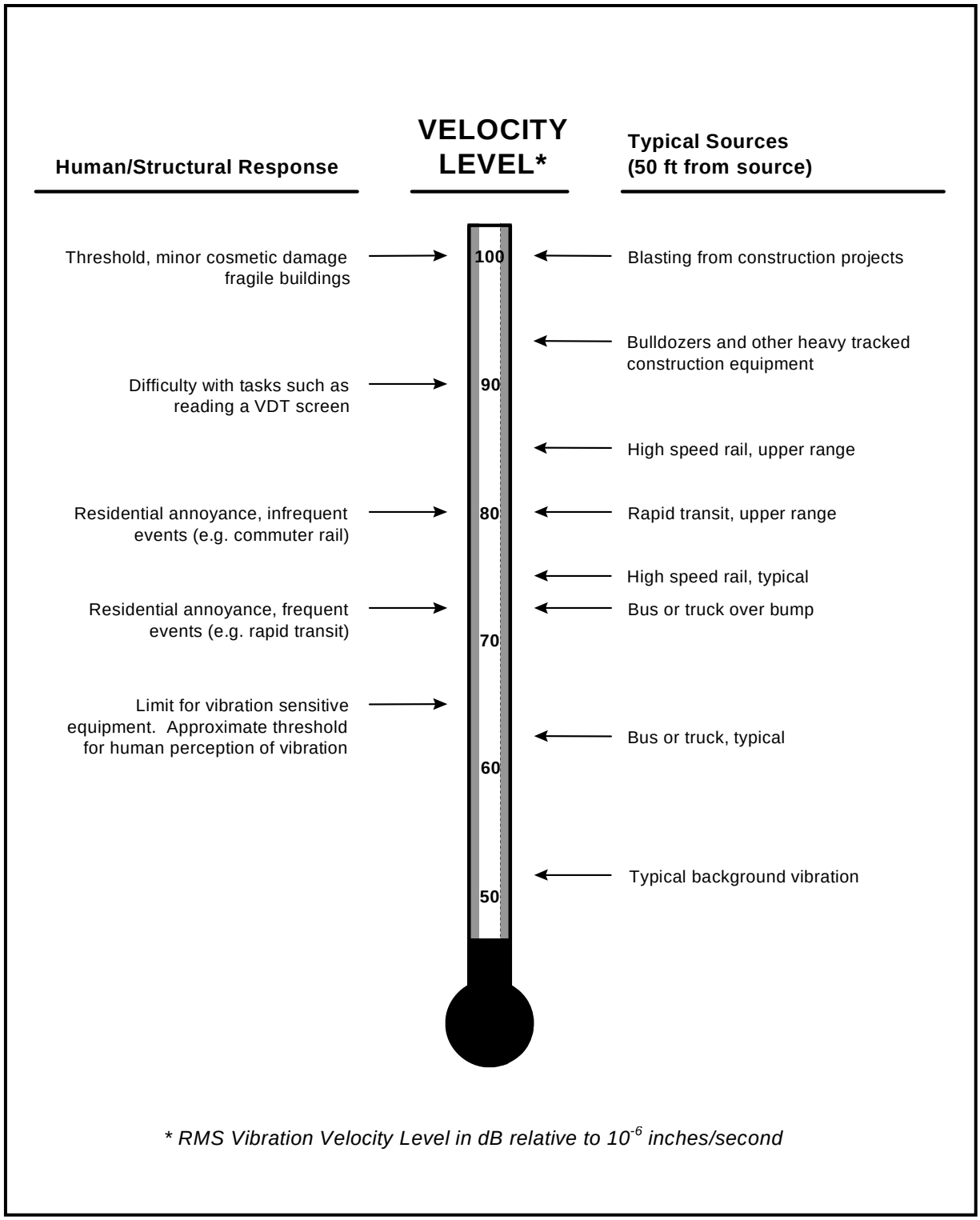
Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the 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) 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 including many associated with the American Civil War. The Study Area 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.

The southern and northern portions of the Project area have a higher concentration of commercial land use and residential development. The central portion is more rural, with a sizable number of residences being farmhouses. Throughout VA and NC, there are a significant number of historic and archaeological sites. The Study Area generally adheres to a late 1800's railroad alignment. Portions of the alignments are adjacent to historical and archaeological sites.

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

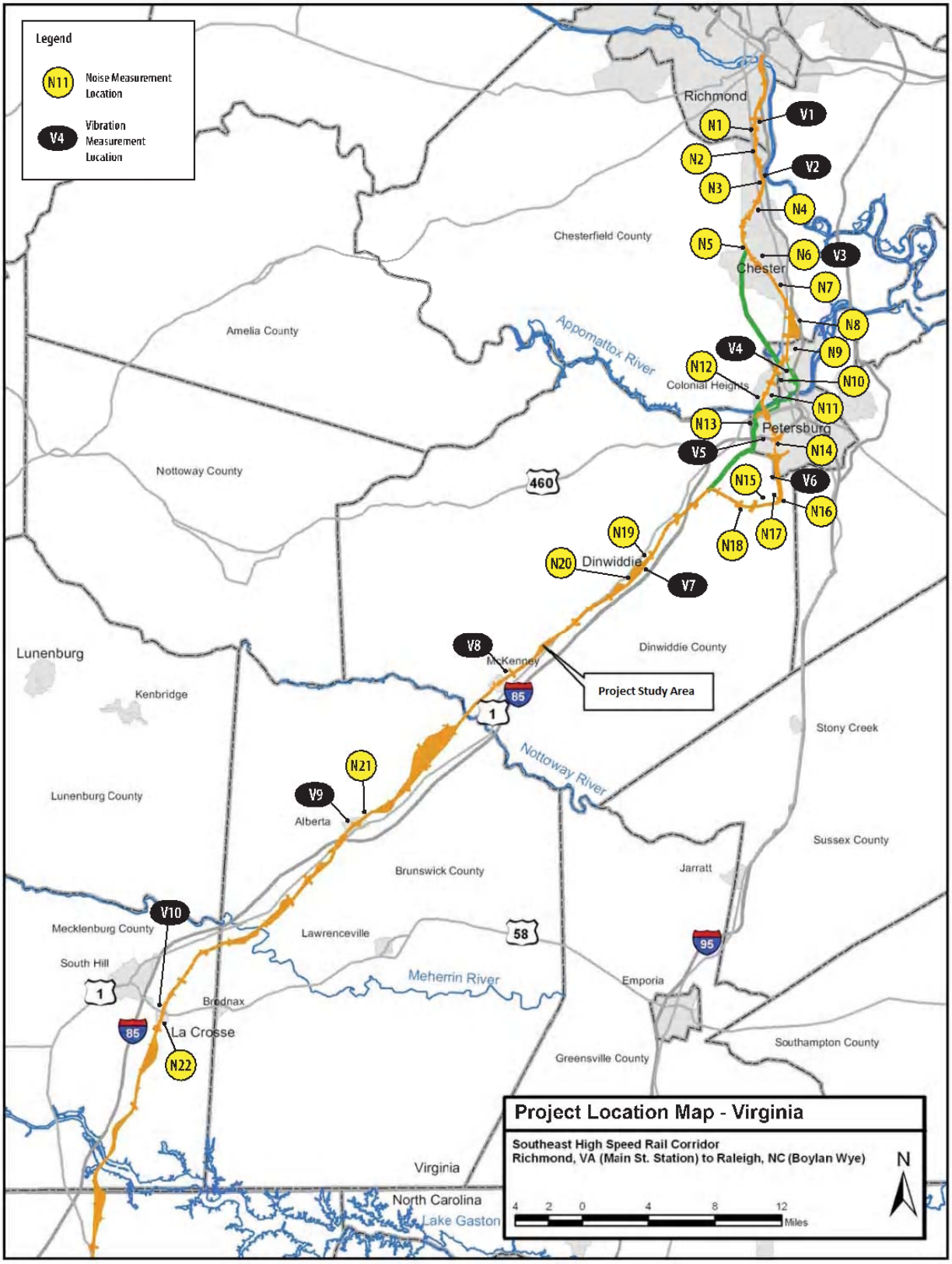

Legend
N11 Noise Measurement Location
V4 Vibration Measurement Location
Richmond
Chesterfield County
Chester
Amelia County
Appomattox River
Colonial Heights
Petersburg
Nottoway County
460
Dinwiddie
Dinwiddie County
Lunenburg
Kenbridge
McKenney
Project Study Area
85
1
Stony Creek
Nottoway River
Lunenburg County
Alberta
Sussex County
Brunswick County
Jarratt
Mecklenburg County
Lawrenceville
58
95
South Hill
Meherrin River
Emporia
Brodnax
La Crosse
Southampton County
Greensville 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)

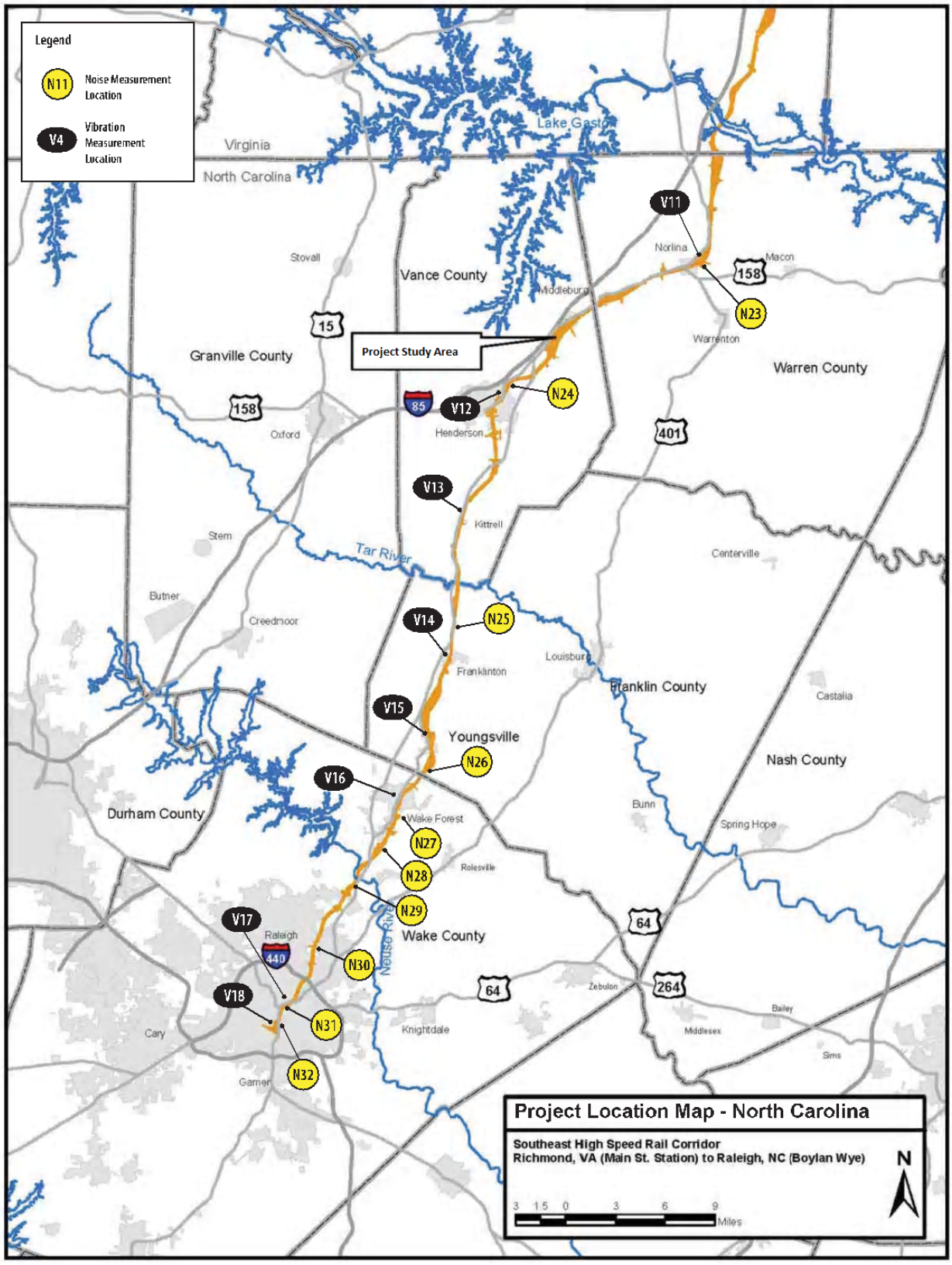


Table 3-10
Noise Measurement Sites

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

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-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	-
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. Ldn 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 3-12						
V-2	FTY Group Warehouse, Richmond, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 3-12						

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-3	11542 Chester Station Dr., Chester, VA	East	SFR	Existing Train Passby Vibration Measurement – See Table 3-12						
V-4	2801 Boulevard, Colonial Heights, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 3-12						
V-5	1510 W Washington St Petersburg, VA	East	COM	Existing Train Passby Vibration Measurement – See Table 3-12						
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 3-12						

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-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 Forest, 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 3-12						
V-18	1101 Haynes St. (Pilot Mill), Raleigh, NC	East	HST	Existing Train Passby Vibration Measurement – See Table 3-12						

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

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 Corridor Tier I EIS established the benefits of the Project in terms of energy savings.

Energy is commonly measured in terms of British thermal units, or BTUs. A BTU is defined as the amount of heat required to raise the temperature of one pound of water by 1° Fahrenheit. For transportation projects, energy usage is predominantly influenced by the amount of fuel used. Table 3-13 shows U.S. Department of Energy estimates for average national energy use per passenger mile for the three primary transportation modes that operate within the Study Area The table shows that intercity passenger rail is 19% more efficient than domestic airline travel and 52% more efficient than auto travel on a per-passenger-mile basis.

Table 3-13 Passenger Energy Use - 2011	
Transportation Mode	**BTUs per Passenger Mile**
Intercity Rail	2,214
Car	3,364
Commercial Airline	2,638

Source: U.S. Department of Energy, Transportation Energy Data Book Edition 32 Released July 31,2013

3.9 VISUAL ENVIRONMENT

No changes have been made to the description of the visual environment for the Richmond to Raleigh Project Tier II FEIS. 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 Study Area ranges from undeveloped natural areas and small towns to large-scale industrial development and vibrant urban districts. A portion of the Study Area contains active freight and passenger rail service, while part of the Study Area follows an inactive rail corridor.

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

3.9.1 VIRGINIA

3.9.1.1 *CITY OF RICHMOND*

Throughout Richmond, VA the Study Area follows the active CSX S-Line railroad; Amtrak also operates passenger service along these tracks. The northern terminus of the Study Area 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 Area.

The area surrounding the station consists of elevated highway and rail structures, the James River floodwall, industrial land uses, and the Shockoe Bottom area – a former 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."

South of the James River, much of the Study Area includes large-scale industrial facilities, including above-ground storage tanks. The Study Area 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 Area continues through industrial land uses as the active CSX S-Line runs south between US-1 and I-95. In the area of Bellwood, VA the Study Area passes the Defense Supply Center Richmond (DSCR) to the west, which includes a small forested elk refuge. The Study Area then turns to the southwest where the railroad passes under US-1. The Study Area 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, the corridor passes through the original "downtown" core area of Chester, which developed around Chester Station, a 19th century rail stop. As the Study Area continues to the southeast, it begins to traverse suburban and transitioning-to-suburban (from rural) areas. The Study Area 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. The corridor traverses a short section of Colonial Heights, VA (described below) 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, VA area. The Study Area 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.

3.9.1.3 *CITY OF COLONIAL HEIGHTS*

Approaching Colonial Heights, VA, land uses within the Study Area 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 Area begins to follow the active CSX A-line in a southwesterly direction through wooded and suburban areas. The Study Area crosses US-1, and then the alignment of an abandoned section of the CSX S-Line before reaching Ettrick Station, in Chesterfield County.

3.9.1.4 *CITY OF PETERSBURG*

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

3.9.1.5 *DINWIDDIE COUNTY*

In Dinwiddie County, the Study Area continues along the CSX A-Line to the southern end of Collier Yard, where the north-south alignment transitions from the CSX A-Line to the CSX S-Line along CSX's inactive east-west 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 Area begins to follow the existing but inactive CSX S-Line ROW. Along this segment of the Study Area, 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 Area 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 Area 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 Area 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 are largely undeveloped.

3.9.1.6 *BRUNSWICK COUNTY*

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

Midway through the county, the Study Area 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 Area crosses both I-85 and US-1, moving through more woodlands. The Study Area 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 are largely undeveloped.

3.9.1.7 *MECKLENBURG COUNTY*

Within the northern part of the county, the Study Area passes through mostly forested areas with some farmlands and occasional residential development. Near the Forksville community, the Study Area comes close to some residential areas before curving to the south. 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 Area 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 Area 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 Area 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 abandoned houses. Near Bracey, VA, the Study Area passes by commercial and trucking operations along VA 903. As the Study Area approaches the Lake Gaston area, it passes between lake-oriented subdivisions, a golf course and a wastewater treatment facility.

The Study Area 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 Area 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 Area 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 CSX 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 Area 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 Area approaches Middleburg, NC. 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 CSX S-Line. Through Middleburg, the corridor includes mostly commercial and some industrial uses. As the Study Area 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 Area 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 Area 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 Area 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 region (Raleigh-Durham-Chapel Hill area). 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 Area.

Franklin County is transitioning from a predominately rural area to a bedroom community for employment centers in the Triangle region.

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 Area 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 Area is largely wooded, interspersed with industrial and residential development.

3.9.2.4 *WAKE COUNTY*

As the Study Area 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 Area 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 Area 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 Area crosses US-1 and its commercial and industrial development. The Study Area 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 Area passes between a landfill and a chemical operation's tanks and lagoons. As it crosses Durant Road, the Study Area enters Raleigh, NC, passing through subdivisions, commercial land uses, and the former Cheviot Hills golf course. As it approaches I-540, the Study Area passes through a heavy industrial area and by Gresham Lake. After crossing I-540, the Study Area 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 Area 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 Area 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 Area are parking garages. The Study Area 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. The NS-Line lies parallel to and west of the Study Area is at a higher grade, and crosses the downtown streets on bridges. The two rail lines meet at Jones Street, where the Study Area 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 Area enters the Boylan Wye area, where the 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 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 United States, 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 (16 U.S.C. 1531-1544, 87 Stat. 884). North Carolina and Virginia have also established endangered species lists. Threatened and endangered species listed for each city and county in the 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 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 Study Area.

3.10.1.1 TERRESTRIAL COMMUNITIES

Terrestrial communities in the Study Area include natural and manmade systems that are characterized as mixed forest, pine forest, and maintained/disturbed systems.

Maintained/disturbed communities account for about 53% of the terrestrial Study Area.

Mixed forests account for about 30% of the terrestrial Study Area.

Pine forest systems are located in fragmented areas throughout the Study Area and comprise about 17% of the total land.

Terrestrial communities in the 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 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 Project NRTR (NCDOT and Virginia DRPT, 2004a, 2008).

Maintained/disturbed communities account for about 53% 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 30% 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 about 17% 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 3-14 provides a list of representative terrestrial community flora and fauna species that may be found in the Study Area. Table 3-15 summarizes the acreage of terrestrial communities for localities in the Study Area.

Table 3-14
Terrestrial Community Representative Flora and 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*	●	●	

Table 3-14
Terrestrial Community Representative Flora and Fauna

Common Name	Scientific Name	Terrestrial Community System		
		Mixed Forest	Pine Forest	Maintained/ Disturbed
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 Virginia DRPT, 2004a, 2008

Table 3-15
Terrestrial Communities Summary

Location	State	Mixed Forest (Acres)	Pine Forest (Acres)	Maintained/Disturbed (Acres)
Richmond	VA	2.02	0	95.88
Chesterfield	VA	109.48	13.13	241.03
Colonial Heights	VA	3.31	0	17.41
Petersburg	VA	15.16	1.33	54.63
Dinwiddie	VA	225.66	132.23	173.3
Brunswick	VA	190.93	136.84	160.72
Mecklenburg	VA	147.50	104.28	154.27
Warren	NC	88.6	59.31	227.53
Vance	NC	75.16	33.55	364.53
Franklin	NC	69.21	77.43	104.27
Wake	NC	51.89	37.76	261.49

Source: NCDOT and Virginia DRPT, 2004a, 2008

3.10.1.2 *AQUATIC COMMUNITIES*

The aquatic communities in the Study Area include wetlands, man-made and beaver ponds, streams, and river floodplains.

There are 720 waterbodies including streams, unnamed tributaries, and man-made and beaver ponds within the Study Area (462 in Virginia and 258 in North Carolina).

Wetland systems within the Study Area are closely associated with floodplain systems.

The aquatic communities in the 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 720 waterbodies including streams, unnamed tributaries, and man-made and beaver ponds within the Study Area (462 in Virginia and 258 in North Carolina). Streams throughout the 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 Study Area is provided in the Project NRTR (NCDOT and Virginia 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 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 Study Area is provided in the Project NRTR. Table 3-16 provides a list of representative aquatic community flora and fauna species that may be found in the Study Area.

Table 3-16
Aquatic Community Representative Flora and 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	*Woodwardia 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	*Lepomis macrochirus*				●		●	●
box turtle	*Terrapene carolina*	●	●		●	●		●
Carolina chickadee	*Poecile carolinensis*	●	●	●				
common carp	*Cyprinus carpio*				●		●	●
eastern cottontail	*Sylvilagus floridanus*	●	●	●		●		

Table 3-16
Aquatic Community Representative Flora and Fauna

Common Name	Scientific Name	Aquatic Community System						
		Wetlands				Flood-plain	Stream	Man-Made / Beaver Pond
		PFO	PSS	PEM	PUB			
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 bislineata*				●		●	●
whitetail deer	*Odocoileus virginianus*	●	●	●				
wild turkey	*Meleagris gallopavo*	●	●					
wood duck	*Aix sponsa*				●			●

Source: NCDOT and Virginia 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 ten 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 3-17 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 Project NRTR (NCDOT and Virginia 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. Field work was not conducted for the Northern long-eared bat, because it was listed after completion of field surveys.

Table 3-17
Federally Protected Species Listed for Counties in the Study Area

Scientific Name	Common Name	Status	County/State	Species Habitat	Habitat Present
Haliaeetus leucocephalus	bald eagle	BGPA	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
Myotis septentrionalis	Northern long-eared bat	T	Richmond, Colonial Heights, Chesterfield, Dinwiddie, Brunswick, Mecklenburg /VA Wake/NC	Live and dead trees of at least 3-inch diameter at breast height, caves, mines, barns, sheds, old buildings, bridges, and large culverts	Yes
Percina rex	Roanoke logperch	E	Dinwiddie, Brunswick/VA	medium to large streams and rivers with moderate gradient and relatively silt-free substrates	Yes
Alasmidonta heterodon	dwarf wedgemussel	E	Dinwiddie, Brunswick/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
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	Dinwiddie, Brunswick/ VA Franklin, Wake/NC	rocky or sandy open woods, woodland edges, and roadsides; dependent on disturbance; needs full sunlight	Yes
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

Table 3-17
Federally Protected Species Listed for Counties in the Study Area

Scientific Name	Common Name	Status	County/State	Species Habitat	Habitat Present
Aeschynomene virginica	sensitive joint-vetch	T	Chesterfield/ VA	fresh to slightly brackish tidal river shores and estuarine river marsh borders.	No
Echinacea laevigata	smooth coneflower	E	Chesterfield, Mecklenburg/ VA	openings in woods, such as cedar barrens and clear cuts, along roadsides and utility line rights-of-way, and on dry limestone bluffs	No
Helonias bullata	swamp pink	T	Chesterfield/ VA	forested wetlands that are groundwater influenced and are perennially water-saturated with a low frequency of inundation	No

Source: USFWS, 2012
Notes:
E Endangered. A taxon "in danger of extinction throughout all or a significant portion of its range."
T Threatened. A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
BGPA 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 VA and NC USFWS field offices list 20 FSC species for the counties in the Study Area.

The Virginia and North Carolina USFWS field offices list 20 FSC species for the counties in the Study Area. Project Team biologists conducted habitat surveys throughout the Study Area for FSC species habitat. Table 3-18 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 Project NRTR (NCDOT and Virginia DRPT, 2004a, 2008).

Table 3-18
Federal Species of Concern Listed for Counties in the Study Area

Scientific Name	Common Name	NCNHP Status	VDCR Status	County/State	Habitat Present
Aimophila aestivalis	Bachman's sparrow	SC	NL	Warren, Wake/NC	Yes
Etheostoma collis lepidinion	Carolina darter	SC	NL	Wake/NC	No
Heterodon simus	southern hognose snake	SC	NL	Wake/NC	Yes
Lythrurus matutinus	pinewoods shiner	W2	NL	Warren, Vance, Franklin, Wake/NC	Yes
Myotis austroriparius	southeastern myotis	SC	NL	Wake/NC	Yes
Noturus furiosus	Carolina madtom	T	NL	Vance, Franklin, Wake/NC	Yes
Anguilla rostrata	American eel	NL	NL	Franklin, Vance, Warren, Wake/NC	Yes
Ambloplites cavifrons	Roanoke bass	SR	NL	Franklin, Warren, Wake/NC	Yes
Elliptio lanceolata	yellow lance	E	NL	Warren, Vance, Franklin, Wake/NC	Yes
Fusconaia masoni	Atlantic pigtoe	E	LT	Dinwiddie, Brunswick, Mecklenburg/VA Warren, Franklin, Wake/NC	Yes
Lampsilis cariosa	yellow lampmussel	E	NL	Vance, Franklin/NC	Yes
Lasmigona subviridus	green floater	E	NL	Wake/NC	Yes
Speyeria diana	Diana fritillary butterfly	W2	NL	Wake/NC	Yes
Juncus caesariensis	New Jersey rush	NL	LT	Dinwiddie/VA	Yes
Lindera subcoriacea	bog spicebush	SR-T	NL	Wake/NC	No
Monotropsis odorata	sweet pinesap	SC-V	NL	Wake/NC	Yes
Phacelia covillei	buttercup phacelia	SR-T	NL	Vance/NC	Yes
Lotus unifoliolatus var. helleri	prairie birdsfoot-trefoil	SC-V	NL	Warren/NC	Yes
Sagittaria weatherbiana	grassleaf arrowhead	E	NL	Wake/NC	Yes

Table 3-18
Federal Species of Concern Listed for Counties in the Study Area

Scientific Name	Common Name	NCNHP Status	VDCR Status	County/State	Habitat Present
Trillium pusillum var. virginianum	Virginia least trillium	E	NL	Wake/NC	Yes

Source: USFWS, 2012; NCNHP, 2013; VADCR, 2013
Notes:
E Endangered. Any native or once-native species of wild animal whose continued existence as a viable component of NC's fauna is determined by NCWRC to be in jeopardy or any species of wild animal determined to be an 'endangered species' pursuant to the NC Endangered Species Act. (Article 25 of Chapter 113 of the NC General Statutes; 1987).
"Any species or higher taxon of plant whose continued existence as a viable component of the State's flora is determined to be in jeopardy" (NCGS 19B 106: 202.12).
T Threatened. "Any native or once-native species of wild animal which 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 pursuant to the NC Endangered Species Act." (Article 25 of Chapter 113 of the NC General Statutes; 1987).
LT Listed Threatened (VA)
SC Special Concern. "Any species of wild animal native or once-native to NC which is determined by the NCWRC to require monitoring but which may be taken under regulations adopted under the provisions of this Article." (Article 25 of Chapter 113 of the NC General Statutes; 1987).
SC-V Special Concern-Vulnerable. "Any species or higher taxon of plant which is likely to become a threatened species within the foreseeable future" (NCAC 02 NCAC 48F .0401).
SR Significantly Rare. Any animal species which has not been listed by the NCWRC as an Endangered, Threatened, or Special Concern species, but which exists in North Carolina (or recently occurred in North Carolina) in small numbers and has been determined by the NCNHP to need monitoring.
SR-T Significantly Rare-Throughout. The species is rare throughout its range (fewer than 100 populations total).
W2 Watch Category 2. Rare, but taxonomically questionable. Any other species believed to be rare and of conservation concern in North Carolina but not warranting active monitoring at this time.
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 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 Study Area, while other migratory birds live in the North Carolina and Virginia Piedmont and Virginia Coastal Plain

There are more than 800 species of birds covered under the MBTA; however, the Project is not located near a major bird migration flyway.

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 3-19.

Table 3-19
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
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 has been revised to include updated information on established communities and other elements of the human environment existing within the 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 the values and needs of the communities in the Study Area. 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 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 Project 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

The 2010 Census data became available subsequent to the release of the Richmond to Raleigh Project Tier II DEIS. This section uses 2000 and 2010 Census data and American Community Survey (ACS) 5-Year Summary File estimates to examine population and demographic data, including race, English-speaking ability, age, income, and poverty. For this Project, the Demographic Study Area was defined as the census block groups within or adjacent to the rail Study Area. Data for this area are compared with the same measures for the city or county and for the state. Note that the use of 2010 data resulted in some changes to the list of census tract and block group numbers in the Demographic Study Area that were used in the Richmond to Raleigh Project Tier II DEIS; the 2010 census tracts and block groups in the Demographic Study Area are shown in Appendix J.

As of the 2010 Census, the population increased by 7.6% to 219,845 people in the demographic Study Area. While there is an overall increase in population in the demographic Study Area, the growth rate is lower than that of the combined localities (26.8%) during the same period.

The Project traverses 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 Demographic Study Area. As of the 2010 Census, the population increased by 7.6% to 219,845 people in the Demographic Study Area. While there is an overall increase in population in the Demographic Study Area, the growth rate is lower than that of the combined localities (26.8%) during the same period. (Table 3-20).

Table 3-20
Population and Minority Changes: 2000 and 2010 Comparison in VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	2000 Pop.Total	2010 Pop. Total	% Change 2000 to 2010	2000 White (Alone) Not Minority	2010 White (Alone) Not Minority	% Change 2000 to 2010	2000 Minority (All Categories)	2010 Minority (All Categories)	% Change 2000 to 2010
Virginia	7,078,515	8,001,024	13.0%	5,116,929	5,186,450	1.4%	1,961,586	2,814,574	43.5%
				72.3%	64.8%	-7.5%	27.8%	35.2%	7.4%
Richmond City	197,790	204,214	3.2%	76,204	79,813	4.7%	121,586	128,082	5.3%
				38.5%	41.7%	3.2%	61.6%	58.3%	-3.3%
Demographic Study Area	10,646	15,954	49.9%	2,835	4,394	55.0%	7,811	11,560	48.0%
				26.60%	27.5%	0.9%	73.4%	72.5%	-0.9%
Chesterfield County	259,903	316,236	21.7%	198,872	206,792	4.0%	61,031	109,444	79.3%
				76.5%	65.4%	-11.1%	23.4%	34.6%	11.2%
Demographic Study Area	38,142	44,568	16.8%	25,165	23,352	-7.2%	12,977	21,216	63.5%
				66.00%	52.4%	-13.6%	34.0%	47.6%	13.6%
Colonial Heights City	16,897	17,411	3.0%	15,148	14,020	-7.4%	1,749	3,391	93.9%
				89.6%	80.5%	-9.1%	10.3%	19.5%	9.2%
Demographic Study Area	7,875	8,303	5.4%	6,648	6,202	-6.7%	1,329	2,101	58.1%
				84.4%	74.7%	-9.7%	15.4%	25.3%	9.9%
Petersburg City	33,740	32,420	-3.9%	6,212	4,902	-21.1%	27,528	27,518	0.0%
				18.4%	15.1%	-3.3%	81.7%	84.9%	3.2%
Demographic Study Area	12,098	12,655	4.6%	1,620	1,764	8.9%	10,478	10,891	3.9%
				13.4%	13.9%	0.5%	86.5%	86.1%	-0.4%
Dinwiddie County	24,533	28,001	14.1%	15,913	17,617	10.7%	8,620	10,384	20.5%
				64.9%	62.9%	-2.0%	35.3%	37.1%	1.8%
Demographic	11,517	13,608	18.2%	6,996	8,463	21.0%	4,521	5,145	13.8%

Table 3-20
Population and Minority Changes: 2000 and 2010 Comparison in VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	2000 Pop.Total	2010 Pop. Total	% Change 2000 to 2010	2000 White (Alone) Not Minority	2010 White (Alone) Not Minority	% Change 2000 to 2010	2000 Minority (All Categories)	2010 Minority (All Categories)	% Change 2000 to 2010
Study Area				60.70%	62.2%	1.5%	39.3%	37.8%	-1.5%
Brunswick County	18,419	17,434	-5.3%	7,723	6,943	-10.1%	10,696	10,491	-1.9%
				41.9%	39.8%	-2.1%	58.0%	60.2%	2.2%
Demographic Study Area	7,067	8,471	19.9%	2,680	3,067	14.4%	4,378	5,404	23.4%
				37.9%	36.2%	-1.7%	61.8%	63.8%	2.0%
Mecklenburg County	32,380	32,727	1.1%	19,190	19,215	0.1%	13,190	13,512	2.4%
				59.3%	58.7%	-0.6%	40.7%	41.3%	0.6%
Demographic Study Area	5,595	6,141	9.8%	3,235	3,708	14.6%	2,360	2,433	3.1%
				57.8%	60.4%	2.6%	41.6%	39.6%	-2.0%
North Carolina	8,049,313	9,535,483	18.5%	5,802,165	6,223,995	7.3%	2,247,148	3,311,488	47.4%
				72.1%	65.3%	-6.8%	27.9%	34.7%	6.8%
Warren County	19,972	20,972	5.0%	7,793	7,971	2.3%	12,179	13,001	6.7%
				39.0%	38.0%	-1.0%	61.0%	62.0%	1.0%
Demographic Study Area	5,205	5,768	10.8%	2,113	2,205	4.4%	3,092	3,563	15.2%
				40.6%	38.2%	-2.4%	59.4%	61.8%	2.4%
Vance County	42,954	45,422	5.7%	20,778	19,101	-8.1%	22,176	26,367	18.9%
				48.4%	42.1%	-6.3%	51.6%	58.0%	6.4%
Demographic Study Area	25,432	26,032	2.4%	10,925	9,232	-15.5%	14,507	16,800	15.8%
				43.0%	35.5%	-7.5%	57.0%	64.5%	7.5%
Franklin County	47,260	60,619	28.3%	31,290	38,478	23.0%	15,970	22,141	38.6%

Table 3-20
Population and Minority Changes: 2000 and 2010 Comparison in VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	2000 Pop.Total	2010 Pop. Total	% Change 2000 to 2010	2000 White (Alone) Not Minority	2010 White (Alone) Not Minority	% Change 2000 to 2010	2000 Minority (All Categories)	2010 Minority (All Categories)	% Change 2000 to 2010
				66.2%	63.5%	-2.7%	33.7%	36.5%	2.8%
Demographic Study Area	14,471	17,516	21.0%	9,821	11,635	18.5%	4,650	5,881	26.5%
				67.9%	66.4%	-1.5%	32.1%	33.6%	1.5%
Wake County	627,846	900,993	43.5%	453,928	560,536	23.5%	173,918	340,457	95.8%
				72.3%	62.2%	-10.1%	27.8%	37.8%	10.0%
Demographic Study Area	66,297	60,829	-8.2%	44,466	35,196	-20.8%	21,831	25,633	17.4%
				67.1%	57.9%	-9.2%	32.9%	42.1%	9.2%
VA/NC Localities Combined	1,321,694	1,676,449	26.8%	853,051	975,388	14.3%	468,643	704,788	50.4%
				64.5%	58.2%	-6.4%	35.5%	42.0%	6.6%
VA/NC Demographic Study Area	204,345	219,845	7.6%	116,504	109,218	-6.3%	87,934	110,627	25.8%
				57.0%	49.7%	-7.3%	43.0%	50.3%	7.3%

Source: Census 2000 and Census 2010 Summary File 1; QTP4

3.11.1.1 *RACE*

Minorities are defined as all race/ethnicity categories except non-Hispanic White persons.

The combined population of the localities along the project is 42% minority. However, the population within the demographic Study Area is a greater percentage minority at 50.3%. The demographic Study Area location with the highest percentage of minority residents is Petersburg, VA, where 86.1% of the demographic Study Area is non-white or mixed race.

Based on the 2010 Census, the combined population of the localities along the project is 42% minority. However, the population within the Demographic Study Area is a greater percentage minority at 50.3%. The Demographic Study Area location with the highest percentage of minority residents is Petersburg, VA, where 86.1% of the Demographic Study Area is non-white or mixed race. Conversely, the locality with the lowest percentage of minority residents is directly to the north in Colonial Heights, VA, where 80.5% of the overall population is white. In the Demographic Study Area portion of Colonial Heights, 74.7% of the population is white. Racial diversity within the Study Area is presented in Tables 3-20 and 3-21. Black or African Americans make up the largest minority group throughout the Study Area.

As shown in Table 3-20, the percentage of minority populations is increasing in Virginia and North Carolina as a whole. This trend is even more pronounced in the Study Area localities and in the census block groups adjacent to or within the Project corridor.

Table 3-21
2010 Race: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Total Population	White (Alone)	Black or African American (Alone)	American Indian and Alaska Native (Alone)	Asian (Alone)	Native Hawaiian and Other Pacific Islander (Alone)	Some Other Race (Alone)	Hispanic or Latino	Multi-Racial
Virginia	8,001,024	5,186,450	1,523,704	20,679	436,298	5,061	15,338	631,825	181,669
	100%	64.8%	19.0%	0.3%	5.5%	0.1%	0.2%	7.9%	2.3%
Richmond City	204,214	79,813	102,264	514	4,679	93	367	16,484	3,681
	100%	41.7%	53.4%	0.3%	2.4%	0.0%	0.2%	0.1%	1.9%
Demographic Study Area	15,954	4,394	9,118	74	475	13	52	1,532	296
	100%	27.5%	57.2%	0.5%	3.0%	0.1%	0.3%	9.6%	1.9%
Chesterfield County	316,236	206,792	68,196	849	10,219	142	606	22,864	6,568
	100%	65.4%	21.6%	0.3%	3.2%	0.0%	0.2%	7.2%	2.1%
Demographic Study Area	44,568	23,352	14,605	166	834	32	91	4,495	993
	100%	52.4%	32.8%	0.4%	1.9%	0.1%	0.2%	10.1%	2.2%
Colonial Heights City	17,411	14,020	1,732	63	570	8	14	674	330
	100%	80.5%	9.9%	0.4%	3.3%	0.0%	0.1%	3.9%	1.9%
Demographic Study Area	8,303	6,202	1,152	25	320	6	3	417	178
	100%	74.7%	13.9%	0.3%	3.9%	0.1%	0.0%	5.0%	2.1%
Petersburg	32,420	4,902	25,419	87	263	12	31	1,216	490

Table 3-21
2010 Race: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Total Population	White (Alone)	Black or African American (Alone)	American Indian and Alaska Native (Alone)	Asian (Alone)	Native Hawaiian and Other Pacific Islander (Alone)	Some Other Race (Alone)	Hispanic or Latino	Multi-Racial
City	100%	15.1%	78.4%	0.3%	0.8%	0.0%	0.1%	3.8%	1.5%
Demographic Study Area	12,655	1,764	10,157	30	56	2	11	449	186
	100%	13.9%	80.3%	0.2%	0.4%	0.0%	0.1%	3.5%	1.5%
Dinwiddie County	28,001	17,617	9,134	83	122	7	18	674	346
	100%	62.9%	32.60	0.3%	0.4%	0.0%	0.1%	2.4%	1.2%
Demographic Study Area	13,608	8,463	4,489	32	67	2	6	351	198
	100%	62.2%	33.0%	0.2%	0.5%	0.0%	0.0%	2.6%	1.5%
Brunswick County	17,434	6,943	9,944	35	47	4	9	298	154
	100%	39.8%	57.0%	0.2%	0.3%	0.0%	0.1%	1.7%	0.9%
Demographic Study Area	8,471	3,067	5,109	27	22	1	3	147	95
	100%	36.2%	60.3%	0.3%	0.3%	0.0%	0.0%	1.7%	1.1%
Mecklenburg County	32,727	19,215	11,958	73	213	10	22	806	430
	100%	58.7%	36.5%	0.2%	0.7%	0.0%	0.1%	2.5%	1.3%
Demographic Study Area	6,141	3,708	2,019	14	31	1	5	273	90
	100%	60.4%	32.9%	0.2%	0.5%	0.0%	0.1%	4.4%	1.5%
North Carolina	9,535,483	6,223,995	2,019,854	108,829	206,579	5,259	15,088	800,120	155,759
	100%	65.3%	21.2%	1.1%	2.2%	0.1%	0.2%	8.4%	1.6%
Warren County	20,972	7,971	10,911	1,026	49	3	21	692	299
	100%	38.0%	52.0%	4.9%	0.2%	0.0%	0.1%	3.3%	1.4%
Demographic Study Area	5,768	2,205	3,240	35	14	3	4	198	69
	100%	38.2%	56.2%	0.6%	0.2%	0.1%	0.1%	3.4%	1.2%
Vance County	45,422	19,101	22,477	79	199	7	41	3,518	46
	100%	42.1%	49.5%	0.2%	0.4%	0.0%	0.1%	7.7%	0.1%
Demographic Study Area	26,032	9,232	14,076	49	80	1	30	2,316	248
	100%	35.5%	54.1%	0.2%	0.3%	0.0%	0.1%	8.9%	1.0%
Franklin County	60,619	38,478	15,995	253	272	5	67	4,776	773
	100%	63.5%	26.4%	0.4%	0.4%	0.0%	0.1%	7.9%	1.3%
Demographic Study Area	17,516	11,635	4,136	68	128	2	19	1,293	235
	100%	66.4%	23.6%	0.4%	0.7%	0.0%	0.1%	7.4%	1.3%

Table 3-21
2010 Race: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Total Population	White (Alone)	Black or African American (Alone)	American Indian and Alaska Native (Alone)	Asian (Alone)	Native Hawaiian and Other Pacific Islander (Alone)	Some Other Race (Alone)	Hispanic or Latino	Multi-Racial
Wake County	900,993	560,536	182,793	2,537	48,287	317	1,755	87,922	16,846
	100%	62.2%	20.3%	0.3%	5.4%	0.0%	0.2%	9.8%	1.9%
Demographic Study Area	60,829	35,196	14,748	167	1,402	34	97	8,013	1,172
	100%	57.9%	24.2%	0.3%	2.3%	0.1%	0.2%	13.2%	1.9%
VA/NC Localities Combined	1,676,449	975,388	460,823	5,599	64,920	608	2,951	139,924	29,963
	100%	58.2%	27.5%	0.3%	3.9%	0.0%	0.2%	8.4%	1.8%
VA/NC Demographic Study Area Combined	219,845	109,218	82,849	687	3,429	97	321	19,484	3,760
	100%	49.7%	37.7%	0.3%	1.6%	0.0%	0.2%	8.9%	1.7%

Source: Census 2010 Summary File 1; QTP4.

