2 ALTERNATIVES

The Record of Decision (ROD) for the Tier I Southeast High Speed Rail (SEHSR) environmental impact statement (EIS) identified a preferred corridor that runs from Washington, DC, through Richmond, VA, Petersburg, VA, Henderson, NC, Raleigh, NC, and Greensboro, NC, to Charlotte, NC, with a separate connection to Winston-Salem, NC. The focus of this Tier II document is the portion between Richmond, VA, and Raleigh, NC. The following section describes the Richmond to Raleigh Tier II study corridor, and the development of alternatives within the corridor.

2.1 Study Corridor

The project study corridor provides boundaries for potential SEHSR rail and associated road alignments and includes areas where construction of the project could have direct impacts on the environment. Initially, the study corridor width was between 1,000 and 6,000 feet, centered primarily on the centerline of the existing rail right of way (ROW). This broad area allowed for the development of alternative alignments. Once potential alignments were proposed, the eastern and western limits of the study corridor were narrowed to a 600-foot corridor along each alternative (Figure 2-1).

The study corridor begins at Main Street Station in Richmond, VA, and extends to the south, following the existing CSX S-line railroad across the James River and through Chesterfield County towards Centralia, VA. From Centralia, the study corridor follows the existing CSX A-line south to Dunlop, VA, south towards Ettrick Station on the west side of Petersburg, and across the Appomattox River. After crossing the river, it continues to follow the CSX A-line south through Petersburg.

The study corridor initially included an eastern branch through the Petersburg, VA, area that followed abandoned rail ROW from Dunlop through Colonial Heights, VA. However, this route was excluded from further consideration based on impacts to historic resources, relocations, constructability, and other issues. More information on this evaluation is included in Section 2.2.2.

South of Petersburg, VA, the corridor continues to follow the A-line south through Collier Yard, a CSX rail yard. At the south end of Collier Yard, the study corridor turns west, following the alignment of the inactive Burgess Connector rail line. The tracks have been removed along the Burgess Connector, and small portions of the ROW have been sold. At Burgess, the study corridor curves south, joining again with the alignment of the CSX S-line. The tracks along this section of the S-line were removed in 1987; however, the ROW remains intact throughout most of the corridor, and portions of it were leased to MCI-WorldCom for the installation of underground fiber optic cable, which is currently in place.

As the study corridor moves through southern Virginia, it passes through the Town of McKenney, VA, where a portion of the ROW has been sold, before crossing the Nottoway River and into Brunswick County. The corridor progresses south through the Town of Alberta, VA, and crosses the Meherrin River before crossing into Mecklenburg County. In Mecklenburg County the corridor continues to follow the S-line through the Town of La Crosse, VA, and then crosses Lake Gaston, before passing into North Carolina.

In North Carolina, the corridor continues along the inactive S-line through Warren County to the Town of Norlina, NC, where the S-line returns to an active freight railroad (Norfolk Southern). From Norlina, the study corridor follows the active freight line into Vance County and through the towns of Middleburg, Henderson, and Kittrell, NC, before crossing the Tar River, and on into Franklin County; the corridor then passes through Franklinton and Youngsville before entering into Wake County.

In Wake County, the corridor passes through the Town of Wake Forest, NC, before crossing the Neuse River, and then into the City of Raleigh. In Raleigh, the southern ten miles of the study corridor includes ROW recently purchased by Triangle Transit (TT) for planned regional commuter rail service, which would be operated on a separate rail system.

On the north side of downtown Raleigh near Capital Boulevard, the study corridor again splits into two alternatives: the western branch follows the existing Norfolk Southern (NS) NS-line through Glenwood Yard, the NS switching yard, and continues south; the eastern branch continues to follow the CSX S-line south through Capital Yard, the CSX switching yard. The two branches re-join near Jones Street in downtown Raleigh. From Jones Street, the study corridor continues south for two blocks along the S-line to the Boylan Wye on the railroad, near Boylan Avenue. The Boylan Wye represents the southern terminus of the study corridor.

2.2 Build Alternatives

For engineering purposes and discussions of impacts, the project corridor was divided into 26 sections labeled AA to V, from Richmond, VA, south to Raleigh, NC (Figure 2-1). The endpoints of each of the 26 sections are in locations where the alternative alignments are in a common location. This allows for the broadest range of options when selecting the preferred alternative. The alternatives will be evaluated section by section, and a preferred alternative will be selected for each section, and then joined with preferred alternatives from the other sections to determine the “best-fit” preferred alternative for the entire study corridor.

Figure 2-1

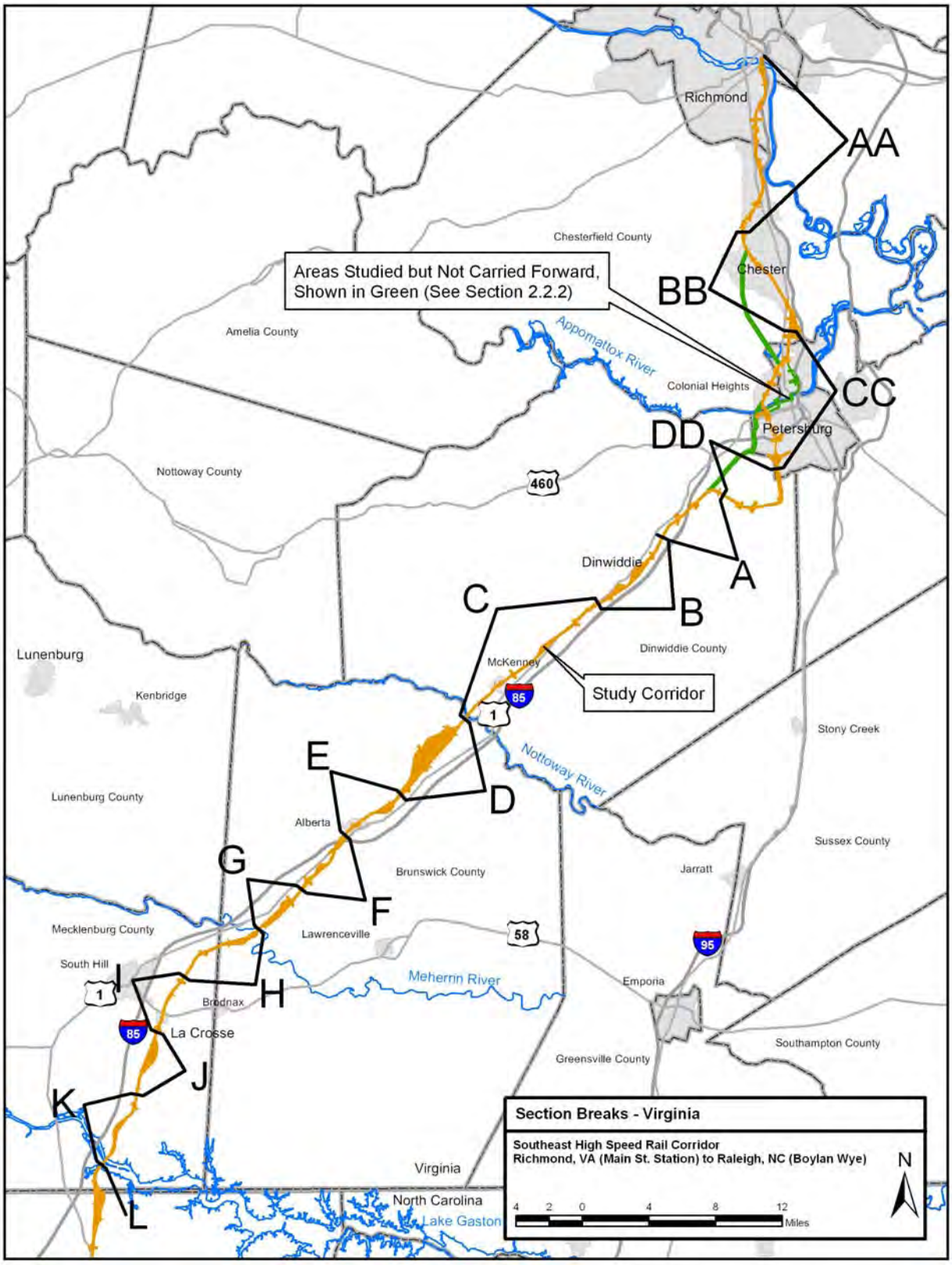

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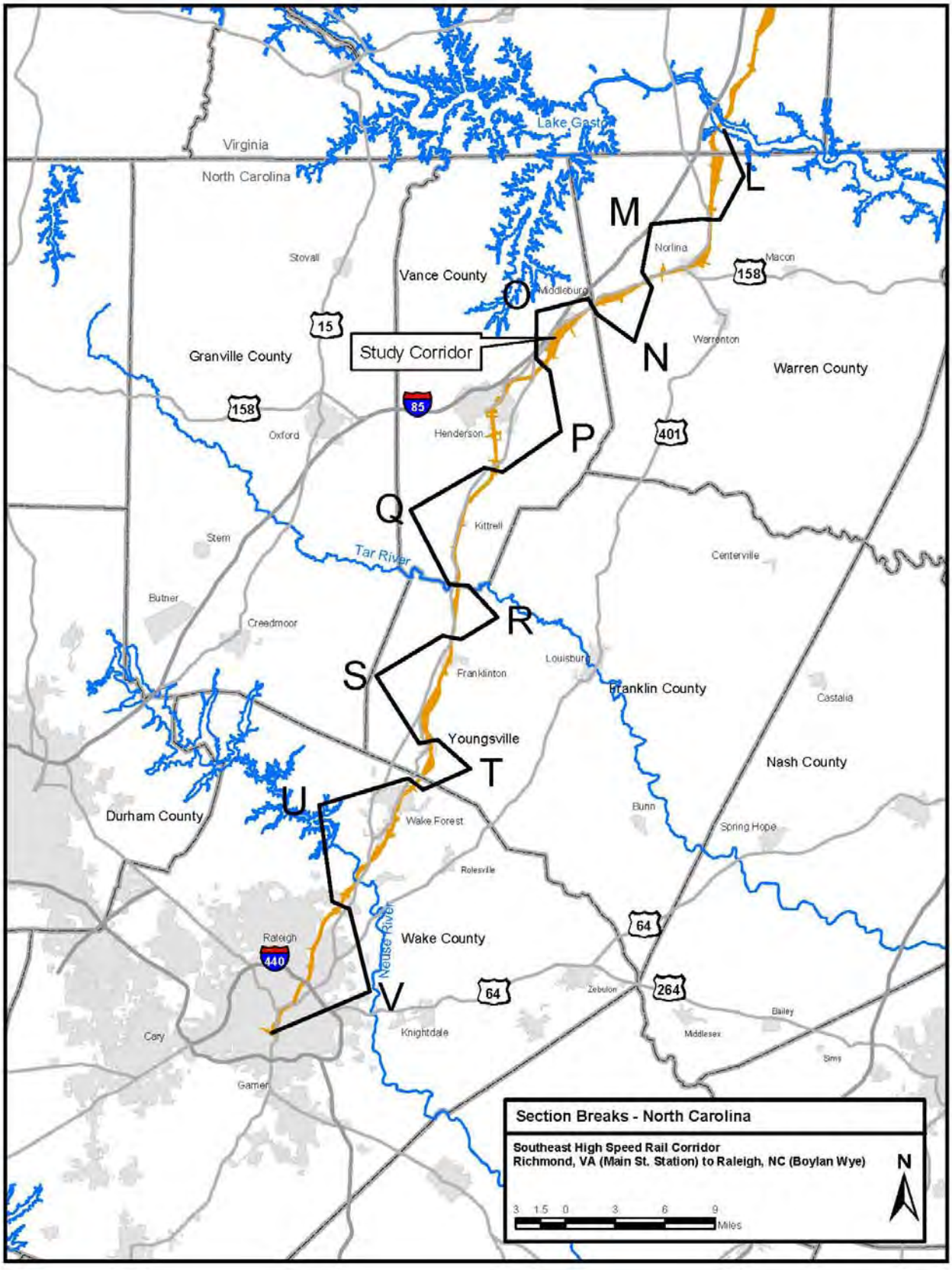
Figure 2-1 (continued)



2.2.1 Alternative Alignments

2.2.1.1 Rail Alignments

The SEHSR Tier II EIS applies the incremental approach to the development of alternative alignments that was adopted in the Tier I EIS. This incremental approach utilizes existing rail lines or segments of existing rail lines in conjunction with areas of new track, taking advantage of existing rail ROW and infrastructure through improvements such as track upgrades, double tracking, additional sidings, curve straightening, train signal improvements, crossing consolidations, and grade separated crossings. This approach upgrades existing railroad ROW to accommodate higher speeds, while avoiding or minimizing impacts to the human and natural environment.

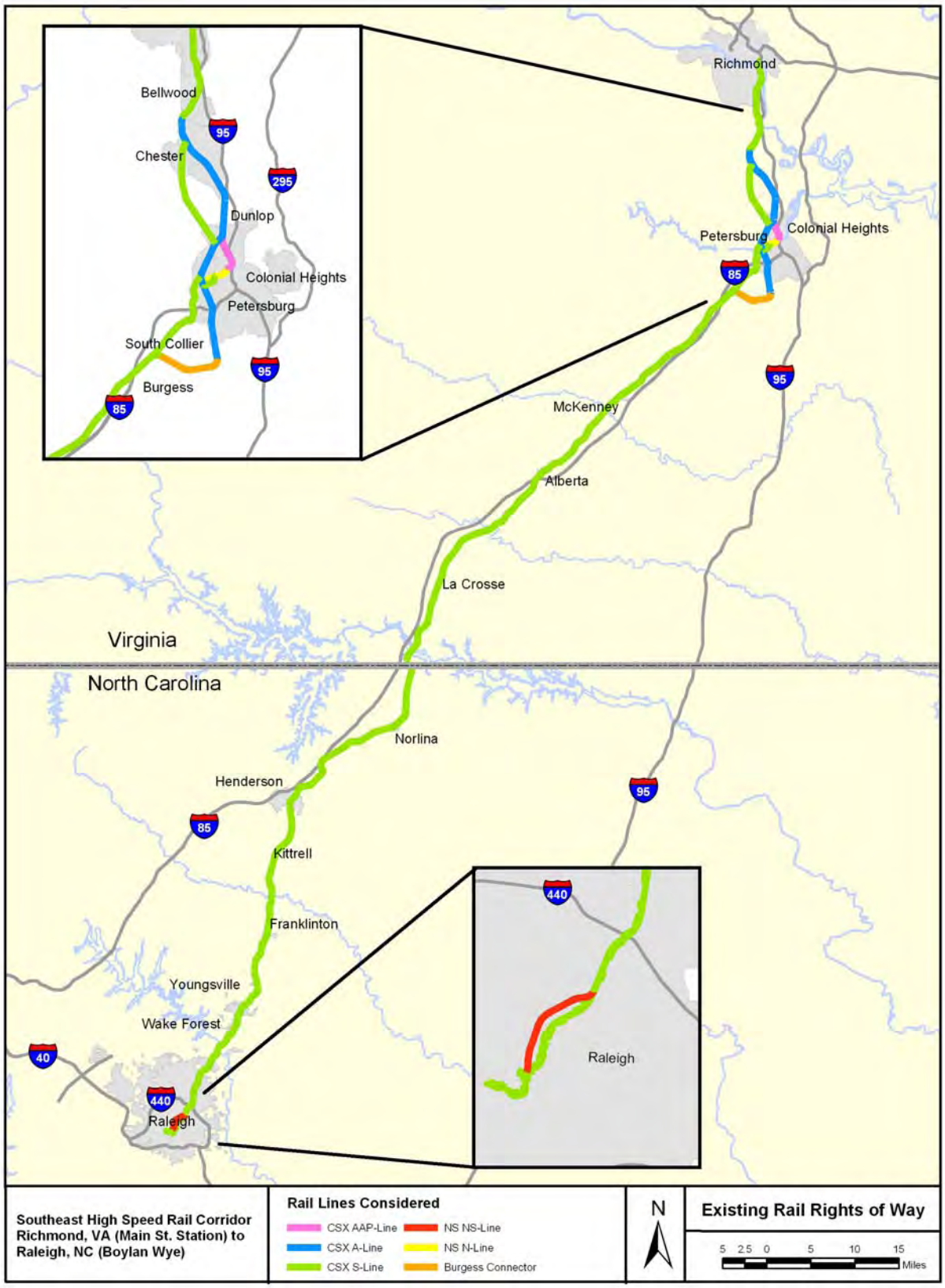
To be considered a viable alternative, a potential alignment was required to meet a variety of design parameters. The maximum authorized speed (MAS) of the proposed SEHSR train was established as 110 miles per hour (mph), and the proposed average speed as 85 to 87 mph. To achieve these objectives, design modifications for existing rail lines were required in terms of straightening curves, and adjusting the vertical and horizontal alignments, as well as adding passing sidings and new sections of additional track. For these reasons, the proposed alternatives include new location areas as well as some areas along inactive rail ROW, even though the proposed alignments stay within existing rail ROW for the majority of their length. Existing rail ROW considered for the project is shown in Figure 2-2.

In the early alignment alternative development stage, the Quantm software system was used to generate potential alignments. Quantm is a route optimization planning tool that quickly finds optimal transportation alignments using terrain data, costs, design criteria, and other specified constraints. Extensive field data delineating areas of environmental constraints and community resources were input into Quantm along with engineering criteria. Several program runs produced hundreds of potential alignments.

Initially, alignment options were narrowed to two optimum alignments for further study. As more detailed information became available throughout the design process, a third alignment was added. In most cases, the third alignment provides an avoidance alternative in areas with potential impacts to historic properties.

Throughout much of the corridor, the alignments are on common location within existing rail ROW in order to minimize impacts. The alternative alignments are called VA1, VA2, VA3 in Virginia, and NC1, NC2, NC3 in North Carolina. Except where otherwise specified, the VA3 and NC3 alignments are concurrent with VA1 and NC1, respectively. Overviews of the alignments in each of the 26 sections are provided below.

