CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.0 Introduction

The purpose of this chapter is to describe the existing environmental conditions in the areas that would be affected by the proposed passenger rail project alternatives; evaluate potential environmental impacts associated with constructing and operating the alternatives; and present potential program-level mitigation strategies to avoid or reduce those impacts. At the end of each section, there are also recommended next steps to be considered as the project advances into more detailed analysis of the selected alternative.

This Tier I Draft EIS concentrates primarily on the issues related to intercity passenger and freight rail operations between Richmond and Newport News and between Petersburg and Norfolk. The environmental impacts associated with route alternatives between Richmond and Petersburg are being studied by the SEHSR. Detailed analysis of this segment is contained in the SEHSR Tier I Documents and the Tier II document under development.[20]

The SEHSR Tier II EIS, under development, will identify specific actions needed to fully implement high speed rail in the corridor, including the identification of specific alignments, station locations, and number of train stops, detailed environmental and engineering analyses and more accurate capital cost estimates. During the Tier II process, planning will be done to avoid, minimize and mitigate environmental impacts. This EIS provides generalized cost estimates for the Richmond - Petersburg section for comparative evaluation of alternatives.

3.1 Travel Demand

This section describes passenger rail demand projections for the Richmond/Hampton Roads study area. It includes an analysis of passenger ridership forecasts and impacts on travel times.

Passenger rail travel demand is the primary measurement of transportation benefits for this project. Ridership travel demand measures the potential attractiveness of a new passenger rail service investment for the traveling public. Several measures of ridership were examined to determine the impacts associated with the build alternatives. These measures include average annual passenger rail trips for each Build alternative and the change in ridership when compared to the Status Quo and No Action Alternatives.

3.1.1 Methodology

Travel demand analysis was initially performed for the project and reported in the Travel Demand Methodology and Results Report in April 2005, and updated in March 2008 (http://www.rich2hrrail.info/pages/mp_reports.html). The travel demand model applied in this analysis was developed from extensive market research and observed travel volumes and service characteristics by travel mode that were conducted and assembled in study area markets in the southeast and other regions[21]. For application in this study area, data describing travel within the Richmond/Hampton Roads region was used, including existing travel trips by mode and purpose, and population/employment market growth.

The travel demand forecasting approach utilized a two-stage model system. The first stage forecasted the growth in the total number of travel trips in each market, and the second stage predicted the market share of

[20] SEHSR Tier I documents and current information about the Tier II documents can be found at www.sehsr.org.

[21] Phase II – New Orleans to Mobile Corridor Development Plan, Ridership and Revenue Forecasts prepared for Southern Rapid Rail Transit Commission (January 2005); Pacific Northwest Rail Corridor, Ridership and Revenue Forecasts in Support of the Amtrak Cascades Plan for Washington State 2003-2023 Update (July 2003); Southeast High-Speed Rail (SEHSR) and other corridor studies for adjacent states in the Southeast (1997-2008); California intercity passenger rail forecasting in the Pacific *Surfliner*, *Capitol*, and *San Joaquin* corridors for Amtrak and California (1996-2008).

each available travel mode in each market. Both stages were dependent on the service characteristics of each travel mode and the characteristics of the study area population. Additional details regarding the travel demand modeling analysis methodology may be found in Appendix G of this Tier I Draft EIS. A brief description of the required model inputs is provided below.

Key travel demand model data sources include the three Metropolitan Planning Organizations (MPOs) in the study area:

- Hampton Roads Planning District Commission (HRPDC);
- Richmond Regional Planning District Commission (RRPDC); and
- Crater Planning District Commission (CPDC).

Current (2007) travel volumes across all travel modes within the study area were estimated from the following sources:

- Origin-destination license plate survey conducted at two locations in the Richmond/Hampton Roads region in September 2004.
- Origin-destination data compiled as part of a 1994 survey for the Chesapeake Bay Bridge-Tunnel (CBBT) Study.
- Origin-destination data collected in 1995 in conjunction with data from the Southeast High-Speed Rail Study.
- Actual air travel and Amtrak ridership data.

Socio-economic data and forecasts provided by local and state sources within the Richmond/Hampton Roads study area and supplemented by the national vendor Moody's Economy.com were applied to the current travel volume estimates to project estimated future automobile, air, and rail (No-Build) travel trips.

Current and future highway characteristics were provided by the local MPOs in the Richmond/Hampton Roads study area, supplemented by a national data source to account for the remaining highway network in the travel demand study area. Published Amtrak timetables (2007) provided the basis for quantifying the travel time and frequency of intercity passenger rail service in each market. Average rail fares were computed by dividing actual Amtrak revenue by ridership and airfares. According to Amtrak, current (2007) on-time performance of trains serving the Richmond/Hampton Roads study area is approximately 72 percent. Current market-based air travel data, including travel times and fares, were provided by an outside vendor, BACK Associates.