3.11.1.2 *LIMITED ENGLISH PROFICIENCY*

The highest percentages of Limited English Proficiency (LEP) within the Demographic Study Area are in Mecklenburg County, VA, and Wake County, NC. The Hispanic or Latino population makes up the

Limited English Proficiency (LEP) occurs when a person or population speaks English less than "very well." The 2010 census indicates that 5.7% of Virginia and 2.8% of North Carolina residents are classified as LEP (Table 3-22). Table 3-22 also presents the LEP percentages for the localities along the Project corridor and the Demographic Study Area. The highest percentages within the Demographic Study Area are found in Mecklenburg County, VA, and Wake County, NC. Based on the race data provided in Table 3-21, the Hispanic or Latino population makes up the majority of LEP individuals.

3.11.1.3 *AGE*

According to the 2010 Census, 23% of Virginians were under age 18, while 12% were age 65 or older. In North Carolina, 23.9% were under age 18, while 12.9% were age 65 or older (Table 3-23). The age dependency ratio is the ratio of dependent-age population to the working age population and is derived by dividing the combined under 18 and 65-and-over populations by the 18-to-64 population and multiplying by 100 (US Census Bureau, 2012). The higher the ratio, the greater the support burden is for those working. The age dependency ratio is 54.7:100 in Virginia and 58.4:100 in North Carolina, compared to 58.9:100 in the United States. As the data Table 3-23 demonstrate, the Study Area ranges from urban centers with large working age populations to rural counties with

The age dependency ratio is 54.7:100 in VA and 58.4:100 in NC, compared to 58.9:100 in the United States.

higher proportions of younger and older residents.

3.11.1.4 *INCOME AND POVERTY*

The 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 locality.

For 2010, the US Census Bureau established the poverty threshold for a household/family of four as $22,314. Based on the 2010 Census, 429,533 Virginia households (14.4%) and 755,625 North Carolina households (20.8%) were found to live below the poverty threshold (Table 3-24). In the Virginia portion of 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 portion of Study Area, the urban center had poverty levels lower than the state average, adjacent suburban counties had a poverty rate equivalent with the state average, and rural counties had higher poverty levels. With the exception of Chesterfield County, VA, and Wake County, NC, all Study Area localities had lower median household than their respective states. Only Wake County exceeded the state per capita income of Study Area localities. Overall, Demographic Study Area tends to have a greater percentage of households below the poverty threshold than do the localities within which they are located.

With the exception of Chesterfield County, VA, and Wake County, NC, all Study Area localities had lower median household than their respective states. Only Wake County exceeded the state per capita income of Study Area localities. Demographic Study Area tends to have a greater percentage of households below the poverty threshold than do the localities within which they are located.

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 indicate 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 are documented in Table 3-25. In Virginia and North Carolina, the lowest percentages of owner occupied housing are in the Demographic Study Area within the cities of Richmond and Raleigh. This is not surprising given that house prices are typically greater per square foot in urban areas than in rural areas. Similarly, the highest percentages of households without vehicles are also in Richmond and Raleigh. While this is a reflection of low-income households, the lack of vehicle ownership is somewhat offset by the availability of public transportation in these urban areas. In rural areas, the lack of a vehicle is more onerous as public transportation is often not available, compounding the cycle of rural poverty.

Table 3-22
Limited English Proficiency: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Population by Age Group Who Speak English Less Than "Very Well"								
	Ages 5-17		Ages 18-64		Ages 65 and over		Total Population Ages 5 and over		% Population Ages 5 and over Who Speak English Less than "Very Well"
	Estimate	Standard Error (SE)	Estimate	Standard Error (SE)	Estimate	Standard Error (SE)	Estimate	Standard Error (SE)	
Virginia	41,250	2,710	336,330	4,789	37,817	1,069	7,335,505	488	5.7%
Richmond City	931	232	6,963	670	281	101	188,805	11	4.3%
Demographic Study Area	51	491	722	261	11	501	13,799	761	5.7%
Chesterfield County	1,439	447	10,742	598	815	158	288,569	19	4.5%
Demographic Study Area	285	725	1,844	620	72	783	37,364	940	5.9%
Colonial Heights City	86	35	377	165	65	133	16,608	19	3.2%
Demographic Study Area	42	316	271	245	65	344	7,615	393	5.0%
Petersburg City	31	157	195	146	62	109	30,246	52	1.0%
Demographic Study Area	13	482	78	480	13	482	11,218	632	0.9%
Dinwiddie County	22	121	311	69	16	113	25,875	57	1.3%
Demographic Study Area	12	463	118	412	12	457	11,960	575	1.2%
Brunswick County	0	0	144	0	27	0	16,847	N/A	1.0%
Demographic Study Area	0	353	80	290	27	353	8,628	503	1.2%
Mecklenburg County	79	95	452	81	52	78	31,133	38	1.9%

Table 3-22
Limited English Proficiency: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Population by Age Group Who Speak English Less Than "Very Well"								
	Ages 5-17		Ages 18-64		Ages 65 and over		Total Population Ages 5 and over		% Population Ages 5 and over Who Speak English Less than "Very Well"
	Estimate	Standard Error (SE)	Estimate	Standard Error (SE)	Estimate	Standard Error (SE)	Estimate	Standard Error (SE)	
Demographic Study Area	11	797	75	360	362	0	5,369	413	8.3%
North Carolina	58,675	2,346	161,324	3,189	18,570	1,004	8,649,307	390	2.8%
Warren County	29	134	242	58	47	3,624	19,643	57	1.6%
Demographic Study Area	0	309	117	253	0	299	4,161	432	2.8%
Vance County	188	151	850	222	10	3,625	41,825	1	2.5%
Demographic Study Area	162	654	740	615	10	668	24,364	977	3.7%
Franklin County	316	206	1,756	264	72	108	54,556	24	3.9%
Demographic Study Area	59	358	399	328	0	401	14,557	598	3.1%
Wake County	6,872	952	42,246	1,607	3,050	3,468	786,528	2	6.6%
Demographic Study Area	346	784	2,962	523	62	840	51,316	1,330	6.6%

Source: 2010 ACS 5yr Estimate. Population by Age Group Who Speak English Less Than Very Well – BG B16004.

Table 3-23
Age: VA and NC Localities and Demographic Study Area (Within Each Locality)

Virginia			North Carolina		
Location	**Under Age 18**	**Age 65 or Older**	**Location**	**Under Age 18**	**Age 65 or Older**
Virginia	23.0%	12.0%	**North Carolina**	23.9%	12.9%
Richmond City	18.6%	11.1%	Warren County	20.3%	18.9%
Demographic Study Area	21.4%	6.3%	Demographic Study Area	18.9%	15.2%
Chesterfield County	26.1%	10.4%	Vance County	25.4%	14.1%
Demographic Study Area	25.1%	9.4%	Demographic Study Area	26.3%	12.3%
Colonial Heights City	22.3%	19.6%	Franklin County	24.5%	12.7%
Demographic Study Area	22.8%	18.5%	Demographic Study Area	26.4%	10.6%
Petersburg City	20.7%	15.0%	Wake County	26.0%	8.5%
Demographic Study Area	19.5%	15.3%	Demographic Study Area	24.0%	8.2%
Dinwiddie County	22.8%	13.7%			
Demographic Study Area	22.1%	14.7%			
Brunswick County	19.3%	16.5%			
Demographic Study Area	21.7%	17.5%			
Mecklenburg County	19.5%	20.7%			
Demographic Study Area	20.9%	21.0%			

Source: 2010 Census Summary File 1; Detailed Table P12.

Table 3-24
Income and Poverty: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Median Household Income				Per Capita Income				Households Below Poverty Level (1)				
	Low*		High*		Low*		High*						
	Low Estimate	Low Estimate SE	High Estimate	High Estimate SE	Low Estimate	Low Estimate SE	High Estimate	High Estimate SE	Total # Households	Standard Error (SE)	# Households Below Poverty Level Estimate	Standard Error (SE)	% Households Below Poverty Level Estimate
Virginia	$61,406		143 SE		$32,145		95 SE		2,974,481	5,858	429,533	2,818	14.4%
Richmond City	$38,266		533 SE		$26,034		428 SE		83,498	657	23,260	620	27.9%
Demographic Study Area	$17,368	5,380	$54,000	4,297	$10,684	1,159	$46,387	7,840	6,044	210	1,845	222	30.5%
Chesterfield County	$71,321		712 SE		$31,711		278 SE		112,404	452	9,271	418	8.2%
Demographic Study Area	$12,031	10,015	$91,923	15,939	$8,310	819	$44,186	2,704	14,940	310	2,118	459	14.2%
Colonial Heights City	$50,571		2548 SE		$26,115		741 SE		7,075	137	938	111	13.3%
Demographic Study Area	$36,522	6,299	$52,593	10,470	$18,966	1,277	$27,302	1,401	3,272	141	663	129	20.3%
Petersburg City	$36,449		1208 SE		$19,142		521 SE		12,305	222	3,125	222	25.4%
Demographic Study Area	$21,192	1,883	$61,413	10,503	$9,186	1,703	$28,895	2,184	4,626	203	1,129	221	24.4%
Dinwiddie County	$51,459		1942 SE		$23,423		744 SE		9,800	154	1,449	160	14.8%

Table 3-24
Income and Poverty: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Median Household Income				Per Capita Income				Households Below Poverty Level (1)				
	Low*		High*		Low*		High*						
	Low Estimate	Low Estimate SE	High Estimate	High Estimate SE	Low Estimate	Low Estimate SE	High Estimate	High Estimate SE	Total # Households	Standard Error (SE)	# Households Below Poverty Level Estimate	Standard Error (SE)	% Households Below Poverty Level Estimate
Demographic Study Area	$41,618	8,176	$56,354	10,414	$23,105	1,981	$26,212	2,671	4,763	197	791	167	16.6%
Brunswick County	$35,184		1753 SE		$16,739		835 SE		6,086	229	1,644	169	27.0%
Demographic Study Area	$29,556	4,333	$47,500	7,774	$12,721	1,300	$21,077	1,924	3,509	202	1,109	135	31.6%
Mecklenburg County	$36,431		1245 SE		$20,162		790 SE		12,594	249	3,533	228	28.1%
Demographic Study Area	$20,625	5,607	$60,625	30,045	$15,846	1,113	$24,815	2,194	2,320	148	749	133	32.3%
North Carolina	$45,570		125 SE		$24,745		71 SE		3,626,179	5,799	755,625	3,568	20.8%
Warren County	$30,641		2,137 SE		$17,838		1,119 SE		7,835	217	2,776	206	35.4%
Demographic Study Area	$21,143	5,272	$35,196	5,276	$17,599		2,351 SE		1,776	154	718	149	40.4%
Vance County	$34,025		1019 SE		$17,622		607 SE		16,473	261	5,154	295	31.3%
Demographic Study Area	$9,583	4,643	$47,366	8,106	$9,620	1,596	$27,345	2,495	9,012	311	3,115	281	34.6%

Table 3-24
Income and Poverty: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Median Household Income				Per Capita Income				Households Below Poverty Level (1)				
	Low*		High*		Low*		High*						
	Low Estimate	Low Estimate SE	High Estimate	High Estimate SE	Low Estimate	Low Estimate SE	High Estimate	High Estimate SE	Total # Households	Standard Error (SE)	# Households Below Poverty Level Estimate	Standard Error (SE)	% Households Below Poverty Level Estimate
Franklin County	$43,710		1,170 SE		$21,331		407 SE		22,765	332	4,884	297	21.5%
Demographic Study Area	$38,269	8,114	$70,754	6,382	$19,410	1,709	$25,229	1,576	6,286	223	1,186	154	18.9%
Wake County	$63,770		447 SE		$32,592		210 SE		325,486	971	39,413	898	12.1%
Demographic Study Area	$11,094	6,719	$83,698	8,422	$2,913	483	$48,512	4,638	22,980	412	4,312	423	18.8%

Sources: Census 2010 SF1: Owner Occupied Housing – H11. 2010 ACS 5-Year Estimates: Median Household Income – B19013; Per Capita Income – DP03; Households Below Poverty Level – B19001

(1) Households below the poverty level were determined based on the 2010 ACS 5yr Estimates and 2010 Census Bureau poverty threshold of $22,314 for a family/household of four persons.

* Of the Census Block Groups or Census Tracts in the Study Area within the county.

Table 3-25
Vehicle and Home Ownership: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Total Households		No Vehicle Household			Owner Occupied Housing (1)
	#	Standard Error (SE)	Estimate	Standard Error (SE)	% No Vehicle Households Estimate	
Virginia	2,974,481	5,858	102,149	1,861	3.4%	68.9%
Richmond City	83,498	657	8,283	501	9.9%	43.7%
Demographic Study Area	6,044	210	1,044	140	17.3%	26.0%
Chesterfield County	112,404	452	1,848	258	1.6%	78.4%
Demographic Study Area	14,940	310	465	220	3.1%	66.0%
Colonial Heights City	7,075	137	177	86	2.5%	65.4%
Demographic Study Area	3,272	141	177	139	5.4%	49.9%
Petersburg City	12,305	222	702	159	5.7%	45.1%
Demographic Study Area	4,626	203	365	141	7.9%	43.3%
Dinwiddie County	9,800	154	285	91	2.9%	76.5%
Demographic Study Area	4,763	197	261	84	5.5%	74.6%
Brunswick County	6,086	229	205	90	3.4%	72.2%
Demographic Study Area	3,509	202	205	91	5.8%	68.1%
Mecklenburg County	12,594	249	380	97	3.0%	70.9%
Demographic Study Area	2,320	148	32	81	1.4%	77.2%
North Carolina	3,626,179	5,799	104,197	1,876	2.9%	67.8%

Table 3-25
Vehicle and Home Ownership: VA and NC Localities and Demographic Study Area (Within Each Locality)

Location	Total Households		No Vehicle Household			Owner Occupied Housing (1)
	#	Standard Error (SE)	Estimate	Standard Error (SE)	% No Vehicle Households Estimate	
Warren County	7,835	217	216	55	2.8%	72.1%
Demographic Study Area	1,776	154	30	18	1.7%	66.3%
Vance County	16,473	261	705	157	4.3%	61.4%
Demographic Study Area	9,012	311	653	165	7.2%	56.8%
Franklin County	22,765	332	309	97	1.4%	74.2%
Demographic Study Area	6,286	223	30	111	0.5%	78.2%
Wake County	325,486	971	9,577	541	2.9%	68.2%
Demographic Study Area	22,980	412	1,593	240	6.9%	50.7%

Sources: Census 2010 SF1: Owner Occupied Housing – H11; 2010 ACS 5-Year Estimates: No Vehicle Household – B09141

(1) Owner Occupied Housing was determined from 2010 Census Summary File 1 data. All other determinations were derived from 2010 ACS 5yr Estimates.

3.11.2 ECONOMICS

3.11.2.1 *COMMUNITY ECONOMIC PROFILE*

The Study Area traverses three distinct macro-regions across two states (Table 3-26). 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.

The 2007-2011 American Community Survey 5-Year Estimates (Source File DP03) data on Selected Economic Characteristics was used to update the employment data presented in the Richmond to Raleigh Project Tier II DEIS for the cities, counties, and communities described in Table 3-27.

Table 3-26 State Profile Comparisons		
Selected Economic Characteristic	**Virginia**	**North Carolina**
Civilian Labor Force (2011)	4,210,000	4,723,000
Labor Force Participation Rate (2011)	66.6%	63.0%
Total Employment (2011)	3,962,000	4,275,000
Total Unemployment (2011)	247,000	448,000
Unemployment Rate (2011)	5.9%	9.5%
High School Graduates – 25+ years (2011)	86.6%	84.1%
College Graduates – 25+ years (2011)	34.4%	26.5%
Per Capita Income (2011)	$31,746	$23,955
Median Family Income (2011)	$75,962	$57,171
Population (2011-Projected)	8,064,574	9,658,876

North Carolina Department of Commerce, State to State Comparisons, 2013

Table 3-27
Percent Employment by Sector by Community

State	Area	Employment Sector								
		Construction	Financial	Government	Information	Manufacturing	Mining	Services	Trade: Combined (Wholesale and Retail)	Transportation/Utilities
Virginia	Richmond City	6.1%	8.4%	16.5%	2.1%	6.1%	0.3%	21.0%	8.3%	4.2%
	Chesterfield County	6.9%	9.5%	19.4%	2.0%	8.9%	0.3%	13.9%	14.9%	5.4%
	Colonial Heights	8.9%	5.6%	20.9%	0.7%	9.4%	0.2%	19.1%	16.8%	5.2%
	Petersburg City	5.50%	3.5%	26.2%	0.7%	10.4%	0.4%	24.9%	14.4%	4.3%
	Dinwiddie County	10.8%	3.8%	23.1%	0.8%	12.6%	2.3%	17.3%	18.4%	6.1%
	Brunswick County	9.3%	4.5%	25.9%	1.6%	12.6%	2.9%	24.7%	14.3%	4.1%
	Mecklenburg County	8.8%	3.8%	21.7%	1.9%	11.7%	3.8%	19.0%	14.5%	7.2%
North Carolina	Warren County	6.5%	3.0%	24.9%	0.7%	12.5%	4.5%	19.6%	15.4%	4.9%
	Vance County	6.0%	3.7%	20.7%	0.4%	16.1%	1.3%	21.5%	17.2%	3.9%
	Franklin County	12.5%	4.9%	16.6%	1.5%	13.4%	2.3%	14.90 %	15.8%	4.7%
	Wake County	6.5%	7.3%	15.6%	3.2%	9.4%	0.4%	13.0%	13.3%	3.5%

Source: U.S. Census Bureau, American Fact Finder. Selected Economic Characteristics: 2007-2011 American Community Survey. Source File DP03.

3.11.2.1.1 VIRGINIA

3.11.2.1.1.1 *RICHMOND*

Richmond, Chesterfield County, Colonial Heights, and Petersburg, and Dinwiddie County are part of the Richmond-Petersburg metropolitan statistical area (MSA). In each of these areas, the 3 of the top 4 employers are the government, wholesale/retail trade, and the service industry.

Richmond is the largest city within the Richmond-Petersburg metropolitan statistical area (MSA) and, as the state capital, state government is one of the city's largest employers, second only to the service industry. The city is also a major financial center and wholesale and retail trade center.

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. Similar to Richmond, government is one of the largest employers, followed by wholesale/retail trade and the service industry.

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 (DSCR), 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. Government, the service industry, and wholesale/retail trade account for the majority of employment.

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, and 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. Like Colonial Heights, government, the service industry, and wholesale/retail trade account for the majority of employment.

Major manufacturing employers are BI Chemicals Inc., Boars Head Provisions, Brenco Inc., and Inland Temple Container. Other major employers include BP Short and Son Paving

Company, Roper Bros Lumber, Southside Regional Medical Center, the Fort Lee Army Base, Virginia State University and Virginia T's.

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. As with the communities to the north, government, the service industry, and wholesale/retail trade account for the majority of employment.

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 and Mecklenburg counties are part of Southside Virginia. Agriculture, manufacturing, government, service, and wholesale/retail trade are important industries in this area.

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 (Raleigh-Durham-Chapel Hill area) in North Carolina. 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. Government, the service industry, and wholesale/retail trade account for the majority of employment.

Major manufacturing employers include Brick and 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. Government, the service industry, and wholesale/retail trade account for the majority of employment.

Major manufacturing employers include American Building Company, Brodnax Mills Inc., Carlisle Motion Control, International Veneer Company, 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 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. Government, the service industry, and wholesale/retail trade account for the majority of employment.

The Raleigh-Durham MSA starts in Warren County and continues through Vance and Franklin counties before reaching Wake County, becoming more urban towards the south. Government, the service industry, and wholesale/retail trade account for the majority of employment.

Major manufacturing employers include Elberta Crate and Box Company, 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. Service, government, and wholesale/retail trade account for the majority of employment in the area.

Major manufacturing employers include Wal-Mart distribution center, Pacific Coast Feather Co, Saint-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 County is 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. Government, service, and wholesale/retail trade account for the majority of employment in the area.

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. Government, wholesale/retail trade, and the service industry account for the majority of employment in the area.

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 the state economies. The Virginia Department of

Agriculture and Consumer Services states agriculture is the largest industry by far, with no other business sector even a close second. The agriculture industry has an economic impact of $52 billion annually and provides more than 357,000 jobs in Virginia. Agriculture and forestry combined have a total economic impact of almost $70 billion. The total employment impact was approximately 414,700 employees. Every job in agriculture and forestry supports 1.6 jobs elsewhere in the Virginia economy (VDACS, 2013).

The North Carolina Department of Agriculture and Consumer Services states that North Carolina's agricultural industry, including food, fiber, and forestry; contributes $70 billion annually to the State's economy; accounts for 18% of the State's income; and employs over 17% of the work force (NCDACS, 2013).

Agriculture is a minor element of the economy within the Richmond metropolitan area. It employs only about 0.3% of the Richmond, Petersburg, and Chesterfield County workforce, and 0.2% of Colonial Heights. Agricultural employment increases in suburban fringe Dinwiddie County to 2.3% and in more rural Brunswick and Mecklenburg Counties to 2.9% and 3.8%, respectively.

In NC, agriculture employs 4.5% of the workforce in rural Warren County. In suburban fringe Vance and Franklin counties, agricultural employment drops to 1.3% and 2.3%, respectively. Much like metropolitan Richmond, only 0.4% of the workforce in urban Wake County is involved with agriculture.

Cities and counties within the Study Area vary from urban state capitals to suburban bedroom communities to rural areas; therefore, the relative economic importance of agriculture varies substantially. Agriculture is a minor element of the economy within the Richmond metropolitan area. It employs only about 0.3% of the Richmond, Petersburg, and Chesterfield County workforce, and 0.2% of Colonial Heights. Agricultural employment increases in suburban fringe Dinwiddie County to 2.3% and in more rural Brunswick and Mecklenburg Counties to 2.9% and 3.8%, respectively (US Census Bureau, American Fact Finder, 2013).

In North Carolina, agriculture employs 4.5% of the workforce in rural Warren County. In suburban fringe Vance and Franklin counties, agricultural employment drops to 1.3% and 2.3%, respectively. Much like metropolitan Richmond, only 0.4% of the workforce in urban Wake County is involved with agriculture (US Census Bureau, American Fact Finder, 2013).

While agriculture does not employ many people within the overall Study Area, in places it makes a substantial contribution to the local economy. Based on the most recent 2007 Census of Agriculture, the agricultural market value of products sold in rural and exurban counties in Virginia was $12.6 million in Dinwiddie County, $32.2 million in Brunswick County, and $32.2 million in Mecklenburg County. In North Carolina, the agricultural market value of products sold was $22.9 million in Warren County and $48.1 million in Franklin County. 2007 data for Vance County was not disclosed (USDA, 2007).

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.

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. Richmond Region Tourism estimates over 6 million visitors come to the region each year and spend over $1.93 billion annually (Richmond Region Tourism, 2013).

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, as well as some arts and crafts activities.

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 and 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 and Visitors Bureau estimates approximately 12.4 million visitors to the region contributed over $1.9 billion to the economy in the 2012-2013 fiscal year (GRCVB, 2013).

3.11.3 LAND USE AND TRANSPORTATION PLANNING

This section identifies the entities responsible for the oversight of general land development planning and transportation planning in and around the SEHSR Study Area. Updated information has been added to summarize the most recent adopted plans and studies from each agency (as relevant to the Project), as well as an expanded discussion of relevant planning activities by state, regional and local agencies. Connectivity to other modes of transportation is an important aspect of planning for existing and future passenger rail stations. Refer to Section 1.4.3 for additional discussion regarding local planning efforts related to development of stations, which are being undertaken separately, outside of this Project.

3.11.3.1 *STATE PLANNING*

The following section identifies existing state improvement plans in the Study Area. The intent of the Project is not to build local, planned improvements along in its path; however, the designs for the preferred alternative (as discussed further throughout this Richmond to Raleigh Project Tier II FEIS) were developed to ensure that they would include improvements that either worked in conjunction with other plans, or assure that the Project would not preclude future planned improvements.

The intent of the Project is not to build local, planned improvements along its path; however, the designs for the preferred alternative were developed to ensure that they would include improvements that either worked in conjunction with other plans, or assure that the Project would not preclude future planned improvements.

3.11.3.1.1 VIRGINIA

Virginia 2035 Surface Transportation Plan (VSTP) (April 2013) This plan identifies deficiencies in Virginia's transportation systems, and recommends improvements including capacity expansion and spot improvements, as well as intelligent transportation systems and transportation demand management solutions. No projects requiring detailed coordination with the Project were identified in the VSTP 2035.

Virginia Statewide Rail Plan (2013) This newly updated business plan issued by the Virginia DRPT is intended to provide a defined vision for rail transportation in the Commonwealth of Virginia through 2040. The SEHSR Corridor alignment is shown on the Passenger Rail map (Figure ES-6) as a route under study. Section ES.3.4 provides a discussion of SEHSR Corridor planning efforts, including the SEHSR Corridor Tier I EIS; this Richmond to Raleigh Project Tier II EIS; the Richmond to Hampton Roads SEHSR Corridor Tier I FEIS ; and the Washington, DC to Richmond Southeast High Speed Rail Tier II EIS.

3.11.3.1.2 NORTH CAROLINA

NCDOT Draft State Transportation Improvement Program: 2013-2023 (STIP) (September 2012) The following projects from the STIP in the vicinity of the rail corridor were identified:

- R-2587 – US-158, Warren and Halifax Counties. I-85 to SR 1405 east of Littleton - Widen to multi-lanes with bypasses of Norlina, Macon, and Littleton. The proposed Project alignment would intersect with the R-2587 new location section east of US-1 and

south of the Town of Norlina. Currently, R-2587 is unfunded and in the planning stage, and as such, has no approved alignment.

- *U-5307 – US-1, Wake County.* Corridor improvement project from I-540 to NC 98 - there is one crossing of US-1 and the Project alignment in this area; the crossing location has an existing grade separation.

North Carolina Strategic Highway Corridors NCDOT has identified specific facilities throughout the State as critical mobility corridors. Three North Carolina Strategic Highway Corridors were identified in the Study Area:

- US-1 (Warren, Vance, Franklin, Wake County)
- I-440 (Wake County)
- I-540 (Wake County)

North Carolina Statewide Transportation Plan, From Policy to Projects 2040 Plan (NCDOT August 2012) This plan is a policy-based document intented to set investment and policy priorities for the State's transportation system. The Richmond to Raleigh Project portion of the SEHSR Corridor is identified as an underserved market; and SEHSR Corridor service is identified as the largest future passenger rail expenditure.

3.11.3.2 *REGIONAL PLANNING*

Regional planning in both states is performed by a regional planning agency tasked to promote the orderly and efficient development of the physical, social, and economic elements of the region by planning, encouraging and assisting governmental subdivisions to plan for the future. In Virginia, this task is performed by Planning District Commissions (PDC) and in North Carolina it is performed by Councils of Government (COG).

Regional transportation planning is performed by a Federal and state designated organization called a Metropolitan Planning Organization (MPO). An MPO is a transportation policy-making organization made up of representatives from local government and transportation authorities. In 1962, the US Congress passed legislation that required the formation of an MPO for any urbanized area with a population greater than 50,000. In North Carolina's rural counties, Rural Planning Organizations (RPOs) are the rural equivalent of MPOs. MPOs and RPOs are responsible for preparing the Federally-required regional long-range 20-year Comprehensive Transportation Plan (CTP), the Transportation Improvement Program (TIP) (which provides a four-year program of Federal, state, and locally funded transportation projects for which MPO/RPO approval is required), regional transit (including bus) planning, and related plans and studies. The regional PDC or COG often administers the MPO or RPO in its area. Areas of authority for regional land use and transportation agencies in the Study Area are provided in Figures 3-7 through 3-11.

As mentioned in Chapter 1, Virginia and North Carolina have both evaluated the feasibility of adding conventional passenger train service to eastern and western portions of the states to allow proposed SEHSR Corridor service to serve as the spine to these added routes, connecting conventional rail service passengers to the proposed SEHSR Corridor service and other points in the Northeast, Southeast, and beyond.

3.11.3.2.1 VIRGINIA REGIONAL PLANNING

In Virginia, each PDC is made up of professional staff and is directed by elected officials and citizens appointed by its member local governments. The Study Area traverses three PDC regions – Richmond Regional, Crater, and Southside.

3.11.3.2.1.1 *RICHMOND REGIONAL PDC*

The Richmond Regional Planning District Commission (RRPDC) focuses on regional transportation, land use planning, housing, community development, environmental planning, and local technical assistance and information services including demographic and geographic information systems. The RRPDC serves the Town of Ashland; City of Richmond; and counties of Charles City, Chesterfield, Goochland, Hanover, Henrico, New Kent, and Powhatan. Relative to the Study Area, the Richmond Regional PDC serves all of Richmond and all but the southern portion of Chesterfield County.

The RRPDC focuses on regional transportation, land use planning, housing, community development, environmental planning, and local technical assistance and information services including demographic and geographic information systems.

The RRPDC's Urban Transportation Planning Division's staff, with staff from the PDC's other two divisions, provide administrative support to RAMPO.

The RRPDC's Urban Transportation Planning Division's staff, with staff from the PDC's other two divisions, provide administrative support to the Richmond Area Metropolitan Planning Organization (RAMPO). RAMPO's geographic coverage extends to that area which is projected to be urbanized within the next 20 years; it includes approximately two-thirds of the Richmond Regional Planning District (see Figure 3-7).

Figure 3-7

Richmond Area MPO Study Area

Source: Richmond Regional Planning District Commission, 2012

RAMPO has recently produced several transportation planning documents pertinent to the Project, including:

Plan 2035: RRPDC Regional Long Range Transportation Plan (adopted July 12, 2012) Portions of the plan pertinent to the Project are:

- *Rail in the Richmond Region* (Chapter 10) - summarizes the National Rail Policy, Virginia's Statewide Rail Policy, the role of the CSX and Norfolk Southern in statewide goods movement, and HSR. This Plan identified a variety of potential rail investment projects important to Virginia, including Class I and short-line railroads, the Port of Hampton Roads, passenger rail initiatives, and HSR initiatives. The Plan also states that with the return of passenger rail service to Main Street Station in 2003, continued investments in the rail system will be required in order to fully realize the potential of center-city to center-city rail service envisioned in the National Rail Policy.
- *Summary of the 2008 Virginia Statewide Rail Plan* (Chapter 10) – Included in the summary is a reference to the Project in noting that higher-speed rail will operate in Virginia in the near future (*Note that as described above, the Virginia Statewide Rail Plan was updated in 2013*).
- *Rail System Investments* (Chapter 10) - A chart of rail system investments includes infrastructure improvements for HSR between Richmond and the North Carolina state line, and between Richmond and Hampton Roads; projects that are both in progress.
- *Regional Transit* (Chapter 7) – The chapter describes Greater Richmond Transit Company (GRTC) transit system, the principal mass transit option for travel within the Richmond metropolitan area. GRTC provides bus fixed route services to the Cities of Richmond and Petersburg, and the Counties of Henrico and Chesterfield as well as paratransit service on demand through the CARE program and a van and carpool service (i.e. Ridefinders). GRTC is the local bus service provider for the proposed SEHSR Corridor station (Main Street Station) in Richmond.
- *Fiscally Constrained Project List* (Chapter 17) – The projects within the Project corridor are listed below:
    - Project 5 - Replace Bridge on US-1 near VA 145 (Chester Road)
    - Project 74 - Add center turn lane to Commerce Road from Bells Road to Bellemeade Road; the Project alignment currently crosses Commerce Road at an existing at-grade crossing
    - High-Speed Intercity Rail - Listed under Transit Type, Rail Improvements Project, Richmond (Main Street Station) to Raleigh Termini; it notes the cost is to be determined via mix of Federal, state and local funds, with completion date of 2018-2022.
- *Unconstrained Project List* (Chapter 21) – Other projects within the study corridor are listed below:
    - Widen Centralia Road to three lanes from Nott Lane to Chester Road
    - Construct E/W Freeway from Route 360 (Hull Street Road) to I-95.

The Transportation Improvement Program (TIP) FY12-15 (Amended September 20, 2012) The TIP is multimodal, and includes highway and public transit projects as well as bicycle, pedestrian, air, rail (mostly improving at-grade crossings), port and freight-related projects.

Although the TIP does not specifically include Project elements, it does state that RAMPO is "working to fund projects to benefit implementation of high-speed rail in region".

Regional Transportation Priority Projects (2013) There are no roadway improvement projects on this list that need to be coordinated with the Project design; however, two Main Street Station projects are listed. Although Main Street Station planning is not part of the

None of the roadway improvement projects on the *Regional Transportation Priority List 2013* need to be coordinated with the SEHSR design; however, the list includes two projects at Main Street Station, which is the northern terminus of the SEHSR project.

Project, it is the northern terminus for this Richmond to Raleigh Project Tier II FEIS:

- *Restoration/Construction of Main Street Station, Phase 3* - This is the final phase of a joint city/state project that totaled $79.8 million with projected completion in 2017. The project is intended to create a multimodal transportation center that will accommodate the SEHSR Corridor as well as serve Amtrak trains, GRTC buses, airport shuttles, taxis, and tour buses, with bicycle and pedestrian access at one centralized location in downtown Richmond.
- *Extension of Main Street Station Platforms*

In addition, the list includes the Virginia DRPT/FRA SEHSR/Intercity Passenger Rail, Richmond (Main Street Station) to Washington D.C. project (Washington, DC to Richmond Southeast High Speed Rail). The MPO supports the extension of the SEHSR Corridor from Washington D.C. to Richmond (Main Street Station). The description notes that the project covers a critical section of the SEHSR Corridor, and includes a discussion of the connection at Main Street Station to the Richmond to Raleigh portion of the SEHSR Corridor studied by this Richmond to Raleigh Project Tier II FEIS.

RRPDC 2035 Rural Long Range Transportation Plan (LRTP) (2011) The 2035 Rural LRTP was developed to guide planning of the rural transportation network in the Richmond planning area. Recommendations for the rural district plans also serve as a component of the overall Surface Transportation Plan described previously.

3.11.3.2.1.2 *CRATER PDC*

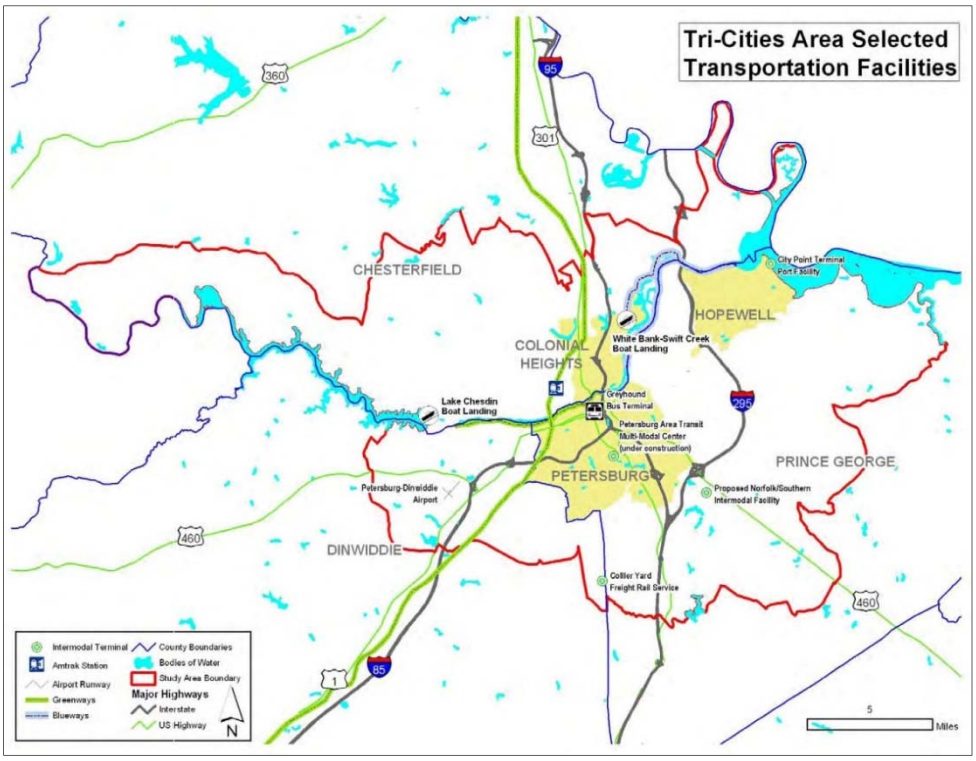
The Crater PDC is a regional entity serving the counties of Charles City, Chesterfield, Dinwiddie, Greenville, Prince George, Surry and Sussex, and the Cities of Colonial Heights, Petersburg, Emporia and Hopewell (Figure 3-8). Relative to the Study Area, the Crater PDC serves all of Colonial Heights, VA and Petersburg, VA but only the southern portion of Chesterfield County. Transportation planning for the urbanized area of the Crater PDC is performed by the Tri-Cities MPO (Figure 3-9).

Relative to the Study Area, the Crater PDC serves all of Colonial Heights, VA and Petersburg, VA but only the southern portion of Chesterfield County. Transportation planning for the urbanized area of the Crater PDC is performed by the Tri-Cities MPO

Figure 3-8

Source: Crater Planning District Commission, 2012

Figure 3-9



Source: Crater Planning District Commission, 2012

The Crater PDC and Tri-Cities MPO have produced the following transportation planning documents pertinent to the Project:

Tri-Cities Area (TCA) Year 2035 Transportation Plan (June 2012) The intent of the 2035 TCA Plan is to meet future-oriented, multimodal transportation needs of the region, such as autos, transit, marine, rail, bicycling and pedestrians. The plan references the Project, describes the approved alignment through the Tri-Cities region, and provides a link to the Project website.

The *Tri-Cities Area Year 2035 Transportation Plan* references the SEHSR project, describes the approved alignment through the Tri-Cities region, and provides a link to the SEHSR project website.

The plan notes that intercity passenger rail service in the Tri-Cities area is provided by Amtrak, and that the existing Amtrak Ettrick Station serves the Tri-Cities portion of the Richmond area providing an important modal connection. Planning is included for PAT, the fixed-route public transportation system operating within the Tri-Cities area. The plan further references the Tri-Cities Multimodal Station Study, which was anticipated but not yet under way at the time the TCA was released. This plan has since been completed, and is referenced below.

The plan also outlines the ongoing planning assistance provided to the rural portion of the Crater Planning District, noting ongoing coordination with the Project.