Figure 2-2


Bellwood
Chester
Dunlop
Colonial Heights
Petersburg
South Collier
Burgess
95
295
85
Richmond
Petersburg
Colonial Heights
McKenney
Alberta
La Crosse
Virginia
North Carolina
Norlina
Henderson
Kittrell
Franklinton
Youngsville
Wake Forest
Raleigh
40
440
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to
Raleigh, NC (Boylan Wye)
Rail Lines Considered
CSX AAP-Line
CSX A-Line
CSX S-Line
NS NS-Line
NS N-Line
Burgess Connector
N
Existing Rail Rights of Way
5 2.5 0 5 10 15
Miles

2.2.1.2 Road Alignments

The overarching philosophy of the design of the SEHSR from Richmond, VA, to Raleigh, NC, is to consolidate and grade separate all railroad-roadway crossings for safety and operability purposes. Grade separations replace at-grade crossings (i.e., locations where railroads and roadways cross at the same elevation) with bridges or underpasses. The primary reason for removing at-grade crossings is safety; however, there are several other reasons:

- Absolute collision avoidance: At-grade crossings inherently have risk of train-automobile collisions. A collision at a crossing on a higher speed track is a significant event often causing a death in the vehicle and in the case of larger, heavier trucks, the possible derailment of the train. These accidents also disrupt operation of both the rail and roadway systems for many hours

- Elimination of railroad/roadway traffic issues: Under normal railroad operation, the event of a train crossing at-grade may cause delay of up to several minutes for vehicular traffic depending on type and speed of train. Likewise, a stopped train will experience further delay as it must accelerate very slowly in areas where crossings are present to avoid occupying crossings before gates are down

- Elimination of possible system failure and associated delays: Crossing signal systems are very complex computer and electronics systems that operate in harsh environments. When a signal system fails, trains are often required to stop at the crossing with a crew member stopping traffic by flagging

- Elimination of easy trespasser access: Trespassing is a major safety and security problem for railroads. At-grade crossings provide attractive locations for trespassers to access the railroad right-of-way

- Elimination of horn noise: Trains are required to sound horns on approach to an at-grade crossing. By eliminating crossings, trains will not be required to whistle, significantly reducing unwanted noise

- Comparable capital cost to grade-separated structure: On a high speed track, the cost of the signal system, approaches, crossing surface, and lifelong maintenance for an at-grade crossing can approach that of the cost of a grade separated structure

- Improved long term cost of maintenance: There are many ongoing costs for at-grade crossings with active warning devices, including inspections, replacement of damaged or worn out parts, and replacement of crossing surfaces when a track is surfaced and ties are replaced

- Allows for future speed increases: Federal Railroad Administration (FRA) regulations require grade separations for speeds above 125 mph.

All existing at-grade crossings located between proposed and existing grade separations along the SEHSR project will be closed and vehicular traffic re-routed to the nearest grade separation. Grade separations are typically located less than one mile apart. The locations chosen for grade separations were based on input from local officials,

connectivity to the existing road network, minimizing impacts to natural and cultural resources, and constructability.

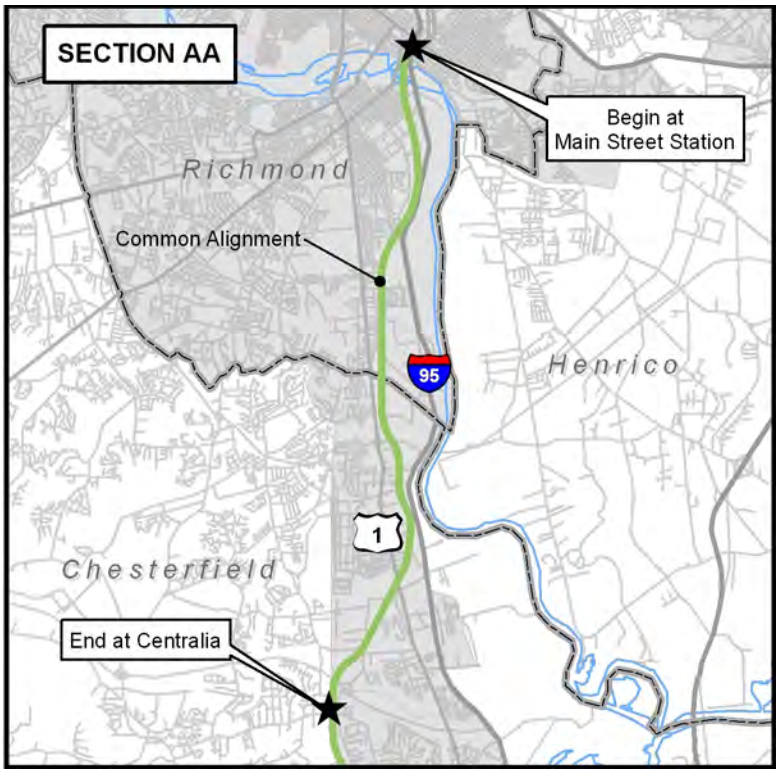
Design of grade separations along the SEHSR project often necessitated changes to the design of adjacent roads. These changes primarily address: (1) realignments of existing roads to accommodate a bridge or overpass, and (2) new roads to maintain connectivity to the existing road network. The proposed roadwork associated with each rail alignment is considered part of that alternative (VA1, VA2, VA3 in Virginia, and NC1, NC2, NC3 in North Carolina). The impacts associated with project alternatives (Chapter 4) address changes from both rail and roadway alignments.

2.2.1.3 Detailed Alignment Information

The following section contains quick reference guides, or "overview sheets" for each section. The overview sheets contain a schematic map along with several design details. One of the design details is Limiting Speed, which is the maximum train speed through the most restrictive curve within the section based on current design assumptions. Average running speed through the section would be greater than the Limiting Speed except where the Limiting Speed is 110 mph.

More detailed information can be found in the Appendices. Appendix Q contains maps that show a greater level of detail for each alignment, and include proposed associated roadwork; Appendix E contains schematic track charts of the alternative rail designs, and Appendix F contains detailed information on each of the existing and proposed crossings of the rail and road alignments.

Section AA

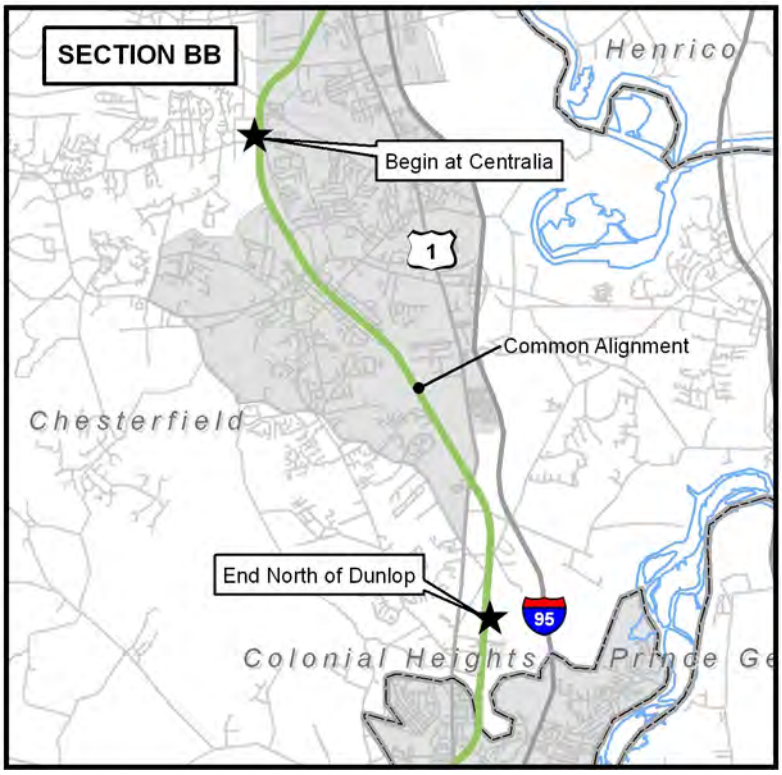


State	Virginia
Begins	Main Street Station
	Railroad Milepost S-0
Ends	Centralia
	Railroad Milepost A-11
Cities/Towns	Richmond
Counties	Chesterfield
Major Rivers	James
Appendix Q Detailed Map Sheets	001-010

Alternatives VA1, VA2, VA3 (All on Common Alignment; Shown in Green)		
Design Objectives	Maximizes use of existing rail ROW; rebuilds double track where it previously existed (currently only single track in several areas)	
Length	11.31miles	
Limiting Speed	80 mph	
Operability & Constructability	No difference between alternatives	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	James River (new single track in addition to existing single track bridge)	
Proposed New Roadway Bridges/ Underpasses*	Maury Street	Bridge
	Goodes Street	Bridge
	East Commerce Road	Bridge
	Ruffin Road	Underpass
	West Bells Road	Bridge
	Station Road	Bridge
	Kingsland Road	Bridge
	New Public Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section BB

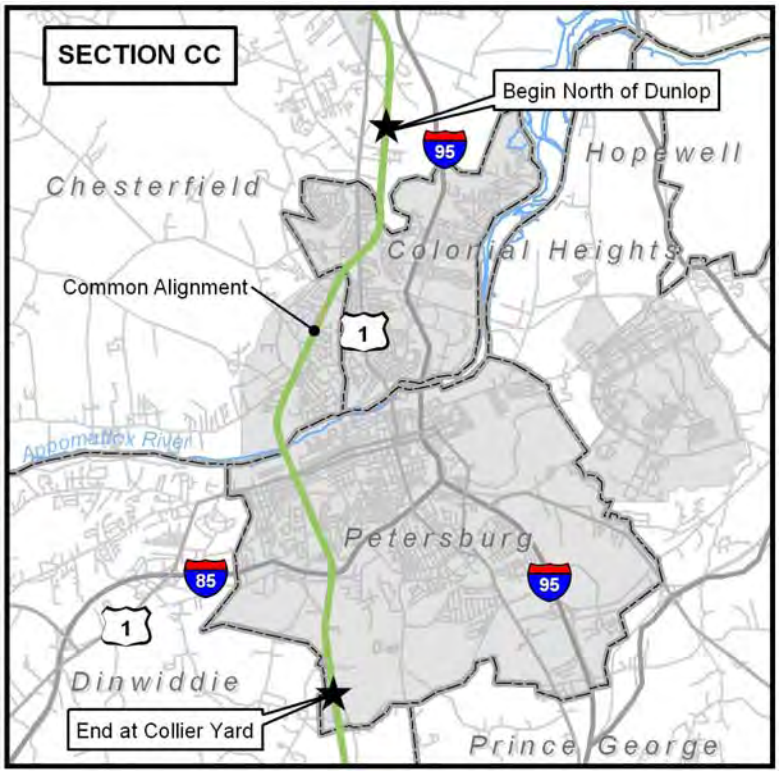


State	Virginia
Begins	Centralia
	Railroad Milepost A-11
Ends	North of Dunlop (where CSX A-line and CSX AAP-line (abandoned) come together)
	Railroad Milepost A-18
Cities/Towns	Chester
Counties	Chesterfield
Major Rivers	None
Appendix Q Detailed Map Sheets	010-016

Alternatives VA1, VA2, VA3 (All on Common Alignment; Shown in Green)		
Design Objectives	Maximizes use of existing rail ROW; new passenger track approximately 30 feet to east of existing track	
Length	6.91 miles	
Limiting Speed	110 mph	
Operability & Constructability	No difference between alternatives	
Primary Rail ROW	CSX A-line	
Proposed New Roadway Bridges/ Underpasses*	Centralia Road	Bridge
	Curtis Street	Underpass

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section CC

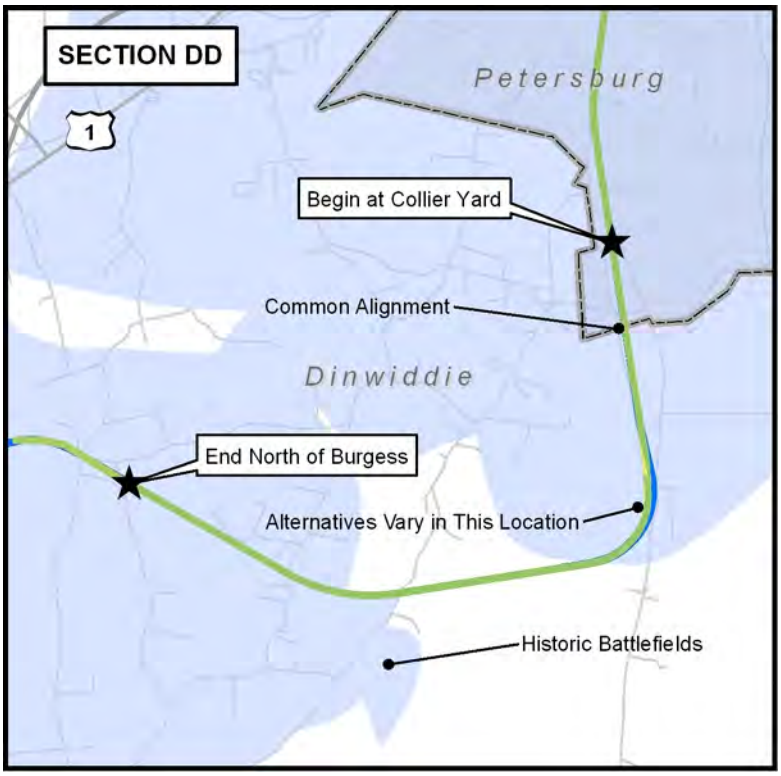


State	Virginia
Begins	North of Dunlop
	Railroad Milepost A-18
Ends	Collier Yard
	Railroad Milepost A-27.5
Cities/Towns	Colonial Heights
	Petersburg
Counties	Chesterfield
Major Rivers	Appomattox
Appendix Q Detailed Map Sheets	017-028

Alternatives VA1, VA2, VA3 (All on Common Alignment; Shown in Green)		
Design Objectives	Minimizes travel time through Petersburg and provides options for a Petersburg station at one of four locations • Dunlop area • Ettrick (existing station location) • Washington Street area • Collier area Note: these locations are evaluated for roadway access only in the Tier II EIS	
Length	8.91 miles	
Limiting Speed	80 mph	
Operability & Constructability	No difference between alternatives	
Primary Rail ROW	CSX A-line, CSX AAP-line (abandoned)	
River and Major Creek Bridges	Appomattox River (new single track in addition to existing single track bridge)	
Proposed New Roadway Bridges/ Underpasses*	Pine Forest Drive	Bridge
	Branders Bridge Road	Bridge
	Dupuy Road	Bridge
	Lincoln Street- Pedestrian Only	Underpass
Note: Other alternatives through Petersburg were considered, but not carried forward. See Section 2.2.2 for more information.		

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section DD



State	Virginia
Begins	Collier Yard
	Railroad Milepost A-27.5
Ends	North of Burgess
	Railroad Milepost S-29
Cities/Towns	Petersburg
Counties	Dinwiddie
Major Rivers	None
Appendix Q Detailed Map Sheets	028-033

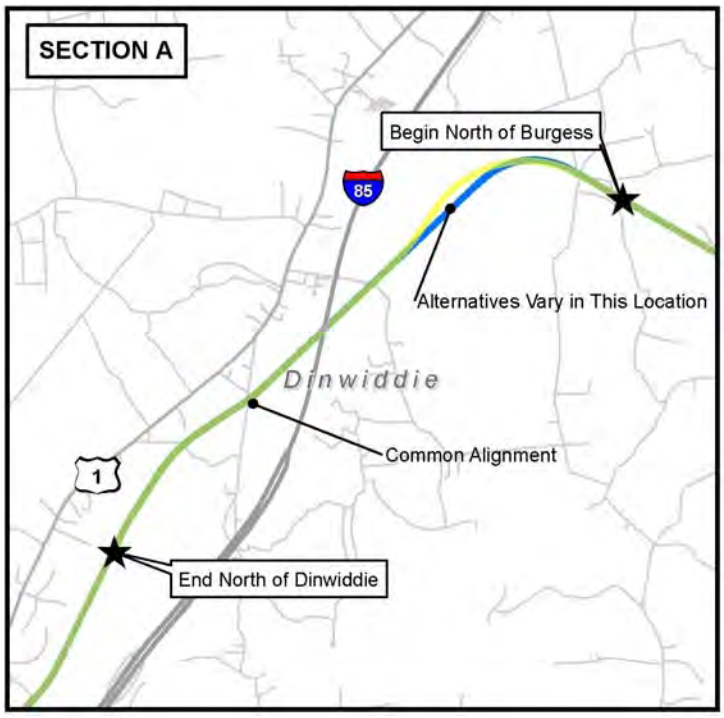
Alternative VA1 (Shown in Blue When Varies from VA2/3; Shown in Green When Common with VA2/3)		
Design Objectives	Maximizes use of existing rail ROW in approach to Collier Yard; new track 30 feet to east of existing tracks; leaves existing ROW as it goes up and over the CSX A-line tracks on a bridge as it transitions to the Burgess Connector ROW	
Length	5.66 miles	
Limiting Speed	75 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX A-line	
	CSX Burgess Connector (inactive)	
Proposed New Roadway Bridges/ Underpasses*	Unnamed Road	Underpass
	Vaughan Road	Bridge
	Squirrel Level Road	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Maximizes use of existing rail ROW; new track 30 feet to east of existing tracks; tighter curve than VA1 and VA2, with additional piers on longest bridge over CSX A-line tracks (compared to VA1 and VA3) in order to minimize ROW needed from Weldon Railroad/Globe Tavern battlefield	
Length	5.63 miles	
Limiting Speed	70 mph	
Operability & Constructability	Skew requires bridge pilings that limit future expansion of CSX main line; limits access for CSX maintenance; speed is 5 mph slower than VA1 and VA3	
Primary Rail ROW	CSX A-line	
	CSX Burgess Connector (inactive)	
Proposed New Roadway Bridges/ Underpasses*	Unnamed Road	Underpass
	Vaughan Road	Bridge
	Squirrel Level Road	Bridge