3.1.2 Regulatory Requirements

The FRA's Procedures for Considering Environmental Impacts (64 Fed. Reg. 28545 (May 26, 1999)), under the topic of transportation states, "The EIS should assess the impacts on both passenger and freight transportation, by all modes, from local, regional, national and international perspectives. The EIS should include a discussion of both construction period and long-term impacts on vehicular traffic congestion."

3.1.3 Affected Environment

The Richmond/Hampton Roads study area stretches approximately 120 miles from Virginia Beach and southeastern Hampton Roads to the western suburbs of Richmond. I-64 connects the Peninsula/CSXT route from end-to-end and Route 460 connects the Southside/NS route from end-to-end. The mouth of the James River presents a natural barrier in the study area, separating the Peninsula from the Southside. Two crossings, the Hampton Roads Bridge-Tunnel and the Monitor-Merrimac Bridge-Tunnel, provide automobile access from the Southside to the Peninsula.

The travel demand study area includes the portion of I-95 in the Northeast Corridor stretching from Petersburg to Boston, MA; including Washington, DC; Baltimore, MD; Philadelphia, PA; and New York, NY. The study area also includes the portion of the I-85 Corridor consistent with the proposed SEHSR project,

stretching between Petersburg and Charlotte, NC; including Raleigh, NC; Durham, NC; Greensboro, NC; and Winston-Salem, NC.

Amtrak intercity passenger rail service, Greyhound intercity bus service, and direct airline service operate in the study area. Currently Amtrak provides two daily round-trip trains between Newport News and Richmond, with through service to the Northeast Corridor. Amtrak also provides service between Newport News and the Southeast through connections in Richmond.

Greyhound provides six direct daily round-trips between Norfolk and Richmond, but provides limited direct intercity bus service to destinations outside the Richmond/Hampton Roads region. Greyhound provides one direct daily round-trip between Norfolk and Washington, DC, three direct daily round-trips between Norfolk and New York, NY, and no direct daily round-trips between Norfolk and Charlotte, NC.

Though there is no direct air travel service between the three major airports within the study area, (Norfolk International, Newport News-Williamsburg International, and Richmond International), the airports provide direct daily service to all of the major cities in the northeast and southeast.

3.1.4 Environmental Consequences

This section provides an overview of the potential effects of travel demand, followed by a discussion of each of the proposed alternatives. If any alternative is selected and advanced, future travel conditions would be analyzed in more detail and additional ridership forecasts will be prepared as part of the Tier II EIS.

3.1.4.1 Range of Passenger Rail Ridership Forecasts

As described above, the analysis and prediction of future intercity passenger rail travel demand began with quantifying existing travel by mode, geography, and trip purpose. The analysis included an examination of existing automobile, air, rail and intercity bus trips to and from the Hampton Roads region. Total intercity travel trips in 2025, the forecast year, were estimated to be approximately 28 million annual trips in both directions. The 28 million annual trips refer to total annual 2025 intercity travel trips between Hampton Roads and Richmond and between Hampton Roads and other communities along the Northeast Corridor and the proposed SEHSR system from New York to Charlotte, NC. This estimate is based on projected population and employment growth in the study area, and the future highway network as described by the MPOs in the study area. This estimate represents an increase over current conditions, and does not include the impact of proposed improvements to passenger rail service in the corridor.

Table 3-1 summarizes the estimated range of probable 2025 ridership to/from Hampton Roads for the proposed alternatives. All of the ridership results are shown in total and relative to the Status Quo and No Action Alternatives that provide conventional (79 mph maximum) speed service along the existing Amtrak Peninsula/CSXT route.

Table 3-1: Estimated Range of Probable Passenger Rail Ridership (2025)

	Status Quo 79 mph	No Action 79 mph	Alternative 1		Alternative 2a		Alternative 2b	
			90 mph	110 mph	90 mph	110 mph	90 mph	110 mph
Peninsula/CSXT high	262,300	464,800	223,400	222,300	914,600	968,400	1,101,100	1,147,000
Peninsula/CSXT low	245,500	425,700	212,500	211,200	732,200	768,000	897,800	937,000
Southside/NS high	0	0	886,700	939,900	209,700	193,000	0	0
Southside/NS low	0	0	727,100	773,000	192,500	187,000	0	0
Total High	262,300	464,800	1,110,100	1,162,200	1,124,300	1,161,400	1,101,100	1,147,000
Total Low	245,500	425,700	939,600	984,200	924,700	955,000	897,800	937,000
Difference from 79 mph Status Quo Alternative								
High		202,500	847,800	899,900	862,000	899,100	838,800	884,700
Low		180,200	694,100	738,700	679,200	709,500	652,300	691,500
Difference from 79 mph No Action Alternative								
High			645,300	697,400	659,500	696,600	636,300	682,200
Low			513,900	558,500	499,000	529,300	472,100	511,300

Source: Travel Demand Methodology and Results, revised March 2008.