Tri-Cities Multimodal Station Study (August 2012) This pre-NEPA study was developed by Virginia DRPT in cooperation with the Tri-Cities MPO to present comparative data for two alternate station sites in the Petersburg, VA area: the existing Amtrak Station at Ettrick, VA, and a site near the CSX Collier Rail Yard south of Petersburg, VA. Section 1.4 contains information about the planning work for the project, which began in August 2014. Currently, and Environmental Assessment is under development that will be used to select the preferred location for a multimodal station in the Petersburg, VA area

Crater Planning District Regional Planning District Commission 2035 Long Range Transportation Plan (2011) This plan was developed to guide planning of the rural transportation network in the Crater planning area. Recommendations for the rural district plans also serve as a component of the overall VSTP. Portions of the plan pertinent to the Project include three projects in Dinwiddie County:

- *Project 7* - VA 40 from VA 1009 to US-1. Mid-term: Widen to 4 lanes.
- *Project 15* - VA 646 from VA 647 to US-1. Long-term: Reconstruct road to address geometric deficiencies (10-foot lanes).
- *Project 23* - VA 613 from VA 1 South to VA 670 West. Long-term: Reconstruct road to address geometric deficiencies (12-foot lanes).

3.11.3.2.1.3 *SOUTHSIDE PDC*

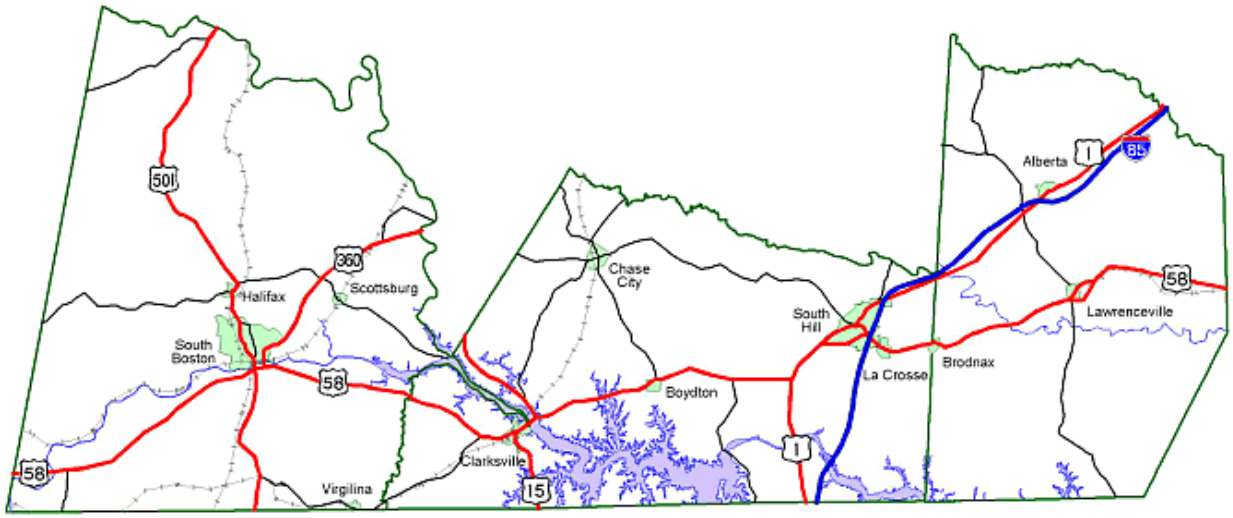
The Southside PDC is a regional entity serving the counties of Brunswick, Halifax, and Mecklenburg and the Towns of South Boston and South Hill (Figure 3-10). The Southside PDC lacks any sizable urbanized areas; therefore, this region does not have an MPO. Transportation planning within this region is the responsibility of the Virginia Department of Transportation (VDOT) in coordination with the local governments.

The Southside PDC is a regional entity serving Brunswick, Halifax, and Mecklenburg counties and the Towns of South Boston and South Hill

Transportation planning within this region is the responsibility of VDOT in coordination with the local governments.

Figure 3-10

Southside Planning District Commission Study Area



Source: Southside Planning District Commission 2012

VDOT worked with the Southside PDC and its local governments to produce the following transportation planning document pertinent to the Project:

Southside PDC 2035 Regional Long Range Transportation Plan (April, 2011) This plan was developed to guide planning of the rural transportation network in the Southside planning area. Recommendations for the rural district plans also serve as a component of the overall state-wide Surface Transportation Plan. The plan states that there is currently no intercity rail or commuter rail service within the region, and that the nearest Amtrak services are provided in Danville (10 miles west of the region) on the New York to New Orleans Crescent Service and in Petersburg (25 miles northeast of the region).

Southside PDC's *2035 Regional Long Range Transportation Plan* references the SEHSR. Portions of the plan pertinent to the SEHSR project include four projects in Dinwiddie County and one project in Mecklenburg County.

The plan references the SEHSR Corridor, stating that "one of the most anticipated rail projects in the Commonwealth is the planned SEHSR" that is planned to traverse the region in a corridor that follows the CSX line which parallels I-85 and US-1. The plan notes that regionally preferred locations for SEHSR Corridor rail stops include Alberta and La Crosse.

The plan also covers the public transportation systems operating within the Southside PDC area, including Lake Area Bus (LAB), which operates within Mecklenburg County, La Crosse, and Alberta.

Portions of the plan pertinent to the Project include four projects in Dinwiddie County, and one project in Mecklenburg County.

Brunswick County Projects –

- *Project 35 - VA 630 (Sturgeon Road) from I-85 to US-1*- Long-term: reconstruct road to address geometric deficiencies.

- *Project 36 - VA 629 from VA 630 to US-1*- Long-term: reconstruct road to address geometric deficiencies.
- *Project 38 - VA T-628 (Church Street) from VA 136 to VA T-106* - Long-term: reconstruct road to address geometric deficiencies.
- *Project 39 - VA T-1404 (Virginia Avenue) VA T-606 (Virginia Avenue) to VA T-628 (Church Street)* - Long-term: reconstruct road to address geometric deficiencies

Mecklenburg County Projects –

- *Project 38- VA T-618 from southern city limits of La Crosse to VA T-1507* - Long-term: widen to urban two-lane roadway.

3.11.3.2.2 NORTH CAROLINA REGIONAL PLANNING

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

3.11.3.2.2.1 *KERR-TAR REGIONAL COG*

The Kerr-Tar Regional COG serves 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 RPO.

The Kerr-Tar Regional COG serves 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).

Kerr-Tar Area Rural Transportation System Authority (KARTS) - KARTS provides public transit throughout these region K counties: Franklin, Granville, Vance and Warren Counties. Planning for KARTS is partially funded by the state through the STIP, and is undertaken by the Kerr-Tar COG.

The Kerr-Tar RPO has worked with NCDOT and the local governments to develop the following transportation planning documents that contain projects pertinent to the Project:

Warren County Comprehensive Transportation Plan (CTP) (adopted June 2008; Technical Report dated March 2010) This plan replaced the 2004 Norlina, NC Thoroughfare Plan and covers the entire county. The planning was a joint effort between the Town of Norlina, NCDOT, and the Kerr-Tar RPO. The plan includes a description of the SEHSR Corridor and includes the following relevant elements:

The Warren County CTP includes the SEHSR project in its transportation improvement plans.

- *Public Transportation and Rail Map* – The alignment of the Project preferred alternative is shown along with a recommended station and park and ride facility in Norlina, NC.
- *Rail Recommendations* - As part of improvements for the Project, a grade separated crossing of Ridgeway Rd. (SR 1107), west of Norlina, to be constructed and to re-align Ridgeway Rd. (SR 1107) with St. Tammany Rd. (SR 1210) to create a continuous route to I-85 from US-401 as referenced below.
- *US-158 Bypass* – A recommended primary route improvement is a bypass of US-158, extending along a new location from the existing US-158 to US-1 just north of SR 1210 (St. Tammany Road) was originally included in the 2004 Norlina Plan, and then

carried forward into the Warren County CTP. Both plans call for the bypass to intersect the Project rail corridor by-way of a grade separated crossing.

- *US-401/Warrenton Loop* – A recommended primary route improvement is for US-401 to be rerouted around Warrenton and Norlina, intersecting the Project rail corridor.

Vance County CTP, Draft (June, 2012) The Vance County CTP plan was a joint effort between Vance County, its municipalities, NCDOT, and the Kerr-Tar RPO. The Vance County CTP replaced the 2002 Henderson Thoroughfare Plan (which was used to develop the Project designs shown in the Richmond to Raleigh Project Tier II DEIS) when it was adopted in 2012.

The CTP acknowledges the planned SEHSR Corridor through the county along the current CSX S-Line, and addresses the initial recommendations from the Richmond to Raleigh Project Tier II DEIS, including the locations of grade separations and road connections.

The CTP acknowledges the planned SEHSR Corridor through the county along the current CSX S-Line, and addresses the initial recommendations from the Richmond to Raleigh Project Tier II DEIS, including the locations of grade separations and road connections. It notes that the proposed road crossings and grade separations are not final and are subject to change, and that they were coordinated with the local governments and the NCDOT Rail Division. The updated CTP, however, does not include the Main Street Extension project previously shown in the Henderson, NC Thoroughfare Plan.

- *Proposed road closings due to the Project* - The plan shows road closings at the following locations along the Project railroad alignment:
  - Oak Ridge Church Road
  - Beechtree Trail Road
  - McClanahan Street, (Kittrell, NC)
  - Main Street
  - North Chavis Road
  - Cole Lane
  - Bobbitt Road
  - Eastern Minerals Road
  - Welcome Avenue
  - Warehouse Road (does not cross railroad)
  - Miriam Street
  - Chavasse Avenue
  - West Spring Street
  - Orange Street
  - Winder Street
  - Montgomery Street
  - Rock Spring Street
  - Harris Street
  - North Oliver Drive
  - Currin Road
- *Proposed grade separated crossings due to the Project* - The plan shows proposed grade separated crossings at the following locations along the Project alignment:
  - Oak Ridge Church Road
  - Egypt Mountain Road
  - Church Street
  - Edwards Road
  - Wild Life Lane
  - Bear Pond Road

  - JP Taylor Road
  - Dabney Drive to Alexander Avenue
  - NC39
  - Beckford Drive
  - Warrenton Road
  - Brookston Road
  - Greystone Road
- *Public Transportation and Rail Map and Highway Map* – These maps show the Project alignment through downtown Kittrell, NC, Henderson, NC, and Middleburg, NC with a recommended rail stop and intermodal connector in Henderson on US-158 Business (Garnett Street).
- *KARTS bus transit system*- Several changes are proposed to the KARTS bus transit system ("Around Town Shuttle") in Henderson due to the proposed Project road closings.

Franklinton Thoroughfare Plan (1997) This plan was the basis for the traffic analysis conducted for the Richmond to Raleigh Project Tier II DEIS. Projects in the plan pertinent to the Project include:

- *South Franklinton Connector* - proposed to extend from NC 56 east of SR 1118 (Lane Store Road) to US-1 south of SR 1127 (Pocomoke Road). The plan calls for the Connector to intersect the rail corridor by way of a grade separated crossing. Subsequently, the 2012 Franklin County CTP was adopted and is described below.

Franklin County Comprehensive Transportation Plan (July 2011) This plan was a joint effort between all the municipal and county areas in Franklin County, NCDOT, the Capital Area Metropolitan Planning Organization (CAMPO), and the Kerr-Tar RPO. The plan was coordinated with the Project team, and includes the grade separated crossings that are presented in the Richmond to Raleigh Project Tier II FEIS designs.

The CTP maps were adopted by Franklin County and the Towns of Centerville, NC and Louisburg, NC and endorsed by the Kerr-Tar RPO and the Towns of Bunn, NC, Franklinton, NC, and Youngsville, NC. The CTP maps contain the following notation: "*Exact rail alignment, grade separation locations and other corresponding projects to be determined by SEHSR project study*." Specific details of the CTP maps include:

- *Public Transportation and Rail Map* - shows the Project alignment through downtown Franklinton and Youngsville with no recommended rail stops.
- *Highway Map Inset for Franklinton* - shows proposed grade separations of the Project corridor at these locations:
  - Winston Street
  - Mason Street
  - South of existing Cedar Creek Road
  - Planned Bypass Expressway
  - Bert Winston Road new alignment
- *Highway Map Inset for Youngsville* - shows proposed grade separations of the Project corridor at these locations:
  - Proposed NC 98 bypass
  - Main Street.
- *Franklin County Projects* - projects pertinent to the Project include:
  - Project 100 – Future commuter rail with stops at Franklinton and Youngsville

- Project 101-104 – Provide a grade-separated pedestrian crossing across the railroad per the Project plan at the following locations: College Street, Hillsborough/Hawkins Street, Franklin Street, and Mason Street
- Project 111 – Improve existing grade separations over railroad (Project alignment) at NC 56
- Project 112 – Provide grade separation for NC 96.

Kerr-Tar Regional Planning Organization (KTRPO) Project Priority Listing (2014-2020)
The following projects from the KTRPO are within the Study Area:

- *Project 5* - Widen Warrenton Road (SR 1001) to 12-foot lanes
- *Project 7* - Continuation of Western Outer Loop
- *Project 12* - Create southbound movements from I-85 to US-1
- *Project 14* - Upgrade SR 1151
- *Project 24* - Widen US-1 Business from Peter Gill Road (SR 1548) to Dabney Drive (SR 1267)
- *Project 31* - Widen US-1/US-158 through Vance County to four lanes.

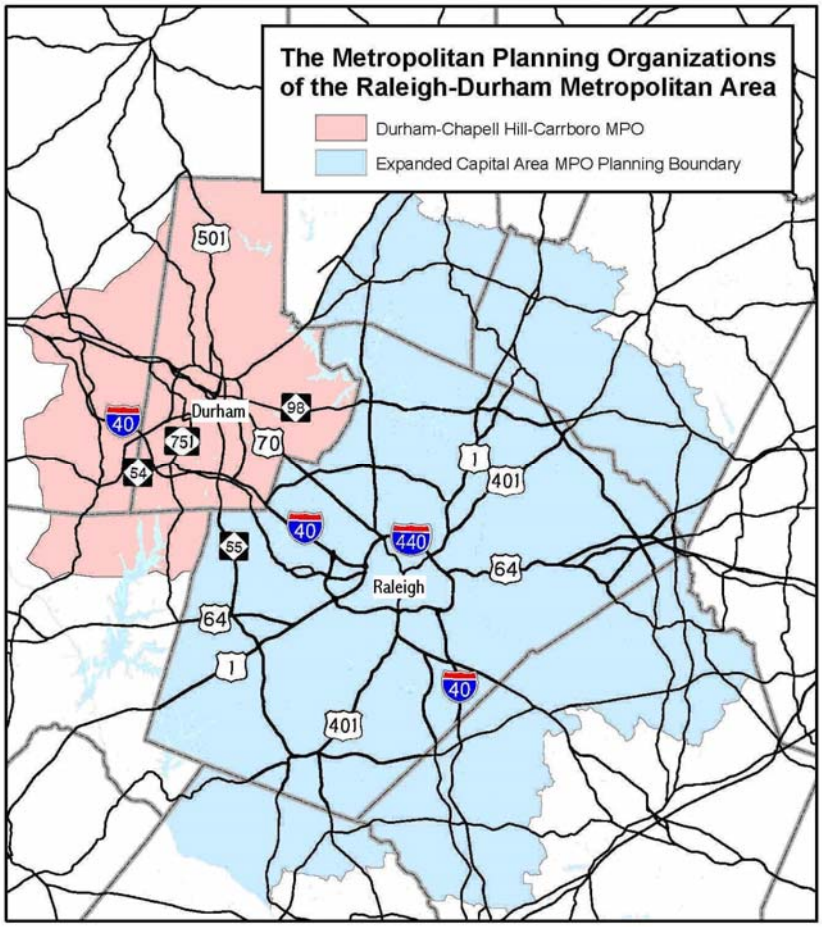
The Triangle J COG is a regional entity serving Chatham, Durham, Johnston, Lee, Moore, Orange, and Wake counties. Transportation planning for the urbanized areas of the COG is performed by CAMPO and the adjacent Durham-Chapel Hill-Carrboro MPO. CAMPO serves the portion of the region within the Study Area, including Wake County and the southern portion of Franklin County.

3.11.3.2.2.2 *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 areas of the COG is performed by CAMPO and the adjacent Durham-Chapel Hill-Carrboro MPO (Figure 3-11). CAMPO serves the portion of the region within the Study Area, including Wake County and the southern portion of Franklin County.

Figure 3-11

CAMPO Study Area



Source : North Carolina Capital Area Metropolitan Planning Organization, 2012

CAMPO has recently produced several transportation planning documents pertinent to the Project, including:

US-1 Corridor Study - CAMPO prepared a two-phased report with the involvement of the affected localities and Franklin, Vance and Wake Counties. It is a comprehensive multimodal transportation and growth plan intended to preserve the functional characteristic of the corridor, manage the overall growth within the area, enhance the quality of life of its surrounding communities, while providing for the local and regional transportation needs along US-1, which closely parallels the Project corridor.

- *Phase I (September 2006)* – The Phase I study includes 13 miles of US-1 in Wake and Franklin Counties, between I-540 in Raleigh and the northern intersection of US-1/ Park Avenue (US-1A) in Youngsville.
- *Phase II Study (Draft Report December 2012)* – The Phase II Study is a continuation of the Phase I Study, and includes sections of the US-1 (Capital Boulevard) corridor through Franklin County and the Town of Franklinton, starting from Park Avenue in Youngsville and ending at the Vance County line to the north, with planned implementation between years 2015 and 2050.

Phase II recommends a land use vision and phased multimodal transportation improvements that are consistent with regional transportation and land use plans, including the proposed Project alignment.
The study also recommends long range roadway, highway, transit, bicycle and transit improvements needed to facilitate proposed future land uses in the corridor, including industrial and economic development in the immediate vicinity of the Project corridor, to take advantage of enhanced freight access.

The CAMPO/DCHCMPO LRTP specifically supports the SEHSR project as well as "any other passenger rail initiatives that the MPO might designate in the future" with a clear goal of prioritizing transit facilities and services, including bus and rail, to create a more modally balanced and interconnected system.

CAMPO and Durham-Chapel Hill-Carrboro MPO (DCHCMPO) 2035 Joint Long Range Transportation Plan (March 2011) The proposed Project alignment crosses a number of projects identified on mapping for the CAMPO 2035 Joint LRTP:

- *A-126a - Ligon Mill Road Widening from Burlington Mills Road to US-1A* - currently an at-grade crossing of the rail corridor.
- *A-10 - Widening of Old Wake Forest Road from Litchford Road to Capital Boulevard (US-1)* - Currently, SR 3555 (Old Wake Forest Road) crosses over the proposed rail corridor via a two-lane bridge.
- *F-11 - US-1 - Upgrade to Freeway* - US-1 crosses the proposed Project alignment via two two-lane bridges.

The Plan specifically supports the development of the SEHSR Corridor as well as "any other passenger rail initiatives that the MPO might designate in the future" with a clear goal of prioritizing transit facilities and services, including bus and rail, to create a more modally balanced and interconnected system.

The plan also includes a focus on the connection between transportation and land use, including transit station area development, roadway access management and developing "complete streets" to allow a variety of transportation modes. The plan incorporates a "Regional Transit Vision Plan" developed by a Special Transit Advisory Commission that includes plans for linking major activity centers to regional and intercity rail services (such as the SEHSR Corridor). Bus service within the CAMPO area is currently provided by the City of Raleigh, the Town of Cary, NCSU and TT. These bus service providers currently cover these areas: Raleigh, Cary, Morrisville, Wake Forest, Garner, Apex, Durham, Chapel Hill, Carrboro and Hillsborough

The plan includes TT proposed light rail service between Durham, Raleigh and North Raleigh, which is planned to operate within existing railroad ROW, some portions of which are adjacent and parallel to the Project proposed ROW.

2012-2018 Metropolitan Transportation Improvement Program (TIP) (September 2011) The CAMPO TIP includes the following projects pertinent to this Project:

- *P-3819 SEHSR between Charlotte, NC and the Virginia state line*, including environmental study, preliminary engineering, ROW, design, and construction.
- *TE-4903 Fixed Guideway – Alternatives Analysis for Major Transit Corridor Projects*- in Durham, Orange and Wake Counties.

Capital Area Bus Transit Development Plan (TDP) Final Report (October 2011) This 2040 Transit Development Plan was prepared for CAMPO and the City of Raleigh/Capital Area Transit (CAT), along with partner agencies TT, Cary Transit, North Carolina State University

Wolfline, and Wake County. The TDP is intended to serve as a guide in developing a transit vision for the entire CAMPO area. The City of Raleigh's planned Union Station multimodal transportation center (which includes plans to serve future SEHSR Corridor trains) is included in Recommended Capital Facility Enhancements.

3.11.3.2.2.3 *TRIANGLE TRANSIT (TT)*

Planning for the Wake County TT transit corridor is on-going, and has included extensive coordination with the NCDOT Rail Division and the Project team.

TT (formerly, Triangle Transit Authority) operates regional bus and shuttle service throughout the CAMPO area, and has been planning for a regional fixed guideway system of transit since the 1980. Plans have continued to evolve since a 2003 Federal Transit Administration (FTA) ROD on the Phase I Regional Rail System FEIS (Triangle Transit, 2013). TT's current focus for regional light rail is on Orange and Durham Counties, which are outside the Project Study Area. Planning for the Wake County TT transit corridor, which includes ROW adjacent and parallel to the proposed Project ROW is on-going, and has included extensive coordination with the NCDOT Rail Division and the Project team.

3.11.3.3 *COUNTY AND MUNICIPAL PLANNING*

3.11.3.3.1 VIRGINIA LOCAL PLANNING

In Virginia, cities are independent from counties in that residents from cities are not considered part of the surrounding county. Residents in Virginia cities, therefore, cannot vote for county representatives, are not able to receive county services, nor are they subject to county taxes. In Virginia, towns are different from cities, in that towns are not independent from counties. Residents of Virginia towns are still residents of the county in which the town is located and are therefore able to vote for county representatives, may have to pay for (and receive) county services and are subject to county taxes as well as any town taxes.

All localities (cities and counties) in Virginia are required to prepare and adopt a plan to guide the physical development of land within their jurisdictions, and to review the plan at least every five years and update as necessary. The planning or development department within each locality is responsible for developing and updating the locality's long range plans. The following summarizes the most pertinent sections of the long range land use plans for the localities in the Study Area.

3.11.3.3.1.1 *CITY OF RICHMOND*

Richmond Master Plan 2000-2010 (2000) This plan is out of date, and as such, includes the renovation and return to operations for Main Street Station as a goal. Subsequently, Main Street Station has re-opened and is currently serving two round-trip Amtrak passenger trains per day to Newport News (4 daily trains). The plan does incorporate the concept behind the Project by including goals for establishment of HSR passenger service connections to the northeast corridor, south to Charlotte, NC, as well as connections to eastern and western parts of the state. In addition, the Transportation and Roadway improvements map shows a HSR alignment that follows the SEHSR Corridor.

Richmond Connects (Richmond's Strategic Multimodal Transportation Plan) (July 2013) This 20-year plan for transportation within Richmond, VA describes actions and plans that Richmond will take over the next 20 years to implement the plan's vision of a truly multimodal transportation system that will support economic development, tourism and sustainability goals.

Richmond Connects recommends using Main Street Station as the City's multimodal hub, with the SEHSR's Preferred Alternative connecting to the Station along the HSR Corridor.

The plan's implementation strategies were developed to support the following guiding principles: Safety, System Preservation, Multimodal Linkages, Complete Streets, Equity and Accessibility, Regional Coordination, sustainable Transportation, Alternative Mode Support, Historic Character, and Innovation. The Plan's Transit and Rail Recommendations includes Main Street Station as the city's "Multimodal Hub," with the SEHSR Corridor's Preferred Alternative connecting to Main Street Station along the "High Speed Rail Corridor". These planned transit improvements also include the Richmond BRT (Bus Rapid Transit) (discussed below), Priority Transit Corridors, Local Route Improvements and Extensions as well as Transfer Centers. The plan includes the following implementation tasks and investment strategies for intercity passenger rail: Coordinate closely with Virginia DRPT and regional entities to ensure the City has a seat at the table during the planning process for expanding passenger rail services; continue to promote the enhancement of Main Street Station as multimodal hub for passenger rail services; and, Continue coordination with state and Federal agencies to incrementally improve intercity passenger rail service.

Richmond Downtown Plan (July 2009) This plan notes that in 2003, Main Street Station was fully restored and re-opened to limited Amtrak service, serving two trains per day to Newport News, VA. A key recommendation of this Plan is to consider Main Street Station as a multimodal transportation hub.

Richmond Riverfront Plan (November 2012) As a continuation of the 2009 Downtown Plan, the Riverfront Plan provides a strategy to revitalize a 2.25 mile long stretch of the James River, from the Lee Bridge to Rocketts Landing, extending at least 200 feet inland from both banks of the river. The plan shows the CSX S-Line railroad (utilized by the Project) and bridge over the James River.

Broad Street Bus Rapid Transit Study (BRT) Greater Richmond Transit Company (GRTC) oversees planning for the City's transit system. GRTC is working in partnership with Virginia DRPT to plan for bus rapid transit along the Broad Street corridor in Richmond, VA. Broad Street BRT is a 7.6 mile proposed project to provide rapid transit service along the Broad Street corridor of Richmond. This project was recommended in the Richmond Connects Plan, described above. The project begins at Willow Lawn in Henrico County in the west and extends on Broad Street through the City of Richmond to 14th Street, then continues from 14th on Main Street where buses will continue at limited BRT stops to the eastern terminus at Rocketts Landing. Within the corridor, a median-running guideway for BRT buses only will be provided from Thompson Street to Adams Street, and a dedicated curb lane for all buses will be provided on Broad from 4th Street to 14th Street. In total, buses will run on dedicated lanes for about half of the corridor and in mixed traffic for the remainder. A total of 14 BRT stations are planned, including a stop at Main Street Station, the northern terminus of this Richmond to Raleigh Project Tier II FEIS. A locally preferred alternative was selected in June, 2014 and the study project is moving toward the preliminary design phase. Current estimates of project completion show the project opening at the end of 2017 or beginning of 2018.

3.11.3.3.1.2 *CHESTERFIELD COUNTY*

Comprehensive Plan for Chesterfield County (October 2012) includes the following regarding passenger rail service in the County:

- *Chapter 13- Transportation*- The plan indicates that Ettrick Station is the passenger rail station in the county and is owned by CSX Transportation and leased by Amtrak, which operates daily service via the Carolinian/Piedmont service between New York, NY and Charlotte, NC, and the Silver Star/Palmetto, serving New York, NY to Miami, FL. The plan also acknowledges Ettrick Station would have a stop for the new passenger service to Norfolk, VA, which began in December 2012.
  The plan references ongoing planning for the SEHSR Corridor authorized under the Intermodal Surface Transportation Efficiency Act of 1991, and shows the location of the SEHSR Corridor as "Potential High Speed Rail" on the Rail Facilities Figure.
- *Chapter 10 Land Use* – The plan acknowledges the Richmond to Raleigh Project Tier II EIS study, indicating that expanded rail service would have a positive economic impact, and would potentially increase housing demand, and would benefit the growth and expansion of Virginia State University (adjacent to the existing Ettrick Station).

The Comprehensive Plan for Chesterfield County acknowledges Ettrick Station would have a stop for the new passenger service to Norfolk, VA, which began in December 2012. The Plan indicates that expanded rail service provided by SEHSR would have a positive economic impact, could potentially increase housing demand, and would benefit the growth and expansion of Virginia State University (adjacent to the existing Ettrick Station).

Ettrick Village Plan (adopted 2004) work is currently underway to update this plan. The 2004 plan recommends using the existing local street network around the Ettrick Station to accommodate traffic from the SEHSR Corridor. It also notes that the proposed conservation and recreation area along the Appomattox River should not interfere with SEHSR Corridor river crossing. Refer to Section 4.13 for additional discussion related to parks within the Study Area. Work is underway to update this plan

3.11.3.3.1.3 *CITY OF COLONIAL HEIGHTS*

City of Colonial Heights Comprehensive Plan 2044 (Updated January 2015) The plan makes no specific reference to the Project. The update does not mention the SEHSR Corridor, but does reference the existing Amtrak Ettrick Station located nearby.

3.11.3.3.1.4 *CITY OF PETERSBURG*

Petersburg Comprehensive Plan (adopted 2011) This plan supports HSR in the region, and references passenger rail as follows:

- *Proposed high speed rail service along the east coast rail corridor through the City of Petersburg includes possible facilities for the city* - "The City of Petersburg should position itself a transit ready City by adopting policies that 1) combine land use and transportation, 2) promote the current transit service and facilities, and 3) encourage transit oriented development at preferred location of pending HSR station. This would include developing a specific Transit Oriented Development (TOD) overlay zoning ordinance that clearly defines the appropriate densities, uses, and types of development that must occur within the zone for HSR to be feasible. Without such market inducing actions, the City risks being over-looked by Amtrak as a viable station area."
- *Multimodal transit center* – The plan describes the City's new multimodal transit center that houses bus lines from PAT, GRTC and Greyhound Bus Lines. In addition, shuttle buses provide service to the Petersburg Amtrak Station in Ettrick. The plan notes that the

transit center shelters riders in a multimodal, multi-purpose facility and enables travelers to move between local, regional, and national travel routes from one central location.

Petersburg Area Transit (PAT) Planning for PAT is undertaken by the City of Petersburg.

3.11.3.3.1.5 *DINWIDDIE COUNTY*

Dinwiddie County Comprehensive Land Use Plan (adopted 2007) This plan also covers the communities of Dinwiddie, VA and McKenney, VA, and supports passenger and freight rail as well as an integrated multimodal transportation system, and specifically mentions actions needed to plan for the SEHSR Corridor, as follows:

- Objectives of the Transportation Chapter include:
  - "Encourage the use of alternative modes of transportation to provide for an efficient, intermodal transportation system." (1d)
  - "Study / plan for public transportation." (1j)
  - "Study the potential impact of high speed rail on Dinwiddie County." (1m)
  - "Study the development of a zoning overlay district for the proposed high speed rail corridor." (1p)
  - "Promote the utilization of railways for economic and industrial growth." (2b).
- *Map X-3, Dinwiddie Corridor Plan*, identifies the "Potential High Speed Rail Corridor" along the alignment of the Project corridor.

3.11.3.3.1.6 *BRUNSWICK COUNTY*

Vision 2015 Brunswick County, 2006 Comprehensive Land Use Plan Update This plan, which covers the Town of Alberta (and others outside the Study Area), references the SEHSR Corridor as well as the importance of rail freight to the county, as follows:

- *Support the development of existing rail and air facilities and encourage the development of additional rail and air service* – This support is outlined within the Transportation Element of the plan as a strategy for promoting a balanced transportation system that supports growth.
- *Southeast High Speed Rail* – The SEHSR Corridor is discussed under the Parks and Recreation Element of the plan as it pertains to the planned Tobacco Heritage Trail. Refer to Section 3.14 for additional discussion related to parks located within the SEHSR Corridor.

3.11.3.3.1.7 *MECKLENBURG COUNTY*

Mecklenburg County Strategic Economic Development Plan (adopted in 2010) This plan establishes a goal of assisting in implementing the SEHSR Corridor from Richmond to Raleigh, with a station in La Crosse, VA.

Mecklenburg 2035 Comprehensive Plan (adopted in October 2012) This plan, which covers the county as well as the Towns of South Hill and La Crosse (and others outside the Study Area), supports the SEHSR Corridor as follows:

- *Proposed SEHSR Corridor map* - The Existing Transportation Section includes a map from the Richmond to Raleigh Project Tier II DEIS showing the proposed Project corridor; also included is the Section I location map from the Project Recommendation Report (NCDOT, Virginia DRPT, 2012) which shows the alignment of the preferred alternative through La Crosse.

- *Challenges and Opportunities, Item 1* - states "The most significant opportunity that can affect transportation in the future is the construction of the high speed rail line between Charlotte and Richmond."
- *Potential Action Items, Infrastructure Planning* - states "Careful land use management along transportation (arterial and high-speed rail) corridors will ensure effective movement of traffic and attractive business areas that enhance the image of Mecklenburg County."
- *Policies and Action Strategies* - "Champion construction of the high speed rail line between Charlotte and Richmond, with a dedicated stop in La Crosse."

3.11.3.3.2 NORTH CAROLINA LOCAL PLANNING

Unlike Virginia, municipal corporations (also referred to as cities, towns or villages) in North Carolina are not independent from the counties wherein they reside. Residents of North Carolina's municipalities are also residents of the county in which the city or town is located; therefore, they are able to vote for county representatives, may have to pay for (and receive) county services and are subject to county taxes as well as city or town taxes.

Municipal corporations (also referred to as cities, towns or villages) in NC are not independent from the counties wherein they reside.

Local governments (or localities) in North Carolina (which refers to both counties and cities) are empowered to prepare and adopt plans 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. Likewise, a North Carolina locality is not required to have zoning regulations, but if it does, those regulations must be made in accordance with a comprehensive plan.

The county planning department is responsible for providing planning services, including developing and updating the county's long range plans, to the unincorporated portions of their county; however, some counties also provide these services to their smaller towns. The city planning department is responsible for providing planning services, including developing and updating the city's long range plans, for its incorporated areas as well as its extra-territorial jurisdiction (ETJ), a special zoning area outside of its current municipal boundary, in order to plan for future expansion and growth. The following summarizes the most pertinent sections of the long range land use plans for the localities in the Study Area.

3.11.3.3.2.1 *WARREN COUNTY*

Warren County 2022 Comprehensive Development Plan (adopted 2002) This plan covers the Town of Norlina (and other towns outside the Study Area) as well as the unincorporated portions of the county, and indicates support for the SEHSR Corridor through the stated goal of creating and updating the County Thoroughfare Plan with consideration of the SEHSR Corridor.

3.11.3.3.2.2 *VANCE COUNTY*

Vance County Land Use Plan (adopted 1996 and amended August 2010) This plan covers the unincorporated portions of the county as well as the Towns of Middleburg and Kittrell (and other towns outside the Study Area). The plan includes a summary and schedule of the SEHSR Corridor in the Transportation Resources Section, noting the SEHSR Corridor

The *Vance County Land Use Plan* notes that the project has "the potential to provide great benefit and exposure to Vance County and may include a passenger stop in downtown Henderson."

would "utilize portions of existing rail lines and would involve building overpasses or underpasses at virtually all intersections of the rail line and roads within the county" and that the SEHSR Corridor has "the potential to provide great benefit and exposure to Vance County and may include a passenger stop in downtown Henderson." The plan also states that "with the timetable for this project inside of 10 years, it is important that the county is prepared for the development pressures which could be a result of the rail line."

3.11.3.3.2.3 *CITY OF HENDERSON*

Henderson 2030 Comprehensive Plan (adopted May 2010) This plan includes consideration of the SEHSR Corridor, stating that "[a] portion of the proposed Southeast High Speed Rail Corridor from Raleigh to Petersburg VA is planned along the CSX rail line, with a planned stop in Henderson. One of the major challenges facing the city is to maintain safe and convenient access across the railroad tracks." The plan includes two goals related to the Project:

- *Identify economic development opportunities related to proposed HSR station.*
- *Develop land conservation plan for the proposed SEHSR Corridor.*

3.11.3.3.2.4 *FRANKLIN COUNTY*

Franklin County Comprehensive Land Use Plan (adopted 2000) This plan also covers the Towns of Youngsville and Franklinton (and other towns outside the Study Area). The Plan makes no specific reference to the SEHSR Corridor, which is expected, given its age. The Plan does, however, recommend industrial land uses to be located along existing rail corridors for future freight access.

3.11.3.3.2.5 *TOWN OF FRANKLINTON*

Franklinton Comprehensive Land Use Plan (adopted in 1989 and updated in 2006) This plan makes no reference to the SEHSR Corridor.

3.11.3.3.2.6 *TOWN OF YOUNGSVILLE*

Youngsville 2000-2010 Land Use Plan (adopted October 2000) This plan references the SEHSR Corridor, noting that plans are underway to include HSR on the CSX railroad corridor within the Town limits. The Plan's Implementation Measure A states that, "The Planning Board strongly recommends that the town officials meet with the Department of Transportation to study the needs of the growing area and to learn and plan for the future plans of the state concerning improvements in the roadway system in and about Youngsville. Included in this study should be the proposed high-speed train and its effect on the road system."

3.11.3.3.2.7 *WAKE COUNTY*

Wake County Transportation Plan (adopted April 2003) This plan covers unincorporated portions of the county, which are not impacted by the Project. The Study Area is located within areas of the county that fall within the planning jurisdictions of the Town of Wake Forest and the City of Raleigh, rather than greater Wake County.

3.11.3.3.2.8 *TOWN OF WAKE FOREST*

Wake Forest Community Plan (adopted September 2009) This plan incorporates and updates previously adopted town-wide plans, including the Land Development Plan, 2020 Community Comprehensive Plan, and Downtown Renaissance Plan.

The *Wake Forest Community Plan* notes that the SEHSR corridor is not expected to seriously impact existing developments or land uses in the vicinity. The Plan also notes that typical concerns associated with HSR through a community include noise and traffic conflicts, but also notes that the high speed trains will pass through the community so quickly that noise and interruption of traffic should be of short duration.

The plan identifies the SEHSR Corridor as following a general alignment with the existing rail line with only minor changes and realignments, noting that the realignments are not expected to seriously impact existing developments or land uses in the vicinity. The plan indicates that the SEHSR Corridor trains are expected to pass through the town without stopping.

The plan notes that typical concerns associated with HSR through a community include noise and traffic conflicts, but also notes that the high speed trains will pass through the community so quickly that noise and interruption of traffic should be of short duration. The plan discusses the fact that at-grade intersections with local streets are viewed with particular concern by rail officials and that there are often initiatives undertaken to permanently close such crossings. Additionally:

- *Policy RT-1 (Regional Transportation in the Growth Management Section)* - states that, "the Town should continue to anticipate and plan for the impacts of new High Speed Rail Service as it passes through Wake Forest en route to major urban centers north and south along the east coast."

NC 98 Bypass Corridor Master Plan (approved August 2003) The Master Plan does not specifically mention the SEHSR Corridor, but the Railroad Crossings Section contains the following recommendations:

- *Pedestrian bridge* – a pedestrian crossing is needed at the NC 98 Bypass railroad crossing because the highway bridge over the railroad does not include sidewalks.
- *Vehicular and pedestrian grade-separated crossing* - is needed to provide a safe crossing of the railroad in the southern area of downtown.

The Wake Forest Transportation Plan (Updated July 2010) This plan is considered both a comprehensive planning element, as well as the Federally required 20-year CTP. The Plan includes a section describing the SEHSR Corridor and proposed service through town, noting that there is no planned stop in Wake Forest.

- *Transit connection to Raleigh Station* - in reference to the fact that there is no planned stop for Wake Forest, the Plan calls for existing bus service between downtown Wake Forest and downtown Raleigh to be modified to include a stop at the proposed Raleigh Union Station.
- *Comments on the Richmond to Raleigh Project Tier II DEIS* - the Plan includes a reiteration of the Town's comments on the Richmond to Raleigh Project Tier II DEIS (which have been responded to in Chapter 8 of this Richmond to Raleigh Project Tier II FEIS).

3.11.3.3.2.9 *CITY OF RALEIGH*

2030 Comprehensive Plan for the City of Raleigh (adopted Oct 2009, last amended October 2013) This plan references high speed intercity passenger rail, and includes several elements that pertain to the proposed SEHSR Corridor, including:

- *Growth Framework Map* – a description of the Downtown Regional Center notes the area's most intense growth and highest levels of transit, bicycle, and pedestrian access

and "a true hub for a rapidly growing region, served by highways, rail transit, high-speed intercity rail, and local and express bus." The planned multimodal transportation center is identified as the heart of this Center, and would serve SEHSR Corridor trains.

- *Transportation Element* - policies and action elements pertinent to the SEHSR Corridor including:
  - Map T-5, Future Interchange Locations, shows proposed new grade separations along the CSX S-Line alignment at these locations:
    - Durant Road
    - Gresham Lake Road
    - Millbrook Road
    - New Hope Church Road
    - Whittaker Mill Road
  - Action T 4.1 calls for the City to pursue the development of a multimodal transportation center in downtown Raleigh, linking multiple travel modes including local, regional, and long-distance bus; regional, commuter, and long-distance rail (Amtrak); taxis, cars, and downtown transit circulators. Note that subsequent to the adoption date of this report that advancements have been made on development of the Raleigh Union Station multimodal transportation center. Construction is scheduled to begin in 2015; refer to Section 1.4 for additional information on this project which is a joint undertaking by the City of Raleigh, the NCDOT, and FRA.
  - Policy T 8.2 states that outside of the downtown street grid, the City should "seek additional opportunities to provide grade-separated street connections across the City's passenger and freight rail corridors, and look to grade separate existing crossings where feasible and desirable."

The plan also provides policies and strategies guiding growth of the CAT transit system, including those related to coordination with future regional commuter and long-distance passenger rail.

Small Area Plans The Richmond to Raleigh Project Tier II DEIS reported that most small area plans acknowledge that the SEHSR Corridor generally follows the existing CSX rail line through Raleigh; however, these plans either simply document the existence of the rail corridor or predicate any land use classifications on current freight or proposed regional commuter rail services. The Glenwood South small area plan does not reference the SEHSR Corridor 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 SEHSR Corridor passes through this "Pedestrian Business Overlay District", which was put in place subsequent to the Richmond to Raleigh Project Tier II DEIS.