Alternative VA3 (Shown in Orange When Varies from VA1/2; Shown in Green When Common with VA1/2)		
Design Objectives	Maximizes use of existing rail ROW; new track 30 feet to east of existing tracks; shortest bridge over CSX A-line tracks (compared to VA1 and VA2); uses retaining walls to minimize ROW needed from Weldon Railroad/Globe Tavern battlefield	
Length	5.66 miles	
Limiting Speed	75 mph	
Operability & Constructability	Construction cost is 25% less than VA1 or VA2	
Primary Rail ROW	CSX A-line	
	CSX Burgess Connector (inactive)	
Proposed New Roadway Bridges/ Underpasses*	Unnamed Road	Underpass
	Vaughan Road	Bridge
	Squirrel Level Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section A



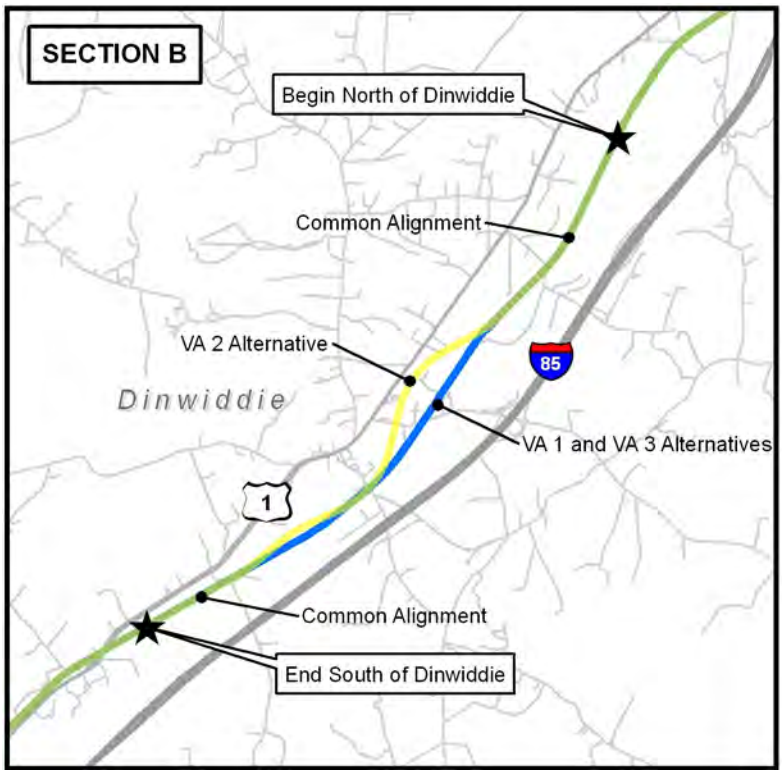
State	Virginia
Begins	North of Burgess
	Railroad Milepost S-29
Ends	North of Dinwiddie
	Railroad Milepost S-34
Cities/Towns	None
Counties	Dinwiddie
Major Rivers	None
Appendix Q Detailed Map Sheets	034-038

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Maximizes use of existing rail ROW	
Length	4.93 miles	
Limiting Speed	80 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 15 mph; increases rail wear, and wear on wheels and brakes; increases schedule time; increases fuel use	
Primary Rail ROW	CSX Burgess Connector, CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Duncan Road	Bridge
	Dabney Mill Road	Bridge
	Quaker Road	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Optimizes transition speed from Burgess Connector to CSX S-line	
Length	4.95 miles	
Limiting Speed	95 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX Burgess Connector, CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Duncan Road	Bridge
	Dabney Mill Road	Bridge
	Quaker Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section B



State	Virginia
Begins	North of Dinwiddie
	Railroad Milepost S-34
Ends	South of Dinwiddie
	Railroad Milepost S-40
Cities/Towns	Community of Dinwiddie Courthouse
Counties	Dinwiddie
Major Rivers	None
Appendix Q Detailed Map Sheets	038-043

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	5.71 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Honeycutt Road	Bridge
	VA 703 Carson Road	Bridge
	Gatewood Road	Underpass

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Maximizes use of existing rail ROW	
Length	5.80 miles	
Limiting Speed	90 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 20 mph; increases rail wear, and wear on wheels and brakes; increases schedule time; increases fuel use	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Honeycutt Road	Bridge
	Gatewood Road	Underpass

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

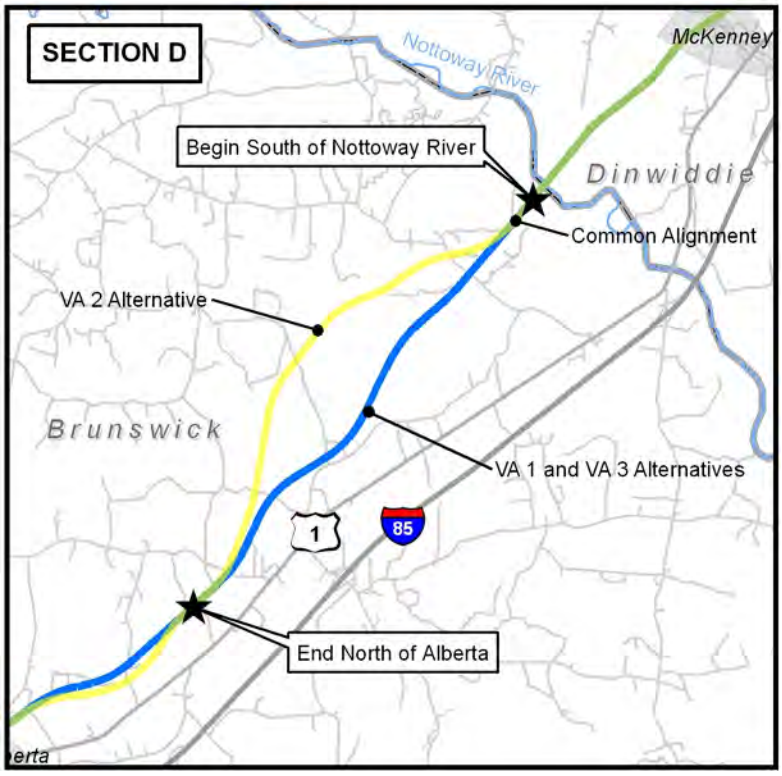
Section C

State	Virginia
Begins	South of Dinwiddie
	Railroad Milepost S-40
Ends	South of Nottoway River
	Railroad Milepost S-51
Cities/Towns	McKenney
Counties	Dinwiddie
Major Rivers	Nottoway
Appendix Q Detailed Map Sheets	044-053

Alternatives VA1, VA2, VA3 (All on Common Alignment; Shown in Green)		
Design Objectives	Maximizes use of existing rail ROW	
Length	10.75 miles	
Limiting Speed	110 mph	
Operability & Constructability	No difference between alternatives	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Nottoway River (single track bridge, utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	Glebe Road	Bridge
	Karla Drive	Bridge
	Asbury Road	Bridge
	VA 40 Doyle Boulevard	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section D



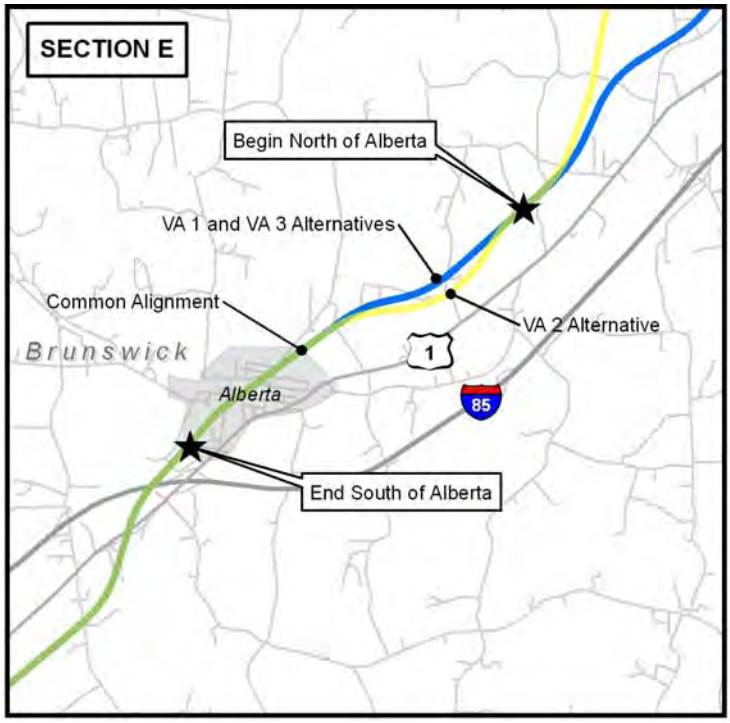
State	Virginia
Begins	South of Nottoway River
	Railroad Milepost S-51
Ends	North of Alberta
	Railroad Milepost S-57.5
Cities/Towns	None
Counties	Brunswick
Major Rivers	None
Appendix Q Detailed Map Sheets	053-062

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	6.07 miles	
Limiting Speed	110 mph	
Operability & Constructability	No significant difference between alternatives	
Primary Rail ROW	CSX S-line, New location	
Proposed New Roadway Bridges/ Underpasses*	Rawlings Road	Bridge
	Kress Road	Bridge
	Flat Rock Road	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Maximizes use of existing rail ROW; avoids historic Wynnhurst property and Michaux's Sumac endangered plant species	
Length	6.41 miles	
Limiting Speed	110 mph	
Operability & Constructability	No significant difference between alternatives	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Rawlings Road	Bridge
	Kress Road	Bridge
	Flat Rock Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section E



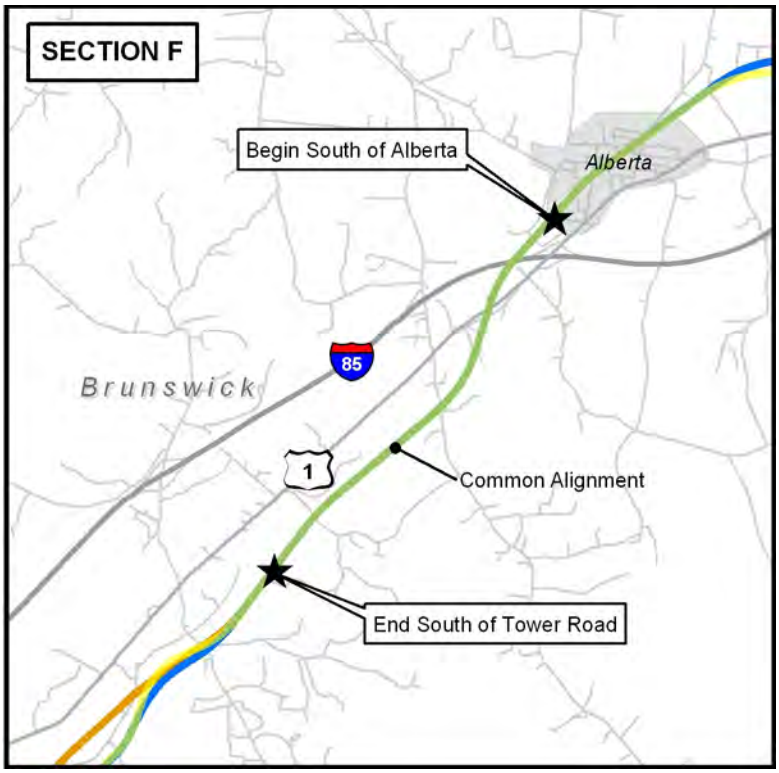
State	Virginia
Begins	North of Alberta
	Railroad Milepost S-57.5
Ends	South of Alberta
	Railroad Milepost S-62
Cities/Towns	Alberta
Counties	Brunswick
Major Rivers	None
Appendix Q Detailed Map Sheets	063-066

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	4.21 miles	
Limiting Speed	110 mph	
Operability & Constructability	Removes reverse curve; reduces rail wear, and wear on wheels and brakes; removes bridge from curve in spiral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Chestnut Road	Bridge
	Littlemont Road/Church Street	Bridge
	VA136 Second Avenue	Bridge
	Main Street	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	4.29 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Chestnut Road	Bridge
	Littlemont Road/Church Street	Bridge
	VA136 Second Avenue	Bridge
	Main Street	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section F

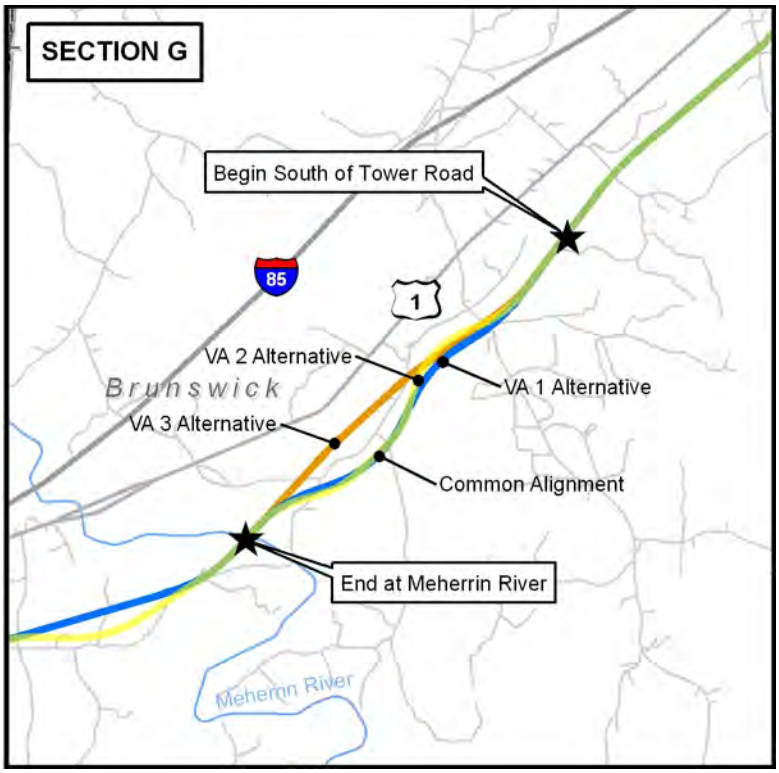


State	Virginia
Begins	South of Alberta
	Railroad Milepost S-62
Ends	South of Tower Road
	Railroad Milepost S-66.5
Cities/Towns	None
Counties	Brunswick
Major Rivers	None
Appendix Q Detailed Map Sheets	067-070

Alternatives VA1, VA2, VA3 (All on Common Alignment; Shown in Green)		
Design Objectives	Maximizes use of existing rail ROW	
Length	4.28 miles	
Limiting Speed	110 mph	
Operability & Constructability	No difference between alternatives	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Rosebud Lane	Bridge
	US 1 (Southbound) Boydton Plank Road	Bridge
	Millville Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section G



State	Virginia
Begins	South of Tower Road
	Railroad Milepost S-66.5
Ends	Meherrin River
	Railroad Milepost S-70
Cities/Towns	None
Counties	Brunswick
Major Rivers	Meherrin
Appendix Q Detailed Map Sheets	071-074

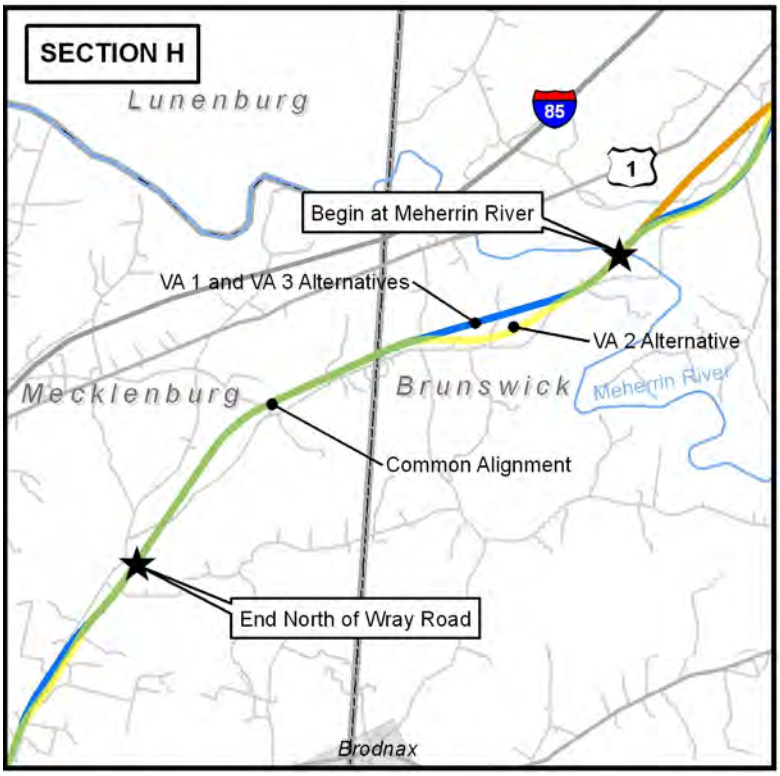
Alternative VA1 (Shown in Blue When Varies from VA2/3; Shown in Green When Common with VA2/3)		
Design Objectives	Improves train performance by straightening curves	
Length	3.61 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Meherrin River (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	Grandy Road	Bridge
	Meredith Mill Road	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	3.66 miles	
Limiting Speed	90 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 20 mph; increases rail wear, and wear on wheels and brakes; increases fuel use; increases schedule time	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Meherrin River (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges / Underpasses*	Meredith Mill Road	Bridge

Alternative VA3 (Shown in Orange When Varies from VA1/2; Shown in Green When Common with VA1/2)		
Design Objectives	Improves train performance by straightening curves; avoids Oak Shades historic property	
Length	3.55 miles	
Limiting Speed	110 mph	
Operability & Constructability	Allows maximum speed; straighter route reduces rail wear, and wear on wheels and brakes	
Primary Rail ROW	New location, CSX S-line	
River and Major Creek Bridges	Meherrin River (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	Old Indian Road (north end)	Bridge
	Meredith Mill Road	Bridge
	Old Indian Road (south end)	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones.