Capital Area Transit In addition to long-range planning contained in the 2040 TDP referenced above in the regional planning section, short range planning for the CAT system is conducted by the City of Raleigh.

Many of Richmond's historically industrial and commercial districts are transitioning to mixed-use areas. Adaptive reuse projects are converting former industrial spaces to condominiums, art galleries, restaurants, and entertainment venues.

3.11.4 NEIGHBORHOODS AND COMMUNITIES

This section has been repeated in its entirety from the Richmond to Raleigh Project Tier II DEIS and

describes the urban residential areas, small towns and distinct neighborhoods within the 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 2010 Census, the area includes one of Richmond's fastest growing census tracts.

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 with the exception of Old Manchester, located west of the railroad. Old Manchester is a largely industrial and heavy commercial district that is transitioning to mixed use. Adaptive reuse projects in recent years converted former industrial spaces to apartments and art studios.

One of the first neighborhoods along the Study Area on the southside of Richmond 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.

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 of 5,300 students, founded in 1882. As the 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 2010 Census, 78% of the population is African-American and 44% is in the 15-24 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 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 auto-oriented and thus shielded by the presence of a rail corridor. City plans indicate future growth may continue to the north and towards the east.

3.11.4.1.4 CITY OF PETERSBURG

Colonial Heights and Petersburg form a single urbanized area, with Colonial Heights accounting for much of the suburban residential and commercial development. Petersburg accounts for much of the urban residential and commercial development in the region.

In contrast to Colonial Heights, Petersburg accounts for much of the urban residential and commercial development in the region. After the Study Area passes Washington Street, it passes through a semi-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 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 Study Area, while a large, urban workforce neighborhood extends north and south along the rail corridor to the east. The remainder of the Study Area is adjacent to either industrial development or undeveloped lands. Urbanized Petersburg essentially ends as the 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 tracts of woodlands, with some scattered residential and commercial development along major roads such as US-1.

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

Most of Brunswick and Mecklenburg counties in VA contain a rural residential and agricultural development pattern, within large tracts of woodlands, with some scattered residential and commercial development along US 1. Lake-oriented subdivisions and development occur at the southern end of the Mecklenburg County near Lake Gaston.

Alberta is an old railroad village, with an intersection of the now inactive CSX S-Line 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 S-Line 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 tracts 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 CSX S-Line 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 CSX S-Line rail corridor in the early 20th century. Most of the town's commercial and industrial buildings face the CSX S-Line rail corridor across Main Street to the west. The fire station, the town's main building, faces the CSX S-Line 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 to serve this Project, 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 CSX S-Line 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 Area 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 tracts 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.

Most of Warren County contains a rural residential and agricultural development pattern, within large tracts 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 active CSX S-Line from the south and the inactive CSX SA-Line to the east, 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 CSX S-Line 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 CSX S-Line 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 active CSX S-Line passes. Henderson is a heavy industry center, much of which is located along the Study Area to the northeast and south of the urban core. Within the urban core, the active CSX S-Line 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 CSX S-Line 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 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 the CSX S-Line rail corridor and to US-1.

Kittrell is a small village originally built straddling the active CSX S-Line rail corridor with much of the core area oriented towards the CSX S-Line rail corridor 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

In Franklin County, Franklinton and Youngsville are small towns that were built straddling the rail corridor and US 1.

Franklinton is an old railroad town built straddling both the active CSX S-Line 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 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 CSX S-Line 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 CSX S-Line rail corridor and the old alignment for US-1. The street grid reflects the orientation of US-1, NC 96, and the CSX S-Line rail corridor, with older houses surrounding the town core. Most structures are oriented towards streets running perpendicular to the active CSX S-Line rail corridor. Northwest of the core is a newer industrial park developed along the west side of the CSX S-Line 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

The SEHSR corridor in Wake County crosses suburban, industrial, and commercial development. Urban development is found in the own core of Wake Forest and inside the Beltline in Raleigh. Most residential development inside the Beltline has occurred since 2000 and consists primarily of mill conversions and high-end condos.

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 CSX S-Line 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 Study Area.

Once the rail corridor crosses Capital Boulevard (inside the Beltline), the Study Area enters urban Raleigh, with the historic Mordecai and neo-traditional Pilot Mill Village neighborhoods adjacent to the ROW, and Peace College near by. The state government office complex lies along much of the eastern edge of the Study Area. The active CSX S-Line 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 describes the public facilities and services located within the Study Area. Regional facilities located outside of the Study Area as well as services provided throughout an entire jurisdiction are also documented. Updates to the information provided in the Richmond to Raleigh Project Tier II DEIS are noted within the sections below.

3.11.5.1 *PUBLIC EDUCATIONAL FACILITIES*

Following publication of the Richmond to Raleigh Project Tier II DEIS, three schools previously located within the Study Area moved to locations outside the Study Area: Franklinton High School in Franklinton, NC; Forest Pines Drive Elementary in Wake Forest, NC; and Raleigh Charter High School in Raleigh, NC. The description below is the same as that provided in the Richmond to Raleigh Project Tier II DEIS, except where otherwise noted below.

Following publication of the Richmond to Raleigh Project Tier II DEIS, 3 schools previously located within the Study Area moved to locations outside the Study Area. The description below is the same as that provided in the Richmond to Raleigh Project Tier II DEIS, except where otherwise noted below.

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 CSX S-Line rail corridor and at-grade railroad 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 via the at-grade railroad crossing, 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 Chesterfield County, west of the CSX S-Line and east of the CSX A-Line existing rail corridors. The Richmond to Raleigh Project Tier II DEIS mistakenly included Bensley Elementary in the list of schools located within the Study Area. Because the school is outside the Study Area, it has not been evaluated for Project impacts in Chapter 4 of this Tier II FEIS.

Perrymont Middle is located at 8610 Perrymont Road, east of the existing CSX S-Line rail corridor. The school is located southeast of the Defense Supply Center Richmond (DSCR). Kingsland Road is the closest access road crossing the existing CSX S-Line and CSX A-Line rail corridors at-grade.

Chester Middle is located at 3900 W. Hundred Road in Chester, east of the existing CSX A-Line rail corridor. The school is located in close proximity to old town Chester. Hundred Road is the closest access road crossing the existing CSX A-Line rail corridor, which is grade separated with a five-lane roadway bridge over the CSX A-Line.

Ettrick Elementary is located at 20910 Chesterfield Avenue in Ettrick, east of the existing CSX A-Line rail corridor. The school is located about two blocks west of Virginia State University. Chesterfield Avenue is the closest access road crossing the existing CSX A-Line rail corridor, which is grade separated with a four-lane roadway bridge over the CSX A-Line.

3.11.5.1.1.3 *CITY OF COLONIAL HEIGHTS*

North Elementary is located at 3201 Dale Avenue, west of the existing CSX A-Line rail corridor. The school is located east of Boulevard. East Ellerslie Avenue is the closest access road crossing the existing rail corridor, which is grade separated with a five-lane roadway bridge over the CSX A-Line.

Lakeview Elementary is located at 401 Taswell Avenue, west of the existing CSX A-Line 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, which is grade separated with the CSX A-Line passing over the four-lane roadway.

3.11.5.1.1.4 *CITY OF PETERSBURG*

J.E.B. Stuart Elementary is located at 100 Pleasants Lane, west of the existing CSX A-Line rail corridor. The school is located about seven blocks east of Central State Hospital. Dupuy Road is the closest access road crossing the existing CSX A-Line rail corridor, which is grade separated with the CSX A-Line passing over the two-lane roadway.

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

3.11.5.1.1.5 *DINWIDDIE COUNTY*

Southside Elementary is located at 10305 Boydton Plank Road, west of the former CSX S-Line rail corridor. The school is located between Burgess and Dinwiddie village. Dabney Mill Road and Quaker Road are the closest access roads crossing the Study Area.

Sunnyside Elementary is located at 10203 Sunnyside Road in McKenney, northwest of the former CSX S-Line rail corridor. The school is located northwest of McKenney's town core. Doyle Road is the closest access road crossing the 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 at 164 Elementary Avenue (on US-1) north of the existing CSX S-Line rail corridor. The school is located within the Norlina town core. Division Street and US-158 are the closest access roads crossing the existing CSX S-Line rail corridor, with Division Street crossing at-grade and US-158 grade separated with the CSX S-Line passing over the two-lane roadway.

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 CSX S-Line rail corridor. The school is located just southwest of the town core. Allison Cooper Road is the closest access road crossing the existing CSX S-Line rail corridor at-grade.

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

Zeb Vance Elementary is located at 4800 Raleigh Road in Kittrell, west of the existing CSX S-Line rail corridor. Peter Gill Road is the closest access road crossing the existing CSX S-Line rail corridor at-grade.

Henderson Middle is located at 219 Charles Street in Henderson, east of the existing CSX S-Line rail corridor. The school is located in central Henderson. Charles Street and East Andrews Avenue are the closest access roads crossing the existing CSX S-Line rail corridor, with Charles Street grade separated with the CSX S-Line passing over the four-lane roadway and East Andrews Avenue crossing at-grade.

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

The Kittrell Job Corp Center is located at 1096 US-1 South, west of the existing CSX S-Line rail corridor. The training center is located along Kittrell's highway corridor. East Main Street is the closest access road crossing the existing CSX S-Line rail corridor at-grade.

3.11.5.1.2.3 *FRANKLIN COUNTY*

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

Since publication of the Richmond to Raleigh Project Tier II DEIS, Franklinton High moved from 3 North Main Street in Franklinton to a location outside the Study Area, and Franklinton Middle School moved into the building at 3 North Main Street. East Mason Street is the closest access road crossing the existing CSX S-Line rail corridor at-grade.

3.11.5.1.2.4 *WAKE COUNTY*

Since publication of the Richmond to Raleigh Project Tier II DEIS, Forest Pines Drive Elementary moved from its temporary location at 530 E. Perry Avenue in Wake Forest to a location outside the Study Area on Forest Pines Drive, southwest of the town core.

Wake Forest Elementary is located at 136 W. Sycamore Avenue in Wake Forest, west of the existing CSX S-Line rail corridor. The school is located south of the town core. Elm Avenue is the closest access road crossing the existing CSX S-Line rail corridor at-grade.

No changes have been made to the description of Emergency Services that was provided in the Richmond to Raleigh Project Tier II DEIS.

Raleigh Charter High School moved from 1111 Haynes Street in Raleigh, to a location outside the Study Area at 1307 Glenwood Avenue, Raleigh, NC.

Peace College is located at 15 Peace Street in Raleigh, east of the

existing CSX S-Line rail corridor. The college is located immediately north of downtown Raleigh. Wake Forest Road and Peace Street (both of which are currently grade separated) are the closest access roads crossing.

3.11.5.2 *EMERGENCY SERVICES*

No changes have been made to the description of Emergency Services that was provided in the Richmond to Raleigh Project Tier II DEIS.

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 Area 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 Area.

3.11.5.2.1.2 *NORTH CAROLINA*

Emergency management for the North Carolina segment of the Study Area 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 Area.

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.

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 AND EMERGENCY MEDICAL SERVICES

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

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 Area 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 Area; 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 Area, 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 Area, 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 Area; 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 Area.

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 Area; 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 Area.

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 Area, while the Norlina Station #2 is located nearby, but outside the Study Area.

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 Area; while the Vance

County Ambulance and Fire Service, City of Henderson Fire Station #1, and Kittrell Volunteer Fire Department are adjacent to, or nearby the Study Area.

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 Area, while the Franklinton EMS and Youngsville Fire Department Station #1 are just outside the Study Area.

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 Area. Located near the Study Area 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*

No changes have been made to the description of Health Services that was provided in the Richmond to Raleigh Project Tier II DEIS.

No changes have been made to the description of Health Services that was provided in the Richmond to Raleigh Project Tier II DEIS.

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 Health Center 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.

3.11.5.1 *PLACES OF WORSHIP AND CEMETERIES*

The list of places of worship and cemeteries in the Study Area has been revised since the Richmond to Raleigh Project Tier II DEIS to include new listings based upon comments or additional information (Table 3-28). Churches that have moved or are no longer in existence are also noted here, but are not discussed in Chapter 4.

The list of places of worship and cemeteries in the Study Area has been revised since the Richmond to Raleigh Project Tier II DEIS to include new listings based upon comments or additional information. Churches that have moved or are no longer in existence are also noted here, but are not discussed in Chapter 4.

Table 3-28 Places of Worship by Section				
Section	**Map Sheet**	**Location**	**Place of Worship**	**Change From Project Tier II DEIS**
AA	3	Richmond, VA	All Saints Apostolic Church, 2001 Royall Ave.	
	4	Richmond, VA	Shekinah Temple Church of Our Lord Jesus Christ, 2102 Ruffin Rd.	Moved or no longer in existence
	4	Richmond, VA	Church of God in Christ, 2208 Summer Hill Ave.	
	8	Near Bellwood in Chesterfield County, VA	Kingsland Baptist Church, 8801 Perrymont Rd.	
	10	Chester, VA	Historic First Baptist Church, 4412 Centralia Rd.	
	10	Chester, VA	Centralia Presbyterian Church, 4625 Centralia Rd.	
BB	12	Chester, VA	Chester Church of Christ, 12100 Winfree St.	
	12	Chester, VA	St. John's Episcopal Church, 12201 Richmond St.	
CC	17	Near Colonial Heights in Chesterfield County, VA	Calvary Baptist Church, 17001 Jefferson Davis Highway	
	18	Colonial Heights, VA	Church of Nazarene, 601 Ellerslie Ave.	
	18	Chesterfield County, VA	Kingdom Hall, 3635 Halifax Rd.	Moved or no longer in existence
	18	Colonial Heights, VA	St. Michael's Episcopal Church, Old Town Rd.	
	20	Near Ettrick in Chesterfield County, VA	Macedonia Tabernacle, 3615 E. River Rd.	
	20	Near Ettrick in Chesterfield County, VA	God Mission of Faith Church, 3718 East River Rd.	
	24	Petersburg, VA	Shining Light Pentecostal Holiness Church, 1417 Farmer St.	

Table 3-28
Places of Worship by Section

Section	Map Sheet	Location	Place of Worship	Change From Project Tier II DEIS
	24	City of Petersburg, VA	Third Presbyterian Church, 1660 Dupuy Rd.	Tier II DEIS incorrectly listed the location as Chesterfield County
	25	City of Petersburg, VA	Greater Faith AME Zion Church, 1301 Youngs Rd.	
	25	City of Petersburg, VA	New First Baptist Church, 1346 Grant Ave.	
	25	City of Petersburg, VA	Zion Apostolic Church, 1601 Youngs Rd.	
DD	--	N/A	N/A	
A	38	Dinwiddie County, VA	Olive Branch Baptist Church, 11119 Boydton Plank Rd.	
B	41	Near the County courthouse in Dinwiddie County, VA	Smyrna Baptist Church, 18725 Carson Rd.	
C	45	Dinwiddie County, VA	Mount Calvary Baptist Church, 16609 Glebe Rd.	
D	54	Between McKenney and Alberta in Brunswick County, VA	Lovely Zion Baptist Church, Lovely Zion Rd.	
	60	North of Alberta in Brunswick County, VA	Mercy Seat RZUA Church, Waqua Creek Rd.	
	62	North of Alberta in Brunswick County, VA	Warfield Baptist Church and Cemetery, 7318 Flat Rock Rd.	
E	66	Alberta, VA	United Methodist Church, 304 Church St.	
	66	Alberta, VA	Trinity-St. Mark's Episcopal Church, 194 Connelly St.	
F to H	--	N/A	N/A	
I	83	South of La Crosse in Mecklenburg County, VA	First Baptist Church, Marengo Rd.	
	83	South of La Crosse in Mecklenburg County, VA	La Crosse Cemetery, Marengo Rd.	New listing

Table 3-28 Places of Worship by Section				
Section	**Map Sheet**	**Location**	**Place of Worship**	**Change From Project Tier II DEIS**
	83	South of La Crosse in Mecklenburg County, VA	Morning Star Apostolic Church, 142 Morris Town Circle	
	83	South of La Crosse in Mecklenburg County, VA	Mecklenburg United Methodist Church, 6503 Marengo Rd.	
J	85	South of La Crosse in Mecklenburg County, VA	Pleasant Hill Reformed Zion Union Apostolic Church, 4143 Marengo Rd.	
	86	South of La Crosse in Mecklenburg County, VA	Sardis United Methodist Church, 3152 Marengo Rd.	
K	--	N/A	N/A	
L	93	Community of Wise in Warren County, NC	Jerusalem United Methodist Church, 850 Paschall Station Road	
	94	Community of Wise in Warren County, NC	Bethlehem Baptist Church, 1258 Cole Farm Road	
	95	Community of Wise in Warren County, NC	Locust Grove Baptist Church, Paschall Station Road	
	95	Community of Wise in Warren County, NC	Providence Church , 1908 US Highway 1 N.	
	95	Community of Wise in Warren County, NC	Wise Baptist Church, 1840 US-1 North	New listing
M	99	Norlina, NC	First Baptist Church, 300 Washington St.	
	100	Warren County, NC	New Creation Church, 108 Hyco St.	Moved or no longer in existence
	100	Norlina, NC	Norlina United Methodist Church, 401 US-1 N.	
	100	Warren County, NC	Unity Prayer House of Faith, 291 US-1 S.	Moved or no longer in existence
	101	East of Ridgeway Community in Warren County, NC	Chapel of the Good Shepherd, NC Rt.1107	
	102	Ridgeway Community in Warren County, NC	Ridgeway Baptist Church, 156 Wycoff Rd.	
N	106	Manson Community in Warren County, NC	Manson Baptist Church, Kimball Rd.	
O	108	Middleburg, NC	Middleburg Baptist Church, 80 N. Plummer Ave.	

Table 3-28 Places of Worship by Section				
Section	**Map Sheet**	**Location**	**Place of Worship**	**Change From Project Tier II DEIS**
	110	Between Middleburg and Henderson in Vance County, NC	Young's Memorial Holy Church, 1379 Brookston Rd.	
	111	Between Middleburg and Henderson in Vance County, NC	Brookston Baptist Church and Cemetery, 242 Baptist Church Rd.	Cemetery added to listing
P	112	North of Henderson in Vance County, NC	North Henderson Church of God, 305 John Deere Rd.	
	114	Henderson, NC	North Henderson Baptist Church, 1211 North Garnett Street	
	114	Henderson, NC	St. John's Episcopal Church, 100 Main Street	
	114	Henderson, NC	Cotton Memorial Presbyterian Church, 511 Chestnut Street	
	114	Henderson, NC	Calvary Temple Holy Church, 215 Kitchen Ave.	
	114	Henderson, NC	Mt Zion Christian Church of Henderson 995 Burr St.	
	114	Henderson, NC	City Road United Methodist Church, N. Garnett St.	New listing
	114	Henderson, NC	Davis Chapel 742 N. Chestnut St.	
	114	Henderson, NC	First Congregational Christian Church, 427 Rowland St.	
	114	Henderson, NC	Rock of the Reach Ministry, 611 N. Garnett St.	Moved or no longer in existence
	115	Henderson, NC	A Touch of Faith Community Church, 601 S. Williams St.	Moved outside corridor
	115	Henderson, NC	First Presbyterian Church, 222 Young St.	
	115	Henderson, NC	First United Methodist Church, 114 Church Street	
	115	Henderson, NC	First Baptist Church, 205 W. Winder St.	
	115	Henderson, NC	Shiloh Baptist Church, 635 S. College St.	

Table 3-28 Places of Worship by Section				
Section	Map Sheet	Location	Place of Worship	Change From Project Tier II DEIS
	116	Henderson, NC	Fisher of Men Church of Our Lord Jesus Christ, 163 Elsie St.	
	116	Henderson, NC	United Prayer of Faith Church, Miriam St.	
	116	Henderson, NC	Cooks Chapel Zion Church, 210 Center St.	
	116	South of Henderson in Vance County, NC	Victory Baptist Church, 475 J P Taylor Rd.	
	116	South of Henderson in Henderson, NC	Welcome Chapel Baptist Church, 237 Welcome Ave.	
	117	South of Henderson in Vance County , NC	Raleigh Rd Baptist Church, 3892 Raleigh Rd.	
Q	120	Vance County, NC	Union Chapel United Methodist Church, 6479 Raleigh Rd.	
	120	Vance County, NC	New Hope Baptist Church, Raleigh Rd.	
	121	Kittrell, NC	Taylor's Chapel AME Zion Church, 106 William St.	
	121	Kittrell, NC	Confederate Cemetery, West Chavis Rd.	New listing
	121	Kittrell, NC	Kittrell Baptist Church, 100 W. Williams St.	New listing
	121	Kittrell, NC	St. James Episcopal Church, William St.	
	121	South of Kittrell in Vance County, NC	Grace Missionary Baptist Church, 1625 US-1 South	New listing
	122	South of Kittrell in Vance County, NC	Long Creek United Holy Church, 313 Oak Ridge Rd.	Moved or no longer in existence
	122	South of Kittrell in Vance County, NC	Oak Ridge Baptist Church and Cemetery, Oak Ridge Church Road	New listing
	122	South of Kittrell in Vance County, NC	Kittrell Church of God, 2540 US-1 South	
R	--	N/A	N/A	
S	127	Franklinton, NC	Franklinton United Methodist Church, 109 N. Main St.	

Table 3-28 Places of Worship by Section				
Section	**Map Sheet**	**Location**	**Place of Worship**	**Change From Project Tier II DEIS**
	127	Franklinton, NC	First United Church of Christ, 20 W. Green St.	
	127	Franklinton, NC	Franklinton Baptist Church, 102 W. Mason St.	
	127	Franklinton, NC	Mt. Pleasant Presbyterian Church, S. Main St.	
	127	Franklinton, NC	Holy Trinity Church, 118 S. Hawkins St.	New listing
	128	Franklinton, NC	First Baptist Church, S. Main St.	
	132	North of Youngsville, in Franklin County NC	Union Grove Baptist Church, 552 N. College St.	
T	132	Youngsville, NC	Youngsville Baptist Church, 315 E. Main St.	Tier II DEIS incorrectly listed under Section S
	132	Youngsville, NC	Grace Fellowship Church, 120 W. Franklin St.	Moved or no longer in existence
	133	Wake Forest, NC	Holy Redeemer Catholic Church, 1841 N. White St.	Tier II DEIS incorrectly listed under Section U
U	133	Wake Forest, NC	Wake Forest Cemetery, N. White Street	
	135	Wake Forest, NC	Glen Royal Baptist Church, 731 Elizabeth Ave.	
	135	Wake Forest, NC	Wake Forest Church of God, 155 E. Cedar Ave.	
	135	Wake Forest, NC	Olive Branch Baptist Church, 326 E. Juniper Ave.	
	136	Wake Forest, NC	Spring Street Christian Church, E. Spring St.	
	136	Wake Forest, NC	Hope Baptist Church, new temporary location at 403 Brooks St.	New address
	136	Wake Forest, NC	Tri-Area Ministry, 149 E. Holding Ave.	

Table 3-28 Places of Worship by Section				
Section	**Map Sheet**	**Location**	**Place of Worship**	**Change From Project Tier II DEIS**
	136	Wake Forest, NC	Wake Forest Baptist Church, 107 E. South St.	
	136	Wake Forest, NC	Church of God of Prophecy, 122 N. White St.	Moved or no longer in existence
	136	Wake Forest, NC	Wake Forest United Methodist Church, 905 S. Main St.	
	136	Wake Forest, NC	South Main Baptist Chapel Church, S. Main St	
	137	Wake Forest, NC	Friendship Chapel Baptist Church, 237 Friendship Chapel Rd.	
	139	Between Wake Forest and Raleigh in Wake County, NC	Living Word Family Church, Capital Boulevard	
V	145	Raleigh, NC	Millbrook United Methodist Church, 1712 E. Millbrook Rd.	Tier II DEIS incorrectly listed under Section U
	149	Raleigh, NC	Deliverance Holy Church of God, 626 Capital Boulevard	Moved or no longer in existence
	149	Raleigh, NC	EMI New Covenant Global Ministries, 911 N. West St.	New listing
	149	Raleigh, NC	Powerhouse Church of Jesus Christ, 1130 N. Blount St.	
	150	Raleigh, NC	St Paul AME Church, 402 W. Edenton St.	
	150	Raleigh, NC	Victory Tabernacle Church, W. South St.	

3.12 ARCHAEOLOGICAL AND HISTORICAL RESOURCES

The Richmond to Raleigh Project is subject to the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 306108), and implementing regulations (see 36 CFR Part 800), which require 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 (ACHP) an opportunity to comment on such actions. The following section identifies archaeological and historical resources located within the 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 Project was conducted with the Virginia Department of Historic Resources (VDHR) and North Carolina State Historic Preservation Office (NC-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 Area of Potential Effects (APE) for the Project. 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 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 Richmond to Raleigh Project Tier II DEIS, preliminary investigations were completed to identify potentially eligible archaeological resources along all Project alternatives. For the Richmond to Raleigh Project Tier II FEIS, more intensive (Phase II) surveys were completed at the potential eligible sites located within the APE for the preferred alternative, as well as in areas that were not within the APE footprint at the time of Tier II DEIS submission, but became part of the Project APE after modifications to the associated engineering designs.

Between 2009 and 2011, the Project Team's consultant, Dovetail Cultural Resource Group (Dovetail), conducted Phase II testing at 17 sites in the Virginia portion and five sites in the North Carolina portion of the APE that were determined to be potentially eligible for the NRHP, and were located along areas where all Project alternatives overlapped. All sites were investigated through close-interval shovel testing, test unit excavation, and archival research, where applicable.

After establishment of the preferred alternative, Dovetail examined the non-common alignment areas of the APE and identified 12 additional archaeological sites within the limits of construction in Virginia that were determined to be potentially eligible for the NRHP and three additional sites in North Carolina. As such, these 15 sites were the subject of archaeological Phase II work in 2012 and 2013.

Based on the Phase II investigations, there are 18 archaeological sites eligible for or listed on the NRHP in the VA portion of the preferred alternative APE and none in the NC portion.

Based on the Phase II investigations, there are 18 archaeological sites eligible for or listed on the NRHP in the Virginia portion of the preferred alternative APE and none in the North Carolina portion. Table 3-29 summarizes these sites by location.

Table 3-29
Summary of Eligible Archaeological Sites Located within Preferred Alternative by State and County

Jurisdiction	NRHP Listed Sites	NRHP Eligible Sites	Total Sites
Virginia			
City of Richmond	0	1	1
Chesterfield County	3	6	9
City of Colonial Heights	0	0	0
City of Petersburg	1	0	1
Dinwiddie County	0	2	2
Brunswick County	0	3	3
Mecklenburg County	1	1	2
Total in VA	5	13	18
North Carolina			
Warren County	0	0	0
Vance County	0	0	0
Franklin County	0	0	0
Wake County	0	0	0
Total in NC	0	0	0
Total in Study Area	**5**	**13**	**18**

Source: Berger, 2005; Legacy Research, 2005; 2007; Legacy Research, 2005, 2007; Dovetail (see Appendix K for list of Dovetail reports).

The following discussion identifies the archaeological resources within the APE that are listed in or eligible for the NRHP. Specific location information is not provided due to the nature of the resources.

3.12.1.1 *WILLIAMS BRIDGE COMPANY (SITE 44CF0724)*

The Williams Bridge Company (44CF0724) in Richmond, VA, was constructed in 1918 as a manufacturing facility for ship parts during World War I. Subsequent uses included a Depression-era City of Richmond facility storage, recommissioned during World War II for additional shipbuilding services, and later twentieth century private iron working. Today, the facility is used to manufacture bridge components. Due to this multi-faceted and notable history, the property was determined to be eligible for the NRHP under Criteria A, C, and D in 2009. Archaeological investigations determined that a segment of the site was used as an occupation and personal well-being area during both the World War I and World War II periods, only to be abandoned when the facility became a private enterprise. The property is also the only known remaining Emergency Fleet Corporation domestic complex in Virginia. The above- and below-ground remains have the potential to reveal information on Richmond and the Commonwealth of Virginia during the World War I to World War II period (1917–1945); therefore, the property is also eligible for the NRHP under Criterion D.

3.12.1.2 *FALLING CREEK IRONWORK (SITE 020-0063)*

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. It is also a locally designated historic site.

3.12.1.3 *SHEFFIELDS (SITE 020-0007)*

Sheffields, or Bellwood, is significant as a representative of an early-nineteenth century antebellum plantation that evolved into a modern, twentieth-century farm and dairying operation in Chesterfield County. The main house is an excellent example of vernacular interpretaion of the Early Classical Revival style in the piedmont area constructed in an I-form. During the Civil War, the house served as General P.G.T. Beauregard's headquarters in 1864 and was a meeting site for General Braxton Bragg, General Beauregard, and Jefferson Davis to discuss the defense of Richmond. In 1887, the property was purchased by James Bellwood, who along with his sons transformed the plantation into a nationally reowned farm and dairying operation. In 1941, the Federal government purchased the property for use as a military supply depot, now known as the Defense Supply Center Richmond (DSCR). The period of significance is from the approximate date of construction circa 1804 to 1924. Sheffields is listed on the NRHP under Criterion A for agriculture, Criterion B for its association with James Bellwood, Criterion C for architecture, and potentilally eligible under Criterion D pending archaeological testing.

3.12.1.4 *USDOD SUPPLY CENTER DISTRICT (SITE 020-5336)*

The USDOD Supply Center District in Chesterfield County is a group of residential, industrial, and military buildings dating from the construction of Sheffield/Bellwood Manor (020-0007), circa 1804, to the development of the Korean Conflict era buildings in 1952. The district is eligible for the NRHP under Critera A, B, C, and D.

3.12.1.5 *CENTRALIA EARTHWORKS (SITE 44CF0680)*

The Centralia Earthworks, located in Chesterfield County, were developed in the 1862 by Confederate troops as part of the Outer Line of defenses for Drewry's Bluff, a line of protection around the City of Richmond. This series of trenches and artillery batteries was situated near Centralia, a major railroad/road crossroads in Chesterfield County. Although some segments of the earthworks has been destroyed, the extant areas remain in excellent condition and the remaining elements of the artillary battery, trenches, and gun emplacements are representative of earthworks developed in this area during the Civil War. For its association with the Civil War and its important role during battle, specifically the Battle of Wooldridge's Hill, and as an example of military engineering, the site is eligible for the NRHP under Criteria A and C, and potentially eligible under Criterion D pending archeaological testing.

3.12.1.6 *CHESTER HOTEL SITE (SITE 44CF0304)*

Site 44CF0304 in Chesterfied County is a mid-nineteenth through early-twentieth century site representing many occupations ranging from the Chester Hotel to its transformation to a domestic residence and doctor's office in the 1930s. Due to the presence of intact structural features, the quantity of artifacts and the site's data potential to reveal information on the early years of Chester, this site is eligible for the NRHP under Criteria A and D.

3.12.1.7 *SWANEE SITE (SITE 44CF0748)*

Site 44CF0748 in Chesterfield County was identified as a late-nineteenth century domestic archaeology site during the Phase I archaeology survey completed for the Project in 2009. Dovetail attempted to complete a Phase II survey in February 2011. However, testing was not completed at this site as archaeologists were asked to leave by the property owners during the shovel test portion of the work. Because Phase II testing was not finished at this site, the Site 44CF0748 is still formally considered "potentially eligible" for the NRHP under Criterion D. For the purposes of determining Project effects and potential mitigation as part of the Richmond to Raleigh Project Tier II FEIS, the site is assumed eligible, and it is included in all Project mitigation documents as such, pending futher review once access is granted.

3.12.1.8 *SITE 44CF0707*

Site 44CF0707 in Chesterfield County is a prehistoric site dating to the Middle Woodland Period with a small scatter of late-nineteenth century debris. Due to the presence of stratified deposits, quantity of prehistoric pottery, and integrity of the soils, this site is eligible for listing on the NRHP under Criterion D.

3.12.1.9 *ARROWFIELD PLANTATION (SITE 44CF0708)*

Site 44CF0708 in Chesterfield County contains the archaeological remains of Arrowfield, an early-nineteenth through mid-twentieth century farmstead with a prehistoric component dating to the Middle Woodland and Late Archaic Periods. Based on the presence of intact building remains, high artifact densities, and the potential for this site to yield a plethora of data on Antebellum Chesterfield County, this site is eligible for the NRHP under Criteria A and D.

3.12.1.10 *SITE 44CF0710*

Site 44CF0710 in Chesterfield County is a multicomponent site primarily dating to the Terminal Archaic prehistoric period with an ephemeral mid-late nineteenth century occupation. Based on the presence of diagnostic materials, intact stratigraphy, and the potential for this site to yield additional information on the prehistoric occupation of Chesterfield, this site is eligible for the NRHP under Criterion D.

3.12.1.11 *BATTERSEA (SITE 123-0059)*

Battersea, located in Petersburg, is significant as one of the earliest surviving examples of a five-part, Robert Morris-style Palladian house form in the United States and is the earlist extant, fully developed example of this house type in Virginia. The house was built in 1768 for Colonel John Banister, who was a Virginia Revolutionary War Delegate, a framer of the Article of Confederation, and the first mayor of Petersburg. During the Revoluationary War. Banister contributed to the war effort politically, militarily, financially, and materially. The stables and fields at Battersea were used by the Continental Army throughout the war, and during the invasion of Petersburg, the British occupied the property three different times. Also archaeological studies have yielded Woodland Period lithic fragments, as well as eighteenth-, nineteenth-, and twentieth-century architectural and ceramic artifacts. For these reasons, Battersea is listed on the NRHP under Criterion A for its association with military activity, Criterion B for its association with Colonel John Banister, Criterion C for its architectural merit, and Criterion D in the area of archaeology.

3.12.1.12 *DIMMOCK LINE/EARTHWORKS (SITE 44DW0373)*

The Dimmock Line/Earthworks in Dinwiddie County is a nineteenth century site featuring multiple components dating to the Civil War era. The trench line, known as the Dimmock Line, is a series of Confederate defenses around Petersburg. Construction began in 1862 and was erected in a shape similar to a horseshoe around the city. These defense works are an excellent example of a trench line used throughout the Civil War. This site is eligible for the NRHP under Criteria A, B and C and is potentially eligible under Criteria D pending further archeaological testing.

3.12.1.13 *FORT DAVIS EARTHWORKS (SITE 44DW0314)*

Fort Davis Earthworks in Dinwiddie County comprises a 4,000-foot long portion of Civil War earthworks that led south from Fort Davis to protect the county during the Siege of Petersburg. Fort Davis and the earthworks served as the southern anchor for Union troop occupation from 1864 to 1865. Based on their association with notable Civil War activity in the area and the excellent physical integrity of the earthwork system as a whole, the resource was determined to be eligible for the NRHP under Criteria A and C. The resource is also potentially eligible under Criterion D due to its ability to yield additional information on the Civil War occupation of Dinwiddie, but additional testing is required.

3.12.1.14 *ORGAIN HOUSE (SITE 44BR0280)*

The 1940s Orgain House in Brunswick County was determined eligible for listing on the NRHP under Criterion C as an excellent representative example of Tudor Revival-style architecture. The property also contains above-ground remnants of the original mid-nineteenth century plantation complex, including the preserved stone foundation of the original circa-1840 Orgain home, a ground depression marking the site of a former ice house, and a variety of historic artifacts and landscape features. Although no formal archaeology was conducted on the parcel, historic artifacts litter the entire ground surface, and oral histories with living relatives attest to the retention of all subsurface manifestations of historic properties, wherever possible. As such, the property was determined eligible for NRHP listing under Criterion D for the potential of these remains to reveal important information regarding the physical and cultural development of both the Orgain property and the surrounding area.

3.12.1.15 *OAK SHADES (SITE 44BR0179/012-5048)*

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 US-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. 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. Oak Shades represents a rural interpretation of the Federal style that was popular in the early nineteenth century, and the house is eligible for listing in the National Register under Criterion C for its architectural merit. The surrounding domestic archaeological site is eligible under Criterion D.

3.12.1.16 *DAVIS SITE (SITE 44BR0225)*

The Davis Site (44BR0225) in Brunswick County is a mid-nineteenth through early-twentieth century domestic site, likely occupied around 1914 by Charlie Davis, an African American resident. Given the artifact concentration, preservation of cultural features, and the lack of intensive archaeological studies of mid-nineteenth-century and early-twentieth century domestic

sites in Brunswick County, this site has the potential to reveal information on rural domestic sites and/or settlement patterns in the Piedmont during the Reconstruction and Growth Period (1865–1917) and the World War I and World War II Period (1917–1945) (NRHP Criterion D). This site is also eligible under Criterion A for its potential to reveal significant data on nineteenth century domestic life in Brunswick County. As such, the site is eligible for listing in the NRHP under Criteria A and D.

3.12.1.17 *LA CROSSE HOTEL (SITE 44MC0888)*

The La Crosse Hotel (Site 44MC0888) in Mecklenburg County is a historic hotel dating to the first-half of the twentieth century. The resource was previously listed on the NRHP under Criteria A and C. Archaeological surveys determined the site is also eligible for listing in the NRHP under Criterion D.

3.12.1.18 *WRIGHT FARMSTEAD (SITE 44MC0707)*

The Wright Farmstead (Site 44MC0707) is located south of Belfield Road on the edge of an agricultural field. Mecklenburg County records indicate that the Wright Farmstead was originally a 125-acre tract that remained in the Wright family from as early as 1864 until 1941.The principle building is a two-story, three-bay, single family dwelling that dates to the mid-nineteenth century. It has been uninhabited for many years, and is in a dilapidated state. In addition, three hand hewn log buildings and a shed of milled lumber are located on the property. Artifacts were noted on the ground surface surrounding all of the extant buildings, including ceramics, glass, and architectural materials. Based on the results of the investigations, it was determined that the site is potentially eligible for the NRHP under Criterion A for its association with mid-nineteenth century farming in Mecklenburg County and Criterion D for its ability to reveal information on area history.

3.12.2 HISTORICAL RESOURCES

As described in the Richmond to Raleigh Project Tier II DEIS, the APE for potential historical resources in the Study Area extends 250 feet on either side of the corridor center line in those areas where the proposed HSR corridor would remain within existing rail ROW. However, in town or urban settings, the APE was reduced during the field survey because dense modern development would often 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.

Similar to archaeology, historical resource surveys were also performed in the Study Area in two phases. In the first phase, historians for the Project team identified all properties within the APE listed on or eligible for the NRHP. In the second phase, investigators for the Project team 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, and 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 ACHP'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 (see Chapter 5).

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 Registry (VLR)
- Inventoried previously

The historians 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.

139 historical resources that are listed or eligible for the NRHP are along the Project corridor.

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 (Richmond to Petersburg, additional roadwork areas and historic district evaluations throughout Virginia, and additional roadwork areas throughout North Carolina). Mattson, Alexander, and Associates (Petersburg, VA, to Raleigh, VA) and Dovetail (Richmond, VA, to Petersburg, VA) also conducted research on the Seaboard Air Line (CSX S-Line) and Atlantic Coastline (CSX A-Line) 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 3-30 summarizes by state and county the historic resources in the APE that are listed on or eligible for the NRHP.

Table 3-30
Summary of Historical Resources Located within Study Area by State and County

Jurisdiction	NRHP Listed Sites	NRHP Eligible Sites	Total Sites
Virginia			
City of Richmond	4	5	9
Chesterfield County	1	16	17
City of Colonial Heights	1	0	1
City of Petersburg	2	5	7
Dinwiddie County	1	12	13
Brunswick County	0	6	6
Mecklenburg County	1	8	9

Table 3-30 Summary of Historical Resources Located within Study Area by State and County			
Jurisdiction	**NRHP Listed Sites**	**NRHP Eligible Sites**	**Total Sites**
Multi-county resources*	0	2	2
Total in VA	10	54	64
North Carolina			
Warren County	3	5	8
Vance County	7	16	23
Franklin County	4	5	9
Wake County	22	12	34
Multi-county resources*	0	1	1
Total in NC	36	39	75
Total in Study Area	**46**	**93**	**139**

Source: Berger, 2005; Mattson, Alexander, and Associates, 2005, 2007, 2009; Dovetail (see Appendix K for list of Dovetail reports).
* Includes battlefields, historic railroad corridors, and other large resources.

Table 3-31 through Table 3-33 provide information on the individual resources from north to south as they appear in the Study Area. The tables include a general description of all resources in the Study Area. For resources that were identified subsequent to the publication of the Richmond to Raleigh Project Tier II DEIS or where information presented in the Richmond to Raleigh Project Tier II DEIS has changed, additional information is included in the sections below. For more detailed information on the remaining resources, refer to Section 3.12 of the Richmond to Raleigh Project Tier II DEIS.

Table 3-31 Historical Resources in the Study Area - Virginia					
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**VLR Status**	**NRHP Status/Criteria**	**Description**
Seaboard Air Line Railroad Corridor	AA, BB, CC/ 1-19, 23-24	Chesterfield, Colonial Heights, Petersburg, Richmond		Eligible/A	Historic railroad corridor that represents the origins and growth of the railroad industry in the Richmond to Petersburg corridor; reflects the post-Civil War trend of merging smaller operations to provide better service while being more economical
C. & O. and Seaboard Railroad Depot	AA/1	Richmond	Listed	Listed/A, C	Built 1901, the monumental structure symbolizes the importance of the rail terminal as an entrance gateway to Richmond; example of the influence of the French Ecole des Beaux Arts on American building
Shockoe Valley and Tobacco Row Historic District	AA/1	Richmond	Listed	Listed/A, C	Circa 1740, encompasses the area of Richmond's earliest residential, commercial, and manufacturing activity; architectural styles ranging from Federal through twentieth-century industrial vernacular
Shockoe Slip Historic District	AA/1	Richmond	Listed	Listed/A, C	Circa late-nineteenth and early-twentieth century, erected as wholesale food or tobacco warehouses, with some serving light industry; buildings generally are modified Italianate in style
James River and Kanawha Canal Historic District	AA/1	Richmond	Listed	Listed/A, C	Circa 1785, canal improved navigation on the James River from Richmond to Botetourt County a distance of approximately 200 miles; District comprises of the canal and canal towpath
Atlantic Coast Line Railroad Corridor	AA, BB, CC/ 10-24	Chesterfield, Colonial Heights, Petersburg, Richmond		Eligible/A	Historic railroad corridor that represents the origins and growth of the railroad industry in the Richmond to Petersburg corridor; reflects the post-Civil War trend of merging smaller operations to provide better service while being more economical

Table 3-31 Historical Resources in the Study Area - Virginia					
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**VLR Status**	**NRHP Status/Criteria**	**Description**
Manchester Industrial Warehouse Historic District	AA/1-2	Richmond	Listed	Listed/A, C	Post 1880, industrial area related to the post-war community of Manchester, VA
Williams Bridge Company	AA/2	Richmond		Eligible/A, C, D	Built in 1919 to assist with World War I war efforts; also used by the US government during World War II; eligible boundary contains main factory and apartment structures used to house workers during both world wars
Lucky Strike/RJ Reynolds Tobacco	AA/2	Richmond		Eligible/A,C	Circa 1955 industrial complex made up of brick buildings and metal storage facilities
Transmontaigne Product Services, Inc.	AA/2	Richmond		Eligible/A	Used to refine, store, ship, and process oil extracts for almost 80 years; founded in 1928 as Gulf Refinery Company; associated with the history of oil production and transport in Richmond
Davee Gardens Historic District	AA/4	Richmond		Eligible/A, C	Planned, symmetrical suburb of Richmond, established in 1947
DuPont Spruance	AA/5-6	Chesterfield, Richmond		Eligible/A	1,500 acre processing plant; first building constructed in 1929; factory played a significant role in the development of textiles and plastics in the US
Sheffields; Auburn Chase; Bellwood; Building 42 - DSCR Officer's Club; New Oxford*	AA/8	Chesterfield	Listed	Listed/A, B, C, D	Circa 1797, representative of the changes in the Richmond area economy, from plantation to tenant farm to military depot; The main dwelling is a Federal style structure with Greek Revival modifications

Table 3-31
Historical Resources in the Study Area - Virginia

Resource Name	Section(s)/ Mapsheet(s)	County	VLR Status	NRHP Status/Criteria	Description
USDOD Supply Center Historic District; Bellwood-Richmond Quartermaster Depot Historic District	AA/7-8	Chesterfield		Eligible/A, B, C, D	Resource encompasses Sheffields -Bellwood described above; circa 1940, compound established as the central depot for Richmond area activities associated with World War II
Richmond & Petersburg Electric Railway	AA, BB, CC/ 4-12, 18, 22-23	Chesterfield, Colonial Heights, Petersburg, Richmond		Eligible/A	Circa 1902, creation of this line was the direct impetus for large-scale modifications to settlement patterns in central Virginia
House at 3619 Thurston Rd	AA/9	Chesterfield		Eligible/C	Circa 1900, 1.5-story Colonial Revival dwelling with a gambrel roof and flared eaves
Centralia Post Office	BB/10	Chesterfield		Eligible/A	Served as one of the pivotal social and economic centers of the Centralia community
Ragland House/4626 Centralia Rd*	BB/10	Chesterfield		Eligible/C	Circa 1890, 2.5-story frame single-family dwelling with brick foundation and raised basement
Circle Oaks/4510 Centralia Road*	BB/10	Chesterfield		Eligible/C	Circa 1840, two-story single family dwelling with slave quarters and a kitchen
Centralia Earthworks	BB/10	Chesterfield		Eligible/A, C; Potentially Eligible/D	Earthworks built in 1862 as part of the Confederate outer defensive for Drewry's Bluff; associated with the battle at Wooldridge's Hill and the Bermuda Hundred Campaign; example of Civil War military engineering
Chester Historic District	BB/11-13	Chesterfield		Eligible/A, C	About 10 blocks within Village of Chester; demonstrates a successful planned community in the mid-nineteenth century; high number of extant architectural resources within its period of significance (1830 to 1958)

Table 3-31
Historical Resources in the Study Area - Virginia

Resource Name	Section(s)/ Mapsheet(s)	County	VLR Status	NRHP Status/Criteria	Description
Chester #94 Masonic Lodge	BB/12	Chesterfield		Eligible/A	Circa 1905, simple two-story, one-bay, frame meeting hall; important at the local level as a historic Masonic lodge that received its charter in 1878
Pretlow House	BB/12	Chesterfield		Eligible/B	Circa 1850 home to two notable Chester residents, Joseph Snead and Thomas Pretlow
Eichelberger House	BB/12-13	Chesterfield		Eligible/C	Circa 1890, 1.5-story vernacular Queen Anne-Eastlake style single dwelling with Central Passage plan; eligible boundary includes a stone gate near of the intersection of the former Richmond & Petersburg Railroad
Ellerslie	CC/17-18	Colonial Heights	Listed	Listed/A, C	Circa 1857, associated with the development of Colonial Heights; an excellent example of Italianate architecture
Appomattox River Railroad Bridge	CC/24	Petersburg		Eligible/A, C	Built 1915, open steel, deck-plate-girder bridge with 11 steel latticework bents; of the three railroad bridges that crossed the Appomattox River into Petersburg during the first half of the twentieth century, it is the only one that survives
Battersea	CC/24	Petersburg	Listed	Listed/A, B, C, D	Built 1768 for Colonel John Banister, the first mayor of Petersburg and a signer of the Articles of Confederation; a substantial stuccoed brick house that still retains its historic rural character
North Battersea/Pride's Field Historic District	CC/23-24	Petersburg	Listed	Listed/C	Circa mid-to-late nineteenth and early twentieth century, Italianate, Gothic Revival and Colonial Revival styles residences

Table 3-31 Historical Resources in the Study Area - Virginia					
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**VLR Status**	**NRHP Status/Criteria**	**Description**
Defense Road	CC/25-27	Petersburg		Eligible/A, C	Colonial Revival-era public parkway designed by the National Park Service in the 1920s and built by the Civilian Conservation Corps as a means of aiding tourists visiting the numerous Petersburg area Civil War earthworks and forts; maintains its original white/grey pavement and the surrounding park-like setting
Dimmock Line/Earthworks	CC/26-27	Petersburg		Eligible/A, B, C, D	Series of Confederate defenses around Petersburg; construction began in 1862 and was primarily built with slave labor under the guidance of Captain Charles Dimmock; great example of a trench line used throughout the Civil War
Bridge over Defense Road	CC/26-27	Petersburg		Eligible/A, C	Single-span, three-lane, segmental arch bridge constructed in 1936 as part of the larger Defense Road parkway project
Fort Davis Earthworks	DD/34	Dinwiddie		Eligible/A, C; Potentially Eligible/D	Civil War era earthworks constructed by Union troops in 1864 during the Siege of Petersburg; good physical integrity
Evergreen	A/37	Dinwiddie		Eligible/C	Circa 1790, example of a Federal-era dwelling
Courtworth	C/44	Dinwiddie		Eligible/C	Circa 1878, example of a late nineteenth-century vernacular dwelling incorporating Victorian motifs
Bowen House	C/45	Dinwiddie		Eligible/C	Circa 1878, example of late Victorian domestic vernacular architecture
W. Boisseau's Store, Warehouse, Dwelling	C/45	Dinwiddie		Eligible/A, C	Circa 1900, examples of rural commercial/domestic complexes of the early twentieth century in southern Virginia

Table 3-31
Historical Resources in the Study Area - Virginia

Resource Name	Section(s)/ Mapsheet(s)	County	VLR Status	NRHP Status/Criteria	Description
Bank of McKenney (referred to as Bank Building in Tier II DEIS)	C/50	Dinwiddie		Eligible/A	Circa 1906 commercial building; one of the few surviving early banks associated with the trend of small communities opening banks and one of earliest banks in all of Dinwiddie County
Chesapeake and Potomac Telephone Company (C & P) Building	C/50	Dinwiddie		Eligible/A, C	Circa mid-1920s industrial building; represents a time when the telephone forever changed communication; excellent example of elaborate local telephone company building with notable percentage of original elements intact
Mayton House	C/51	Dinwiddie		Eligible/C	Circa 1905, example of early twentieth-century vernacular Colonial Revival domestic architecture
Zehmer Farm/ Honeymoon Hill Farm	C/51	Dinwiddie	Listed	Listed/C	Circa late nineteenth century; good example of a vernacular dwelling
Wynnhurst	D/54-55	Brunswick		Eligible/C	Built 1925, example of an early twentieth-century Dutch Colonial dwelling
Blick's Store	D/54-55	Brunswick		Potentially Eligible/C	Circa 1909, example of an early twentieth century crossroads store
House/458 Second Avenue	E/66	Brunswick		Eligible/C	Circa 1924 Craftsman style house, rare example of an unmodified kit dwelling
Orgain House	G/73	Brunswick		Eligible/A, C, D	Circa 1840 Tudor Revival dwelling; associated with regional landscape changes and the cultural memory of a single family struggling to maintain their familial land in a rapidly-changing economic environment; contains above-ground remnants of original mid-nineteenth century plantation complex
Tourist Guest House	G/74	Brunswick		Eligible/C	Circa 1926, Craftsman-style tourist house

Table 3-31 Historical Resources in the Study Area - Virginia					
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**VLR Status**	**NRHP Status/Criteria**	**Description**
Oak Shades	G/74	Brunswick		Eligible/C	Built 1812, rural interpretation of the Federal style
Evans House	H/78-79	Meckenburg		Eligible/C	Built 1930, ornate example of an American Foursquare dwelling
Smelley House	I/82	Mecklenburg		Eligible/C	Built 1880, Victorian-era house represents a rural interpretation of the highly ornate Queen Anne style
La Crosse Commercial Historic District	I/83	Mecklenburg		Eligible/A, C	Collection of early twentieth century commercial buildings; significant as a boom community created by the construction of the railroad that brought economic expansion to the region
La Crosse Hotel	I/83	Mecklenburg	Listed	Listed/A, C, D	Early twentieth century small town railroad hotel with excellent integrity; occupies a prominent position across the tracks from the former location of the Seaboard Air Line depot and the main commercial strip in La Crosse
Wright Farmstead	J/84-85	Mecklenburg		Potentially Eligible/A, C, D	Associated with the history of agriculture in this area, particularly the late-nineteenth/early-twentieth century change in the meat-smoking industry; farmstead includes a main house, four outbuildings, and an archaeological site
Sardis Methodist Church	J/86	Mecklenburg		Eligible/C	Built 1911, example of a vernacular early-twentieth century ecclesiastic structure
Bracey Historic District	K/89	Mecklenburg		Eligible/A, C	Circa late nineteenth century; example of a small community created by the construction of the railroad that brought economic expansion to the region; architectural example of a railroad community

Table 3-31
Historical Resources in the Study Area - Virginia

Resource Name	Section(s)/ Mapsheet(s)	County	VLR Status	NRHP Status/Criteria	Description
Bracey Depot	K/89	Mecklenburg		Eligible/A, C, Consideration B (as a moved property)	Rare surviving example of an early-twentieth century depot with much of its original architectural elements; associated with large county-wide, state-wide, and nation-wide trend of development of railroad across the American landscape in the second half of the nineteenth century and early-twentieth century
Bracey & Company Store	K/89	Mecklenburg		Eligible/A, C	Circa 1917 commercial building; excellent example of an important early-twentieth century type of commerce that was common in rural areas though the US; rare intact example of vernacular commercial form of architecture
Granite Hall/Fitts House	L/92-93	Mecklenburg		Eligible/C	Circa early twentieth century; example of Classical Revival architecture

Source: Berger, 2005; Dovetail (see Appendix K for list of Dovetail reports).
* Also a locally designated historic site.

Table 3-32
Battlefields in the Study Area – Virginia

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Proctor's Creek	AA, BB/7-10	Chesterfield	Eligible/A	Battlefield consists of monuments, interpretive markers, a cemetery, historic road bed, buildings and trenches
Port Walthall Junction	BB/14-16	Chesterfield	Eligible/A	Area associated with the Battle at Port Walthall Junction; consists of a historic road bed, trenches, and an old railroad bed

Table 3-32
Battlefields in the Study Area – Virginia

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Swift Creek/Arrowfield Church	CC/16-18	Chesterfield, Colonial Heights	Eligible/A	Area associated with the Battle at Swift Creek
Petersburg III/The Breakthrough	CC, DD/25-28	Dinwiddie, Petersburg	Eligible/A	Area associated with the Battle of Petersburg
Weldon Railroad/Globe Tavern	CC, DD/26-30	Dinwiddie, Petersburg	Eligible/A	Area associated with the Civil War battles fought near the Weldon Railroad
Peebles Farm	CC, DD/27, 31-33	Dinwiddie, Petersburg	Eligible/A	Location of the Battle of Peebles Farm
Boydton Plank Road	DD, A/32-37	Dinwiddie	Eligible/A	Location of the Battle of Boydton Plank Road
Hatcher's Run	DD, A/31-36	Dinwiddie	Eligible/A	Area associated with the Battle near Hatcher's Run
Lewis Farm	A/36-38	Dinwiddie	Eligible/A	Location of an episode in the initial phase of Grant's final drive to outflank Lee's Petersburg force
Dinwiddie Courthouse	B/40-41	Dinwiddie	Eligible/A	Location of the Battle at Dinwiddie Courthouse

Source: Berger, 2005; Dovetail (see Appendix K for list of Dovetail reports).

Table 3-33 Historical Resources in the Study Area – North Carolina				
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**	**Description**
Warren County Training School	L/94-95	Warren	Listed/A, C	Built 1922, first and only high school for African Americans in the county; large and architecturally sophisticated example of the rural schools built for black communities
Wise School	L/95	Warren	Eligible/A, C	Built 1904, reflects the era of school consolidation in NC; imposing and rare surviving example of the rural public schools
House (East side of US-1, Wise, NC)	M/96	Warren	Eligible/C	Circa 1890, especially stylish expression of a common regional design
Holtzmann Farm	M/101	Warren	Eligible/A	Circa 1880, illustrates the agricultural practices and self-sufficiency of a middling Ridgeway farmer
Chapel of the Good Shepherd	M/101-102	Warren	Listed/A, C	Built 1871, Gothic Revival chapel; landmark in Ridgeway community
Dr. Thomas B. Williams House and Office	M/102	Warren	Eligible/C	Circa 1890 residence, size and architectural embellishments reflected the wealth and status of the Williams family
Marshall House/Tavern (House No 245)	M/102	Warren	Eligible/C	Early timber-framed structure, which has been expanded over time to become one of the largest dwellings in the vicinity of Ridgeway; unique example of Colonial, vernacular, and Folk Victorian architecture in Warren County; associated with the planning and development of the town of Ridgeway and the Ridgeway Company
William J. Hawkins House	N/103	Warren	Listed/A, B, C	Circa 1850, Greek Revival and Italianate residence; illustration of the prosperous plantation society; home of Dr. William J. Hawkins
Middleburg Community House (Middleburg Steakhouse)	O/108	Vance	Eligible/A, C	Circa 1930; financed by the Civil Works Administration; rustic style for Depression era residence

Table 3-33 Historical Resources in the Study Area – North Carolina				
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**	**Description**
House (Allison Cooper Rd, Middleburg vicinity)	O/108	Vance	Eligible/C	Circa 1880, Greek Revival residence
Holloway Farm	O/109-110	Vance	Eligible/A, C	Late nineteenth century farm; illustrates the rise of tobacco cultivation; traditional domestic and agricultural buildings
William Haywood Harris Farm	O/109-110	Vance	Eligible/A, C	Built 1860 for tobacco cultivation; Greek Revival residence
Forrest Ellington Farm	O/110	Vance	Eligible/A	Circa 1920-1950 farmstead
R. B. Carter House	P/114	Vance	Eligible/C	Built 1892, adaptation of up-to-date picturesque architecture to traditional forms
Henderson Historic District and Proposed Boundary Expansion	P/114-115	Vance	Listed/A, C	Circa 1890-1930, tobacco market and regional industrial center; represents the national design and style trends of the period
Vance County Courthouse	P/115	Vance	Listed/A, C	1884 and 1908 Neoclassical Revival courthouse
Zollicoffer's Law Office	P/115	Vance	Listed/B, C	1887 small brick Victorian commercial building; landmark of downtown Henderson; one of the best preserved reminders of the town's post-Civil War prosperity; associated with the A. C. Zollicoffer, who was prominent in local and regional legal, political, and business circles
Henderson Fire Station and Municipal Building	P/115	Vance	Listed/A, C	1908 brick firehouse with tower; associated with early twentieth century improvement of municipal service and safety, and improved firefighting efforts
Houses (2 bungalows on E Young Ave)	P/115	Vance	Eligible/A, C	Circa 1900, gabled bungalows
Mistletoe Villa	P/115	Vance	Listed/C	Built in 1885, Queen Anne residence

Table 3-33 Historical Resources in the Study Area – North Carolina				
Resource Name	**Section(s)/ Mapsheet(s)**	**County**	**Status/Criteria**	**Description**
South Henderson Industrial Historic District	P/115-116	Vance	Eligible/A, C	Early twentieth century small-scale commercial buildings, workers dwellings, and three industrial complexes; illustrates rail-oriented industrial development
Vance Flour Mill (Sanford Milling Co.)	P/115-116	Vance	Eligible/A, C	Circa 1920 factory; contributing element to South Henderson Industrial Historic District; represents innovation in industrial construction
Houses (5 worker houses on 1400 block of Nicholas St)	P/116	Vance	Eligible/A, C	Circa 1910-1920 worker dwellings; contributing elements to South Henderson Industrial Historic District
Houses (3 side gable houses on 1500 block of Nicholas St)	P/116	Vance	Eligible/A, C	Circa 1910-1920 worker dwellings; contributing elements to South Henderson Industrial Historic District
Esso Gasoline Station	P/117	Vance	Eligible/A, C	Circa 1930, pre-World War II gasoline station; Spanish Colonial Revival
Confederate Cemetery	Q/121	Vance	Eligible/A	Circa 1864-1865, one of the few Confederate cemeteries in North Carolina
Saint James Episcopal Church	Q/121	Vance	Listed/C	Circa 1850, Carpenter Gothic style church
Hedgepeth and Finch Store	Q/121	Vance	Eligible/A, C	Late nineteenth century general merchandise store; marshalling point for agricultural products

Table 3-33
Historical Resources in the Study Area – North Carolina

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Kittrell Residential Historic District	Q/121	Vance	Eligible/A, C	Circa 1865-1960, district of historic houses embodying diversity in style, scale, and lot size that illustrate the Town of Kittrell's small population and relatively slow pace at which this area was developed; reflects the efforts of several local merchants and companies to use their proximity to the Raleigh and Gaston Railroad and other area roadways to an economic benefit; associated with important events at the local level, such as the establishment of the Raleigh and Gaston Railroad and the broad impacts it made on Kittrell's economic and socio-cultural development by extension
Josiah Crudup House	Q/123	Vance	Listed/C	1830s Federal two-story tripartite frame house; circa 1900 expansion
Person-McGhee Farm	Q, R/124-125	Franklin, Vance	Listed/A, C	Circa 1830, well-preserved farmstead; Queen Anne dwelling surrounded by an array of outbuildings
Raleigh and Gaston Railroad Bridge Piers (Tar River)	Q, R/124	Vance	Eligible/A, C	Circa 1840 railroad piers; oldest railroad structures in the state; illustrate the design, material, and method of construction employed in building before the Civil War
Franklinton Historic District (Includes Sterling Mill Historic District)	S/127-128	Franklin	Eligible/A, C	Epitomizes the development of a Piedmont railroad town circa 1890-1920; remains one of the most intact, small railroad towns in the Piedmont
Aldridge H. Vann House	S/127	Franklin	Listed/C	Built 1918, Classical Revival two-story brick house
Franklinton Depot	S/127	Franklin	Listed/A, C	Built 1886, Raleigh & Gaston Railroad frame depot; associated with one of North Carolina's s first and most important railroads and with the development of the Town of Franklinton
Church	S/127-128	Franklin	Eligible/A, C	Circa 1891, Gothic Revival church
Sterling Cotton Mill	S/127-128	Franklin	Listed/A, C	Circa 1895, two-story, simplified Italianate mill; largest textile operation in Franklin County

Table 3-33
Historical Resources in the Study Area – North Carolina

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Cedar Creek Railroad Bridge Piers	S/129	Franklin	Eligible/A, C	Circa 1840 railroad piers; illustrate the design, material, and method of construction employed in building before the Civil War
Youngsville Historic District	T/132	Franklin	Eligible/A, C	Circa 1890, tobacco market; common commercial and residential building types of the period; stone veneered and several fine, Queen Anne residences
J. B. Perry House	T/132	Franklin	Eligible/C	Circa 1900, Queen Anne residence
Glen Royall Mill Village Historic District*	U/135	Wake	Listed/A, C	Circa 1900, village that provided housing for workers at the Royall Cotton Mill; district includes a company commissary, additional stores, churches, and schools
Wake Forest Historic District*	U/135-136	Wake	Listed/A, C	Original campus of Wake Forest College circa 1820-1890; oldest denominational college in NC; Colonial Revival buildings, Greek Revival, Italianate, Queen Anne, and Classical Revival residences
Downtown Wake Forest Historic District	U/136	Wake	Listed/A	Epitomizes the small, rail-oriented business districts circa 1820-1890; Colonial Revival, Art Moderne, and Art Deco elements
Purefoy-Chappell House and Outbuildings	U/137	Wake	Listed/C	Built 1838 and 1895 two-story frame house and outbuildings
Oakforest*	U/138	Wake	Listed/C	Circa 1807, Federal style hall and parlor home; various additions during the nineteenth century converted it into a Greek Revival house
Powell House	U/139-140	Wake	Listed/A, C	Circa 1790, centerpiece of a large plantation; one of the most imposing and earliest dwellings remaining in Wake County
Neuse Railroad Station	U/142	Wake	Eligible/A, C	Circa 1900 station; typical of the period railway stations
Crabtree Creek Railroad Bridge Pier	V/148	Wake	Eligible/A, C	Circa 1840 railroad pier; illustrates the design, material, and method of construction employed in building before the Civil War

Table 3-33
Historical Resources in the Study Area – North Carolina

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Gulf Petroleum Products Warehouse	V/148	Wake	Eligible/A, C	Circa 1926 warehouse with utilitarian, small-scale, industrial architecture; associated with commerce and industry in Wake County during the period between the World Wars; reflects a larger historic trend for oil and gas companies to establish distribution centers for gasoline and other petroleum products adjacent to major railroads following the exponential growth in automobiles across the country after the end of World War I
Raleigh Bonded Warehouse	V/148-149	Wake	Listed/A, C	Built 1923, cotton warehouse; one million cubic feet of storage space strategically located between the cotton growers of the Coastal Plain and the textile mills in the Piedmont
Mordecai Place Historic District	V/148-149	Wake	Listed/A, C	Circa 1916, subdivision of the plantations that once encircled Raleigh; variety of Revival-style dwellings, Bungalows, and Minimal Traditional domestic designs
Pilot Mill*	V/149	Wake	Listed/A, C	Built 1892; illustrates the emergence of the Piedmont textile industry; example of the simple, brick buildings with long, rectangular plans and limited ornamentation
Roanoke Park Historic District	V/149	Wake	Listed/A, C	Circa 1913-1926, residential neighborhood; Colonial Revival, American Foursquare, Dutch Colonial, Tudor Revival, Minimal Traditional, Period Cottage, and Ranch residences
Noland Plumbing Company Building	V/149	Wake	Eligible/A, C	Built 1960; represents wholesale distribution companies during the postwar years when suppliers built facilities near customers in the new subdivisions; illustrates the postwar modernist movement
John A. Edwards and Company Building	V/149	Wake	Eligible/C	Built 1960; example of postwar commercial modernism

Table 3-33
Historical Resources in the Study Area – North Carolina

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Glenwood-Brooklyn Historic District	V/149	Wake	Listed/A, C	Circa 1905; first of a series of suburban neighborhoods; Queen Anne, Craftsman, Tudor Revival, and Colonial Revival style residences
Seaboard Railway Station	V/149	Wake	Eligible/A, C	Built 1942, Colonial Revival railroad station; represents the important role of rail transportation
Seaboard Railway Warehouses	V/149	Wake	Eligible/A, C	Circa 1940 warehouses; represent the important role of rail transportation; representative of planned warehousing
Raleigh Cotton Mills*	V/149	Wake	Eligible/A, C	Circa 1890; illustrates the rise of the textile industry; typifies the small-scale textile mills of the period
Pine State Creamery*	V/150	Wake	Listed/A, C	Built 1928, dairy farmers' cooperative; Art Moderne building
Seaboard Coast Line Railroad Company Office Building*	V/150	Wake	Listed/C	Built 1861, brick commercial building with restrained Italianate design
Melrose Knitting Mill	V/150	Wake	Eligible/A, C	Built 1902; illustrates the rise of rail-oriented manufacturing; typifies the small-scale textile mills of the period
Raleigh Electric Company Power House*	V/150	Wake	Listed/A	Built 1910, primarily to power the city's electric streetcar system
Carolina Power and Light Company Car Barn and Automobile Garage*	V/150	Wake	Listed/A, C	Built 1925 Art Deco style garage; housed and repaired the company's streetcars and service vehicles
St. Paul A.M.E. Church*	V/150	Wake	Listed/A, B, C	Built 1909, Gothic Revival brick church, constructed by the first independent African-American congregation of Raleigh, ministers were influential leaders of African-American community during Reconstruction

Table 3-33
Historical Resources in the Study Area – North Carolina

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Depot Historic District	V/150	Wake	Listed/A, C	Circa 1880-1952; illustrates the transformation of a downtown neighborhood into a specialized industrial zone and transportation center; area comprises Raleigh's only important collection of rail-related, industrial, and warehouse buildings
Depot Historic District Expansion Area	V/150	Wake	Eligible/A, C	Twelve additional warehouses and commercial buildings and their associated tax parcels that abuts the northwest side of the existing historic district; they form a cohesive collection of resources that contribute to the industrial and commercial significance of the historic district during its period of significance
Montford Hall*	V/150-151	Wake	Listed/C	1858 Italianate-style plantation home located at the northern entrance to the Boylan Heights Historic District; one of the few mansions in Raleigh that survived during the American Civil War era
Boylan Heights Historic District*	V/150-151	Wake	Listed/A, B, C	Circa 1907, Colonial Revival, Neo-Classical Revival, and picturesque dwellings; exemplifies early twentieth century suburban development; associations with developers and civic leaders, Frank Ellington and J. Stanhope Wynne

Table 3-33
Historical Resources in the Study Area – North Carolina

Resource Name	Section(s)/ Mapsheet(s)	County	Status/Criteria	Description
Joel Lane House*	V/150-151	Wake	Listed/A, B, C	Built in late 1760s; manor plantation house overlooking the future site of Raleigh; associated with Joel Lane who was a member of the colonial General Assembly, lobbied to create Wake County, and was directly involved in the decision to locate the permanent capital of the state in Wake County; during the Revolutionary War, house was the site of important government meetings, both formal and informal; National Society of Colonial Dames of America in the State of North Carolina continues to operate this Raleigh Historic Landmark as a house museum
Boylan Apartments*	V/150-151	Wake	Listed/A, C	Built 1935, three-story brick Colonial Revival apartments
Raleigh Hosiery Company Building	V/151	Wake	Eligible/A	Circa 1900; illustrates the small-scale industrial and warehousing properties built along the rail lines
North Carolina School Book Depository	V/151	Wake	Eligible/A	Circa 1940; exemplifies the auxiliary buildings erected to serve the expanding statewide public school system
Governor Morehead School Historic District	V/151	Wake	Eligible/A, C	The North Carolina Institution of the Deaf and Dumb and Blind (now the Governor Morehead School) opened in 1845 and moved to its current location in 1923; significant state-wide for its role in the training of blind, white students in North Carolina; well-preserved collection of Colonial Revival scholastic architecture
Raleigh and Gaston Railroad Corridor	M-V/29	Franklin, Warren, Vance, Wake	Eligible/A	Circa 1836-1840; one of the state's first two railroads and grew to become one of the major rail lines in the southeastern United States

Source: Mattson, Alexander, and Associates, 2005, 2007, 2009; Dovetail (see Appendix K for list of Dovetail reports).
* 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 Project that are listed in or eligible for the NRHP and were identified subsequent to the publication of the Richmond to Raleigh Project Tier II DEIS or where information presented in the Richmond to Raleigh Project Tier II DEIS has changed. They are ordered from north to south through the Study Area. For more detailed information on the remaining resources, refer to Section 3.12 of the Richmond to Raleigh Project Tier II DEIS.

3.12.2.1.1 SEABOARD AIR LINE RAILROAD CORRIDOR (127-6271)

The Seaboard Air Line Railroad Corridor is a historic railroad corridor in Virginia that extends from Richmond, VA south to the North Carolina state line. The Seaboard Air Line opened in 1900 and continued to expand and develop throughout the first-half of the twentieth century. In the 1960s, the Seaboard Airline and Atlantic Coast Line railroads joined as a conglomeration to form the "Seaboard Coast Line Railroad," which was a predecessor of CSX Transportation.

Over the years, the orientation of the rail line was notably modified, but it kept its general north-south trend. Overall, this railroad represents the origins and growth of the railroad industry in the Richmond, VA to North Carolina corridor. It also reflects the post-Civil War trend of merging smaller operations to provide better service while being more economical. For these reasons, the Seaboard Line Railroad Corridor is eligible for the NRHP under Criterion A for its association with transportation history and community planning. The Seaboard Air Line Railroad Corridor is generally congruent with the current CSX S-Line from Richmond through Petersburg to Raleigh, paralleling I-85.

3.12.2.1.2 ATLANTIC COAST LINE RAILROAD CORRIDOR (127-6251)

The Atlantic Coast Line Railroad Corridor was fully completed in 1898 with the merger of the Richmond & Petersburg and Petersburg Railroads into the Atlantic Coast Line Railroad. The rail line connected Richmond and Petersburg, and throughout the early twentieth century it absorbed many smaller railroads eventually creating a line that traveled from Richmond to Tampa, Florida. In the 1960s, the Seaboard Airline and Atlantic Coast Line railroads joined as a conglomeration to form the "Seaboard Coast Line Railroad," which was a predecessor of CSX Transportation.

Over the years, the orientation of the rail lines has been notably modified but has generally kept the north-south trend. This resource is a historic railroad corridor that represents the origins and growth of the railroad industry in the Richmond to Petersburg corridor. It reflects the post-Civil War trend of merging smaller operations to provide better service while being more economical. For these reasons, the Atlantic Coast Line Railroad Corridor is eligible for the NRHP under Criterion A for its association with transportation history and community planning. The Atlantic Coast Line Railroad Corridor is generally congruent with the current CSX A-Line from Richmond through Petersburg to eastern North Carolina, paralleling I-95.

3.12.2.1.3 MANCHESTER INDUSTRIAL WAREHOUSE HISTORIC DISTRICT (127-0457)

The Manchester Industrial 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 boundary of the district was expanded in 2004, and again in 2011. The district comprises an area 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 2011 boundary Increase includes all remaining contributing buildings in the Manchester industrial area between the James River and Commerce Road and from Semmes Avenue on the east to Maury Street on the west that are associated with the most recent period of industrial growth in this area between about 1930 and 1959.

3.12.2.1.4 RICHMOND & PETERSBURG ELECTRIC RAILWAY (020-5351)

The Richmond & Petersburg Electric Railway is a circa 1902 interurban rail line that extends from Richmond, through Chesterfield County and Colonial Heights, to Petersburg. The railway is defined by the railway prism and several associated structures including the 1925 Electric Building in Petersburg (southern terminal) and the 1909-1910 Northern Terminal in Richmond. Between these two terminals, most of the track and structures have been destroyed, but fragments of track are still visible in Petersburg and Richmond. The extant features are significant as relics of an early electric-powered interurban railway. Overall, the creation of this line was the direct impetus for large-scale modifications to settlement patterns in central Virginia, and as such this railway is eligible for the NRHP under Criterion A for its association with transportation history.

3.12.2.1.5 CENTRALIA EARTHWORKS (020-0022)

The Centralia Earthworks were constructed in 1962 as part of the Confederate outer defense line for Drewry's Bruff, a line of protective fortifications around Richmond. They are associated with the May 1864 action at Wooldridge's Hill during the Bermuda Hundred Campaign. The earthworks are eligible for the NRHP under Criterion A because of their association with the battle at Wooldridge's Hill and the Bermuda Hundred Campaign, and under Criterion C as an example of Civil War military engineering. They are also potentially eligible under Criterion D pending additional archaeological testing.

3.12.2.1.6 APPOMATTOX RIVER RAILROAD BRIDGE (020-5579)

The Appomattox River Railroad Bridge is eligible for the NRHP under Criterion A for its association with transportation history and under Criterion C for engineering. The structure is an open steel, deck-plate-girder bridge built in 1915 that extends 1,212 feet across the Appomattox River. It is supported by 11 steel latticework bents visible along the waterway, and at least one multistoried, poured-concrete pier on the south side of the river, all of which elevate the bridge to a height of roughly 79 feet. Of the three railroad bridges that crossed the Appomattox River into Petersburg during the first half of the twentieth century, it is the only one that survives. Still in use on the CSX A-Line, this resource continues to illustrate its significant role in the region's railroad history and economic, as well as physical, development.

3.12.2.1.7 FORT DAVIS EARTHWORKS (026-5012)

The Fort Davis Earthworks are also recorded as archaeological site 44DW0314 (see above). The earthworks comprise a 4,000-foot long earthen structure built by Union troops during the Seige of Petersburg in 1864. The earthworks are eligible for the NRHP under Criteria A and C and are potentially eligibile under Criterion D pending further archaeological testing.

3.12.2.1.8 BANK OF MCKENNEY (257-5004)

The Bank of McKenney (referred to as Bank Building in the Richmond to Raleigh Project Tier II DEIS) in McKenney, VA, is eligible for the NRHP under Criterion A as one of the few surviving early banks associated with the trend of small communities opening banks. It is also one of earliest banks in all of Dinwiddie County. The building was presented in the Richmond to Raleigh Project Tier II DEIS as being "potentially eligible" for the NRHP because permission to survey the building interior had not been granted during the original Section 106 investigations. At that time, it was thought the building was potentially eligible under Criterion C for its architectural merit; however, the subsequent evaluation determined that much of the interior has been compromised by recent modifications and the building is not eligible for the NRHP under this criterion.

3.12.2.1.9 CHESAPEAKE AND POTOMAC TELEPHONE COMPANY (C & P) BUILDING BUILDING (257-5010)

The C & P Building in McKenney, VA, is eligible for the NRHP under Criterion A because the building represents a time when communication technology was rapidly changing. Although the telephone had been around for over thirty years, the process was still being refined and was considered a relatively advanced form of technology for most of the public. It is also eligible for the NRHP under Criterion C as an excellent example of an elaborate local telephone company building with a notable percentage of its original elements intact.

3.12.2.1.10 ZEHMER FARM/HONEYMOON HILL FARM (257-5008)

Zehmer Farm (also known as Honeymoon Hill Farm House) in McKenney, VA, is listed on the NRHP under Criterion C for its collection of agricultural architecture. The house is a good example of an early twentieth century vernacular dwelling possessing integrity of materials, workmanship, setting, feeling, design and location. As an intact collection of agricultural architecture, the outbuildings are significant for their association with the evolution of agricultural practices in Dinwiddie County. The main house and its domestic outbuildings constitute a collection typical for an early twentieth century tobacco and dairy farming complex in Dinwiddie County and with its 309 acres the farm represents an unusually intact example of this property type. Taken together, the house and agricultural buildings, modest structures concerned more with function than design, represent an unusually complete farmstead that documents the county's agricultural architectural history in the era before agricultural specialization.

3.12.2.1.11 HOUSE/458 SECOND AVENUE (012-5013)

The House at 458 Second Avenue in Alberta, VA, is eligible for the NRHP under Criterion C as rare example of an unmodified Craftsman style kit dwelling. The circa 1924 house has had very few alterations or modifications during its 90-year history. The exterior of the building is in excellent condition and has been maintained extremely well. The interior also retains nearly all of its original fabric. It has all of the original door hardware, floors, crown and corner molding, baseboards, light fixtures, and door and window frames. The lot also contains most of its original outbuildings.

3.12.2.1.12 ORGAIN HOUSE (012-5076)

The Orgain House in Brunswick County, VA, is eligible for the NRHP under Criterion A due to its embodiment on regional landscape changes in the nineteenth and twentieth century and, moreover, its association with the pervading cultural memory of a single family struggling to

maintain their familial land in a rapidly-changing economic environment. The 1940s house is also eligible for the NRHP under Criterion C as an excellent representative example of Tudor Revival-style architecture, one of only a few such examples currently recorded in Brunswick County. Last, the resource is also eligble for the NRHP under Criterion D for the potential of above-ground remnants of the original mid-nineteenth century plantation complex to reveal important information regarding the physical and cultural development of both the Orgain property and the surrounding area.

3.12.2.1.13 LA CROSSE HOTEL (250-5001-0003)

The La Crosse Hotel is listed on the NRHP under Criterion A for commerce and Criterion C for architecture. It is also eligible under Criterion D for its subsurface data potential. It is locally significant as an outstanding example of an early twentieth century small town railroad hotel with excellent integrity. The two-story brick hotel occupies a prominent position across the tracks from the former location of the Seaboard Air Line depot and the main commercial strip in La Crosse, and for nearly half a century it drew travelers and locals alike to its communal dining table. Under the guidance and management of three respected business women, the hotel flourished at the center of town. Today it serves as a representative example of many of the defining characteristics of the American hotel industry. The period of significance is from the date of construction, 1917, through 1958, for the central role that it played in the community.

3.12.2.1.14 BRACEY DEPOT (058-5001-0001)

The Bracey Depot in Bracey, VA, is eligible for the NRHP under Criterion A for its association with the large county-wide, state-wide, and nation-wide trend of development of railroad across the American landscape in the second half of the nineteenth century and early-twentieth century. It is also eligible for the NRHP under Criterion C and Consideration B (as a moved property) because, unlike many depots that have been heavily remodeled or demolished, the Bracey Depot retains much of its historic fabric, both on the interior and the exterior, and is a rare example of this type of architecture.

3.12.2.1.15 BRACEY & COMPANY STORE (058-5001-0002)

The Bracey & Company Store in Bracey VA, is eligible for the NRHP under Criterion A as excellent example of an important early-twentieth century type of commerce that was common in rural areas though the United States, but quickly stopped being applicable as times and technologies changed. The circa 1917 commercial building is also eligible for the NRHP under Criterion C as a rare intact example of vernacular commercial form of architecture.

3.12.2.2 *BATTLEFIELDS – VIRGINIA*

Table 3-32 identifies the 10 Civil War battlefields within the Virginia APE for the Project that are listed on or eligible for the NRHP. They are ordered from north to south through the Study Area. For more detailed information on the battlefields in the Study Area, refer to Section 3.12 of the Richmond to Raleigh Project Tier II DEIS. It should be noted that the battlefield boundaries described in the Richmond to Raleigh Project Tier II DEIS are those adopted by the VDHR and have not changed since production of the Richmond to Raleigh Project Tier II DEIS.