Section H



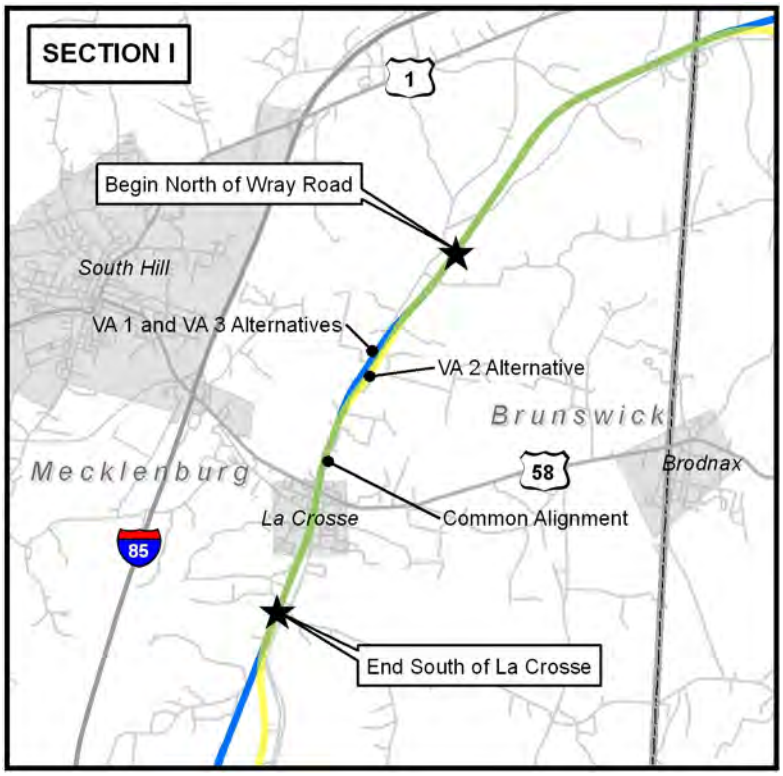
State	Virginia
Begins	Meherrin River
	Railroad Milepost S-70
Ends	North of Wray Road
	Railroad Milepost S-76
Cities/Towns	None
Counties	Brunswick Mecklenburg
Major Rivers	Meherrin
Appendix Q Detailed Map Sheets	075-080

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	5.53 miles	
Limiting Speed	110 mph	
Operability & Constructability	Decreases curvature and curve maintenance; eliminates reverse curve; reduces rail wear, and wear on wheels and brakes	
Primary Rail ROW	CSX S-line, New Location	
Proposed New Roadway Bridges/ Underpasses*	Tanner Town Road	Underpass
	Wilson Road	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	5.58 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	New Public Road	Bridge
	Tanner Town Road	Underpass
	Wilson Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section I



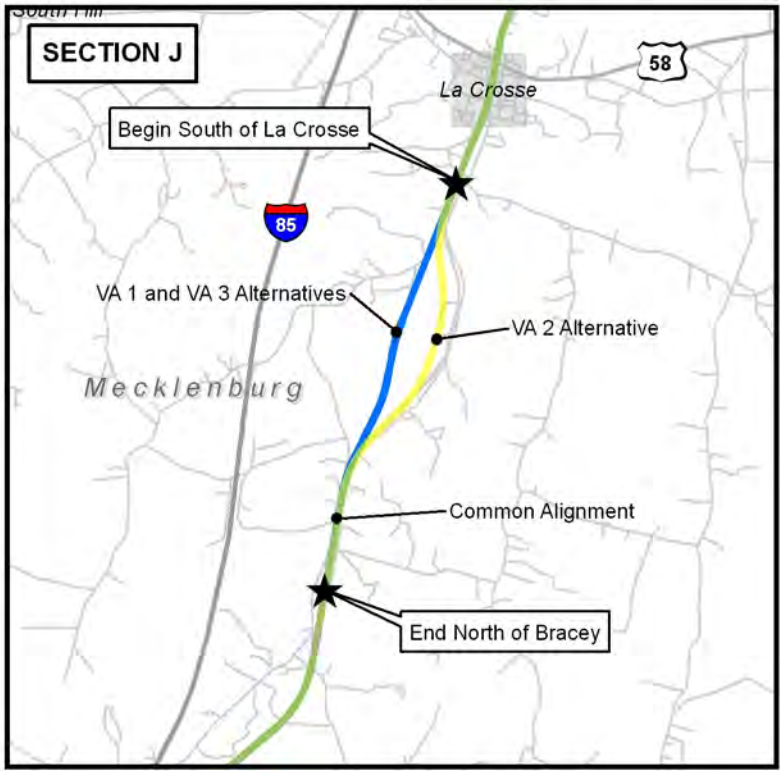
State	Virginia
Begins	North of Wray Road
	Railroad Milepost S-76
Ends	South of La Crosse
	Railroad Milepost S-80
Cities/Towns	La Crosse
Counties	Mecklenburg
Major Rivers	None
Appendix Q Detailed Map Sheets	080-083

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	3.77 miles	
Limiting Speed	110 mph	
Operability & Constructability	No significant difference between alternatives	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	New Public Road	Underpass
	Tobacco Heritage Trail (pedestrian)	Underpass
	Main Street	Underpass

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	3.77 miles	
Limiting Speed	110 mph	
Operability & Constructability	No significant difference between alternatives	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	New Public Road	Bridge
	Tobacco Heritage Trail (pedestrian)	Underpass
	Main Street	Underpass

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section J



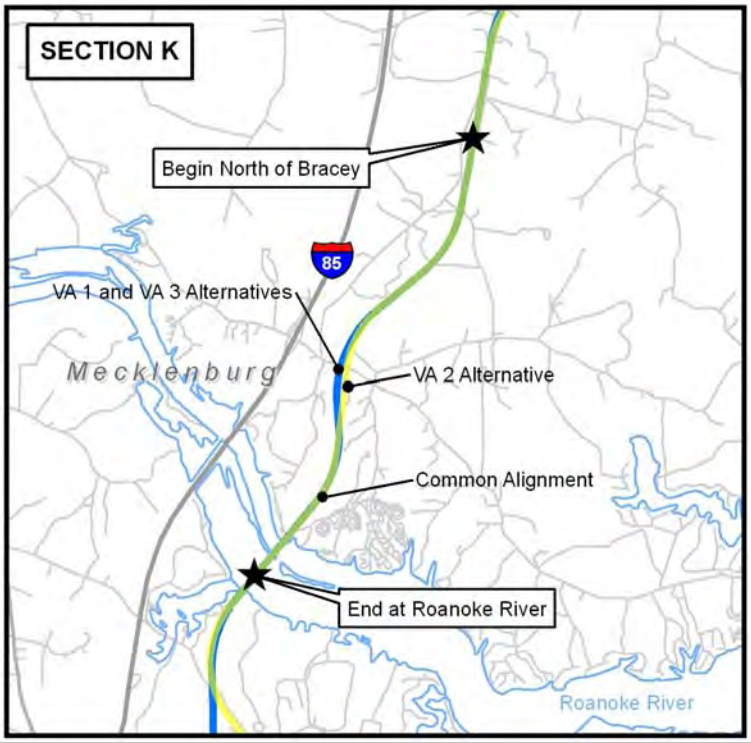
State	Virginia
Begins	South of La Crosse
	Railroad Milepost S-80
Ends	North of Bracey
	Railroad Milepost S-84
Cities/Towns	None
Counties	Mecklenburg
Major Rivers	None
Appendix Q Detailed Map Sheets	084-087

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	3.99 miles	
Limiting Speed	110 mph	
Operability & Constructability	Decreases curvature and curve maintenance; eliminates reverse curve; reduces rail wear, and wear on wheels and brakes	
Primary Rail ROW	CSX S-line, New location	
Proposed New Roadway Bridges/ Underpasses*	Belfield Road	Bridge
	Marengo Road	Bridge
	Gaulding Road	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	4.10 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line, New location	
Proposed New Roadway Bridges/ Underpasses*	Belfield Road	Bridge
	Marengo Road	Bridge
	Gaulding Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section K



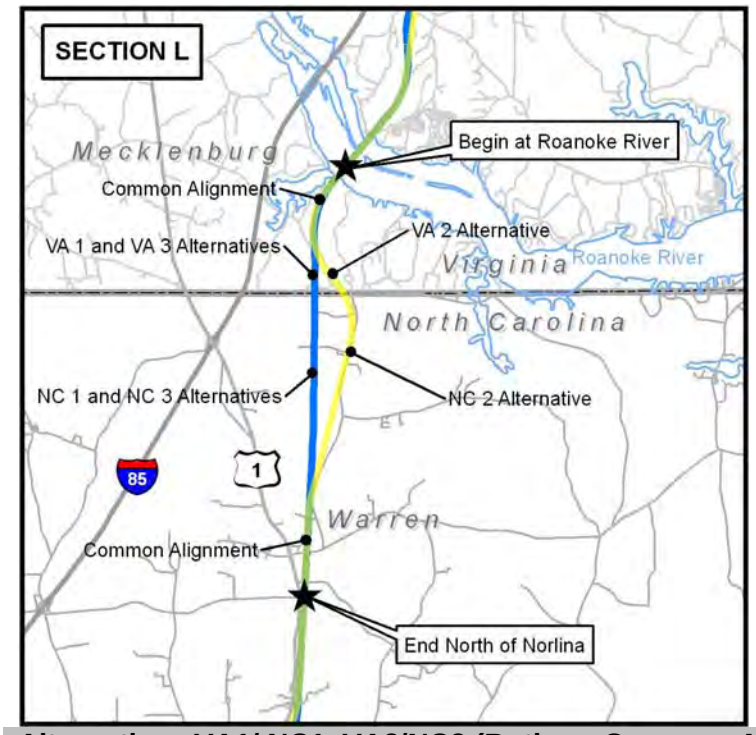
State	Virginia
Begins	North of Bracey
	Railroad Milepost S-84
Ends	Roanoke River
	Railroad Milepost S-89
Cities/Towns	None
Counties	Mecklenburg
Major Rivers	Roanoke
Appendix Q Detailed Map Sheets	087-091

Alternative VA1, VA3 (Both on Common Alignment; Shown in Blue When Varies from VA2; Shown in Green When Common with VA2)		
Design Objectives	Improves train performance by straightening curves	
Length	4.96 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Lake Gaston/Roanoke River (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	VA Highway 903	Bridge

Alternative VA2 (Shown in Yellow When Varies from VA1/3; Shown in Green When Common with VA1/3)	
Design Objectives	Improves train performance by straightening curves
Length	4.94 miles
Limiting Speed	100 mph
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 10 mph; increases rail wear, and wear on wheels and brakes; increases schedule time
Primary Rail ROW	CSX S-line
River and Major Creek Bridges	Lake Gaston/Roanoke River (single track bridge utilizing existing piers)
Proposed New Roadway Bridges/ Underpasses*	None

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section L



State	Virginia/ North Carolina
Begins	Roanoke River
	Railroad Milepost S-89
Ends	North of Norlina, NC
	Railroad Milepost S-95
Cities/Towns	None
Counties	Mecklenburg, VA Warren, NC
Major Rivers	Roanoke
Appendix Q Detailed Map Sheets	091-095

Alternatives VA1/ NC1, VA3/NC3 (Both on Common Alignment; Shown in Blue When Varies from VA2/NC2; Shown in Green When Common with VA2/NC2)

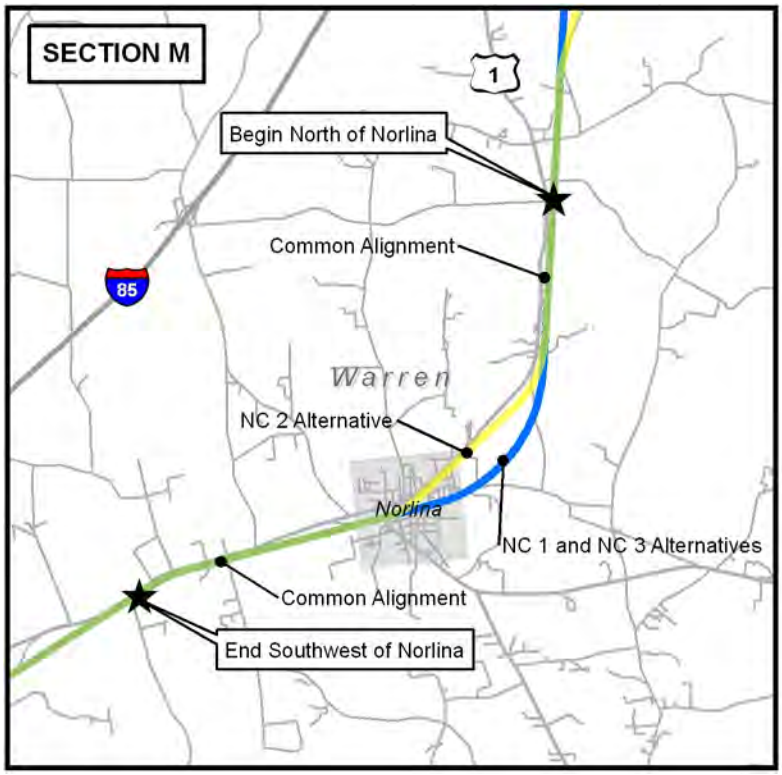
Design Objectives	Avoids Granite Hall historic property; improves train performance by straightening curve	
Length	5.75 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Paschall Road (VA)	Bridge
	Felts Road (NC)	Bridge
	Wise Five Forks Road (NC)	Bridge

Alternatives VA2/ NC2 (Shown in Yellow When Varies from VA/NC 1/3; Shown in Green When Common with VA/NC 1/3)

Design Objectives	Maximizes use of existing rail ROW	
Length	5.96 miles	
Limiting Speed	100 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 10 mph; increases rail wear, and wear on wheels and brakes; increases schedule time	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Paschall Road (VA)	Bridge
	Cole Farm Road (NC)	Bridge
	Wise Five Forks Road (NC)	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section M



State	North Carolina
Begins	North of Norlina
	Railroad Milepost S-95
Ends	Southwest of Norlina
	Railroad Milepost S-101
Cities/Towns	Norlina
Counties	Warren
Major Rivers	None
Appendix Q Detailed Map Sheets	96-102

Alternatives NC1, NC3 (Both on Common Alignment; Shown in Blue When Varies from NC2; Shown in Green When Common with NC2)		
Design Objectives	Improves train performance by straightening curves	
Length	6.14 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Warren Plains Road	Bridge
	Ridgeway Road	Bridge

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Maximizes use of existing rail ROW	
Length	5.97 miles	
Limiting Speed	80 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 30 mph; increases rail wear, and wear on wheels and brakes; increases schedule time; increases fuel use	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Warren Plains Road	Bridge
	Ridgeway Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section N

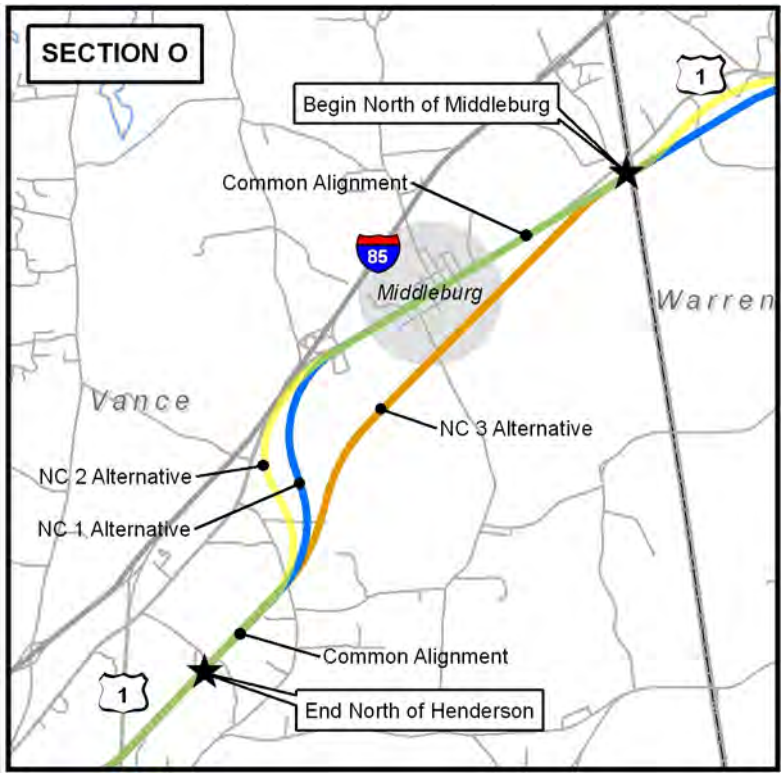
State	North Carolina
Begins	Southwest of Norlina
	Railroad Milepost S-101
Ends	North of Middleburg
	Railroad Milepost S-105
Cities/Towns	None
Counties	Warren Vance
Major Rivers	None
Appendix Q Detailed Map Sheets	103-106

Alternatives NC1, NC3 (Both on Common Alignment; Shown in Blue When Varies from NC2; Shown in Green When Common with NC2)		
Design Objectives	Improves train performance by straightening curves	
Length	3.71 miles	
Limiting Speed	110 mph	
Operability & Constructability	Decreases curvature and curve maintenance; decreases rail wear, and wear on wheels and brakes	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Soul City Boulevard	Bridge
	Kimball Road	Bridge

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	3.77 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Soul City Boulevard	Bridge
	Kimball Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section O



State	North Carolina
Begins	North of Middleburg
	Railroad Milepost S-105
Ends	North of Henderson
	Railroad Milepost S-110
Cities/Towns	Middleburg
Counties	Vance
Major Rivers	None
Appendix Q Detailed Map Sheets	107-111

Alternative NC1 (Shown in Blue When Varies from NC2/3; Shown in Green When Common with NC2/3)		
Design Objectives	Improves train performance by straightening curves	
Length	5.09 miles	
Limiting Speed	90 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 20 mph; increases rail wear, and wear on wheels and brakes; increases schedule time; increases fuel use; increases route approximately 0.4 miles	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Carol Street	Bridge
	New Public Road	Bridge
	Brookstone Road	Bridge
	Greystone Road	Bridge

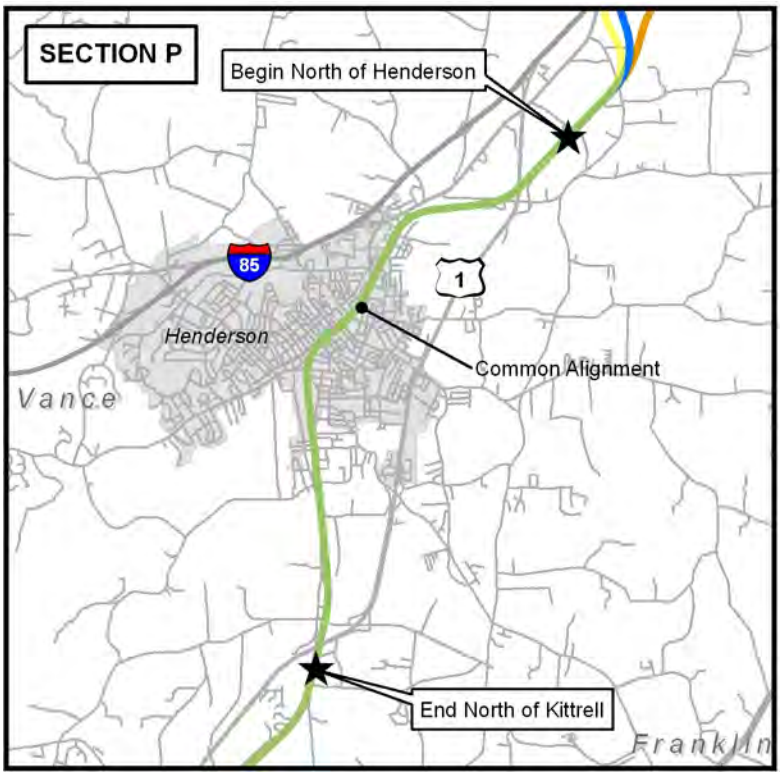
Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)	
Design Objectives	Improves train performance by straightening curves
Length	5.16 miles
Limiting Speed	80 mph
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 30 mph; increases rail wear, and wear on wheels and brakes; increases schedule time; increases fuel use; increases route approximately 0.5 miles

Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges /Underpasses*	Carol Street	Bridge
	Brookstone Road	Bridge
	Greystone Road	Bridge

Alternative NC3 (Shown in Orange When Varies from NC1/2; Shown in Green When Common with NC1/2)		
Design Objectives	Avoids Holloway Farm historic property	
Length	4.70 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Carol Street	Bridge
	Brookstone Road	Bridge
	Greystone Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section P

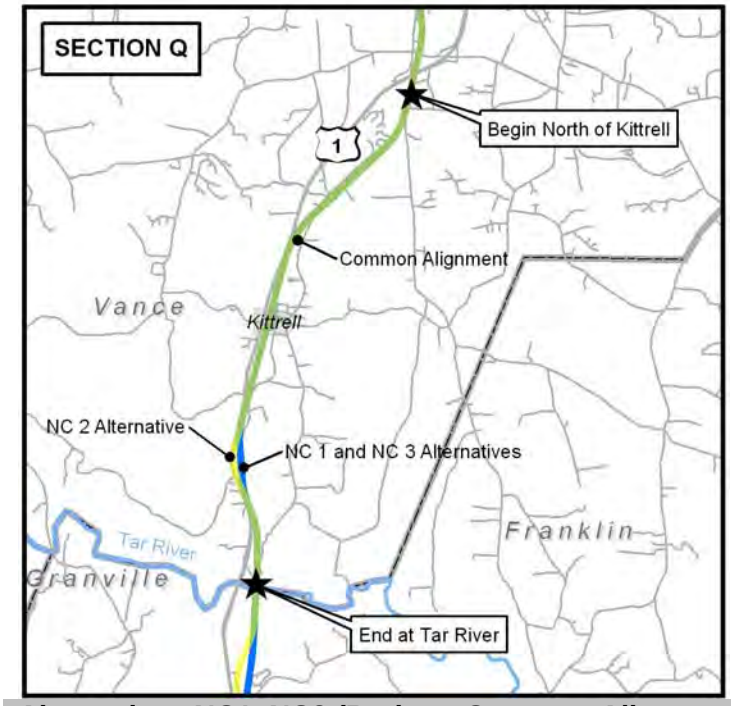


State	North Carolina
Begins	North of Henderson
	Railroad Milepost S-110
Ends	North of Kittrell
	Railroad Milepost S-118
Cities/Towns	Henderson
Counties	Vance
Major Rivers	None
Appendix Q Detailed Map Sheets	111-118

Alternatives NC1, NC2, NC3 (All on Common Alignment; Shown in Green)		
Design Objectives	Maximizes use of existing rail ROW	
Length	7.99 miles	
Limiting Speed	80 mph	
Operability & Constructability	No difference between alternatives	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	Main Street	Underpass
	Andrews Avenue	Bridge
	Peachtree Street Extension-Pedestrian Only	Underpass
	Alexander Avenue	Bridge
	JP Taylor Road	Bridge
	Bear Pond Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section Q



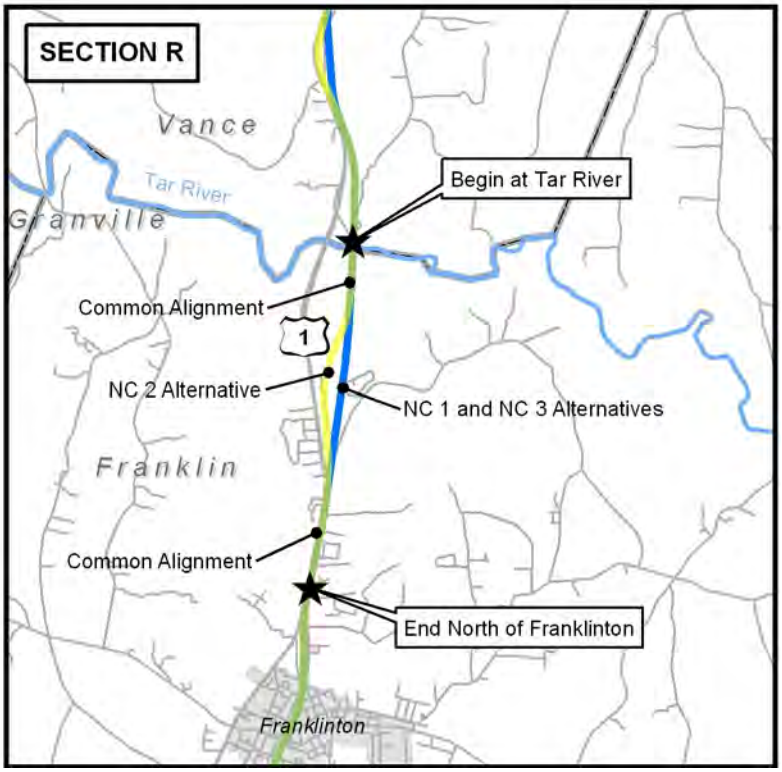
State	North Carolina
Begins	North of Kittrell
	Railroad Milepost S-118
Ends	Tar River
	Railroad Milepost S-125.75
Cities/Towns	Kittrell
Counties	Vance
Major Rivers	Tar
Appendix Q Detailed Map Sheets	118-124

Alternatives NC1, NC3 (Both on Common Alignment; Shown in Blue When Varies from NC2; Shown in Green When Common with NC2)		
Design Objectives	Improves train performance by straightening curves	
Length	7.70 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Tar River (existing single track bridge)	
Proposed New Roadway Bridges/ Underpasses*	Wildlife Lane	Underpass
	Edwards Road	Underpass
	Church Street	Bridge
	Oak Ridge Church Rd	Underpass

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Maximizes use of existing rail ROW	
Length	7.73 miles	
Limiting Speed	90 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 20 mph; increases rail wear, and wear on wheels and brakes; increases schedule time; increases fuel use	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Tar River (existing single track bridge)	
Proposed New Roadway Bridges/ Underpasses*	Wildlife Lane	Underpass
	Edwards Road	Underpass
	Church Street	Bridge
	New Public Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section R



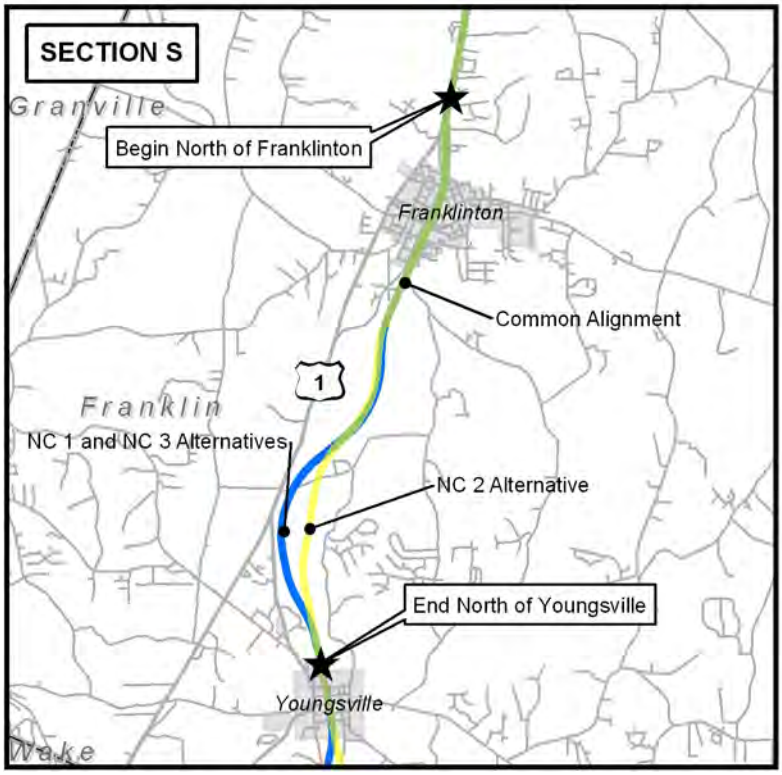
State	North Carolina
Begins	Tar River
	Railroad Milepost S-125.75
Ends	North of Franklinton
	Railroad Milepost S-129
Cities/Towns	None
Counties	Franklin
Major Rivers	Tar
Appendix Q Detailed Map Sheets	124-126

Alternatives NC1, NC3 (Both on Common Alignment; Shown in Blue When Varies from NC2; Shown in Green When Common with NC2)		
Design Objectives	Avoids Person-McGhee Farm historic property; improves train performance by straightening curves	
Length	3.21 miles	
Limiting Speed	110 mph	
Operability & Constructability	Decreases curvature and curve maintenance; decreases rail wear, and wear on wheels and brakes	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	New Eric Medlin Road	Bridge

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Maximizes use of existing rail ROW (does not affect Person-McGhee Farm historic property)	
Length	3.23 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	New Eric Medlin Road	Underpass

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section S



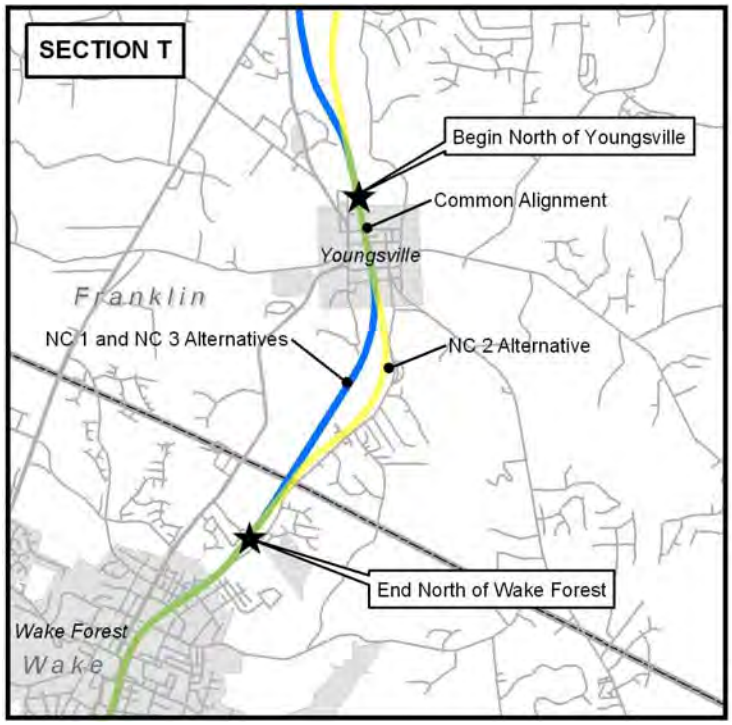
State	North Carolina
Begins	North of Franklinton
	Railroad Milepost S-129
Ends	North of Youngsville
	Railroad Milepost S-136
Cities/Towns	Franklinton
Counties	Franklin
Major Rivers	None
Appendix Q Detailed Map Sheets	126-132

Alternatives NC1, NC3 (Both on Common Alignment; Shown in Blue When Varies from NC2; Shown in Green When Common with NC2)		
Design Objectives	Improves train performance by straightening curves	
Length	6.88 miles	
Limiting Speed	95 mph	
Operability & Constructability	No significant difference between alternatives	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Cedar Creek (new single track bridge on new piers)	
Proposed New Roadway Bridges/ Underpasses*	New Public Road	Underpass
	Mason Street- Pedestrian Only	Bridge
	College Street- Pedestrian Only	Underpass
	Pedestrian Greenway	Underpass
	Cedar Creek Road	Bridge
	Bert Winston Road	Bridge
	NC 96 New Alignment	Bridge

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	6.71 miles	
Limiting Speed	95 mph	
Operability & Constructability	No significant difference between alternatives	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Cedar Creek (new single track bridge on new piers)	
Proposed New Roadway Bridges/ Underpasses*	New Public Road	Underpass
	Mason Street- Pedestrian Only	Bridge
	College Street- Pedestrian Only	Underpass
	Pedestrian Greenway	Underpass
	Cedar Creek Road	Bridge
	Bert Winston Road	Bridge
	NC 96 New Alignment	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section T

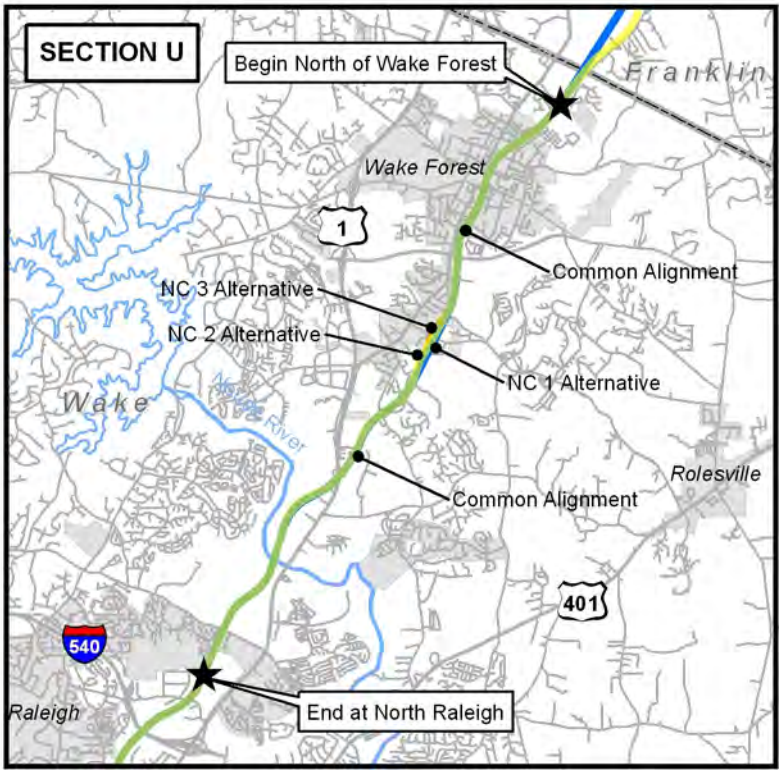


State	North Carolina
Begins	North of Youngsville
	Railroad Milepost S-136
Ends	North of Wake Forest
	Railroad Milepost S-139
Cities/Towns	Youngsville
Counties	Franklin Wake
Major Rivers	None
Appendix Q Detailed Map Sheets	132-134

Alternatives NC1, NC3 (Both on Common Alignment; Shown in Blue When Varies from NC2; Shown in Green When Common with NC2)		
Design Objectives	Improves train performance by straightening curves	
Length	2.83 miles	
Limiting Speed	110 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	W. Franklin Street Extension-Pedestrian Only	Bridge
	Main Street	Bridge
Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Improves train performance by straightening curves	
Length	2.96 miles	
Limiting Speed	95 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 15 mph; increases rail wear, and wear on wheels and brakes; increases fuel use	
Primary Rail ROW	CSX S-line	
Proposed New Roadway Bridges/ Underpasses*	W. Franklin Street Extension-Pedestrian Only	Bridge
	Main Street	Bridge
	New Public Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section U



State	North Carolina
Begins	North of Wake Forest
	Railroad Milepost S-139
Ends	North Raleigh
	Railroad Milepost S-148
Cities/Towns	Wake Forest Raleigh
Counties	Wake
Major Rivers	Neuse
Appendix Q Detailed Map Sheets	135-142