In July 2009, subsequent to resource eligibility coordination on the Project, the American Battlefield Protection Program (ABPP) proposed new National Register-eligible boundaries for the 10 battlefields in the Study Area (see Figures 3-12 and 3-12 continued). 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 APE. There are seven exceptions where the ABPP battlefield boundaries within the 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 3-12

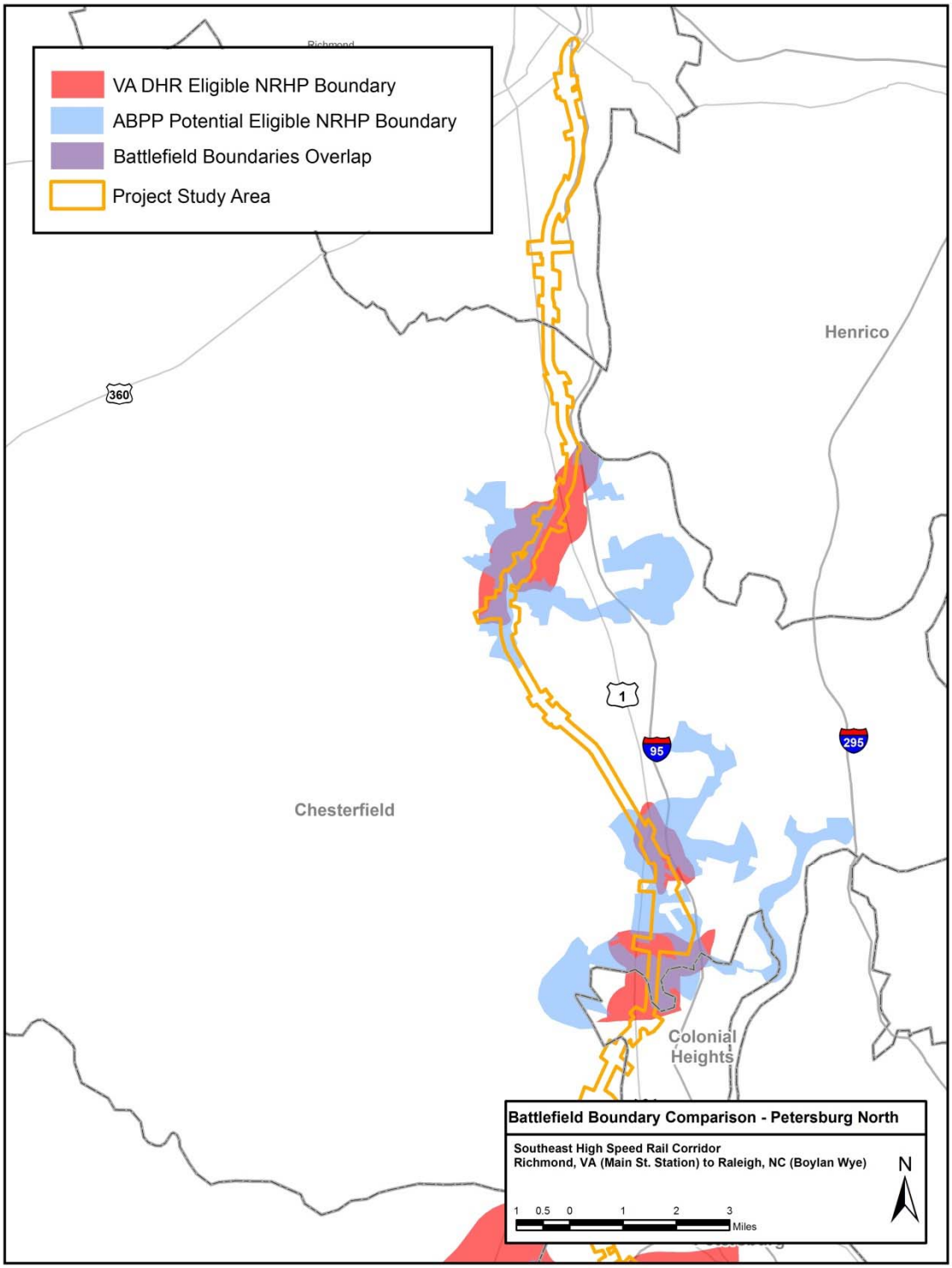


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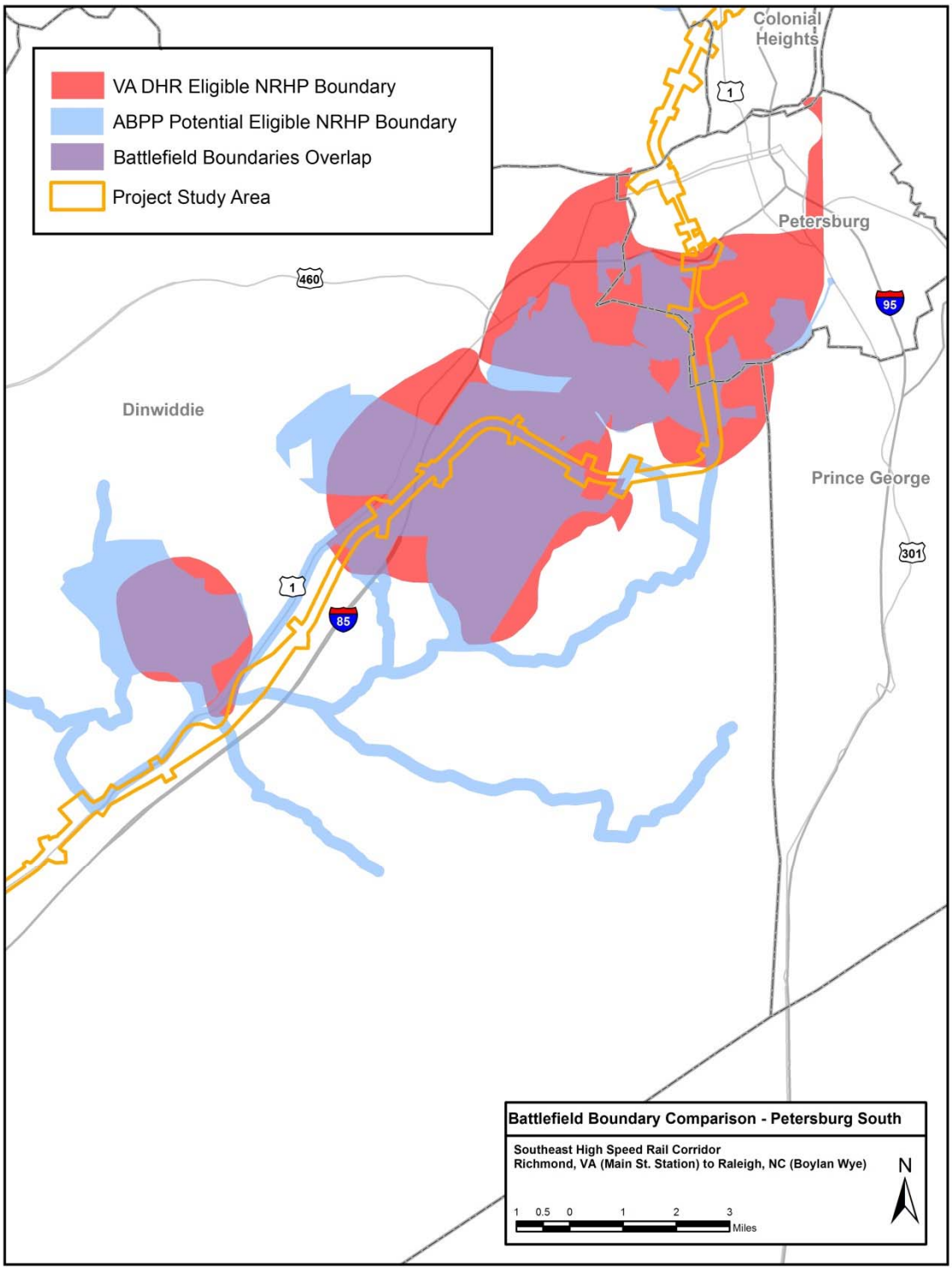
Figure 3-12 continued



3.12.2.3 *HISTORICAL RESOURCES – NORTH CAROLINA*

The following discussion identifies the historic architecture resources within the North Carolina APE for the Project that are listed in or eligible for the NRHP and were identified subsequent to the publication of the Richmond to Raleigh Project Tier II DEIS or where information presented in the Richmond to Raleigh Project Tier II DEIS has changed. They are ordered from north to south through the Richmond to Raleigh Project study corridor. For more detailed information on the remaining resources, refer to Section 3.12 of the Richmond to Raleigh Project Tier II DEIS.

3.12.2.3.1 MARSHALL HOUSE/TAVERN (HOUSE NO 245)

The Marshall House/Tavern is eligible for the NHRP under Criterion A for its associations with the planning and development of the town of Ridgeway and the Ridgeway Company. Although the house is primarily known for its long-standing association with the Marshall family and is considered to be one of Warren County's early taverns, it also has historical associations with the Ridgeway Company and their efforts to develop the town of Ridgeway. The Marshall House is one of just a few buildings that remain in the area from this era and on what was briefly Company land. The parcel on which the house sits was created by the Company before the town of Ridgeway was incorporated and continues to be defined by some of the 1868 boundaries. This resource is also eligible for the NRHP under Criterion C as a unique example of Colonial, vernacular, and Folk Victorian architecture in Warren County.

3.12.2.3.2 VANCE COUNTY COURTHOUSE

The Vance County Courthouse is listed in and remains eligibile for the NRHP under Criterion A. The courthouse was listed in the NRHP in 1979 as part of a thematic nomination of Courthouses in North Carolina. The courthouse in each county has been associated for however long it has stood with the broad patterns of county life, as the center of the local county political process, the administration of justice, and a social and cultural focal point. On a statewide basis, the courthouses have been the subsidiary outlets of political processes and the law.

3.12.2.3.3 ZOLLICOFFER'S LAW OFFICE

Zollicoffer's Law Office is listed in and remains eligibile for the NRHP under Criterion A for its association with the post-Civil War development of Henderson as a county seat and trade center; under Criterion B for its association with A. C. Zollicoffer, who was prominent in local and regional legal, political, and business circles, and under Criterion C for embodying distinctive characteristics of Victorian commercial architecture, practically unaltered on the exterior. The building is a rare survival in the town and region.

3.12.2.3.4 HENDERSON FIRE STATION AND MUNICIPAL BUILDING

The Henderson Fire Station and Municipal Building is listed in and remains eligibile for the NRHP under Criterion A for its association with early twentieth century improvement of municipal service and safety, and improved firefighting efforts. It is also eligible for the NRHP under Criterion C for embodying distinctive characteristics, particularly the fire station tower, of functional, dramatic early twentieth century eclectic architecture. The municipal building was added to the rear in the 1920s and is constructed in an irregular L shape around the fire station.

3.12.2.3.5 KITTRELL RESIDENTIAL HISTORIC DISTRICT

The Kittrell Residential Historic District is eligible for the NRHP under Criterion A for its association with important events at the local level, such as the establishment of the Raleigh and

Gaston Railroad and the broad impacts it made on Kittrell's economic and socio-cultural development by extension. Furthermore, as one of three incorporated towns in Vance County, the community of Kittrell has developed and evolved in response to local conditions, predominantly reflecting the continued success that tobacco and cotton farming had on the area, and also various other types of commerce created by entrepreneurial citizens and the town's location at the center of several overland transportation routes. The Kittrell Residential Historic District is also eligible for the NRHP under Criterion C for architecture. This district plays a vital role in the character and rural setting of the town. The historic houses in Kittrell embody diversity in style, scale, and lot size that illustrate the town's small population and relatively slow pace at which this area was developed, but also reflects the efforts of several local merchants and companies to use their proximity to the Raleigh and Gaston Railroad and other area roadways to an economic benefit.

3.12.2.3.6 JOSIAH CRUDUP HOUSE

The Josiah Crudup House is listed in the NRHP under Criterion C for architecture. With construction beginning in the 1830s, this handsome house was designed as a Federal tripartite dwelling for planter, Baptist minister, and politician Josiah Crudup. The wings were given second stories circa 1900. The two story dwelling has a hip roof, a projecting, central pavilion capped by a pitched pediment, a pedimented entrance porch, and double leaf doors.

3.12.2.3.7 ALDRIDGE H. VANN HOUSE

The Aldridge H. Vann House is listed in the NRHP under Criterion C as an excellent example of an early-twentieth century architect-designed residence combining elements from nationally popular styles. The dwelling is the only known poured concrete residence in Franklin County and is significant locally for both its design and construction. It retains exceptional integrity of design and materials. The dwelling's period of significance is 1918, the year construction was completed.

3.12.2.3.8 FRANKLINTON DEPOT

The Franklinton Depot is listed in the NRHP under Criterion A for its associations with one of the state's first and most important railroads and with the development of the town of Franklinton, and under Criterion C as a well-preserved example of late nineteenth century picturesque railroad architecture along the route of the Raleigh and Gaston Railroad. The building is one of the last surviving railroad structures built along the route of the Raleigh and Gaston Railroad before the line merged with the Seaboard system at the turn of the century. Constructed in 1886, the small frame building combines simple Italianate, Gothic Revival, and Queen Anne period details and is the only remaining example of a type that was built at other stops along the line at the same time. The depot served passenger operations until the early 1970s. When abandoned by the Seaboard Coast Line in 1973, the depot was acquired by the Franklinton Woman's Club and moved a short distance to become the group's clubhouse.

3.12.2.3.9 PUREFOY-CHAPPELL HOUSE AND OUTBUILDINGS

The Purefoy-Chappell House and Outbuildings is listed in the NRHP under Criterion C for architecture. The antebellum house and outbuildings, including the circa 1862 doctor's office, are rare survivors of once common forms. The period of significance for these locally significant buildings is circa 1838 for when the original portion of the house, the smokehouse, and kitchen/dining building were constructed; circa 1862 for the building of the doctor's office; and circa 1895 for the construction of the two-story wing.

3.12.2.3.10 OAKFOREST

Oakforest in Wake Forest, NC, is listed in and remains eligible for the NRHP under Criterion C for architecture. It is one of the oldest and most prominent homes in the Wake Forest area, built circa 1807 as a Federal style hall and parlor home. Various additions during the nineteenth century converted it into a Greek Revival house. The location of the front door was changed from the south side to the west side, exterior chimneys were replaced with interior chimneys, the delicate Federal baluster stairwell was moved to the rear of the hallway, the veranda was covered, and a portico and four Doric columns were added. A rear 2-story ell was built circa 1865. The kitchen wing was built by slave labor during the Civil War.

3.12.2.3.11 GULF PETROLEUM PRODUCTS WAREHOUSE

The Gulf Petroleum Products Warehouse in Raleigh, NC, is eligible for the NRHP under Criterion A for its association with commerce and industry in Wake County during the period between the World Wars, and under Criterion C for its utilitarian, small-scale, industrial architecture. The Gulf Company Petroleum Products complex stands out among the warehouse complexes of Raleigh as a unique example of this building type and the vernacular industrial architecture it embodies from the years between the World Wars. Furthermore, as a warehouse and distribution facility, the Gulf Company complex reflects a larger historic trend for oil and gas companies to establish distribution centers for gasoline and other petroleum products adjacent to major railroads following the exponential growth in automobiles across the country after the end of World War I.

3.12.2.3.12 SEABOARD COAST LINE RAILROAD COMPANY OFFICE BUILDING

The Seaboard Coast Line Railroad Company Office Building is listed in the NRHP under Criterion C for architecture. One of the city's earliest surviving office buildings, the three-story brick Seaboard Building served as railroad offices for more than a hundred years. The building, which has a restrained Italianate design, originally stood on N. Halifax Street. The state purchased the land for the its Government Mall in 1977 and moved the building to N. Salisbury Street. The building has also been designated as a local landmark. The Seaboard Coast Line Railroad was a successor conglomeration of the Seaboard Air Line and Atlantic Coast Line Railroads, and a predecessor of CSX Transportation.

3.12.2.3.13 ST. PAUL A.M.E. CHURCH

St. Paul A.M.E. (African Methodist Episcopal) Church is listed in the NRHP under Criterion A for both politics/ government and ethnic heritage (black), under Criterion B for its associations with Reverend R.W.H. Leak, and under Criterion C for architecture. This imposing, brick, Gothic Revival building was constructed between 1884 and 1909 by African-American masons, and the church displays both elements of the national style and interpretations made by the masons who worked on the building. The building was constructed by the first independent African-American congregation, and thus is important to the religious history of Raleigh. The church also has political significance because the ministers of St. Paul were influential leaders of the African-American community during Reconstruction. In particular, Reverend R.W.H. Leak, minister during the 1880s, was a prominent leader of the black Republicans and served as editor of the Outlook, the second oldest black newspaper in Raleigh. The church has also been designated as a local landmark.

3.12.2.3.14 DEPOT HISTORIC DISTRICT EXPANSION AREA

In early 2013, NC-HPO concurred that an expansion area for the Depot Historic District in Raleigh, NC, was eligible for the NRHP, which included ten additional warehouses and commercial buildings and their associated tax parcels that abuts the northwest side of the existing NRHP-listed Depot Historic District. Later in 2013, NC-HPO concurred that two additional properties, the former US Post Office Morgan Street Station and former Capital Coca-Cola Bottling Company Garage, were also contributing elements to the district and the boundaries should be expanded to include them. The additional industrial and commercial properties contribute to the significance of the Depot Historic District under Criterion A for industry, transportation, and commerce. The Depot Historic District was nominated for its significance in the areas of industry and commerce as the city's wholesale distribution center from the 1880s to the early 1950s. The newly surveyed resources are all wholesale warehouses and commercial buildings that are similar in design, scale, materials, and function to those found within the existing district, and the new properties date to the same period of significance. Furthermore, the Depot Historic District contains the only significant collection of rail-related buildings, factories, and warehouses in Raleigh that date to the period when the railroads predominated in freight transportation, and the additional properties share these characteristics and strengthens the significance of this collection.

The additional properties are also eligible for the NRHP under Criterion C for design/construction. The Depot Historic District was listed in the NRHP under Criterion C because this area, west of the center city, has a locally significant collection of industrial, commercial, and railroad related architecture dating from the 1880s to 1952. The additional warehouses and commercial buildings on the east side of the rail corridor add to the architectural significance and cohesion of the district.

On March 12, 2014, FRA, in partnership with NCDOT, completed an Environmental Assessment for Phase I of the proposed Raleigh Union Station to be constructed at the Boylan Wye to support the expansion of intercity passenger rail service in Raleigh; for which FRA subsequently issued a Finding of no Significant Impact (FONSI) on June 24, 2014. In support of the FONSI, FRA, NCDOT and the NC-HPO executed a Memorandum of Agreement (MOA) for Phase I of the proposed Raleigh Union Station on May 22, 2014.

The MOA determined that Phase I of the Raleigh Union Station project will have an Adverse Effect upon the Depot Historic District and the Proposed Boundary Amendment to the Depot Historic District. Specific areas of effect include the Capital Feed and Grocery and Southern Railway Passenger Station, which may be subject to demolition for Phase I of the Raleigh Union Station project. Although Phase I of the Raleigh Union Station project will provide the primary station building and access facility, it is considered independent from the Richmond to Raleigh Tier-II EIS. A future phase of the Raleigh Union Station will include the expansion of facilities to construct a platform and passenger access to the CSX S-Line on the SEHSR corridor. This future phase will require a separate environmental determination from the Phase I activity as well as this Richmond to Raleigh Tier II FEIS.

3.12.2.3.15 MONTFORT HALL

Montfort Hall was listed in the NRHP in 1978 under Criterion C for architecture. It is an Italianate-style plantation home located at the northern entrance to the Boylan Heights Historic District and is one of the few mansions in Raleigh that survived during the American Civil War era. The house was built for William Montfort Boylan in 1858. The centerpiece of the house's interior is a rotunda supported by four Corinthian columns and lit by a stained glass window located on the roof. Montfort Hall has also been designated as a local landmark.

3.12.2.3.16 JOEL LANE HOUSE

The Joel Lane House in Raleigh, NC, is listed in and remains eligible for the NRHP under Criterion A for politics/government, Criterion B for its association with Joel Lane, and Criterion C for architecture.

In the late 1760s, Joel Lane began building a home in colonial Johnston County. Lane and his house subsequently played a key role in North Carolina's transition from colony to state and in the establishment of Raleigh as the state capital. The manor plantation house stood on a small hill overlooking the future site of Raleigh. In 1770, as a member of the colonial General Assembly, Lane successfully lobbied to create Wake County, which was then a sparsely settled wilderness. In 1771, Wake's first county court is believed to have convened at his house. Lane was appointed a member of the court, a position he held until his death. During the Revolutionary War, Lane's house was the site of important government meetings, both formal and informal. In 1776, Lane hosted the colony Council of Safety; the following year, he obtained a license for a small ordinary (i.e., inn). From May to June 1781, Lane's property was the setting for a session of the state General Assembly. Lane served in the state Senate in 11 of the 14 sessions from 1782 to 1794. He was also a delegate to the 1789 convention in Halifax that ratified the United States Constitution.

Lane was directly involved in the decision to locate the permanent capital of the state in Wake County. In 1792, the legislature authorized the purchase of 1,000 acres of his land upon which to establish the city of Raleigh as the new center of state government. The community's western boundary was drawn just east of Lane's house, and a street of the city was named in his honor. After Lane's death in 1795, the house served several owners before being purchased by planter William Boylan in 1818. The house, along with Montfort Hall, remained in the Boylan family until 1909. During this time, the city of Raleigh absorbed the house into its expanding boundaries. Lane's former plantation lands became the site of new streets, homes and businesses. In 1912, the house was moved a short distance. In 1927, it was purchased by the National Society of Colonial Dames of America in the State of North Carolina to ensure its preservation. The organization continues to operate this Raleigh Historic Landmark as a house museum.

3.12.2.3.17 BOYLAN APARTMENTS

The Boylan Apartments are listed in the NRHP under Criterion C as a well-executed and intact local example of a 1930s garden apartment complex. Built in 1935, one-half-mile due west of the state Capitol, the Boylan Apartments are Raleigh's earliest garden-style apartment complex. The complex is comprised of three three-story brick Colonial Revival-style buildings arranged around an open courtyard. The buildings and site retain integrity of design, setting, and materials.

The Boylan Apartments also meet NRHP Criterion A for their important association with community planning and development and social history. The project to construct the complex, led by local businessman Rufus Boylan, was one nation's first to participate in a Public Works Administration program that loaned Federal money to private developers. The program's goal was to provide jobs for the unemployed at the close of the Depression while creating quality "modern" housing for lower income residents. The project's controversial three-year road to completion was reported in local and national newspapers. The period of significance is 1935, the year construction was completed. The complex has also been designated as a local landmark.

3.12.2.3.18 GOVERNOR MOREHEAD SCHOOL HISTORIC DISTRICT

The North Carolina Institution of the Deaf and Dumb and Blind (now the Governor Morehead School) opened in 1845. The school moved to its current location in 1923. The Governor Morehead School Historic District is eligible for the NRHP under Criterion A for education and

has state-wide significance for its role in the training of blind, white students in North Carolina. The Governor Morehead School Historic District was established at this location in the 1920s as the state's premier educational facility for visually impaired, white girls and boys. The assemblage of substantial, Colonial Revival scholastic buildings erected mainly in the 1920s, as well as its tree-lined pathways, open space, and recreational fields, illustrate the school's major role in the education and care of the state's blind, white students.

The district is also eligible for the NRHP under Criterion C for design/construction. The school's well-preserved collection of Colonial Revival scholastic architecture possesses the integrity of design, materials, and workmanship needed for eligibility under Criterion C. Erected during the school's original construction phase in the 1920s, the administration building, dormitories, library, home economics building, and gymnasium are all notable, well-preserved expressions of the Colonial Revival style as adapted for educational facilities.

3.12.2.4 *RESOURCES NO LONGER ELIGIBLE FOR THE NRHP*

It should be noted that one resource described in the Richmond to Raleigh Project Tier II DEIS was subsequently determined by NC-HPO to no longer be eligible for the NRHP in April 2013. The Commercial Block at 524-530 Hillsborough Street in Raleigh (referred to as "National Art Interiors" in the Richmond to Raleigh Project Tier II DEIS), lacks sufficient integrity to be eligible for the NRHP due to alterations to the first-floor storefronts and the interior of the property. Therefore, it is no longer included in the discussion of historic resources in the Richmond to Raleigh Project Tier II FEIS.

3.12.3 LOCAL LANDMARKS

3.12.3.1 *VIRGINIA*

As indicated in Table 3-31, 11 of the historical resources in the Study Area in Virginia are listed on the VLR, a statewide program established in 1966 and managed by the VDHR. It is the state's official list of properties important to Virginia's history. While these resources are evaluated under the same criteria used for the NRHP, listing on the VLR should not be confused with listing on the NRHP, which is a Federal program. All 11 of the historical resources within the Study Area listed on the VLR are also listed on the NRHP.

Also indicated in Table 3-31 are several historical resources within the Study Area that are also designated as local historic landmarks. Local historic landmarks are designated by county or city governments, and in some cases, such as in the City of Petersburg and the City of Richmond, are participants in the Certified Local Government (CLG) Program, which partners the local government with state and Federal preservation programs. Several county governments in Virginia have crafted ordinances to create and designate local historic districts and landmarks. For example, Chesterfield County Board of Supervisors amended the County Code in 1987 to include Article XXIII, the Historic Districts and Landmarks Ordinance, which enables to the Board to designate historic landmarks, landmark sites, and historic districts. This has led to the designation of 46 local historic resources within the county, including four within the Study Area (Falling Creek Ironwork [020-0063], Sheffields/Auburn Chase/Bellwood [020-0007], Ragland House [020-0432], and Circle Oaks [020-0140]). The other counties and cities in the Study Area did not provide formal lists of their local historic landmarks.

3.12.3.2 *NORTH CAROLINA*

As indicated in Table 3-33, several of the historical resources in the Study Area in North Carolina are locally-designated landmarks. State law (North Carolina General Statutes 160A-400.1-400.14) enables counties and municipalities to create historic preservation commissions and to designate local historic districts and landmarks. These regulations require a Certificate of Appropriateness from the local historic commission in order to make alterations to a landmark property or local district. Local designation should not be confused with listing in the NRHP, which is a Federal program. Although some properties may carry both types of designation, the two designations are separate programs with different requirements and benefits. Within the Study Area, there is one local landmark that was determined not eligible for the NRHP as part of the Project evaluations. All other local landmarks within the Study Area are either listed on or eligible for the NRHP.

The circa 1803 Heartsfield House on Ligon Mill Road in Wake Forest, NC, was designated a Wake Forest Local Landmark in 2011 (subsequent to publication of the Richmond to Raleigh Project Tier II DEIS). At the request of the property owners and Capital Area Preservation (CAP, a nonprofit), the NC-HPO and NCDOT reviewed the original Section 106 eligibility survey for the Heartsfield House, which stated the property was not eligible for the NRHP due to its extensive alternations. Based on their review of the survey, NC-HPO and NCDOT do not recommend altering its NRHP eligibility determination. Both the property owners and CAP have stated they will provide additional information in support of the property's eligibility. Additional materials have not been received at press; once received, NC-HPO and NCDOT will review it and reevaluate the eligibility.

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 3-13 continued show the locations of these areas. A Community Profile Report, including a detailed discussion of parklands, recreational areas, and refuges within the Study Area, was prepared in January 2004 (NCDOT and Virginia DRPT, 2004d); the data from this report have been updated to reflect changes to the 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

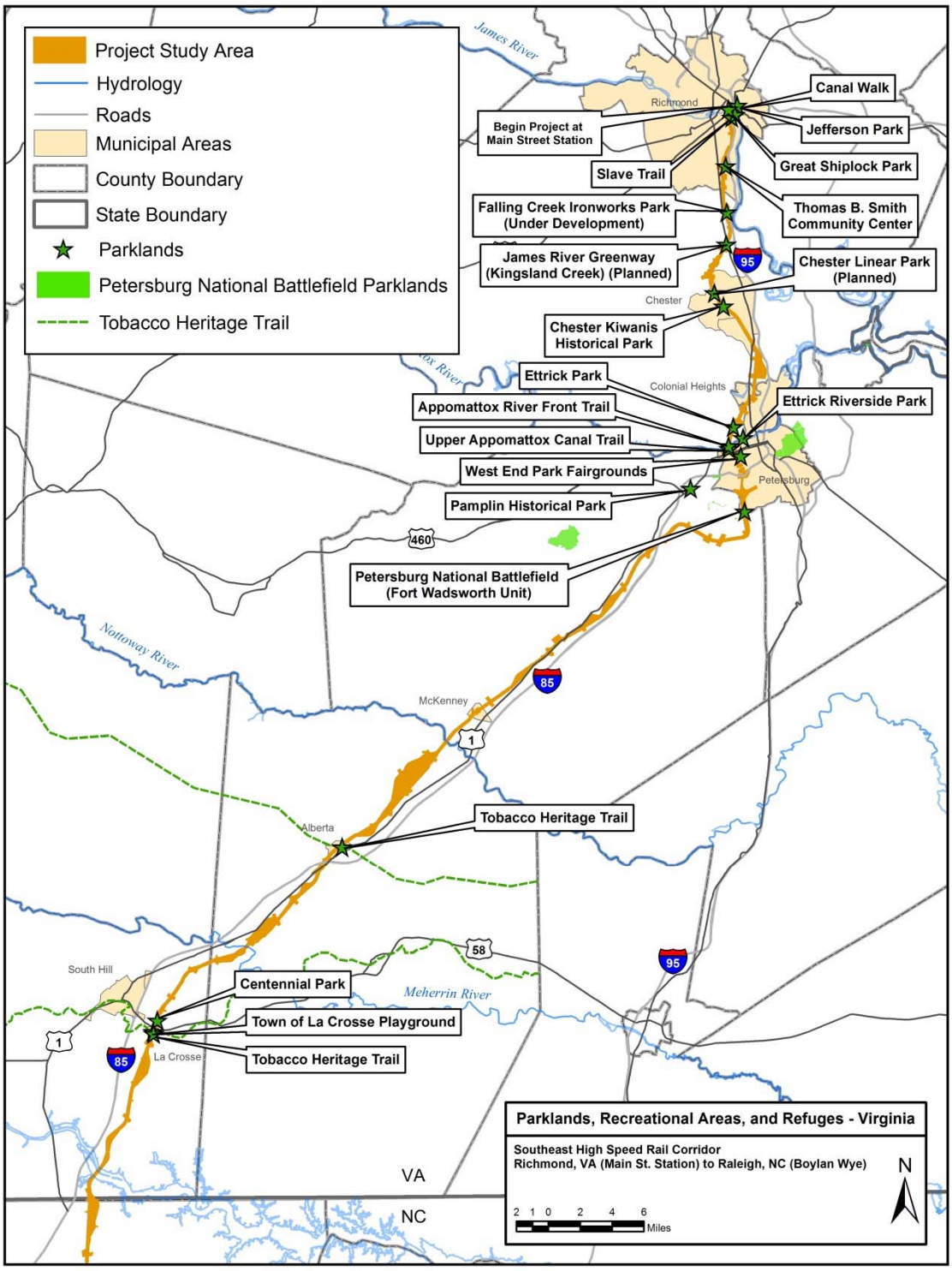


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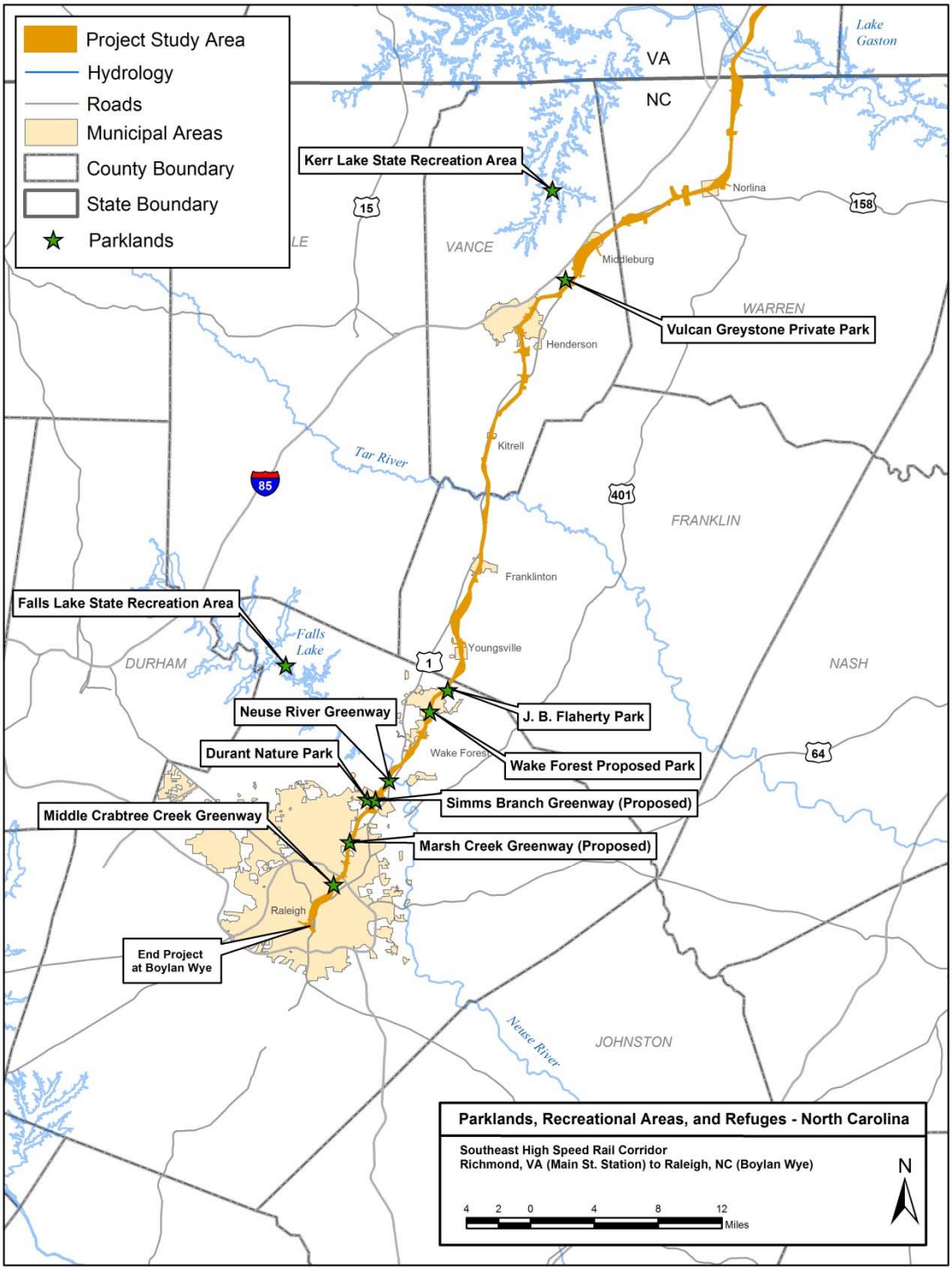
Figure 3-13 continued



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 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 in Durham and Wake counties. 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 and greenways 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 the 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 planning several parks and greenways in the SEHSR Study Area. The County plans to acquire property just north of Falling Creek and east of Jefferson Davis Highway to use for a public park, expanding on the Falling Creek Ironworks Park directly south of the creek. This nearby park at the site of the Falling Creek Ironworks is the first ironworks in English North America. Chesterfield County is also planning a greenway on the north side of Kingsland Creek in the vicinity of the Defense Supply Center Richmond (DSCR) in Bellwood, and an expansion of Chester Linear Park, a strip of land situated in the Chester Village area. The county is also 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 Conservancy (www.railstotrails.org) 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. The town also operates a playground on a vacant parcel at the intersection of College Street and Central Avenue, just south of the historic La Crosse Hotel.

3.13.3.2 *NORTH CAROLINA*

Vulcan Materials Company at Greystone Quarry in Henderson, NC, operates a privately-owned park facility adjacent to its mining operations and the existing rail line within the Study Area.

The Richmond to Raleigh Project Tier II DEIS discussed a proposed park in the Town of Wake Forest, NC, on approximately one acre of land at the intersection of South White Street and East Holding Avenue (All People's Park). The park has not been developed and does not appear in a planning document adopted by the town.

J.B. Flaherty Park is located in the Town of Wake Forest, NC, and is approximately a quarter mile south of the 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 and crafts room, game room, and a meeting room with a small kitchen (Town of Wake Forest, Department of Parks and Recreation, 2004).

The portion of the Neuse River Greenway in Raleigh, NC, that crosses the Study Area was constructed in 2011. This segment, the Upper Neuse Greenway, is part of the City of Raleigh Capital Area Greenway System and provides connections from the Falls Canoe Launch and Falls Lake Recreation Area at Falls of Neuse Road to the private soccer complex on Perry Creek Road. The City is also planning two greenways in the Study Area. The proposed Simms Branch Greenway corridor crosses the CSX S-Line rail corridor between Gresham's Lake Road and Durant Road, and the proposed Marsh Creek Greenway corridor crosses the CSX S-Line rail corridor just north of Millbrook Road. 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 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 U.S.C. § 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 Study Area:

- Canal Walk, Richmond, VA
- Slave Trail (James River Park System), Richmond, VA
- Thomas B. Smith Community Center, Richmond, VA
- Falling Creek Park Expansion (Planned), Chesterfield County, VA
- Falling Creek Ironworks Park (Under Development), Chesterfield County, VA
- James River Greenway (Kingsland Creek) (Planned), Chesterfield County, VA
- Chester Linear Park, Chester, VA
- Chester Kiwanis Historical Park (Planned), Chester, VA
- Ettrick Park and 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
- Town of La Crosse Playground, La Crosse, VA
- Franklinton Elementary School, Franklinton, NC
- Neuse River Greenway, Raleigh, NC
- Simms Branch Greenway (Proposed), Raleigh, NC
- Marsh Creek Greenway (Proposed), Raleigh, NC
- Middle Crabtree Creek Greenway, Raleigh, NC

There are several other recreational resources described in the above sections that are located outside the 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 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 Project alternatives. Subsequent coordination determined that the Project alternatives will not require ROW from or otherwise impact these Section 6(f) resources.

In addition, the Project team coordinated with the National Park Service's American Battlefield Protection Program and Northeast Region land office to determine if any properties acquired using LWCF funds are located within the Study Area. This coordination determined that there were no such properties.

At the time of publication of the Richmond to Raleigh Project Tier II DEIS, 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 Project team that LWCF funds will not be used for any of the ROW potentially required for the Project.

3.14 TRANSPORTATION

3.14.1 **ROADS**

- The discussion below is mostly unchanged from the Richmond to Raleigh Project Tier II DEIS, with corrections noted within the descriptions by location.
- There are numerous transportation facilities within the Study Area, including many that cross the rail ROW within the Study Area. 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 Area, with average daily traffic counts (2002) greater than 1,000 vehicles per day.

3.14.1.1 *CITY OF RICHMOND, VA*

Within the City of Richmond, VA, the Study Area 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

Area, crossing the James River west of the Study Area, and serves local north/south traffic. Within the downtown area, most of the roads that cross the CSX S-Line are grade separated by bridges or underpasses.

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

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

3.14.1.2 *CHESTERFIELD COUNTY, VA*

Within Chesterfield County, major north/south traffic near the Study Area is served by I-95 and Jefferson Davis Highway. The major east/west traffic is carried on Chippenham Parkway, Highway 288, and West Hundred Road. In Chesterfield County, the Study Area is centered along 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 CSX A-Line are listed from north to south:

- Chippenham Parkway, existing highway bridge over railroad
- Station Road, crosses at-grade
- Jefferson Davis Highway, existing roadway bridge over railroad
- Kingsland Road, crosses at-grade
- Brinkley Road, crosses at-grade
- VA-288, existing highway bridge over railroad
- Old Lane, crosses at-grade
- Centralia Road, crosses at-grade
- West Hundred Road, existing roadway bridge over railroad
- Curtis Street, crosses at-grade
- Jefferson Davis Highway, existing roadway bridge over railroad
- Ruffin Mill Road, existing roadway bridge over railroad
- Woods Edge Road, crosses at-grade
- Pine Forest Drive, crosses at-grade
- Branders Bridge Road, crosses at-grade
- Dupuy Road, crosses at-grade (correction; was not included in Richmond to Raleigh Project Tier II DEIS)
- River Road, existing bridge

3.14.1.3 *CITY OF COLONIAL HEIGHTS, VA*

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

- East Ellerslie Avenue, existing roadway bridge over railroad

- Boulevard, existing railroad bridge over roadway

3.14.1.4 *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 Area. The largest east/west traffic volume is carried by Boydton Plank Road and Washington Street. Within Petersburg the Study Area follows the active CSX A-Line.