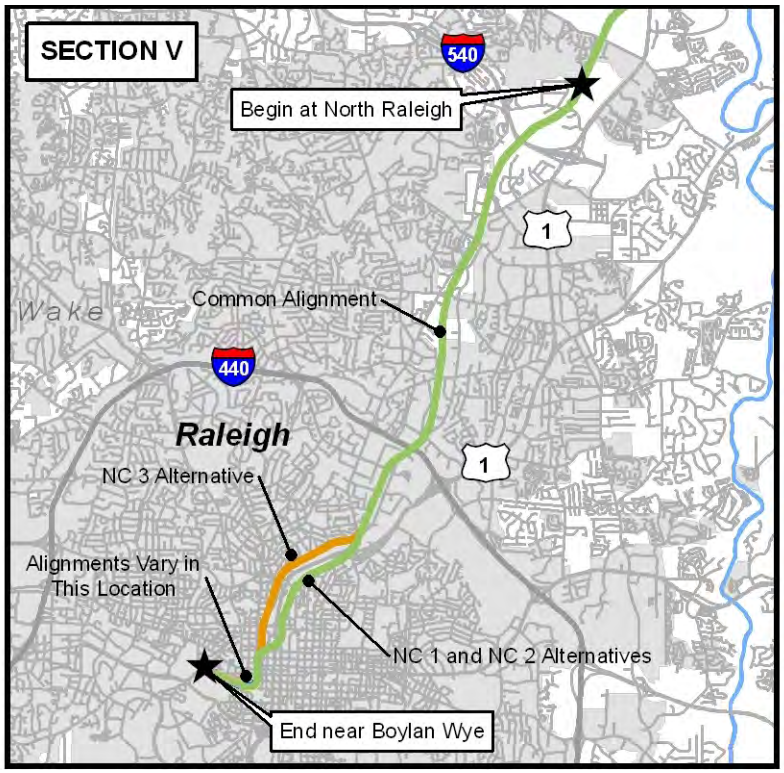
Alternative NC1 (Shown in Blue When Varies from NC2/3; Shown in Green When Common with NC2/3)		
Design Objectives	Minimizes impacts to (private) baseball fields in Wake Forest, but has impact to (private) school	
Length	8.88 miles	
Limiting Speed	85 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Neuse (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	Pedestrian Only near Cedar Avenue	Bridge
	Holding / Dunn Avenue	Underpass
	Rogers Road	Bridge
	Ligon Mill Road	Bridge
	Durant Road	Bridge

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Has less of an impact to the (private) school than NC1, but a greater impact on the (private) baseball fields	
Length	8.89 miles	
Limiting Speed	80 mph	
Operability & Constructability	Increases curvature and curve maintenance; reduces speed 5 mph; increases rail wear, and wear on wheels and brakes; increases schedule time	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Neuse (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	Pedestrian Only near Cedar Avenue	Bridge
	Holding / Dunn Avenue	Underpass
	Rogers Road	Bridge
	Ligon Mill Road	Bridge
	Durant Road	Bridge

Alternative NC3 (Shown in Orange When Varies from NC1/2; Shown in Green When Common with NC1/2)		
Design Objectives	Avoids impact to (private) school, but has greater impact to the (private) baseball fields than NC2	
Length	8.88 miles	
Limiting Speed	85 mph	
Operability & Constructability	Neutral	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Neuse (single track bridge utilizing existing piers)	
Proposed New Roadway Bridges/ Underpasses*	Pedestrian Only near Cedar Avenue	Bridge
	Holding / Dunn Avenue	Underpass
	Rogers Road	Bridge
	Ligon Mill Road	Bridge
	Durant Road	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

Section V



State	North Carolina
Begins	North Raleigh
	Railroad Milepost S-148
Ends	Boylan Wye
	Railroad Milepost S-157.5
Cities/Towns	Raleigh
Counties	Wake
Major Rivers	None
Appendix Q Detailed Map Sheets	142-151

Alternative NC1 (Shown in Blue When Varies from NC2/3; Shown in Green When Common with NC2/3)		
Design Objectives	Maximizes use of existing rail ROW- minor differences between NC1 and NC2 road and rail alignments near the Boylan Wye	
Length	9.89 miles	
Limiting Speed	45 mph	
Operability & Constructability	Creates permanent at-grade crossing conflict with freight operations at Edgeton (near Whitaker Mill Rd) and at Southern Junction (near Boylan); will not allow center platform option or good platform location at proposed Raleigh multimodal station; requires reconfiguration of CSX yard to provide additional track to west (to avoid conflicts with Triangle Transit track on the east)	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Crabtree Creek (new single track bridge adjacent to existing bridge)	
Proposed New Roadway Bridges/ Underpasses*	Gresham Lake Road	Bridge
	Millbrook Road	Underpass
	New Hope Church Rd	Bridge
	Whittaker Mill Road	Bridge
	Harrington Street- Pedestrian Only	Underpass
	Jones Street	Bridge
	Hargett Street	Bridge

Alternative NC2 (Shown in Yellow When Varies from NC1/3; Shown in Green When Common with NC1/3)		
Design Objectives	Maximizes use of existing rail ROW- minor differences between NC1 and NC2 road and rail alignments near the Boylan Wye	
Length	9.91 miles	
Operability & Constructability	Creates permanent at-grade crossing conflict with freight operations at Edgeton (near Whitaker Mill Rd) and at Southern Junction (near Boylan); will not allow center platform option or good platform location at proposed Raleigh multimodal station; requires reconfiguration of CSX yard to provide additional track to west (to avoid conflicts with Triangle Transit track on the east)	
Limiting Speed	45 mph	
Primary Rail ROW	CSX S-line	
River and Major Creek Bridges	Crabtree Creek (new single track bridge adjacent to existing bridge)	
Proposed New Roadway Bridges/ Underpasses*	Gresham Lake Road	Bridge
	Millbrook Road	Underpass
	New Hope Church Rd	Bridge
	Whittaker Mill Road	Bridge
	Harrington Street- Pedestrian Only	Underpass
	Jones Street	Bridge
	Hargett Street	Bridge

Alternative NC3 (Shown in Orange When Varies from NC1/2; Shown in Green When Common with NC1/2)		
Design Objectives	Respond to City of Raleigh request to minimize disruption of traffic and pedestrian patterns in the congested area around Jones Street and Glenwood South	
Length	9.97 miles	
Limiting Speed	45 mph	
Operability & Constructability	Removes freight conflict at Edgeton and Southern Junction by separating freight and passenger operations; allows center platform option for proposed Raleigh multimodal station	
Primary Rail ROW	CSX S-line NS-Line,	
River and Major Creek Bridges	Crabtree Creek (new single track bridge adjacent to existing bridge)	
Proposed New Roadway Bridges/ Underpasses*	Gresham Lake Road	Bridge
	Millbrook Road	Underpass
	New Hope Church Rd	Bridge
	Whittaker Mill Road	Bridge
	Old Wake Forest Road	Underpass
	Hargett Street	Bridge

* Does not include replacements/modifications of existing bridges or new bridges immediately adjacent to existing ones

2.2.2 Alternatives Considered, but Not Carried Forward

In addition to the alternatives described above, three other alternative alignments were considered but subsequently excluded (Figure 2-3).

2.2.2.1 Abandoned S-Line, from near Centralia to Lynch

In the Chester, VA, area, the abandoned portion of the Seaboard Air Line Railway S-line (S-line) from near Centralia (milepost S-12.3) through Lynch (milepost S-20) was considered as a possible alternative to the A-line (Figure 2-3) in the early feasibility studies for the overall corridor. This alternative alignment was rejected because the railroad ROW was no longer intact and extensive development had taken place within the old ROW, including the Chester Linear Park. In addition, there was strong opposition to this alignment from the Chesterfield County government. On October 21, 2001, the Chesterfield County Board of Commissioners passed a resolution in support of the SEHSR with a condition that the abandoned S-Line "not be used to provide service due to the impacts on adjoining neighborhoods, an existing park facility, and future highway construction." Therefore, based on relocation impacts, impacts to a public park, and lack of compatibility with county plans, the alternative was dropped from further consideration.

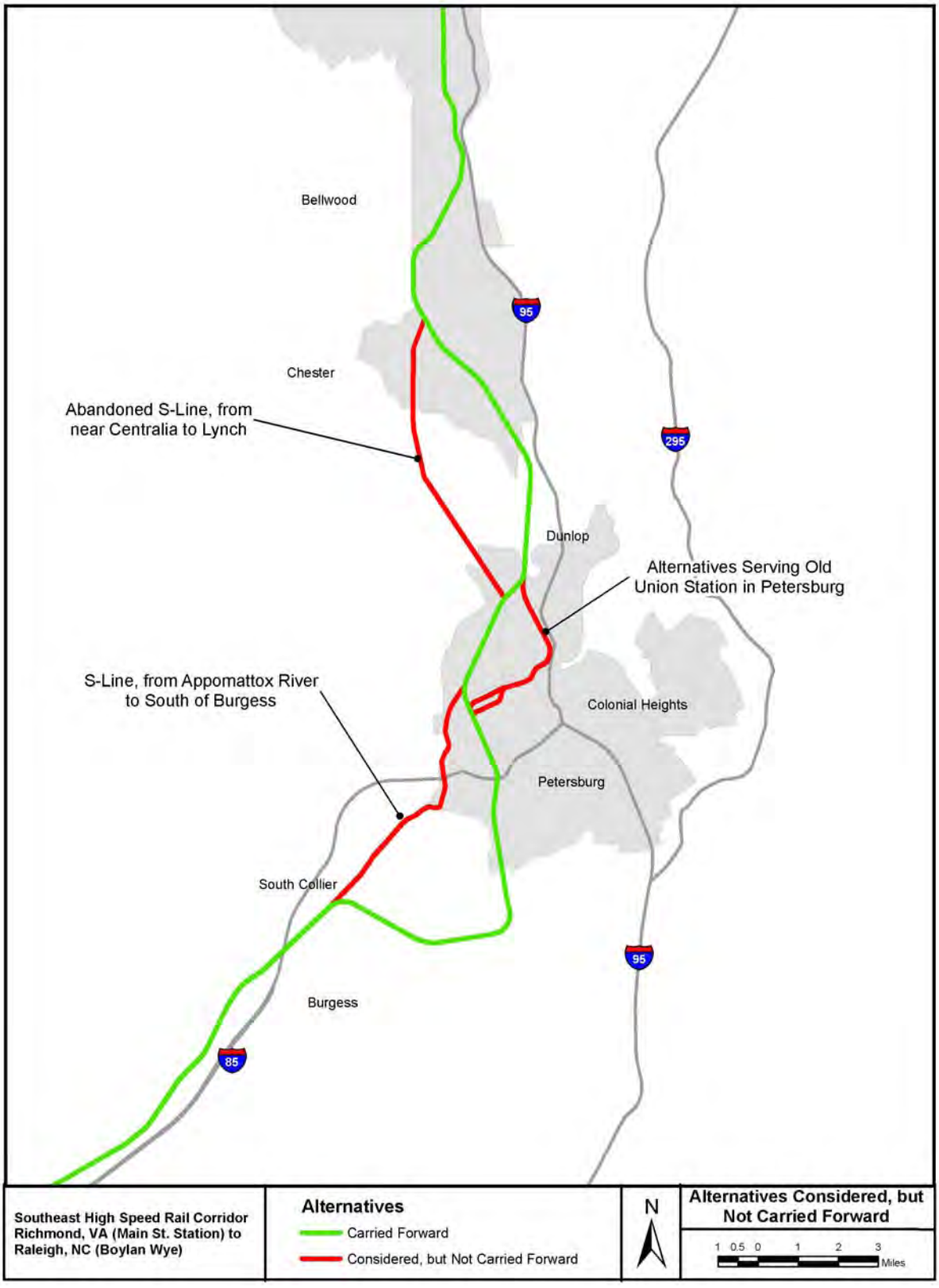
2.2.2.2 S-line, from Appomattox River to Burgess

In Petersburg, VA, the former S-line south of the Appomattox River (milepost S-24) to Burgess (milepost S-30) was considered as an alternative based on previous studies by both FRA and the states of Virginia and North Carolina (Figure 2-3). Early field work and public involvement revealed considerable issues with this alternative.

Use of the former S-Line would affect the operation of the Chaparral Steel processing plant in Dinwiddie County, VA. The facility includes a portion of the former S-Line ROW. It was developed in concert with Dinwiddie County and the Commonwealth of Virginia as an economic improvement effort. Chaparral Steel is the largest employer in Dinwiddie County with approximately 450 employees. The former S-line ROW is part of the infrastructure used for transportation of materials and products, and also serves as the sole vehicle entrance to the facility.

Just south of Chaparral Steel, the S-line alignment runs through the Petersburg Breakthrough Battlefield Historic District at Pamplin Historic Park, which is listed on the National Register of Historic Places (NRHP), and is both a Virginia Historic Landmark and a National Historic Landmark. Pamplin Historical Park and The National Museum of the Civil War Soldier, along with the Civil War Preservation Trust, own significant portions of this National Historic Landmark, including the former S-line ROW that passes through the park. The Pamplin Historical Park maintains a visitor center and museum on the location, and actively provides interpretation of the property via pedestrian trails. The Pamplin Historical Park is located on both sides of the former S-line ROW.

Figure 2-3


Bellwood
Chester
Abandoned S-Line, from near Centralia to Lynch
Dunlop
Alternatives Serving Old Union Station in Petersburg
S-Line, from Appomattox River to South of Burgess
Colonial Heights
Petersburg
South Collier
Burgess
95
295
85
Southeast High Speed Rail Corridor Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
Alternatives
Carried Forward
Considered, but Not Carried Forward
N
Alternatives Considered, but Not Carried Forward
1 0.5 0 1 2 3
Miles

The National Historic Landmark status is the nation's highest designation of historic significance, and thus has the highest level of protection. Section 110(f) of the National Historic Preservation Act requires that federal agencies, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking. National Historic Landmarks, along with other historic resources listed on or eligible for the NRHP, are also protected under Section 4(f) of the Department of Transportation Act of 1966, which states that such 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.

Establishing high speed rail service on the former S-line through the Petersburg Breakthrough Battlefield Historic District at Pamplin Historical Park would alter, both directly and indirectly, many of the characteristics that qualify the property for inclusion in the NRHP, and those alterations would diminish the integrity of the property's design, setting, and feeling. The alignment would bisect the land over which Wright's VI Corps launched its decisive attack on April 2, 1865. The railway would introduce new visual, atmospheric, and audible elements that would diminish the integrity of the battlefield's significant historic features. This conclusion was affirmed by the Virginia Department of Historic Resources in a letter dated March 20, 2007, which stated that the alternative would "most probably have an adverse effect on The Breakthrough Battlefield, a National Historic Landmark. The introduction of high speed railroad traffic …. will dramatically alter the resource's setting and character. Additionally, safety concerns resulting from the active rail line will preclude plans by the National Park Service and Pamplin Historic Park to jointly interpret their respective portions of the battlefield."

In a joint letter dated June 23, 2006, the National Park Service Petersburg National Battlefield, Pamplin Historical Park, Civil War Preservation Trust, Chaparral Steel, and Dinwiddie County, recommended that the SEHSR should not be built using the former S-Line ROW. The letter stated they anticipated "devastating impacts on historic resources," as well as economic, safety, cultural, and environmental repercussions. They argued that the presence of high speed rail would "grossly compromise the battlefield's historic integrity."

Based on the above information, the alternative using the former S-Line from south of Ettrick Station (milepost S-24) to Burgess (milepost S-30) was dropped from further consideration.

2.2.2.3 Alternatives Serving Old Union Station in Petersburg

Early planning efforts by FRA developed rail alignments that would serve old Union Station in downtown Petersburg, VA. The routing used the former CSX AAP-line (Appomattox Lead) from Dunlop through Colonial Heights, VA, into Petersburg, VA (Figure 2-3). Two versions of the concept were developed; both crossed the Appomattox River near old Union Station on the east side of Petersburg, then paralleled the Appomattox River to the west and rejoined the CSX A-line near Washington Street in Petersburg, VA. The alignments varied on the south side of the Appomattox River. One used the Norfolk Southern (NS) N-line ROW until curving south on a bridge to re-connect with the CSX A-line. The other followed the NS N-line ROW until reaching the inactive CSX S-line, where

it crossed over the NS N-line on a bridge to follow the CSX S-line right ROW (past old Commerce Street Station) and re-connect with the CSX A-line.

Design efforts, environmental evaluation, and public involvement identified the following issues associated with the alignments serving old Union Station:

2.2.2.3.1 *Conformity with Local Plans/Local Support*

Coordination with local officials from the cities of Colonial Heights and Petersburg, VA, indicated that the alternatives serving old Union Station would be in conflict with development plans in the region and face local opposition. The City of Colonial Heights opposed this route due to its impacts on existing residential and commercial development. Representatives from the City of Petersburg, while initially expressing interest in a route through downtown, also expressed concerns about the impacts of the project to historic resources and the existing road network, as well as the overall disruptiveness to the community.

2.2.2.3.2 *Cultural Resources*

The alternatives serving old Union Station would have adversely impacted several cultural resources protected under Section 4(f) of the Department of Transportation Act of 1966. These resources include the Battersea plantation, North Battersea/Pride's Field Historic District, and Petersburg Old Town Historic District.

2.2.2.3.3 *Residential and Business Relocations*

Due to the sale of the former CSX AAP-line ROW and subsequent redevelopment, there would have been a significant number of relocations along this route. The preliminary relocation estimate for the alternatives serving old Union Station indicated there would be between 103 and 123 residential and business relocations from just north of Dunlop to Washington Street in Petersburg, VA. In comparison, the VA1 project alternative would have 42 relocations in the same area.

2.2.2.3.4 *Travel Time*

The additional length of the route through downtown Petersburg (a distance of approximately one mile), combined with the reduced train speed due to the curves in this area, would increase travel time compared to the VA1 project alternative. The estimated two to four minute increase in travel time is anticipated to result in a decrease in ridership. The increase in travel time would result in reductions to trip diversions, air quality improvements, and energy efficiency, which does not meet the purpose and need for the project.

2.2.2.3.5 *Engineering Issues and Cost*

The alternatives serving old Union Station were also identified to have significant construction issues due to constraints through downtown Petersburg. These constraints include historic properties and districts, utilities (e.g., a substation), and the Appomattox River. As a result, the alternatives would require the use of retaining walls, additional service roads, and bridges, which add extra expense, ROW requirements, and

construction complexity. The preliminary engineering estimates for the alternatives serving old Union Station ranged from $92 million to $107 million for the section from just north of Dunlop to Washington Street in Petersburg, VA. In comparison, the VA1 project alternative was estimated to cost $53 million for this same section.

As a result of these issues, the alternatives serving old Union Station in Petersburg, VA, were excluded from further consideration. For more details on the evaluation and exclusion of this route, see Appendix G.

2.2.3 Patronage

In order to meet the purpose and need for the project, stops must be placed at reasonable intervals while still serving the population centers along the route. The SEHSR Tier I study outlined an operational model for proposed service consisting of four round trips per day between Washington, DC, and Charlotte, NC, and four additional round trips between Raleigh, NC, and Charlotte, NC. The service model established that the SEHSR would serve all locations where Amtrak currently provides service. Within the SEHSR Tier II corridor, Richmond, VA, Petersburg, VA, and Raleigh, NC, are currently served by Amtrak's conventional passenger trains. Because all proposed stops outside of the Tier II corridor currently have passenger rail service, there are no actions required outside this corridor that would impact the ability of the project to meet its purpose.

There is no existing passenger rail service within the study corridor between Petersburg, VA, and Raleigh, NC, a distance of approximately 138 miles. Due to this distance, consideration was given to an intermediate stop. A stop in Henderson, NC, was originally proposed as the only intermediate stop. However, the Tier I study revealed a strong interest in adding additional stops through the use of "skip stops." Skip stops ensure that all stops get a daily train, although every train does not stop at every station. Based on the interest in "skip stops" and because the project is a joint effort of the two states, it was determined that intermediate stops should be evaluated in south-side Virginia, and northern North Carolina.

Ridership and revenue forecasts from the Tier I study were updated to analyze four different future service options shown in Table 2-1. The scenarios are defined below:

- **SEHSR Baseline** is defined by the operating plan associated with the alternative selected in the SEHSR Tier I ROD. It includes a total of four scheduled train round trips between the Northeast Corridor (NEC) and North Carolina (Charlotte) using the restored S-line between Petersburg and Raleigh. The operating plan also includes four additional scheduled train round trips operating within North Carolina (between Raleigh and Charlotte). The plan assumes that two of the four round trips using the S-line would stop in Henderson, NC.

- **SEHSR w/ Norlina** includes the same number of scheduled round trips (and the same running times) as the SEHSR Baseline. However two of the four round trips using the S-line would stop in Norlina, NC, instead of Henderson, NC.

- **SEHSR w/ La Crosse** also includes the same number of scheduled round trips (and the same running times) as the SEHSR Baseline. However, one of the four round trips using the S-line would stop in La Crosse, VA, and another one would stop at Henderson, NC.

- **SEHSR w/ Alberta** also includes the same number of scheduled round trips (and the same running times) as the SEHSR Baseline. However, one of the four round trips using the S-line would stop in Alberta, VA, and another one would stop at Henderson, NC (AECOM Consult, 2004).

Table 2-1 summarizes the ridership and ticket revenue forecasts for the existing base year (2003) and each of the above future service options (2025). The table also summarizes forecasted passenger miles, average ticket revenue per passenger, average ticket yield per mile and the service provided in key SEHSR markets.

Table 2-1
Annual Passenger Forecasts for Southeast High Speed Rail Service Options Between Charlotte and New York (Prepared 7/05/04)

	Base	SEHSR Baseline	SEHSR w/ Norlina	SEHSR w/La Crosse	SEHSR w/ Alberta
Forecast Year	2003	2025	2025	2025	2025
Annual Ridership					
Southeast Trains (1)	250,600	1,159,100	1,155,400	1,154,300	1,154,400
Long Distance Trains (2)	127,200	114,700	114,700	114,800	114,800
TOTAL	377,800	1,273,800	1,270,100	1,269,100	1,269,200
CHANGE (relative to Baseline)			-3,700	-4,700	-4,600
Annual Ticket Revenue (FY2003$)					
Southeast Trains (1)	$13,520,000	$93,650,000	$93,630,000	$93,580,000	$93,580,000
Long Distance Trains (2)	$8,160,000	$9,910,000	$9,910,000	$9,930,000	$9,930,000
TOTAL	$21,680,000	$103,560,000	$103,540,000	$103,510,000	$103,510,000
CHANGE (relative to Baseline)			$20,000	$50,000	$50,000
Annual Passenger Miles					
Southeast Trains (1)	84,380,000	362,680,000	362,670,000	362,230,000	362,230,000
Long Distance Trains (2)	38,420,000	34,550,000	34,550,000	34,630,000	34,620,000
TOTAL	122,800,000	397,230,000	397,220,000	396,860,000	396,850,000
CHANGE (relative to Baseline)			-10,000	-370,000	-380,000
Average Ticket Revenue per Passenger					
Southeast Trains (1)	$53.95	$80.80	$81.04	$81.07	$81.06
Long Distance Trains (2)	$64.15	$86.40	$86.40	$86.50	$86.50
TOTAL	$57.38	$81.30	$81.52	$81.56	$81.56
Average Ticket Yield per Mile					
Southeast Trains (1)	$0.16	$0.26	$0.26	$0.26	$0.26
Long Distance Trains (2)	$0.21	$0.29	$0.29	$0.29	$0.29
TOTAL	$0.18	$0.26	$0.26	$0.26	$0.26
Service Summary					
- Number of Round Trips					
Charlotte-Raleigh	2	8	8	8	8
Charlotte-Richmond	1	4	4	4	4
Charlotte-Washington	2	5	5	5	5
Charlotte-New York	2	5	5	5	5

Table 2-1 Annual Passenger Forecasts for Southeast High Speed Rail Service Options Between Charlotte and New York (Prepared 7/05/04)					
	Base	**SEHSR Baseline**	**SEHSR w/ Norlina**	**SEHSR w/La Crosse**	**SEHSR w/ Alberta**
Raleigh-Richmond	2	5	5	5	5
Raleigh-Washington	2	5	5	5	5
Raleigh-New York	2	5	5	5	5
Henderson-New York	-	2	-	1	1
Norlina-New York	-	-	2	-	-
La Crosse-New York	-	-	-	1	-
Alberta-New York	-	-	-	-	1
- Average Travel Time					
Charlotte-Raleigh	3:37	2:17	2:17	2:17	2:17
Charlotte-Richmond	7:12	4:18	4:18	4:18	4:18
Charlotte-Washington	8:42	6:39	6:39	6:39	6:39
Charlotte-New York	12:58	9:57	9:57	9:57	9:57
Raleigh-Richmond	3:21	2:14	2:14	2:14	2:14
Raleigh-Washington	5:38	4:19	4:19	4:19	4:19
Raleigh-New York	10:18	7:47	7:47	7:47	7:47
NOTES:					
(1) includes the Carolinian, Piedmont, new SEHSR trains					
(2) parts of the Crescent, Silver Star, Silver Meteor, and Palmetto operating within SEHSR study corridor (Charlotte-Raleigh-New York)					

Source: AECOM Consult, Inc., 2004

As the table shows, the SEHSR Baseline option generates the highest ridership and forecast ticket revenue. However, the differences among the options are small because the four options all have the same service characteristics in the major markets served by SEHSR (e.g., travel between Charlotte, Raleigh, Richmond, Washington, and New York).

Travelers have different expectations depending on the trip length. For short trips, the location of station stops is very important. Travelers will generally not tolerate substantial time spent getting to or from stations if it is perceived to be simpler to drive all the way. However, passengers taking longer trips are generally willing to travel further to reach a station with better service.

Consequentially, many of the destinations associated with longer trips are not substantially impacted by the relatively small change in station location, particularly with respect to Henderson and Norlina, NC. The forecast projects that such passengers would choose to drive south to Raleigh or Durham, NC, or drive north to Petersburg, VA, to access SEHSR services if no local service is available. Although the ridership losses for Norlina, NC, and La Crosse/Alberta, VA, are of similar magnitude, the Norlina revenue losses are much smaller. This occurs because most of the Norlina ridership losses take place on relatively short trips with much lower ticket prices (AECOM Consult, 2004).

The four service options were also reviewed with regard to population accessibility. Table 2-2 displays population estimates for the four potential intermediate station locations. Although the ridership/revenue modeling showed comparable losses between the station choices, the accessible population was much larger for the La Crosse and Henderson

areas. Based on feedback from the public involvement process and on the size of the accessible population, the Virginia Department of Rail and Public Transportation (DRPT) and North Carolina Department of Transportation (NCDOT) recommend La Crosse, VA, and Henderson, NC, for the placement of the intermediate stops.

Table 2-2
County/Town Populations
of Potential Intermediate Station Locations

County/Town	Population (2000 Census)	Population (2006 estimate)
Brunswick County, VA	18,419	18,652
Alberta	314	302
Mecklenburg County, VA	32,380	32,845
La Crosse / South Hill	574 / 4,400	598 / 4,608
Warren County, NC	19,972	19,896
Norlina	1,092	1,086
Vance County, NC	42,954	43,590
Henderson	16,252	16,450

Source: (US Census Bureau, 2000; Weldon Cooper Center for Public Service, 2007; NC State Demographics, 2007)

2.2.4 Stations

The previous section described the operational model and revenue forecasting that were used to evaluate the five municipal locations for SEHSR stops in the Richmond, VA, to Raleigh, NC, SEHSR service area. The three municipalities with stations and existing Amtrak service are: Richmond, VA, Petersburg, VA, and Raleigh, NC. La Crosse, VA, and Henderson, NC, do not currently have passenger service or stations. The FRA also requested that alternative station sites be considered in Petersburg, VA, due to accessibility difficulties with the existing station at Ettrick.

This document does not evaluate environmental impacts related to specific station locations within those municipalities. Potential station locations are evaluated generally in terms of accessibility to the larger transportation network. Specific station locations will be determined in the future by the municipalities, and appropriate levels of environmental documentation will be undertaken at that time.

All proposed rail alternatives have been designed to accommodate operational requirements of 600 feet to 800 feet of straight alignment for station platforms at each stop location. The alternative rail designs also allow for flexibility in final station designs by ensuring the ability to meet Americans with Disabilities Act (ADA) standards for platform design at each stop location.

The public involvement process revealed a strong interest in conventional passenger rail service that would utilize the same equipment and speeds as high speed service, but would provide access opportunities to smaller towns along the route. This option will be given further consideration as the system develops based on user demand along the route.

2.2.4.1 Richmond, VA

Each high speed train will stop at Main Street Station in downtown Richmond, VA, the northern terminus for the project. Alternatives VA1 and VA2 are on common alignment in this location, as shown in Figure 2-4. Main Street Station was opened in 1901 and has remained one of Downtown Richmond's most visible landmarks. The station was closed in 1975 due to a decline in passenger rail service. The historic reopening of Main Street Station in 2003 marked the culmination of years of renovation to this 102-year-old landmark, and the return of passenger train service to downtown Richmond.

2.2.4.2 Petersburg, VA

Each high speed train will stop at a station in the vicinity of Petersburg, VA. All alternatives follow the CSX A-line on common alignment through the Petersburg area. The existing Amtrak station at Ettick is located along the rail alternatives, as well as three alternative station locations: Dunlop, Washington Street, and Collier. These locations are shown in Figure 2-5.

As discussed above, FRA has an historical interest in evaluating alternative station sites in Petersburg, VA. There is a desire to determine whether or not alternative sites could better serve the Petersburg, VA, area by offering greater accessibility. As discussed above, this document evaluates the potential station locations only from an access perspective. Future studies of this matter will address key issues such as parking, transit connections, and potential impacts to the surrounding area. An additional consideration for the future selection of a station site in Petersburg, VA, will be connectivity to the planned Richmond/Hampton Roads Passenger Rail Project (R2HR). The SEHSR alternatives do not limit connectivity to R2HR.

The potential Dunlop location (approximate milepost A-19.8) is located north of the Appomattox River near Ellersbie Avenue, and is located near Interstate 95. There is no existing station at this location.

The current Ettrick Station was erected in the 1950s to allow Atlantic Coast Line (ACL) Florida-bound trains to avoid downtown Petersburg streets as well as the steep grades on the north side of the Appomattox River. Following the 1967 merger between the ACL and the Seaboard Air Line (SAL), passenger trains of both railroads stopped at Ettrick's red brick depot, making it the primary rail station in the Petersburg, VA, area. Passenger use of the Ettrick station continued when Amtrak took over intercity passenger service in 1971. The station currently accommodates eight passenger trains daily – the northbound and southbound Carolinian, Silver Star, Silver Meteor, and Palmetto trains.

The potential Washington Street location is on the west side of Petersburg, VA, near the intersection of the CSX A-line, S-line, and the NS N-line. There is no current railroad station at this location.

The potential Collier location is just north of Collier Yard at the intersection of the CSX A-line and the NS N&W Beltway. Collier Yard is a rail switching yard owned and operated by CSX Transportation, which serves as an interchange between CSX and NS. There is no existing station in this area.

2.2.4.3 La Crosse, VA, and Henderson, NC

There has been strong public support for high speed rail stations in Southside Virginia and northern North Carolina. Evaluation and ridership-revenue modeling (see Section 2.2.3) support one daily train stop in each of these areas. Specific locations of stations in La Crosse, VA, and Henderson, NC, have not been determined. However, sites proposed by both towns were determined to have adequate spacing for platforms. All alternatives are on common alignment through these two locations. The local municipalities will develop plans for the stations and conduct the required environmental documentation for these stations.

2.2.4.4 Raleigh, NC

Each high speed train will stop in Raleigh, NC. The southern terminus for this project is the Boylan Wye, in downtown Raleigh, NC. Alternatives NC1, NC2, and NC3 are on different alignments approaching the terminus, but come together on common alignment along a straight section of the CSX S-line near Jones Street, approximately 3 blocks north of the Boylan Wye.

The Southern Railway Company built the current Amtrak station in 1950; it is located south of the Boylan Wye as shown in Figure 2-6. Southern Railway discontinued passenger service to their Raleigh station in 1964. Service resumed in 1984, when Amtrak moved from the old Raleigh Seaboard station. Amtrak has completed renovations to expand the waiting room and to add a First Class passenger lounge and long-term parking facility to the Raleigh station, one of the busiest in North Carolina and in the South. Unfortunately, the station's location is not desirable for the SEHSR routing because it would require a backing movement for both southbound and northbound trains.

The City of Raleigh, NC, previously recognized the need for a new station to accommodate the current passenger load and to prepare for expanded service in coming years. In 1995, a study was conducted to identify a suitable location for a new, larger, multi-modal center. The study recommended the purchase of property adjacent to the Boylan Wye, which would allow all existing and proposed intercity and commuter trains to use a single facility. More recent studies have determined that a new station could serve more than 500,000 passengers annually by 2015. Conceptual planning for a multi-modal center is still underway. Completion is expected after designs for the Triangle Transit regional rail system are finalized.

Figure 2-4

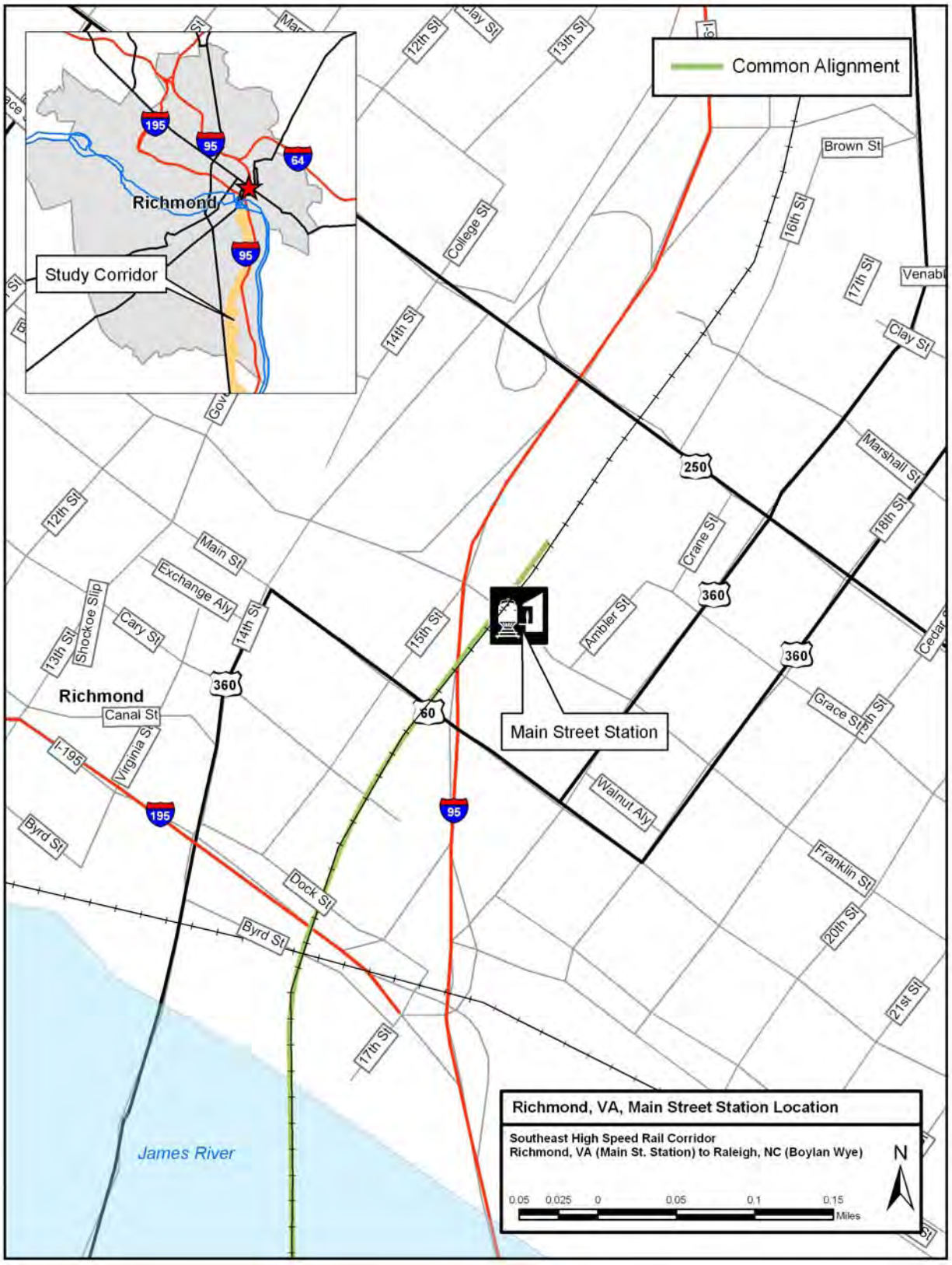

Common Alignment
Study Corridor
Richmond
Main Street Station
James River
Richmond, VA, Main Street Station Location
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
0.05 0.025 0 0.05 0.1 0.15
Miles
Brown St
College St
Clay St
Marshall St
Main St
Exchange Aly
Cary St
Shockoe Slip
Canal St
Virginia St
I-195
Byrd St
Dock St
Crane St
Ambler St
Walnut Aly
Grace St
Franklin St
12th St
13th St
14th St
15th St
16th St
17th St
18th St
20th St
21st St
250
360
60
95
195
64