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

- Washington Street, existing railroad bridge passing over roadway
- Farmer Street, existing railroad bridge over roadway
- Halifax Street, existing roadway bridge over railroad
- I-85, existing highway bridge over railroad
- Defense Road, existing railroad bridge over roadway
- Halifax Road, existing roadway bridge over railroad

3.14.1.5 *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 and the Study Area. VA 703/Carson Road carries the greatest east/west traffic volume across the Study Area 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 Area 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 inactive CSX S-Line are listed from north to south:

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

3.14.1.6 *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 and the Study Area. 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 inactive CSX S-Line are listed from north to south:

- Main Street (Alberta), crosses at-grade
- I-85 (south of Alberta), existing highway bridge over railroad
- Boydton Plank Road/US-1 (south of Alberta), existing highway bridge over railroad
- Christianna Highway/Route 46 (south of Alberta), existing roadway bridge over railroad

3.14.1.7 *MECKLENBURG COUNTY, VA*

In Mecklenburg County, I-85 and US-1 continue to loosely parallel the Study Area, 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 Area 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 inactive CSX S-Line are listed from north to south:

- US-58 (La Crosse), existing highway bridge over railroad
- Main Street (La Crosse), crosses at-grade
- Morris Town Circle (La Crosse), crosses at-grade
- Route 903 (Bracey community), existing roadway bridge over railroad

Note that the Richmond to Raleigh Project Tier II DEIS incorrectly included St. Tammany Street in the listing of roads that cross the railroad in La Crosse, VA (with an AADT over 1,000). The road has been removed from the listing here in the Richmond to Raleigh Project Tier II FEIS. St. Tammany ties to Main Street very near the Main Street at-grade railroad crossing, with Main Street the road that actually crosses the railroad.

3.14.1.8 *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 CSX S-Line becomes an active freight railroad.

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

- Wise Five Forks Road, crosses at-grade (inactive railroad segment)
- Warren Plains Road(Norlina), crosses at-grade (inactive railroad segment)
- US-158 (Norlina), existing railroad bridge over roadway
- Ridgeway Road SR 1107 (south of Norlina), crosses at-grade
- Axtell Ridgway Road (south of Norlina), crosses at-grade (correction; was not included in Richmond to Raleigh Project Tier II DEIS)

3.14.1.9 *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 Area briefly come together near Middleburg, NC; however, at this location I-85 diverges from the Study Area and remains well to the west throughout the remainder of the corridor. US-1 Bypass crosses the active CSX S-Line on a bridge north of Henderson, NC. US-158 provides east/west access through the Henderson, 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 active CSX S-Line are listed from north to south:

- US-1 Bypass (north of Henderson), existing highway bridge over railroad
- Warrenton Road (north of Henderson), crosses at-grade (correction to description)
- 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 railroad bridge over roadway (correction to description)
- 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
- Miriam Avenue/ St. Matthews Street/ Nicholas Street (Henderson), crosses at-grade (revised name)
- 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 highway bridge over railroad
- Peter Gill Road (north of Kittrell), crosses at-grade
- Chavis Road (north of Kittrell), crosses at-grade
- Main Street (Kittrell), crosses at-grade

3.14.1.10 *FRANKLIN COUNTY, NC*

Within Franklin County, US-1 carries the highest volume of north/south traffic near the Study Area, while NC 56, which crosses the Study Area 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 active 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 railroad bridge over roadway
- College Street (Franklinton), crosses at-grade
- Bert Winston Road (north of Youngsville), crosses at-grade (correction; was not included in Richmond to Raleigh Project Tier II DEIS)
- Main Street/NC 96 (Youngsville), crosses at-grade

3.14.1.11 *WAKE COUNTY, NC*

In Wake County, the preferred alternative primarily follows the active CSX S-Line along the busy US-1 corridor, although in Downtown Raleigh, it parallels the NS line on the east side for a short distance. 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.

The listing below of major public road facilities that cross railroad ROW has been revised from the Richmond to Raleigh Project Tier II DEIS to reflect the alignment of Preferred Alternative (NC5) in Downtown Raleigh.

Major public road facilities that cross the active CSX S-Line or NS rail alignment are listed from north to south:

- Roosevelt Avenue (Wake Forest), existing CSX railroad bridge over roadway

- Elm Avenue (Wake Forest), crosses CSX railroad at-grade
- Holding Avenue (Wake Forest), crosses CSX railroad at-grade
- NC 98 Bypass (Wake Forest), existing roadway bridge over CSX railroad
- Rogers Road (Wake Forest), crosses CSX railroad at-grade
- Ligon Mill Road (Wake Forest), crosses CSX railroad at-grade
- Capital Boulevard/US1 (north of Raleigh), existing highway bridge over CSX railroad
- Durant Road (Raleigh), crosses CSX railroad at-grade
- Gresham Lake Road (Raleigh), crosses CSX railroad at-grade
- I-540 Outer Beltline (Raleigh), existing highway bridge over CSX railroad
- Old Wake Forest Road (Raleigh), existing roadway bridge over CSX railroad
- Spring Forest Road (Raleigh), existing CSX railroad bridge over roadway
- Atlantic Avenue (Raleigh), existing roadway bridge over CSX railroad
- Millbrook Road (Raleigh), crosses CSX railroad at-grade
- New Hope Church Road (Raleigh), crosses CSX railroad at-grade
- Wolfpack Lane (Raleigh), crosses CSX railroad at-grade
- I-440 Beltline (Raleigh), existing highway bridge over CSX railroad
- Six Forks Road (Raleigh), existing CSX railroad bridge over roadway
- Hodges Street (Raleigh), existing CSX railroad bridge over roadway
- Whitaker Mill Road (Raleigh), crosses CSX railroad at-grade
- Capital Boulevard/US-1 (Raleigh), existing CSX railroad bridge over roadway
- Peace Street (Raleigh), existing NS railroad bridge over roadway
- W. Johnson Street (Raleigh), existing NS railroad bridge over roadway
- Tucker Street (Raleigh), existing NS railroad bridge over roadway
- North Street (Raleigh), existing NS railroad bridge over roadway
- Jones Street (Raleigh), crosses CSX railroad at-grade
- Hillsborough Street (Raleigh), existing roadway bridge over CSX railroad
- Morgan Street (Raleigh), existing roadway bridge over CSX railroad
- Hargett Street (Raleigh), crosses CSX railroad at-grade
- Boylan Avenue (Raleigh), existing roadway bridge over NCRR railroad

3.14.2 TRAFFIC CONDITIONS

Locations where the Study Area 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. Traffic analyses were not performed 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.

Appendix P includes figures displaying existing traffic configurations (e.g., stop signs, stop lights, turn lanes) and the predicted traffic in 2030 without the proposed Project ("No Build"). More detailed information on the traffic analysis methodology is located in the traffic report prepared for the Project (SEHSR Traffic Review, Hatch Mott MacDonald, 2013).

3.14.2.1 *RICHMOND, VA*

As stated above, 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.

3.14.2.2 *CHESTERFIELD COUNTY, VA*

3.14.2.2.1 KINGSLAND ROAD/NORCLIFF ROAD AND PERRYMONT ROAD – BELLWOOD AREA

Chester Road/Bellwood Road and US-1: This intersection is a signalized intersection with several yield movements. US-1 is a north-south US highway while Chester Road is a major north-south arterial. Appendix P Figures 1 and 2 provide the existing laneage and 2030 No Build volumes of the Chester Road/Bellwood Road and US-1 intersection, respectively. The area surrounding the intersection is industrial/undeveloped.

Perrymont Road and Chester Road/Driveway: This intersection is a stop controlled intersection with a stop condition on the Chester Road/Driveway approaches. Perrymont Road is a minor, relatively short facility that parallels US-1. Chester Road is an arterial and VA route, VA 145, which connects US-301 and VA 10 and interchanges with VA 288. Appendix P Figures 1 and 2 provide the existing laneage and 2030 No Build volumes of the Perrymont Road and Chester Road/Driveway intersection. The area around the intersection is a mixture of business and residential land use.

Kingsland Road and Chester Road: This intersection is a three-leg stop controlled intersection with a stop condition on the Kingsland Road approach. Kingsland Road is a local collector type facility serving mostly residential land use and runs mainly east-west. Chester Road is an arterial and VA route, VA 145, which connects US-301 and VA 10 and interchanges with VA 288. Appendix P Figures 1 and 2 provide the existing laneage and 2030 No Build volumes of the Kingsland Road and Chester Road intersection. The western side of the intersection is bounded by the CSX S-Line rail corridor, while the rest of the area around the intersection is mostly undeveloped with some residential land use.

Norcliff Road and Perrymont Road/Church Parking Lot: This intersection is an unsignalized intersection with Norcliff Road and the Church Parking Lot experiencing the stop condition. Norcliff Road is a local collector type facility while Perrymont Road is a minor, relatively short north-south facility that parallels US-1. Appendix P Figures 1 and 2 provide the existing laneage and 2030 No Build volumes of the Norcliff Road and Perrymont Road/Church Parking Lot intersection. The intersection is bounded on the west side by a church facility and its associated parking, in the southeast quadrant by a church, and in the northeast quadrant by a parking lot.

Norcliff Road and US-1: This intersection is a four-leg, unsignalized intersection collector type facility while US-1 is a four-lane undivided major US highway in the area that runs north-south. Appendix P Figures 1 and 2 provide the existing laneage and 2030 No Build volumes of the Norcliff Road and US-1 intersection. The intersection has development in all four quadrants.

Kingsland Road and Dorsey Road: This intersection is a three-leg unsignalized intersection with Kingsland Road the stop condition. Kingsland Road and Dorsey Road are local collector type facilities serving mostly residential land use. Kingsland Road runs mainly east-west while Dorsey Road runs primarily north-south. Appendix P Figures 1 and 2 provide the existing laneage and 2030 No Build volumes of the Kingsdale Road and Dorsey Road intersection. There is a

residence on the east side of the intersection while the northwest and southwest quadrants are undeveloped.

3.14.2.2.2 CHESTER ROAD AND BRINKLEY ROAD – BELLWOOD AREA

Chester Road and Brinkley Road: The intersection of Brinkley Road and Chester Road is located approximately one quarter mile north of the intersection of Kingsdale Road and Chester Road. This intersection is a stop controlled "T" intersection, with a stop condition on Brinkley Road. Brinkley Road is a local connector while Chester Road is an arterial and VA route, VA 145, which connects US-301 and VA 10 and interchanges with VA 288. Appendix P Figures 5 and 6 provide the existing laneage and 2030 No Build volumes for the Chester Road and Brinkley Road intersection, respectively. The intersection is bounded on the west side by CSX S-Line railroad tracks, while the east side is relatively undeveloped.

Hopkins Road and Thurston Road: The intersection of Hopkins Road and Thurston Road is located northwest of the intersection of Park Road and Chester Road, and is a stop controlled "T" intersection, with the stop condition on Thurston Road. Thurston Road is a local collector type facility, while Hopkins Road is more of a major collector that runs north-south from US-301 to Centralia Road. Appendix P Figures 5 and 6 provide the existing laneage and 2030 No Build volumes for the Hopkins Road and Thurston Road intersection, respectively.

Kingsdale Road and Chester Road: 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. Kingsdale Road is a local collector that connects Chester Road to US-301, while Chester Road is an arterial and VA route, VA 145, which connects US-301 and VA 10 and interchanges with VA 288. Appendix P Figures 5 and 6 provide the existing laneage and 2030 No Build volumes for the Kingsdale Road and Chester Road intersection, respectively. The area immediately adjacent to the intersection is undeveloped; however, it should be noted that the western side is bounded by the CSX S-Line railroad tracks and there is low density residential development in the southeast area.

Park Road and Chester Road/Driveway: The intersection of Park Road and Chester Road is a stop controlled intersection, with a stop condition on the driveway and Park Road approaches. The northbound approach of Chester Road is two through lanes (which narrows to one through lane approximately 300 feet downstream of the intersection). The southbound approach has two through lanes as well; however, neither the northbound nor southbound approach functions as a true two lane approach. Since the northbound through lane drops shortly after the intersection, traffic skews to the lane that does not drop. Also, since the second southbound through lane is so short (approximately 300 feet), the amount of vehicles able to reach the second through lane is limited. 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. Park Road is a short residential road, while Chester Road is an arterial and VA route, VA 145, which connects US-301 and VA 10 and interchanges with VA 288. Appendix P Figures 5 and 6 provide the existing laneage and 2030 No Build volumes for the Park Road/Driveway and Chester Road intersection, respectively. The area on the western side of the intersection is undeveloped while the eastern side has low density land use along with the aforementioned fire station.

3.14.2.3 *CHESTER, VA*

3.14.2.3.1 OLD LANE, CENTRALIA ROAD AND CHESTER ROAD

Old Lane and Hopkins Road: Old Lane is a short local collector type facility, while Hopkins Road is more of a major collector that runs north-south from US-301 to Centralia Road. The existing intersection of Old Lane and Hopkins Road is a stop controlled "T" intersection with Old Lane and the northern leg of Hopkins Road experiencing the stop condition. Appendix P Figures 9 and 10 provide the existing laneage and 2030 No Build peak hour volumes, respectively. The land use around the intersection is a mixture of low density residential and undeveloped.

Old Lane and Chester Road: Old Lane is a local collector type facility, while Chester Road is a four-lane divided arterial/VA route (VA 145) that connects US-301 and VA 10 and interchanges with VA 288. The existing intersection of Old Lane and Chester Road is an unsignalized "T" intersection with Old Lane experiencing the stop condition. Currently, there is a daycare on Old Lane between the intersection of Old Lane with Chester Road and the Old Lane at-grade rail crossing of the CSX A-Line. Appendix P Figures 9 and 10 provide the existing laneage and 2030 No Build peak hour volumes, respectively. The area immediately adjacent to the intersection is not developed; however, there is development behind that buffer in each quadrant.

Centralia Road and Chester Road: The existing intersection of Centralia Road and Chester Road is a signalized four-leg intersection with development in all but the southeast quadrant. There is an existing at-grade rail crossing of the CSX A-Line approximately 280 feet west of the intersection on Centralia Road. Centralia Road is an east-west, two-lane arterial/VA route (VA 145) and Chester Road is a north-south, four-lane divided arterial/VA route (VA 145 and VA 144) in this area that connects US-301 and VA 10 and interchanges with VA 288. Appendix P Figures 9 and 10 provide the existing laneage and 2030 No Build peak hour volumes, respectively.

Centralia Road and Hopkins Road: The existing intersection of Centralia Road and Hopkins Road is an unsignalized four-leg intersection with Hopkins Road experiencing the stop condition. Centralia Road is an east-west, two-lane arterial/VA route (VA 145) and Hopkins Road is more of a major two-lane collector that runs north-south from US-301 to Centralia Road. Appendix P Figures 9 and 10 provide the existing laneage and 2030 No Build peak hour volumes, respectively.

3.14.2.4 *LA CROSSE, VA*

3.14.2.4.1 PINE STREET AND MAIN STREET

US-58 and Main Street/Country Club Road: The intersection of US-58 and Main Street is a signalized intersection. US-58 is a US highway, while Main Street is north-south facility that traverses through the center of La Crosse. Country Club Road is a local north-south access facility that extends to US-1. The existing laneage and 2030 No Build traffic volumes for the intersection of US-58 and Main Street are shown in Appendix P Figures 13 and 14, respectively. Aside from a convenience mart/gas station, the area around the intersection is largely undeveloped; however, the southeast and northeast sides are bounded by Main Street as it curves to parallel US-58 in the intersection area.

Pine Street and Main Street: The intersection of Main Street and Pine Street is a stop controlled intersection with a stop condition on Pine Street. Pine Street is a local collector, while Main Street is more of a major type collector. The existing laneage and 2030 No Build traffic volumes for the intersection of Pine Street and Main Street are shown in Appendix P Figures 13 and 14, respectively. The area around the intersection is low density residential.

Carter Street and Pine Street: The intersection of Carter Street and Pine Street is a stop controlled intersection with a stop condition on Carter Street. Carter Street is a north-south local collector, while Pine Street is an east-west local connector. The existing laneage and 2030 No Build traffic volumes for the intersection of Carter Street and Pine Street are shown in Appendix P Figures 13 and 14, respectively. The area around the intersection is a mix of business, recreational and undeveloped land use. It should be noted that US-58 is only approximately 200 feet north of the Carter Street and Pine Street intersection and somewhat bounds the northern side of the intersection.

US-58 and Pine Street: The intersection of US-58 and Pine Street is a stop controlled "T" intersection with Pine Street experiencing the stopped condition. US-58 is a US highway running east-west in the area, while Pine Street is east-west local connector. The existing laneage and the 2030 No Build traffic volumes for the intersection of Pine Street and US-58 are provided by Appendix P Figures 13 and 14, respectively. The land use surrounding the intersection is low density residential or undeveloped.

Hillcrest Road: Hillcrest Road is a local roadway that runs east-west and between Saint Tammany Road and Carter Street.

Central Avenue: Central Avenue is a local roadway that runs north-south in the La Crosse area. Central Avenue begins at Main Street near the intersection of Saint Tammany Road, Seaboard Avenue, and College Street, and extends northward approximately 770 feet just beyond Carolina Street.

Meredith Street: Meredith Street is a short local roadway that runs north-south and has a break between Jones Street and Seaboard Avenue.

Jones Street: Jones Street is a local east-west street that is only approximately 400 feet long. Jones Street connects Saint Tammany Road to Meredith Street.

St. Tammany Road: Saint Tammany Road is a very short north-south facility that becomes Morris Town Circle to the south and terminates at Main Street to the north.

3.14.2.5 *NORLINA, NC*

3.14.2.5.1 WARREN PLAINS ROAD AND YANCEY ROAD

US-1/US-401 and Norlina Pines Drive: The existing intersection of US-1/US-401 and Norlina Pines Drive is an unsignalized "T" intersection with Norlina Pines Drive experiencing the stop condition. Norlina Pines Drive is a "no outlet" road that serves approximately 50 apartment units. US-1/US-401 is a major US route in the area. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes, respectively of the US-1/US-401 and Norlina Pines Drive intersection. Aside from the apartment units, the area around the intersection is largely undeveloped; however, it should be noted the western side of the "T" intersection is bounded by the CSX S-Line railroad property.

Warren Plains-Norlina Road and Yancey Road: The existing intersection of Warren Plains-Norlina Road and Yancey Road is a stop controlled "T" intersection, with Yancey Road experiencing the stop condition. Both Warren Plains-Norlina Road and Yancey Road are local collector type facilities. Current land use in the area is agricultural and residential in nature. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes, respectively for the Warren Plains-Norlina Road and Yancey Road intersection.

Weldon Road and Warren Plains-Norlina Road: The existing intersection of Warren Plains-Norlina Road and Weldon Road is a stop controlled "T" intersection, with Weldon Road

experiencing the stop condition. Both Weldon Road and Warren Plains-Norlina Road are local collector type facilities. Currently, the land surrounding the intersection is agricultural and residential in nature. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes, respectively of the Warren Plains Road and Weldon Road intersection.

3.14.2.5.2 WARREN PLAINS ROAD AND HYCO STREET

Warren Plains Road and Hyco Street: The existing intersection of Warren Plains Road and Hyco Street is an unsignalized "T" intersection with Hyco Street experiencing the stop condition. Both Warren Plains Road and Hyco Street are local collector type facilities. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes for the Warren Plains Road and Hyco Street intersection. Hyco Street is bordered on the north side by the Downtown Norlina Business District and on the south side by the CSX S-Line rail corridor. There is a small museum in the southwest corner of the intersection and unpaved parking in the southeast corner.

US-1/US-401 and Hyco Street/North Street: The existing intersection of US-1/US-401 and Hyco Street/North Street is a four-leg stop controlled intersection with Hyco Street and North Street experiencing stop conditions. Both Hyco Street and North Street are local collector type facilities, while US-1/US-401 is a US highway. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes for the US-1/US-401 and Hyco Street/North Street intersection. The land use around intersection varies from residential to business to undeveloped.

Warren Plains Road and Division Street: The existing intersection of Warren Plains Road and Division Street is an unsignalized "T" intersection with Division Street experiencing the stop condition. Both Warren Plains Road and Division Street are local collector type facilities, with Warren Plains running east-west and Division Street running north-south. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes for the Warren Plains Road and Division Street intersection. The intersection is bordered on the south side by the CSX S-Line rail corridor and the area just north of the intersection is undeveloped.

Liberty Street and US-401/US-158: The existing intersection of Liberty Street and US-401/US-158 is a stop controlled "T" intersection with a stop condition on Liberty Street. Liberty Street is a local collector type facility, while US-401/US-158 is a north-south US highway. It should be noted that the existing CSX S-Line railroad structure creates sight distance concerns at this intersection. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes for the Liberty Street and US-401/US-158 intersection. Liberty Street is bounded by the CSX S-Line railroad property to the north, low density residential land use to the southeast, and undeveloped property to the southwest.

Liberty Street and Division Street: The existing intersection of Liberty Street and Division Street is a stop controlled "T" intersection with a stop condition on Liberty Street. Liberty Street is an east-west local collector, while Division Street is a north-south local connector. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes for the Liberty Street and Division Street intersection. This intersection is bounded by the CSX S-Line railroad property to the north, a business to the southeast, and a vacant facility to the southwest.

Main Street and US-401/US-158: The existing intersection of Main Street and US-401/US-158 is a stop controlled intersection with a stop condition on Main Street. Main Street is a local collector type facility, while US-401/US-158 is a north-south US highway. There are houses located in close proximity to each corner of the intersection. Appendix P Figures 17 and 18 provide the existing laneage and 2030 No Build peak hour volumes for the Main Street and US-401/US-158 intersection.

3.14.2.5.3 US-1 AND AXTELL-RIDGEWAY ROAD AND RIDGEWAY-DREWRY ROAD

US-1/US-158 and Axtell Ridgeway Road/Driveway: Currently, the intersection of US-1/US-158 and Axtell Ridgeway Road is a four-leg unsignalized intersection. A private drive that forms the northern leg of the intersection and Axtell Ridgeway Road operates under stop control. There is an at-grade rail crossing of the CSX S-Line on Axtell Ridgeway Road approximately 50 feet south of the intersection. US-1/US-158 is a US highway that generally runs northwest-southeast, while Axtell Ridgeway Road is a local type facility that runs from Manson-Axtell Road to US-1/US-158. Appendix P Figures 21 and 22 provide the existing laneage and 2030 No Build peak hour volumes for the US-1/US-158 and Axtell Ridgeway Road intersection, respectively. The CSX S-Line rail corridor runs parallel to US-1 at this location, and thus Axtell Ridgeway Road crosses the CSX S-Line rail corridor in close proximity to the intersection of Axtell Ridgeway Road and US-1/US-158. The area surrounding the intersection is rural-agricultural in nature, with low density sporadic development. The south side of the intersection is bounded by the CSX S-Line rail corridor.

US-1/US-158 and Ridgeway-Drewry Road: The intersection of Ridgeway-Drewry Road and US-1 is a “T” intersection with stop control on Ridgeway-Drewry Road. US-1/US-158 is a US highway that runs generally northwest-southeast, while Ridgeway-Drewry Road is a local-type facility that interchanges with I-85 northwest of this intersection. Appendix P Figures 21 and 22 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 and Ridgeway-Drewry Road intersection, respectively. The area surrounding the intersection is low density rural-agricultural and residential in nature.

US-1/US-158 and Ridgeway-Warrenton Road/Grant Lane: The intersection of US-1/US-158 and Ridgeway-Warrenton Road/Grant Lane is a four-leg stop controlled intersection with Grant Lane and Ridgeway-Warrenton Road experiencing the stop condition. US-1/US-158 is a US highway that runs generally northwest-southeast, while Ridgeway-Warrenton Road is a local type facility that connects US-1/US-158 to US-401/US-158 Business near Warrenton. Appendix P Figures 21 and 22 provide the existing laneage and 2030 No Build peak hour volumes for the US-1/US-158 and Ridgeway-Warrenton Road/Grant Road intersection, respectively. The area surrounding the intersection is a mixture of low density residential and undeveloped land.

US-1/US-158 and Saint Tammany Road: The intersection of St. Tammany Road and US-1/US-158 is a "T" intersection with Saint Tammany Road experiencing the stop condition. US-1/US-158 is a US highway that runs generally northwest-southeast, while Saint Tammany Road is a minor north-south facility that connects US-1/US-158 and Oine Road (which interchanges with I-85). Appendix P Figures 21 and 22 provide the existing laneage and 2030 No Build peak hour volumes for the US-1/US-158 and St. Tammany Road intersection, respectively. The area surrounding the intersection is rural-agricultural or undeveloped in nature.

3.14.2.5.4 COLLINS ROAD AND SOUL CITY BOULEVARD - SOUL CITY AREA

Soul City Boulevard and US-1/US-158: The intersection of US-1/US-158 and Soul City Boulevard is an unsignalized “T” intersection, with Soul City Boulevard operating under stop control. There is also a small raised median on the northbound approach to the intersection. The area around the intersection is undeveloped. Soul City Boulevard is a local minor facility, while US-1/US-158 is a US highway. Appendix P Figures 25 and 26 provide the existing laneage and 2030 No Build peak hour volumes for the Soul City Boulevard and US-1/US-158 intersection, respectively.

Collins Road and Manson-Axtell Road: The intersection of Collins Road and Manson-Axtell Road is an unsignalized "T" intersection with Manson-Axtell Road experiencing the stop condition. The intersection is bounded to the north by the CSX S-Line railroad. The land use adjacent to the intersection is very rural in nature. Both Collins Road and Manson-Axtell Road are local-type facilities.

Collins Road and Soul City Boulevard: The intersection of Collins Road and Soul City Boulevard is a four-leg unsignalized intersection with Collins Road experiencing the stop condition. There is development on the south side of the intersection, but little on the north side.

3.14.2.6 *MIDDLEBURG, NC*

3.14.2.6.1 SOUTH CAROL STREET AND US-1/US-158

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.

3.14.2.7 *HENDERSON, NC*

3.14.2.7.1 MAIN STREET/BECKFORD DRIVE AND OLD NORLINA ROAD

Beckford Drive, Chestnut Street, and US-1 Business/US-158 (Garnett Street): The intersection of Beckford Drive, Chestnut Street, and Garnett Street operates under signal control. The northbound movement from Garnett Street is a slip lane and does not go through the signal. Main Street does not directly feed into the intersection; however, it does tie into the northbound slip lane for Garnett Street. Old Norlina Road provides access to the Beckford Drive, Chestnut Street, and Garnett Street intersection for Main Street traffic and vice-versa.

Garnett Street is an urban arterial that essentially parallels US-1 in Henderson. Chestnut Street is a local type facility that parallels Garnett Street from this intersection to Corbitt Road. Beckford Road is a four-lane undivided east-west facility, while Main Street is a minor local connector. It should be noted that the Henderson Thoroughfare Plan recommends extending Main Street eastward to connect with a new north-south facility that would connect to John Deere Road near Warrenton Road. While traffic volumes on Main Street are currently relatively low, this extension project could increase the volume on Main Street on and around the crossing well above current levels which was accounted for in this analysis process.

The area around the intersection of Main Street and the North Garnett Street northbound slip lane is a mix of low density residential land use, businesses, and churches. Appendix P Figures 29a and 30a provide the existing laneage and 2030 No Build peak hour volumes for the Beckford Drive/Main Street, Chestnut Street, and Garnett Street intersections, respectively.

Main Street and Old Norlina Road: The Main Street and Old Norlina Road intersection is a two-way stop controlled intersection with Main Street experiencing the stop conditions. Main Street has an existing at-grade crossing of the CSX S-Line rail corridor approximately 200 feet east of this intersection, which is proposed to be grade separated under the Project. Main Street also has an offset at this intersection, with the west leg approximately 25 feet north of the east leg at the intersection. Both Main Street and Old Norlina Road are local-type facilities and run for relatively short distances. Appendix P Figures 29a and 30a provide the existing laneage and 2030 No Build peak hour volumes for the Main Street and Old Norlina Road intersection, respectively.

3.14.2.7.2 US-1 BUSINESS (GARNETT STREET) AND NC 39 (ANDREWS AVENUE)

Rock Spring Street and Chestnut Street: The intersection of Rock Spring Street and Chestnut Street is a four-leg unsignalized intersection with Rock Spring Street experiencing the stop conditions. Rock Spring Street is a relatively short minor facility that mainly serves residential land use. While also a relatively short facility, Chestnut Street is an arterial type facility and parallels Garnett Street. Appendix P Figures 29a and 30a provide the existing laneage and 2030 No Build peak hour volumes for the Rock Spring Street and Chestnut Street intersection, respectively. The area surrounding the Rock Spring Street and Chestnut Street intersection is currently either low density residential or undeveloped.

Rock Spring Street and Garnett Street: The intersection of Rock Spring Street and Garnett Street is a four-leg offset unsignalized intersection with eastbound Rock Spring Street experiencing a stop condition and westbound Rock Spring Street experiencing a yield condition. There is an existing at-grade rail crossing of the CSX S-Line on Rock Spring Street approximately 50 feet east of the intersection. The two legs of Rock Spring Street (southeast-northwest) are offset approximately 100 feet. Rock Spring Street is a relatively short minor facility that serves mainly residential land use. Garnett Street serves as US-1 Business/US-158 and is an arterial type facility. Appendix P Figures 29a and 30a provide the existing laneage and 2030 No Build peak hour volumes for the Rock Spring Street and Garnett Street intersection, respectively. There is development that abuts the intersection on the west side while the east side is bounded by the existing CSX S-Line railroad tracks and associated right-of-way.

Rock Spring Street and Williams Street: The intersection of Rock Spring Street and Williams Street is a four-leg unsignalized intersection with Williams Street experiencing the stop condition. There is an existing at-grade rail crossing of the CSX S-Line approximately 50 feet northwest of this intersection on Rock Spring Street. Williams Street is local-type facility that parallels Garnett Street in this area. Rock Spring Street is a relatively short minor facility that serves mainly residential land use. Appendix P Figures 29a and 30a provide the existing laneage and 2030 No Build peak hour volumes for the Rock Spring Street and Williams Street intersection, respectively. Each quadrant on east side of the intersection currently has development, while the west side is bounded by the CSX S-Line railroad tracks and its associated right-of-way with no development.

Chestnut Street and Andrews Avenue (NC 39): The intersection of Chestnut Street and Andrews Avenue is a four-leg signalized intersection. Chestnut Street is a relatively short arterial type facility and parallels Garnett Street. Andrews Avenue is a major arterial and serves as NC 39 in this area, providing access from Henderson to US-1 and I-85. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Chestnut Street and Andrews Avenue intersection, respectively. Development exists on all four corners of the intersection and abuts the intersection in three of the four quadrants, with the exception of southwest quadrant.

Garnett Street and Andrews Avenue (NC 39): Garnett Street and Andrews Avenue is a four-leg signalized intersection. Garnett Street serves as US-1 Business/US-158 and is an arterial type facility. Andrews Avenue is a major arterial and serves as NC 39. Andrews Avenue provides access between Henderson and US-1 and I-85. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Garnett Street and Andrews Avenue intersection, respectively. Development exists on all four corners of the intersection and there is an at-grade rail crossing of the CSX S-Line on Garnett Street approximately 150 feet southeast of the intersection.

Williams Street and Andrews Avenue (NC 39): Williams Street and Andrews Avenue is a four-leg unsignalized intersection. Williams Street is local-type facility that parallels Garnett Street in this area. Andrews Avenue is a major arterial and serves as NC 39. Andrews Avenue provides access between Henderson and US-1 and I-85. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Williams Street and Andrews Avenue intersection, respectively. Aside from a residence in the southeast quadrant the area adjacent to the intersection is relatively undeveloped; however, the existing at-grade CSX S-Line rail crossing and associated right of way on Andrews Avenue approximately 80 feet from the intersection bounds the western side of the intersection.

Montgomery Street and Chestnut Street: The intersection of Montgomery Street and Chestnut Street is a four-leg signalized intersection. Chestnut Street is a short arterial type facility that parallels Garnett Street. Montgomery Street is a relatively short local type facility that parallels Andrews Avenue in this area. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Montgomery Street and Chestnut Street intersection, respectively. Development extends up to the intersection in every quadrant aside from the southeast quadrant, which has a buffer between an existing parking lot and the intersection.

Montgomery Street and Garnett Street: The intersection of Montgomery Street and Garnett Street is a four-leg signalized intersection with pedestrian crossings on Garnett Street and the southern leg of Montgomery Street. Montgomery Street is a short local-type facility that parallels Andrews Avenue in this area. Garnett Street serves as US-1 Business/US-158 and is an arterial facility. Marked parking spaces are located on both sides of Garnett Street. There is an at-grade CSX S-Line rail crossing on Montgomery Street approximately 180 feet southwest of the intersection. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Montgomery Street and Garnett Street intersection, respectively. Development abuts the intersection on all four corners, as well as along each leg of the intersection.

Montgomery Street and Williams Street: The intersection of Montgomery Street and Williams Street is four-leg unsignalized intersection with Williams Street experiencing the stop condition. Montgomery Street is a relatively short local type facility that parallels Andrews Avenue in this area. Williams Street is a local type facility that parallels Garnett Street in this area. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Montgomery Street and Williams Street intersection, respectively. The western side of the intersection is bounded by the CSX S-Line railroad; however, parking is provided in the southwest quadrant between the intersection and the CSX S-Line railroad tracks. Development exists in the southeast quadrant, while the northern quadrants are undeveloped.

Charles Street and Garnett Street: The intersection of Charles Street and Garnett Street is a split intersection. The northeastern intersection is unsignalized with Charles Street under yield control and the southwestern intersection is signalized with pedestrian crosswalks on Charles Street and parking on Church Street. Charles Street ends/begins at Garnett Street. Church Street, which is an access facility to parking and businesses, is located across from Charles Street at the western intersection forming a four-leg signalized intersection. Approximately 160 feet east of the intersection, Charles Street has an existing grade separated crossing of the CSX S-Line rail corridor, crossing under the CSX S-Line rail corridor. Garnett Street serves as US-1 Business/US-158 and is an arterial type facility. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Charles Street and Garnett Street intersection, respectively. All sides of this intersection are developed with the southeast side bounded by the grade separation.

Williams Street and Charles Street: The intersection of Williams Street and Charles Street is a four-leg signalized intersection with pedestrian crosswalks on each leg. Charles Street is a local-

type facility that runs from Garnett Street to Cherry Street and has a grade separated crossing of the CSX S-Line rail corridor, crossing under the rail line. Williams Street is a local type facility that parallels Garnett Street in this area. Appendix P Figures 29b and 30b provide the existing laneage and 2030 No Build peak hour volumes for the Williams Street and Charles Street intersection, respectively. Development exists in the northeast and southeast quadrants while the northwest and southwest quadrants are bounded by the CSX S-Line railroad grade separation which is approximately 50 feet from the intersection.

3.14.2.7.3 CHAVASSE AVENUE/DABNEY DRIVE/ALEXANDER AVENUE

Chavasse Avenue and Williams Street: The intersection of Chavasse Avenue and Williams Street is currently a four-leg signalized intersection. There is an at-grade rail crossing of the CSX S-Line on Chavasse Avenue approximately 70 feet west of the intersection. Chavasse Avenue is a short, local east-west facility that provides access to US-1 Business. Williams Street is a local facility that runs approximately north-south, paralleling the existing CSX S-Line rail corridor. Appendix P Figures 35 and 36 provide the existing laneage and 2030 No Build peak hour volumes for the Chavasse Avenue and Williams Street intersection, respectively. The eastern side of the intersection is bounded by the CSX S-Line railroad tracks, while the western side has some residential development that does not encroach upon the intersection.

Chavasse Avenue/Oxford Road and Dorsey Avenue and US-1 Business: The intersection of Chavasse Avenue/Oxford Road and Dorsey Avenue and US-1 Business is a five-leg signalized intersection. The northwest leg (Dorsey Avenue) is stop controlled and allows for right-turn egress only, but allows for all movements to enter. Chavasse Avenue is a short local east-west facility that provides access to US-1 Business while Oxford Street is an arterial in the area and serves as US-158 west of this intersection. Dorsey Avenue is a short local east-west facility running from Young Street to Dabney Drive. US-1 Business is a major arterial connecting Henderson to points north and south. Appendix P Figures 35 and 36 provide the existing laneage and 2030 No Build peak hour volumes for the Chavasse Avenue/Oxford Street and Dorsey Avenue and US-1 Business intersection, respectively. This intersection is developed in every quadrant.

Dabney Drive and Oxford Road: The intersection of Dabney Drive and Oxford Road is a four-leg signalized intersection. Dabney Drive runs northwest-southeast and provides access to I-85. Oxford Road is an arterial in the area and serves as US-158 west of the intersection. There is development in each quadrant consisting of residential and commercial land uses. This development is close to the intersection. Appendix P Figures 35 and 36 provide the existing laneage and 2030 No Build peak hour volumes for the Dabney Drive and Oxford Road intersection, respectively.

Dabney Drive and Garnett Street/Deer Court: The intersection of Dabney Drive and Garnett Street/Deer Court is an offset signalized intersection with Deer Court serving as a one-way loop and Garnett Street intersecting Dabney Drive between the two Deer Court intersections. The split intersections are operated by one signal controller. Dabney Drive runs northwest-southeast and provides access to I-85, while Deer Court is a local access facility. Garnett Street serves as US-158 and is an arterial facility in this location. There is development in each quadrant consisting of residential and commercial land uses. Appendix P Figures 35 and 36 provide the existing laneage and 2030 No Build peak hour volumes for the Dabney Drive and Garnett Street/Deer Court intersection, respectively.

Dabney Drive/Shopping Center and US-1 Business: The intersection of Dabney Drive and US-1 Business is a signalized four-leg intersection. The east leg of this intersection serves as access to a shopping center. Dabney Drive runs northwest-southeast and provides access to I-85. US-1

Business is a major arterial connecting Henderson to points north and south. Appendix P Figures 35 and 36 provide the existing laneage and 2030 No Build peak hour volumes for the Dabney Drive and US-1 Business intersection, respectively. There is development along the eastern side of the intersection, while both the northwest and southwest quadrants are currently undeveloped.

Alexander Avenue and Nicholas Street: The intersection of Alexander Avenue and Nicholas Street is a four-leg, two-way stopped controlled intersection with Alexander Avenue experiencing the stop condition. The western leg of the intersection is currently unpaved and provides access to industrial facilities. Alexander Avenue is a local east-west access facility, while Nicolas Street is a north-south local type access facility that parallels the existing CSX S-Line rail corridor in this area. Appendix P Figures 35 and 36 provide the existing laneage and 2030 No Build peak hour volumes for the Alexander Avenue and Nicholas Street intersection, respectively. This intersection is currently bounded by development on all sides.

3.14.2.7.4 BELMONT DRIVE AND WELCOME AVENUE

US-1 Business (Raleigh Road) and Welcome Avenue/Belmont Drive: The intersection of US-1 Business and Belmont Drive/Welcome Avenue is a signalized intersection. This is an offset intersection in the east-west direction. Approximately 100 feet north of Belmont Drive, Welcome Drive intersects US-1 Business from the east. Both Belmont Drive and Welcome Avenue are short, local-type facilities. US-1 Business is an arterial route that was converted to the Business designation with the completion of US-1 on new alignment east of this facility. Appendix P Figures 39 and 40 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and Belmont Drive/Welcome Avenue intersection, respectively. This area has development on the west side and the southeast sides of the intersection while the intersection is bounded by Matthews Street on the northeast side. There is an existing at-grade rail crossing of the CSX S-Line on Welcome Avenue approximately 275 feet east of the intersection.

Welcome Avenue and Nicholas Street: The intersection of Welcome Avenue and Nicholas Street is a four-leg unsignalized intersection with Nicholas Street experiencing the stop condition. The at-grade crossing on Welcome Avenue is approximately 30 feet west of the Intersection. Welcome Avenue is a short, local-type facility, while Nicholas Street is currently a minor dirt facility in the intersection area. Appendix P Figures 39 and 40 provide the existing laneage and 2030 No Build peak hour volumes for the Welcome Avenue and Nicholas Street intersection, respectively. While there is development on the east side of the intersection, aside from fences, it is offset from the intersection.

US-1 Business (Raleigh Road) and JP Taylor Road: The intersection of US-1 Business and JP Taylor Road is an unsignalized three-leg intersection with JP Taylor experiencing the stop condition. This is an existing at-grade rail crossing of the CSX S-Line on JP Taylor Road approximately 60 feet east of the intersection. JP Taylor Road is a short, east-west, local-type facility connecting US-1 Business to Facet Road, which has access to Old Epson Road adjacent to its interchange with US-1. US-1 Business is an arterial route that was converted to the Business designation with the completion of US-1 on new alignment east of this location. Appendix P Figures 39 and 40 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and JP Taylor Road intersection, respectively. There is development on all sides of the intersection.

3.14.2.7.5 US-1 BUSINESS (RALEIGH ROAD) AND BEAR POND ROAD AND PETER GILL ROAD

US-1 Business (Raleigh Road) and Bear Pond/Lynnbank Road: US-1 Business (Raleigh Road) and Bear Pond Road/Lynnbank Road is a four-leg signalized intersection. Bear Pond

Road/Lynnbank Road is a relatively short, east-west facility that provides access to US-1 and US-1 Business. US-1 Business is an arterial that provides long distance north-south travel. Appendix P Figures 43 and 44 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and Bear Pond Road/Lynnbank Road intersection, respectively. Buildings are located in the southeast, northeast and northwest quadrants of the intersection. The southwest quadrant is currently undeveloped and wooded.