Figure 2-5

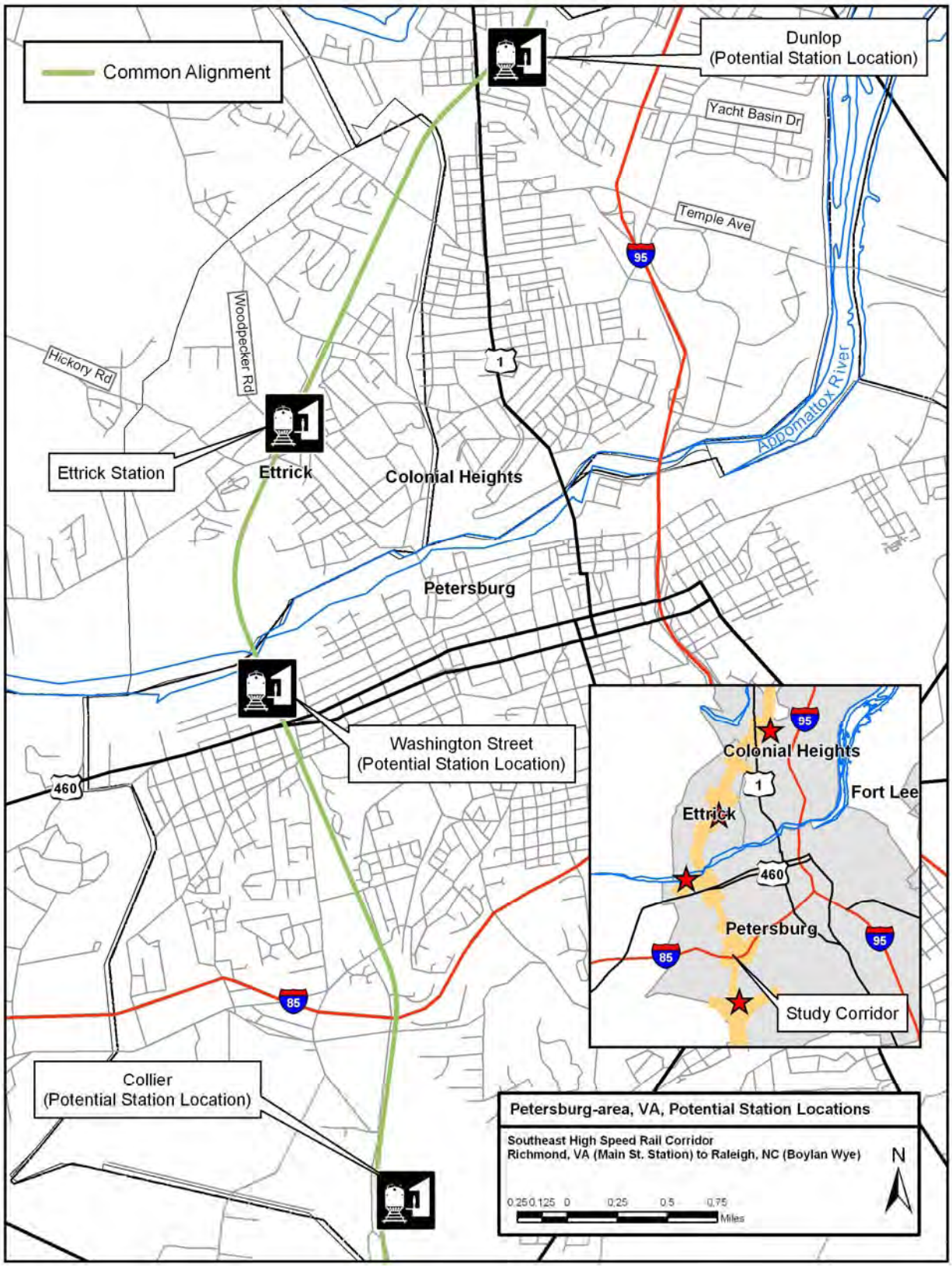
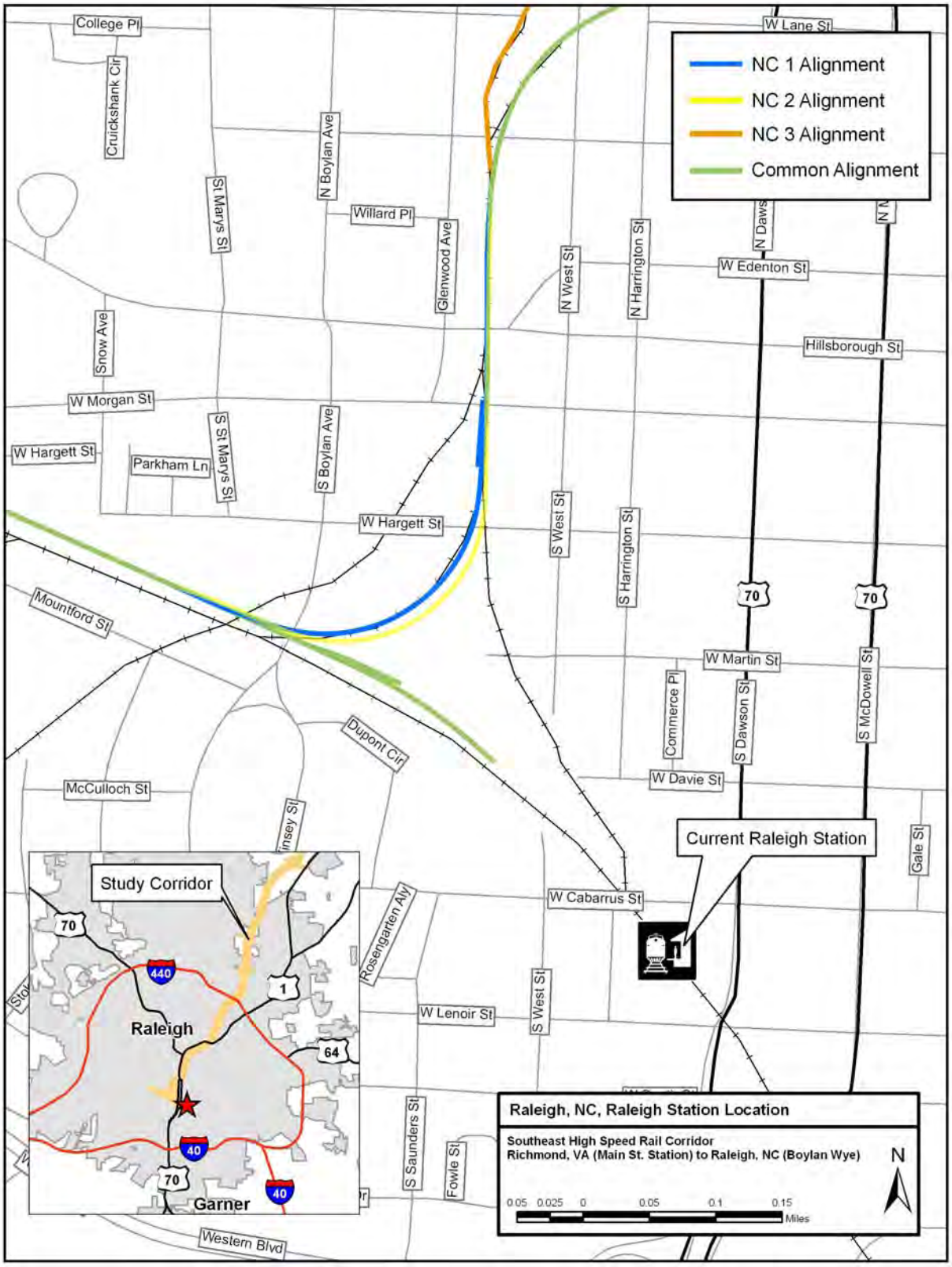

Common Alignment
Dunlop
(Potential Station Location)
Yacht Basin Dr
Temple Ave
95
Woodpecker Rd
Hickory Rd
1
Appomattox River
Ettrick Station
Ettrick
Colonial Heights
Petersburg
Washington Street
(Potential Station Location)
460
85
Collier
(Potential Station Location)
Colonial Heights
Fort Lee
Ettrick
Petersburg
Study Corridor
Petersburg-area, VA, Potential Station Locations
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
0.25 0.125 0 0.25 0.5 0.75
Miles

Figure 2-6


NC 1 Alignment
NC 2 Alignment
NC 3 Alignment
Common Alignment
College Pl
Cruickshank Cir
St Marys St
N Boylan Ave
Willard Pl
Glenwood Ave
N West St
N Harrington St
W Lane St
W Edenton St
Hillsborough St
Snow Ave
W Morgan St
W Hargett St
Parkham Ln
S St Marys St
S Boylan Ave
W Hargett St
S West St
S Harrington St
Mountford St
70
W Martin St
Commerce Pl
S Dawson St
S McDowell St
Dupont Cir
W Davie St
McCulloch St
Current Raleigh Station
Gale St
W Cabarrus St
Rosengarten Aly
W Lenoir St
S West St
S Saunders St
Fowle St
Western Blvd
Study Corridor
70
440
1
Raleigh
64
40
70
Garner
40
Raleigh, NC, Raleigh Station Location
Southeast High Speed Rail Corridor
Richmond, VA (Main St. Station) to Raleigh, NC (Boylan Wye)
N
0.05 0.025 0 0.05 0.1 0.15
Miles

2.2.5 Operations

As with patronage, operations in the SEHSR corridor must be consistent from Washington, DC, to Charlotte, NC. Therefore, the general service characteristics for service between Richmond, VA and Raleigh, NC are the same as those that were adopted in the SEHSR Tier I EIS.

In the Tier I EIS, the operational model assumed a MAS of 110 mph in the corridor, with a desired average speed of 85 to 87 mph. Based on this analysis, estimated end-to-end travel time for the SEHSR service from Washington, DC, to Charlotte, NC was six hours to seven and one-half hours depending on the design of the system. Proposed service will consist of eight round trips per day between Charlotte, NC, and Raleigh, NC, with four of these trips continuing on to Washington, DC, and beyond.

This service operation model is merely conceptual for the purposes of the Tier I and Tier II analyses and is common among all alternatives. As the SEHSR program moves forward, further operational modeling would be undertaken to determine actual schedules.

The modeling assumes that all existing Amtrak stations will receive one or more trains (skip-stop type scheduling). New stops are recommended for La Crosse, VA, and Henderson, NC. These stops would initially receive one round trip daily.

2.2.5.1 Operating Costs

Operations within the Richmond, VA, to Raleigh, NC portion of the SEHSR corridor must be considered as part of the overall SEHSR service. The operating expense projections for the Tier I EIS used cost factors developed in the Amtrak Intercity Business Unit State Pricing Model. The base year for all expenses was 1997, and they were inflated to 2000 dollars for the Tier I document using Amtrak inflation rates ranging from three to five percent annually.

Passengers, passenger miles, and ticket revenue were forecast by KPMG (now AECOM Consult, Inc.), using the Southeast Corridor Model, which also assumed constant 2000 dollars for two forecast years, 2015 and 2025.

The projected operating expense of service on the SEHSR Tier I preferred corridor between Washington, DC and Charlotte, NC was $81,722,000 in the year 2015 and $83,750,000 in the year 2025. It was projected to have a net operating income of $13,922,500 in the year 2015, and $ 21,649,000 in the year 2025 (NCDOT and VA DRPT, 2002).

Because operations will be relatively similar for all the alternatives in this Tier II study, it is assumed that the operating costs will be the same. Therefore, operating costs will not be a factor in the evaluation of alternatives in the Tier II EIS.

2.3 No Build Alternative

The No Build Alternative was evaluated in the Tier I EIS. This alternative consisted of the existing transportation network in the Southeast travel corridor. Included in this alternative were:

- Major highways that make up the roadway network
- Air travel
- Existing conventional passenger rail service (Amtrak)
- Intercity bus services
- Local public transit services
- Commuter rail services
- Freight railroad services

The No Build Alternative also included existing and committed highway, rail, and airport improvements.

The Tier I Record of Decision (ROD) rejected the No Build Alternative because it did not meet the purpose and need of the proposed action. It did not account for growth or alleviate congestion; it did not improve travel times, connectivity, energy efficiency, or air quality; and it did not improve safety within the preferred study corridor. The Tier I ROD found that under the No Build scenario, commuter and freight traffic would face increased delays; planned improvements to air facilities and major highways would not meet projected increases in demand; safety concerns would continue along areas of railway that lacked grade separations; and there would be an increase in congestion and air pollution concerns in the project study area.

It was concluded that the No Build Alternative did not meet the purpose and need of the project; therefore the No Build Alternative is not carried through in the Tier II EIS. However, "no-build" conditions are evaluated for comparison in numerous resource areas, such as air quality, noise, and traffic.

2.4 Multiuse Greenway Concept

In December 2006, Virginia's Department of Conservation and Recreation (DCR), and representatives of Dinwiddie, Brunswick, and Mecklenburg counties voiced their support for a multiuse Greenway Concept associated with the SEHSR corridor and its inclusion in the SEHSR Tier II DEIS. The North Carolina Department of Environment and Natural Resources (DENR) also voiced its support for an extension of the Greenway Concept south into North Carolina and terminating at the Neuse River, north of Raleigh, NC. The advantage of including the Greenway Concept in the SEHSR study is that the potential environmental impacts, both human and natural, that would result from the proposed greenway can be determined at an earlier stage in the process. This would allow the necessary environmental documentation for the greenway to be prepared so that local municipalities could pursue the construction of the greenway in their jurisdictions.

The exact location of the Greenway Concept will not be determined until the preferred alternative for the SEHSR project is selected because the impacts associated with the Greenway Concept would be too minor to have a bearing on the selection of a preferred alternative. The potential impacts associated with the Greenway Concept will be documented

in the Final Environmental Impact Statement (FEIS) for the SEHSR. A separate decision document (e.g., Finding of No Significant Impact) will be prepared for the Greenway Concept. If construction of the greenway is undertaken by local municipalities, guidance from the US Department of Transportation will be used and FRA will be consulted.

For purposes of impact evaluation, the greenway is proposed to have a 30 foot trail "footprint" on a 60 foot ROW. The greenway ROW will be adjacent to but separate from the rail ROW. The 60 feet should provide enough room for the greenway cut/fill slopes not to interfere with the proposed SEHSR construction limits as well as allow for necessary design adjustments for the greenway. The trail itself will be approximately 10 feet wide. Problem areas will be identified where additional ROW may be needed (contained within the current SEHSR study corridor), and impacts will be calculated for those areas. It is anticipated that in municipal areas, trail traffic would be redirected to existing city street ROW and sidewalks or other trail networks as determined by each municipality. In addition, the trail will utilize portions of the existing inactive rail ROW not needed for the new rail service.

The Greenway Concept design will conform to the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004) and the AASHTO Guide for the Development of Bicycle Facilities (1999), as well as the NCDOT adopted "Design Guidelines for Bicycle Facilities," where possible and practicable.

The SEHSR Greenway Concept has potential to be an important feature of the state-wide trail networks that are being developed by the states of Virginia and North Carolina in conjunction with local governments. Additionally, the SEHSR Greenway Concept may be incorporated into the East Coast Greenway (ECG), an urban version of the Appalachian Trail for walkers, cyclists, and other non-motorized trail users. Founded in 1991, the East Coast Greenway Alliance is a non-profit organization aimed at connecting cities and towns along the East Coast with a continuous, 3,000 mile long, traffic-free path from Maine to Florida (Figure 2-7). The ECG is a combination of paved greenways, crushed gravel paths, urban streets, and rural bike routes. Approximately 21 percent of the ECG was been completed as of December 2008. As stated on the Alliance's website, the "Alliance will not own or directly manage any portion of this trail. Rather, it will be owned and managed by municipal, county and state agencies. The Alliance works to ensure continuity and a consistent quality of route" (ECG Alliance, 2008).

The route and ownership of the ECG is determined by each state, municipality, locality, and community through which it passes. Therefore, each section of trail is independently managed and representative of the needs of its respective region.

Figure 2-7


East Coast Greenway®
A Trail Connecting Cities
Maine to Florida
Proposed Route Corridor
Rev. March 2008
CANADA
MAINE
VT
NH
MA
CT
RI
NEW YORK
MICHIGAN
PENNSYLVANIA
NJ
MD
DE
OHIO
INDIANA
WEST VIRGINIA
VIRGINIA
KENTUCKY
NORTH CAROLINA
TENNESSEE
SOUTH CAROLINA
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
East Coast
Greenway
Legend
Spine Route
Alternate Route
State Capital
Major City
Calais, ME to Key West, FL = 3000 miles
Fuss & O'Neill Inc. Consulting Engineers