US-1 Business (Raleigh Road) and US-1 NB Ramp/Eastern Minerals Road: US-1 Business (Raleigh Road) and US-1 northbound off ramp/Eastern Minerals Road is a four-leg unsignalized intersection. The US-1 Business northbound off ramp is one-way eastbound and is offset with Eastern Minerals Road by approximately 50 feet. Eastern Minerals Road provides access to an industrial area and to Commerce Drive which intersects Bear Pond Road. US-1 Business is an arterial that provides long distance north-south travel. Appendix P Figures 43 and 44 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and US-1 northbound off ramp/Eastern Minerals Road intersection, respectively. While each quadrant of the intersection is undeveloped, the eastern quadrants are bounded by the existing CSX S-Line railroad tracks, approximately 200 feet away.

US-1 Business (Raleigh Road) and Peter Gill Road/Driveway: US-1 Business and Peter Gill Road is a four-leg stop controlled intersection. The western leg serves as a driveway to a gas station/convenience mart. Both Peter Gill Road and the driveway experience the stop conditions. Peter Gill Road is a local east-west facility that connects US-1 Business and Bear Pond Road. Appendix P Figures 43 and 44 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and Peter Gill Road/Driveway intersection, respectively. Each quadrant of the intersection is currently developed aside from the southwest quadrant. The existing CSX S-Line rail corridor located approximately 150 feet west of the intersection, bounds the intersection on the east side.

3.14.2.7.6 US-1 BUSINESS (RALEIGH RD) AND CHAVIS ROAD

Chavis Road and US-1 Business: Chavis Road currently intersects US-1 Business at an angled "T" intersection located north of the US-1 Business connection to US-1. The Chavis Road and US-1 intersection is an unsignalized intersection with Chavis Road experiencing the stop condition. The existing at-grade rail crossing of the CSX S-Line is on Chavis Road approximately 180 feet southeast of its US-1 Business intersection. Chavis Road is a local access facility that runs north-south east of US-1. US-1 Business is a north-south arterial that becomes US-1 approximately 2,300 feet south of this intersection. Appendix P Figures 47 and 48 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and Chavis Road intersection, respectively. The area around the intersection is a mix of low density residential land use and open land.

US-1 Business and Edwards Road: US-1 Business and Edwards Road is a stop controlled "T" type intersection with the stop condition on Edwards Road. Currently, Edwards Road is a relatively short local facility in the Kittrell area that generally runs north-south. US-1 Business is a north-south arterial that becomes US-1 approximately 4,000 feet south of this intersection. Appendix P Figures 47 and 48 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 Business and Edwards Road intersection, respectively. The area around the intersection is a mix of low density residential land use and open land.

3.14.2.8 *KITTRELL, NC*

3.14.2.8.1 US-1 (CAPITAL BOULEVARD) AND KITTRELL COLLEGE ROAD/NEW CONNECTOR

US-1 and Kittrell College Road/College Street: The intersection of Kittrell College Road/College Street and US-1 is an unsignalized four-leg intersection with the stop control on Kittrell College Road/College Street. Kittrell College Road is a local east-west facility west of US-1, while College Street is east of US-1 and is only approximately 400 feet long ending at Railroad Street. US-1 is a north-south arterial that runs through Kittrell, paralleling the existing CSX S-Line rail alignment. Appendix P Figures 51 and 52 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 and Kittrell College Road/College Street intersection, respectively. The area around the intersection is developed with low density land use.

US-1 and Kittrell Vance Avenue: Currently, the intersection of Kittrell Vance Avenue and US-1 is a three-leg stop controlled intersection with a stop condition on Kittrell Vance Avenue. Kittrell Vance Avenue is a short east-west residential street. US-1 is a north-south arterial that runs through Kittrell, paralleling the existing CSX S-Line rail alignment. Appendix P Figures 51 and 52 provide the existing laneage and 2030 No Build peak hour volumes for the US-1 and Kittrell Vance Road intersection, respectively. The area around the intersection is developed with low density residential land use.

Main Street and Railroad Street: Currently, the intersection of Main Street and Railroad Street is a three-leg stop controlled intersection with Railroad Street experiencing the stop condition. There is a driveway to a residence on the northern side of the intersection. Railroad Street is a short north-south access facility, while Main Street is a minor east-west facility. Appendix P Figures 51 and 52 provide the existing laneage and 2030 No Build peak hour volumes for the Main Street and Railroad Street intersection, respectively. The area around the intersection is developed with low density land use.

3.14.2.9 *FRANKLINTON, NC*

3.14.2.9.1 MAIN STREET AND NC 56 (GREEN STREET)

Subsequent to the traffic counts that were taken in this area for the Richmond to Raleigh Project Tier II DEIS, Franklinton High School, which was in very close proximity to the intersection of Mason Street and Main Street, has relocated to Cedar Creek Road near its intersection with Lane Road. At the time traffic studies were completed, there was a plan for Franklinton Middle School to occupy the old high school (the plan has subsequently been implemented). Based on this information, new counts were performed and data were obtained on the future middle school. Based on information found on the new school, the amount of new school trips that would be added to the area was estimated. These new trips were added to the 2030 No Build traffic volumes, which were estimated by comparing counts taken and historic traffic volumes in the area to determine a growth rate. The counts from 2006 to 2012 showed little to no growth in this area. Therefore, along with the fact that considerable traffic was being added to the area to account for the proposed middle school, a 1% growth rate was used to estimate background growth.

Mason Street and Main Street: The intersection of Mason Street and Main Street is a four leg signalized intersection. On-street parking is provided on each leg of the intersection. Mason Street is a local type east-west facility that parallels NC 56 and provides access to US-1. Main Street is a north-south facility that runs through Franklinton and connects to US-1 at its northern and southern termini. There is an existing at-grade rail crossing of the CSX S-Line on Mason

Street approximately 300 feet east of this intersection. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the Mason Street and Main Street intersection, respectively. This intersection is in an urban area with development in each quadrant. Development or its associated parking abuts the intersection in each quadrant.

NC 56 (Green Street) and Main Street: The intersection of NC 56 and Main Street is a four leg signalized intersection. On-street parking is provided on the north leg of the intersection. In the Study Area, NC 56 is an east-west highway that travels through Franklinton. NC 56 has a grade separated rail crossing of the CSX S-Line at the proposed Project alignment. Main Street is a north-south facility that runs through Franklinton and connects to US-1 at its northern and southern termini. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the NC 56 and Main Street intersection, respectively. This intersection is in an urban area with development in each quadrant. Development abuts the intersection in each quadrant aside from the southeast quadrant.

College Street and Main Street: The intersection of College Street and Main Street is currently a four-leg unsignalized intersection with College Street experiencing the stop condition. There is an at-grade rail crossing of the CSX S-Line on College Street approximately 300 feet east of its intersection with Main Street. College Street is a minor east-west facility that runs from Chavis Street on the east to Cheatham Street on the west. Main Street is a north-south facility that runs through Franklinton and connects to US-1 at its northern and southern termini. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the College Street and Main Street intersection, respectively. The area around the intersection is either undeveloped or low density residential.

College Street and Hawkins Street: The intersection of College Street and Hawkins Street is currently a three-leg unsignalized intersection with Hawkins Street experiencing the stop condition. There is an at-grade rail crossing of the CSX S-Line approximately 350 west of the intersection on College Street. The rail crossing is between this intersection and the intersection of College Street and Main Street. College Street is a minor east-west facility that runs form Chavis Street on the east to Cheatham Street on the west. Hawkins Street is a local-type facility that connects College Street and Main Street. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the College Street and Hawkins Street intersection, respectively. The area around the intersection is either vacant or low density residential.

3.14.2.9.2 CEDAR CREEK ROAD AND MAIN STREET

Person Street and Main Street: The intersection of Person Street and Main Street is currently a three leg unsignalized intersection with Person Street experiencing the stopped condition. Person Street is a one-way street in the eastbound direction and serves school traffic. Main Street is a north-south facility that runs through Franklinton and connects to US-1 at its northern and southern termini. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the Person Street and Main Street intersection, respectively. The area surrounding the intersection is low density residential.

Hillsborough Street/Hawkins Street and Main Street: The intersection of Hillsborough Street/Hawkins Street and Main Street is currently a four leg unsignalized intersection with Hillsborough Road and Hawkins Street experiencing the stopped conditions. Hillsborough Street services school traffic and can be gated to prevent through traffic. Hawkins Street is a local-type facility that connects Main Street and College Street. Main Street is a north-south facility that runs through Franklinton and connects to US-1 at its northern and southern termini. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the

Hillsborough Street/Hawkins Street and Main Street intersection, respectively. The western quadrants are developed by the school while the remaining area around the intersection is low density residential.

Cedar Creek Road and Main Street: The intersection of Cedar Creek Road and Main Street is currently a three leg unsignalized intersection with Cedar Creek Road experiencing the stopped conditions. Cedar Creek Road provides access to Franklinton High School. There is an existing at-grade rail crossing of the CSX S-Line approximately 450 feet east of the intersection on Cedar Creek Road. Main Street is a north-south facility that runs through Franklinton and connects to US-1 at its northern and southern termini. Appendix P Figures 55 and 56 provide the existing laneage and 2030 No Build peak hour volumes for the Cedar Creek Road and Main Street intersection, respectively. The development surrounding the intersection is a mix of low density land use including athletic fields, residential, and a church all in the vicinity of the intersection.

3.14.2.10 *RALEIGH, NC*

3.14.2.10.1 ATLANTIC AVENUE AND WOLFPACK LANE/HIGHWOODS AVENUE

Wolfpack Lane and Tarheel Drive: The intersection of Wolfpack Lane and Tarheel Drive is currently a three-leg unsignalized intersection with an offset driveway on the south side. Tarheel Drive experiences the stop condition. For the purposes of the analysis and based on the peak hour traffic counts, this intersection was analyzed as a "T" intersection. Wolfpack Lane is a local-type facility that provides access from an industrial area to Atlantic Avenue. Tarheel Drive serves the same industrial area and connects Wolfpack Lane and Tarheel Drive. Appendix P Figures 59 and 60 provide the existing laneage and 2030 No Build peak hour volumes for the Wolfpack Lane and Tarheel Drive intersection, respectively. The area around the intersection is developed with industrial type land use.

Wolfpack Lane/Highwoods Boulevard and Atlantic Avenue: The intersection of Wolfpack Lane/Highwoods Boulevard and Atlantic Avenue is a four-leg signalized intersection. There is an at-grade rail crossing of the CSX S-Line on Wolfpack Lane approximately 200 feet northwest of the intersection. Wolfpack Lane is a facility that provides access from an industrial area to Atlantic Avenue. Highwoods Boulevard is a short multilane facility that provides access to a business park and connects Atlantic Avenue and Capital Boulevard. Atlantic Avenue is a north-south arterial in the Study Area. Appendix P Figures 59 and 60 provide the existing laneage and 2030 No Build peak hour volumes for the Wolfpack Lane/Highwoods Boulevard and Atlantic Avenue intersection, respectively. The intersection is bounded by the CSX S-Line rail corridor on the west side and the Highwoods Office Park on the east side.

Highwoods Boulevard and Beechleaf Court: The Highwoods Boulevard and Beechleaf Court intersection is a four-leg unsignalized intersection with Beechleaf Court experiencing the stop condition. This intersection is closely spaced (approximately 400 feet) to the Wolfpack Lane/Highwoods Boulevard and Atlantic Avenue intersection. Highwoods Boulevard is a short multilane facility that serves a business park and connects Atlantic Avenue and Capital Boulevard. Beechleaf Court is an access facility to office buildings and their associated parking. Appendix P Figures 59 and 60 provide the existing laneage and 2030 No Build peak hour volumes for the Highwoods Boulevard and Beechleaf Court intersection, respectively. The immediate area adjacent to the intersection is wooded, but parking and office buildings are offset behind the tree line.

Highwoods Boulevard and Smoketree Court: The Highwoods Boulevard and Smoketree Court intersection is a four-leg unsignalized intersection with Beechleaf Court experiencing the stop

condition. Highwoods Boulevard is a short arterial that serves a business park and connects Atlantic Avenue and Capital Boulevard. Smoketree Court is an access facility to office buildings and their associated parking. Appendix P Figures 59 and 60 provide the existing laneage and 2030 No Build peak hour volumes for the Highwoods Boulevard and Smoketree Court intersection, respectively. The immediate area adjacent to the intersection is wooded but parking and office buildings are offset behind the tree line.

3.14.2.10.2 DOWNTOWN RALEIGH

It should be noted that there is active freight service on both the Norfolk Southern and CSX railroads through Downtown Raleigh.

Glenwood Avenue and North Street: The intersection of Glenwood Avenue and North Street is an urban four-leg intersection located in the northern section of Downtown Raleigh and is signalized. There is an existing grade separated rail crossing of North Street on the Norfolk Southern NS-Line east of this intersection between Glenwood Avenue and West Street. Glenwood Avenue is a north-south downtown grid facility that transitions to an arterial and becomes US 70 north of Downtown Raleigh. North Street is a downtown grid street that runs east-west on the northern side of Downtown Raleigh. North Street has two segments; one runs from Saint Mary's Street to Harrington Street and the other runs from Wilmington Street to Person Street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Glenwood Avenue and North Street intersection, respectively.

North Street and West Street: The intersection of West Street and North Street is an urban four-leg intersection located in the northern section of Downtown Raleigh. It is a stop controlled intersection with North Street experiencing the stopped condition. An existing grade separated crossing of North Street and the Norfolk Southern NS-Line is located just west of this intersection. West Street runs north-south from the Boylan Wye to Wade Avenue, servicing downtown facilities as well as industrial uses north of downtown. North Street is a downtown grid street that runs east-west on the northern side of Downtown Raleigh. North Street has two segments; one runs from Saint Mary's Street to Harrington Street and the other begins Wilmington Street and ends at Person Street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the North Street and West Street intersection, respectively.

North Street and Harrington Street: The intersection of Harrington Street and North Street is a three-leg intersection located in the northern section of downtown Raleigh. It is a stop controlled intersection with North Street experiencing the stopped condition. Harrington Street crosses the CSX S-Line at-grade between North Street and Lane Street. North Street is a downtown grid street that runs east-west on the northern side of downtown Raleigh. North Street has two segments; one runs from Saint Mary's Street to Harrington Street and the other runs from Wilmington Street to Person Street. Harrington Street is a north-south downtown grid street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the North Street and Harrington Street intersection, respectively.

Lane Street and Harrington Street: The intersection of Lane Street and Harrington Street is a four-leg intersection located in the northern section of downtown Raleigh. The western leg serves a parking area and is not part of Lane Street. The Lane Street and Harrington Street intersection is stop controlled with Lane Street experiencing the stopped condition. Lane Street is an east-west downtown grid street that is one-way westbound at this intersection. Lane Street is currently split in the area of the existing CSX S-Line and NS rail lines west of Harrington Street. Harrington Street is a north-south downtown grid street. Appendix P Figures 63 and 64 provide the existing

laneage and 2030 No Build peak hour volumes for the Lane Street and Harrington Street intersection, respectively.

Jones Street and Glenwood Avenue: The intersection of Jones Street and Glenwood Avenue is an urban four-leg intersection located in eastern Downtown Raleigh. It is signalized with pedestrian signal heads and crosswalks on each approach. There is an at-grade rail crossing approximately 200 feet to the east of the intersection on Jones Street. Jones Street is an east-west downtown grid facility, while Glenwood Avenue is a north-south downtown grid facility that transitions to an arterial and becomes US 70 north of Downtown Raleigh. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Jones Street and Glenwood Avenue intersection, respectively.

Jones Street and West Street: The intersection of Jones Street and West Street is an urban four-leg intersection located in Downtown Raleigh. It is unsignalized with West Street experiencing the stop condition. Sidewalks and crosswalks are located along each leg of the intersection. There is an at-grade rail crossing of the combined CSX S-Line and Norfolk Southern NS-Line approximately 300 feet east of the intersection on Jones Street. West Street runs north-south from the Boylan Wye to Wade Avenue, servicing downtown facilities as well as industrial land uses north of downtown. Jones Street is an east-west downtown grid facility that varies from one-way to two-way operations in the Study Area. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Jones Street and West Street intersection, respectively.

Jones Street and Harrington Street: The intersection of Jones Street and Harrington Street is an urban four-leg intersection located in Downtown Raleigh. It is unsignalized with Harrington Street experiencing the stop condition and sidewalks and crosswalks located along each leg of the intersection. The eastern leg is one-way in the eastbound direction, while all other legs are in two-way operation. Jones Street is an east-west downtown grid facility than varies from one-way to two-way operations in the Study Area. Harrington Street is a north-south downtown grid street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Jones Street and Harrington Street intersection, respectively.

Glenwood Avenue and Hillsborough Street: The intersection of Glenwood Avenue and North Street is an urban four-leg intersection located in the western section of Downtown Raleigh. It is signalized, including pedestrian phases. Crosswalks and sidewalks are located on each leg of the intersection. There is an existing grade separated crossing of Hillsborough Street located approximately 150 feet east of this intersection. Glenwood Avenue is a north-south downtown grid facility that transitions to an arterial and becomes US 70 north of Downtown Raleigh. Hillsborough Street is an east-west downtown grid facility that transitions to an arterial and services North Carolina State University west of downtown. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Glenwood Avenue and Hillsborough Street intersection, respectively.

West Street and Edenton Street: The intersection of West Street and Edenton Street is an urban four-leg intersection located in Downtown Raleigh and is signalized, including pedestrian phases. Crosswalks are located on three approaches and sidewalks are on each leg of the intersection. Edenton Street is one-way in the westbound direction. There is an existing grade separated crossing of Hillsborough Street where Edenton Street becomes Hillsborough Street located approximately 150 feet west of this intersection. West Street runs north-south from the Boylan Wye to Wade Avenue servicing downtown facilities as well as industrial land uses north of downtown. Edenton Street is an eastbound downtown grid facility that terminates at Hillsborough Street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the West Street and Edenton Street intersection, respectively.

Hillsborough Street and Edenton Street: The intersection of Hillsborough Street and Edenton Street is an urban, unsignalized, two-leg intersection located in Downtown Raleigh. Edenton Street is one-way in the westbound direction. Hillsborough Street in the westbound direction experiences the stop condition, while the eastbound direction is free-flow. Sidewalk is located on one side of each leg of the intersection. The intersection is located on the eastern edge of the bridge for the existing grade separated roadway crossing over the combined CSX S-Line and Norfolk Southern NS-Line. Hillsborough Street is an east-west downtown grid facility that transitions to an arterial and services North Carolina State University west of downtown while Edenton Street is an eastbound downtown grid facility that terminates at this intersection with Hillsborough Street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Hillsborough Street and Edenton Street intersection, respectively.

Boylan Street and Morgan Street: The intersection of Boylan Street and Morgan Street is an urban four-leg intersection located in the southern section of Downtown Raleigh and is signalized, including pedestrian phases. Crosswalks and sidewalks are located on each leg of the intersection. Morgan Street is an east-west downtown grid facility that begins at Hillsborough Street to the west and becomes New Bern Avenue east of the Study Area. Boylan Street is a north-south downtown grid facility and is one of the few in Downtown Raleigh that traverses the the combined CSX S-Line, Norfolk Southern NS-Line, and NCRR H-LIne railroad tracks south of the Boylan Wye. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Boylan Street and Morgan Street intersection, respectively.

Morgan Street and Glenwood Avenue: The intersection of Morgan Street and Glenwood Avenue is an urban three-leg intersection located in the southern section of Downtown Raleigh north of the Boylan Wye and is signalized, including pedestrian phases. Crosswalks and the associated pedestrian phases are located on two of the three legs of the intersection while sidewalks are located on every leg of the intersection. The eastern leg of the intersection crosses the combined CSX S-Line and Norfolk Southern NS-Line rail corridor on an existing grade separated crossing adjacent to the intersection. Morgan Street is an east-west downtown grid facility that begins at Hillsborough Street to the west and becomes New Bern Avenue east of the Study Area. Glenwood Avenue is a north-south downtown grid facility that transitions into an arterial and becomes US 70 north of Downtown Raleigh. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Boylan Street and Glenwood Avenue intersection, respectively.

Boylan Street and Hargett Street: The intersection of Boylan Street and Hargett Street is an urban four-leg intersection located in the southern section of Downtown Raleigh north of the Boylan Wye and is signalized. Crosswalks and sidewalks are located on each leg of the intersection; however, no pedestrian phasing is currently provided. There is an existing at-grade rail crossing of the combined CSX S-Line and Norfolk Southern NS-Line approximately 300 feet east of the intersection on Hargett Street. Boylan Street is a north-south downtown grid facility and is one of the few in Downtown Raleigh that traverses the railroad tracks at the Boylan Wye. Hargett Street is an east-west downtown grid facility that serves City of Raleigh offices. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Boylan Street and Hargett Street intersection, respectively.

West Street and Hargett Street: The intersection of West Street and Hargett Street is an urban four-leg intersection located in the southern section of Downtown Raleigh and is unsignalized. West Street experiences the stop condition and crosswalks are located on both legs of West Street. Sidewalks are located on each leg of the intersection. There is an existing at-grade rail crossing of the combined CSX S-Line and Norfolk Southern NS-Line approximately 300 feet west of the intersection on Hargett Street. West Street runs north-south from the Boylan Wye to

Wade Avenue, servicing downtown facilities as well as industrial land uses north of downtown. Hargett Street is an east-west downtown grid facility that serves City of Raleigh offices. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Boylan Street and Hargett Street intersection, respectively.

Harrington Street and Hargett Street: The intersection of Harrington Street and Hargett Street is an urban four-leg intersection located in the southern section of Downtown Raleigh. It is unsignalized. Hargett Street experiences the stop condition and crosswalks are located on both legs of Hargett Street. Sidewalks are located on each leg of the intersection and parking is allowed on each intersection leg. Hargett Street is an east-west downtown grid facility that serves City of Raleigh offices, while Harrington Street is a north-south downtown grid street. Appendix P Figures 63 and 64 provide the existing laneage and 2030 No Build peak hour volumes for the Harrington Street and Hargett Street intersection, respectively.

3.14.3 RAIL

The discussion below is largely unchanged from the Richmond to Raleigh Project Tier II DEIS, with the exception of minor corrections, and an update to reflect the new and planned passenger rail connections to the area of Hampton Roads, VA (refer to Section 1.1.2 for additional discussion regarding new Amtrak NEC Regional service to Norfolk, VA, and information on the Richmond to Hampton Roads SEHSR Corridor Tier I EIS).

The two main Class I railroads operating in Virginia and North Carolina are Norfolk Southern and 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 in both states is single track, which creates bottlenecks in high traffic areas. Amtrak passenger rail operates within a portion of the Study Area on the private freight railroad system. The following section describes the active railroads within the Study Area, including rail lines that cross the corridor. Figure 3-14 displays the railroads in Virginia that intersect the Study Area, while Figure 3-15 shows the railroads that intersect the Study Area in North Carolina.

Figure 3-14

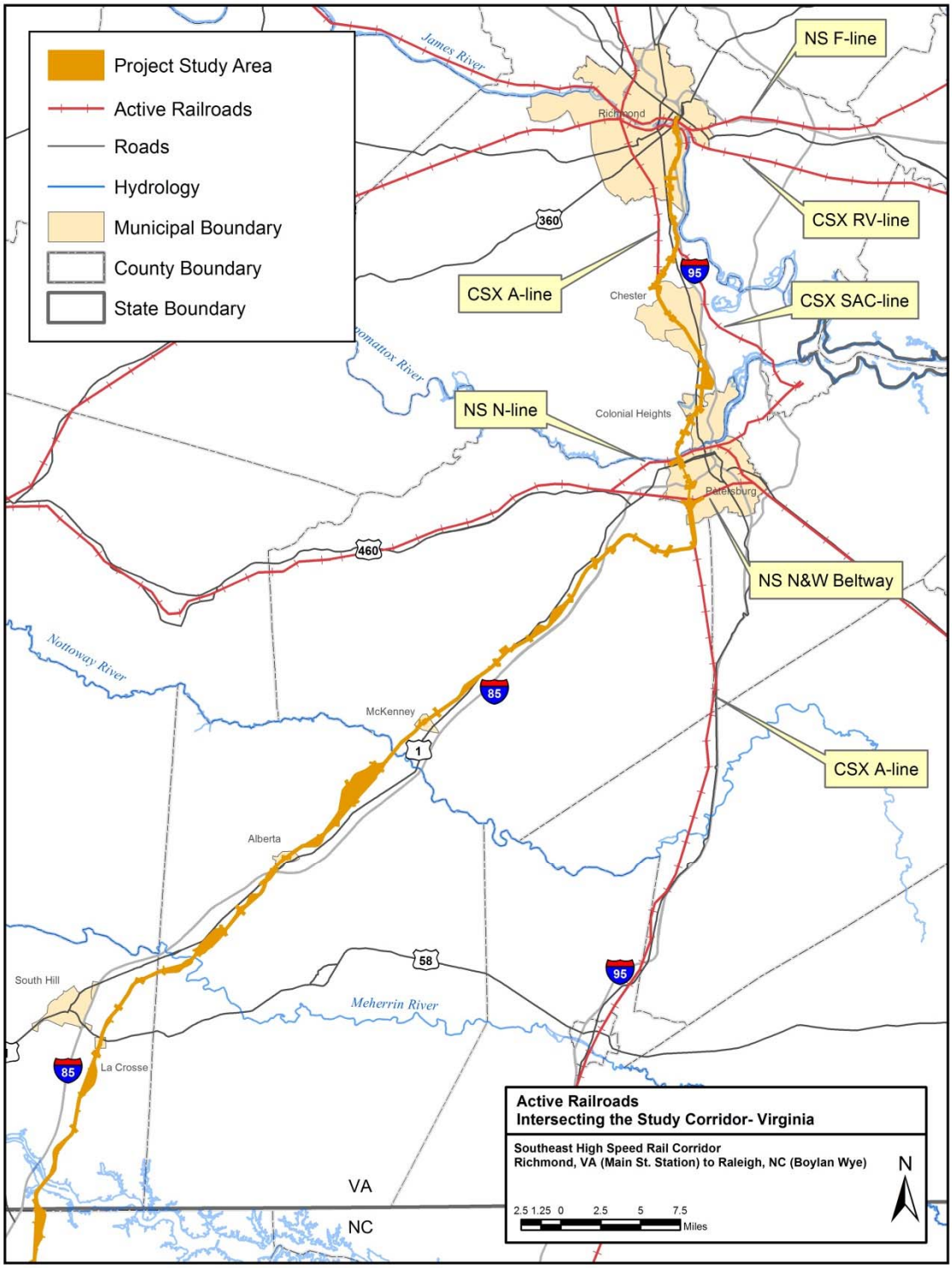
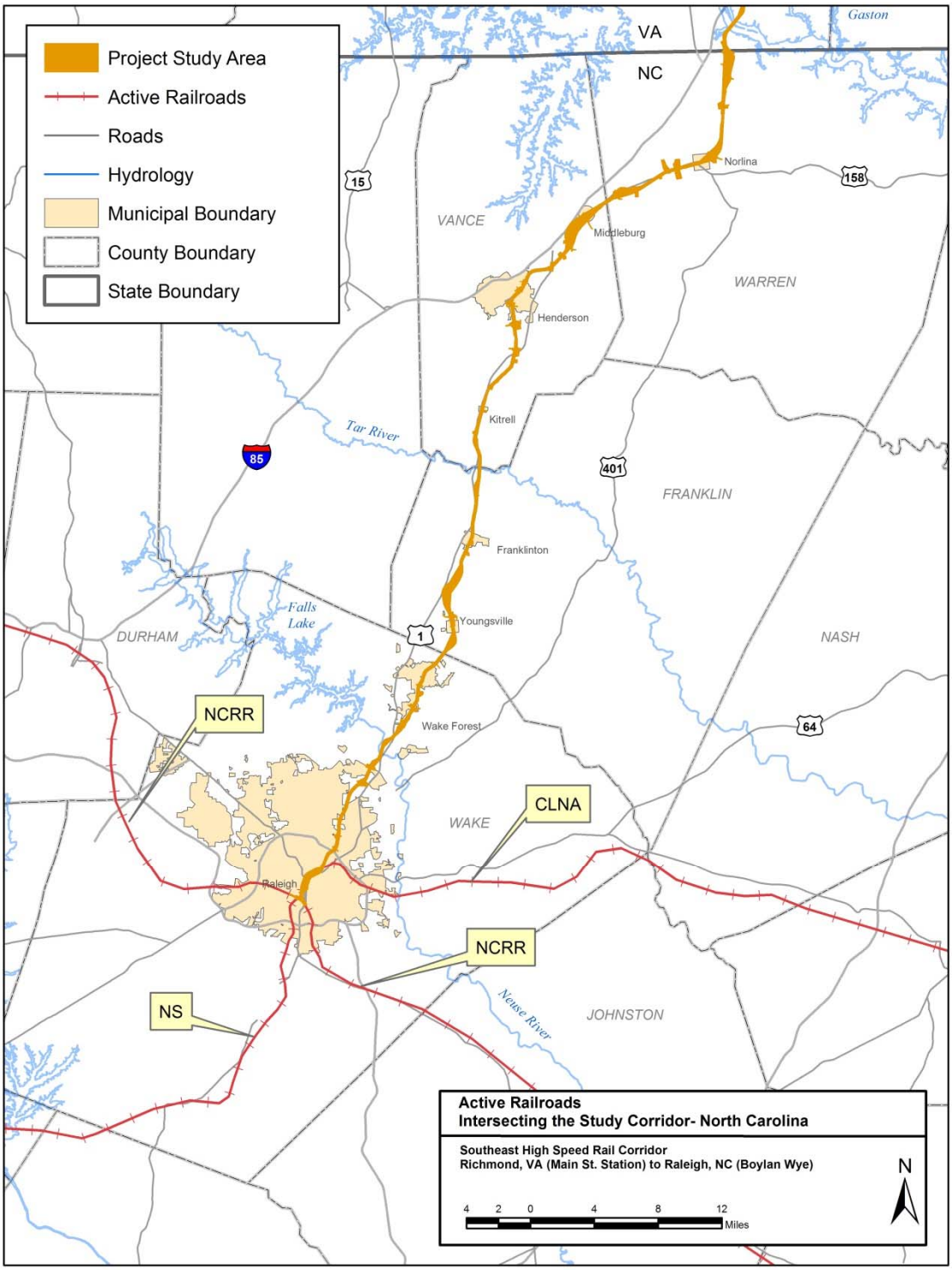

Project Study Area
Active Railroads
Roads
Hydrology
Municipal Boundary
County Boundary
State Boundary
James River
Richmond
NS F-line
CSX RV-line
360
CSX A-line
95
Chester
CSX SAC-line
Appomattox River
NS N-line
Colonial Heights
Petersburg
460
NS N&W Beltway
Nottoway River
85
McKenney
1
CSX A-line
Alberta
58
South Hill
95
Meherrin River
85
La Crosse
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 3-15


Project Study Area
Active Railroads
Roads
Hydrology
Municipal Boundary
County Boundary
State Boundary
VA
NC
Gaston
Norlina
Middleburg
Henderson
Kitrell
Franklinton
Youngsville
Wake Forest
Raleigh
Tar River
Falls Lake
Neuse River
VANCE
WARREN
FRANKLIN
NASH
DURHAM
WAKE
JOHNSTON
15
158
85
401
1
64
NCRR
CLNA
NCRR
NS
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

3.14.3.1 *VIRGINIA*

The Study Area begins in Richmond, VA, at Main Street Station, following the CSX S-Line south. The CSX S-Line is a secondary mainline and carries approximately 12 freight trains daily. Just south of the station, the CSX S-Line is elevated 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 railroad lines cross each other at different levels). The CSX 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 the CSX RV-Line, making a connection from Main Street Station, to the east of the triple crossing. The CSX RV-Line is the preferred route for expanded conventional passenger rail service from Richmond Main Street Station to Newport News, VA as part of the extension of the SEHSR Corridor to Hampton Roads.

From the triple crossing, the CSX S-Line continues south elevated on structure, crossing the James River on a single track bridge. After crossing the river, the NS F-Line intersects the CSX 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 CSX 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. The Richmond to Hampton Roads SEHSR Corridor Tier I EIS selected the CSX S-Line as the preferred route for the extension of the SEHSR Corridor to Hampton Roads from Richmond Main Street Station to Norfolk through Centralia.

At Centralia, VA, the Study Area and the CSX S-Line join the CSX A-Line; this track carries approximately 30 freight trains daily, and the 10 daily Amtrak passenger trains (including one Amtrak Auto Train) that serve the Staples Mill Station on the northwest side of Richmond. Continuing south into Petersburg, VA, the CSX 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 CSX 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, and recent upgrades have also allowed the introduction of Amtrak NEC Regional passenger service to Norfolk. The CSX A-Line and NS N&W Line is the preferred route for the extension of the SEHSR Corridor to Hampton Roads from Richmond Main Street Station to Norfolk south of Centralia.

At the south end of Collier Yard, the CSX A-Line continues south, while the Study Area 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, the Study Area curves south, joining again with the alignment of the CSX S-Line. Although the tracks along this section of the CSX S-Line were removed in 1987, CSX retains exclusive ownership with exceptions, of the CSX S-Line (i.e., fee simple) and leases a portion of the corridor for operation of an underground fiber optic cable. The exceptions are located along the Burgess Connector south of Collier Yard, where portions of the ROW have been sold to individual property owners for driveway access, and in southside Virginia, where

sections of the ROW have been sold to adjacent landowners, such as a 1.3 mile long section at the Nottoway River in Dinwiddie County owned by Reedy Creek Farm Associates.

3.14.3.2 *NORTH CAROLINA*

There are no changes to the description provided in the Richmond to Raleigh Project Tier II DEIS of the rail network within the Study Area in North Carolina.

In North Carolina, the Study Area continues to follow the inactive CSX S-Line to Norlina, NC. Between Norlina, NC, and Raleigh, NC, the CSX S-Line is an active freight railroad that carries approximately four local trains daily. There are no active railroads that intersect the Study Area until it reaches Capital Boulevard in downtown Raleigh, NC. At this point, the Study Area widens to include both the CSX S-Line and the Norfolk Southern 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 Norfolk Southern NS-Line carries eight trains daily, and there are approximately eight trains operating daily on the CSX 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, and it is a more heavily used freight and passenger corridor, carrying approximately 16 trains daily. The SEHSR Corridor 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.

3.14.4 STATIONS

The Richmond to Raleigh Project Tier II DEIS contained a discussion regarding station locations in Chapters 3 and 4. However, this document does not evaluate environmental impacts related to specific station locations, but rather provides a general discussion of potential station locations in relationship to the larger transportation network. As stated in the Richmond to Raleigh Project Tier II DEIS, specific station locations within municipalities will be determined in the future by the local governments with the passenger service operator, and appropriate levels of environmental documentation will be undertaken at that time. For the Richmond to Raleigh Project Tier II FEIS, the Project Team determined the discussion regarding stations was more appropriately placed within Chapter 1 and was, therefore, moved to the Project Description in Section 1.4.

3.14.5 TRANSIT

In the Richmond to Raleigh Project Tier II DEIS, connectivity to local public transportation was discussed under “Stations” (Sections 3.17 and 4.1). To address public comments, a new separate section has been added to the Richmond to Raleigh Project Tier II FEIS.

As described in Chapter 1, the intent of the Project is to be connected to other forms of transit to enhance regional connectivity. The following public transit service agencies either currently provide, or are anticipated to be expanded to provide public transit (bus or van) services for SEHSR passengers at rail stations in the following locations:

- Richmond, VA - GRTC
- Petersburg Area, VA - Petersburg Area Transit (PAT) and GRTC
- La Crosse, VA - Lake Area Bus (LAB)
- Henderson, NC - Kerr Area Rural Transportation System (KARTS)

- Raleigh, NC - CAT and TT

Discussion regarding the impact of the preferred alternative on existing and planned transit systems (bus, light rail, commuter rail, etc.) is provided in Chapter 4.

3.14.6 AVIATION

This section is new to the Richmond to Raleigh Project Tier II FEIS and was added to address a request by the Virginia Department of Aviation's Airport Services Division to identify all applicable airport runways within 20,000 linear feet of the Preferred Alternative. Chapter 4 contains discussion regarding the likelihood of the Project in penetrating an existing or proposed Part 77 surface or approach path as defined in Federal Aviation Administration (FAA) Advisory Circular 150/5300.

Table 3-34 below, lists airports located within 20,000 feet of the Richmond to Raleigh Project Tier II FEIS Preferred Alternative.

Table 3-34
Airports Located Near Study Area

Name	Airport ID	Location	Runway Length (ft.)	Distance Between Runway and Study Corridor (ft.)
Mecklenburg-Brunswick Regional Airport	AVC	South Hill, VA	5,000	10,300
Chesterfield County	FCI	Richmond, VA	5,500	18,900
Dinwiddie County	PTB	Petersburg, VA	5,000	10,000

3.15 UTILITIES AND RELATED SERVICES

The text for this section has been summarized from the Richmond to Raleigh Project Tier II DEIS, except for the discussion on water supply, which has been amended to address public and agency questions and comments.

Utilities are, by definition, a commodity or service provided for public use. As discussed in Section 3.18 of the Richmond to Raleigh Project Tier II DEIS, the Study Area contains municipal, regional, interstate and private utility infrastructure systems, including: 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. For more detail on those systems in the Study Area, please see Section 3.18 of the Richmond to Raleigh Project Tier II DEIS. For a discussion of the potential impact to these utilities from the proposed Preferred Alternative for the Project, see Section 4.15.

3.15.1 WATER SUPPLY

Water treatment and supply facilities are owned, operated and maintained by municipalities, counties or private entities in the Study Area. Some of the rural counties and communities have joined together 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 groundwater wells, water supply reservoirs and intakes, water 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.

The data sources were different for each state. Table 3-35 lists groundwater wells that are within a 1,000 foot radius of the SEHSR Study Area in Virginia. Table 3-36 lists the public water supply groundwater wells that are located within the SEHSR Study Area in North Carolina.

Table 3-35
Virginia Groundwater Wells Within 1,000 Feet of Study Areaa

Well Owner	Milepost Marker (Approximate)
Southside Elementary School	S-32.5/S-33
Food Lion	S-36.25
Dinwiddie Elementary School	S-37
Hoagie Bob's	S-38.5
Home Place Restaurant	S-38.5
Town of McKinney-North Well	S-47
Town of McKinney-South Well	S-47
Town of McKinney-Well 01	S-48.5
Hillcrest Mobile Home Park*	S-77/S-78

Source: Virginia Department of Health, 2010
* The wells at Hillcrest Mobile Home Park are no longer required to follow Virginia Waterworks Regulations (Virginia Department of Health correspondence, 20120); however, the Project team confirmed two active wells at the location.

Table 3-36
North Carolina Public Water Supply Groundwater Wells Within Study Area

ID	Owner	Site Location
0235452	Church of God of Prophecy	Left side of church
0392222	Aqua North Carolina Inc.	Ligon Mill Rd at RR crossing
0291470	Brookston Baptist Church	Far right of parking lot
0291538	Kittrell Church of God	Front yard adjacent to house
4035007	Living Springs Church of God	Front left corner of parking lot

Source: NCDENR, 2009

In Virginia, the Study Area falls within Zone 2 (greater than 5 miles into the watershed) of five surface water intakes, as shown in Table 3-37. The Study Area does not fall within Zone 1 (up to 5 miles into the watershed) of any public surface water intakes.

In North Carolina, there is one surface water intake located within the Study Area. The Burlington Industries Inc. – Wake Forest site at 9701 Capital Boulevard, on the Neuse River, in Section U is not currently in use.

Table 3-37 Virginia Surface Water Intakes with Zone 2 (greater than 5 miles into the watershed)		
River Basin	**Surface Water Intake Owner**	**Water Source**
James Virginia	American Water Company Hopewell	Appomattox
Chowan	Greensville County WSA-Jarratt	Nottoway
Chowan	Town of Lawrenceville	Meherrin
Chowan	Town of Lawrenceville	Great Creek
Chowan	City of Emporia	Meherrin
Chowan	City of Norfolk	Nottoway
Roanoke	City of Norfolk- Left VB Intake	Lake Gaston
Roanoke	City of Norfolk- Right VB Intake	Lake Gaston

Source: Virginia Department of Health, 2010.

3.16 SAFETY AND SECURITY

The text for this section is repeated in its entirety from the Richmond to Raleigh Project Tier II DEIS, with no changes. 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 CSX 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 four quadrant gates with median barriers and signals at high traffic 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 Norfolk Southern 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 at all rail yards throughout the corridor.

This Project assumes that all freight and passenger trains will share all tracks along all segments of the Project corridor (refer to Figure 1-4 for proposed rail improvements and associated MAS

throughout the Project corridor). However, FRA regulations will require the preparation of a system safety plan, with partnership from the operating freight railroads, for the delivery of the new passenger HSR service or shared freight service prior to authorization to operate the new service at any speed.