The forecast passenger rail ridership results for 2025 reflect changes in service frequencies; improved connections; population and employment growth over the planning time horizon; improved on-time performance; and highly competitive rail travel times when compared to highway travel times. The significant increase in ridership forecast for the No Action Alternative when compared to the Status Quo Alternative reflects the addition of one daily round-trip train between Richmond and Newport News. SEHSR trains would serve the Richmond Main Street Station, providing faster, more frequent service to Washington DC. The link to the Northeast Corridor at Richmond would ultimately enable connection via Amtrak to major markets in the Northeast and Southeast, such as New York, Boston, Raleigh and Charlotte.

These ridership and revenue results are presented as a range to highlight the sensitivity to key assumptions in the ridership forecasting model: 1) the on-time performance of the proposed service and 2) the future highway speeds outside the Richmond/Hampton Roads study area. The forecasts at the lower end of the range assume:

- The on-time performance (OTP) of the proposed service will not improve from the existing 72 percent in the study area today, and
- The highway speeds outside the Richmond/Hampton Roads corridor will not change in the future.

The forecasts at the higher end of the range assume:

- The future on-time performance of the proposed service will be 90 percent, and
- The future highway travel times outside the Richmond/Hampton Roads study area will increase in a similar magnitude as the increase in future highway travel times within the Richmond/Hampton Roads study area as shown by the MPO models.

A detailed explanation of the assumptions used in the travel demand model is contained in the Travel Demand Methodology and Results Report (April, 2005, revised March 2008).

3.1.4.2 Impact on Travel Times

The impact on travel times between origins and destinations in the Richmond/Hampton Roads study area was evaluated using several representative trips from within the study area to Charlotte, New York, Richmond and Washington, DC. The selected origins include terminal stations on each route in the study area. The terminal stations on the Peninsula/CSXT route include either the existing Newport News Amtrak Station in Alternative 1 or the proposed Downtown Newport News Station in Alternatives 2a or 2b. The terminal station on the Southside/NS route is Downtown Norfolk.

Table 3-2 presents a summary comparison of the travel times, frequency and designed on-time performance (OTP) for each of the representative rail trips under each proposed alternative and changes from the Status Quo and No Action alternatives for the 90 mph option. All of the travel times represent total travel time, including transfer-related wait time (for trips to Charlotte, NC) and in vehicle (on-mode) travel time. The travel times and frequencies are based on existing and proposed schedules. Table 3-3 presents a summary comparison of the travel times for each of the representative rail trips under each proposed alternative and changes from the Status Quo and No Action Alternatives for the 110 mph option.

Future improved passenger rail services between Richmond and Hampton Roads along the two routes would benefit from new capital investment in the railroads to improve speed, capacity, and OTP. OTP of approximately 90 percent is expected for any new service associated with this project. The proposed capital improvements have been designed to support this specific OTP goal.

Table 3-2: Summary of Station-to-Station Round Trips for Alternatives (90 mph)

		79 mph Status Quo				79 mph No Action				Southside NS Alternative 1				Peninsula CSXT Alternative 2a				Peninsula CSXT Alternative 2b			
Station 1	**Station 2**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**
Newport News - Existing Amtrak Station	Richmond - Main Street	2	1:25	79	72%	3	1:11	79	72%	3	1:11	79	72%								
	Washington, DC	2	4:13	79	72%	3	3:32	79	72%	3	3:32	79	72%								
	New York, NY	2	8:38	79	72%	3	7:03	79	72%	3	7:03	79	72%								
	Charlotte, NC [3]	1	11:07	79	72%	2	8:41	79	72%	2	8:41	79	72%								
Newport News - Downtown Station	Richmond - Main Street													6	1:03	90	90%	9	1:03	90	90%
	Washington, DC													5.5[4]	3:03	90	90%	8.5[4]	3:10	90	90%
	New York, NY													5.5[4]	5:59	90	90%	8.5[4]	6:19	90	90%
	Charlotte, NC [3]													4	7:11	90	90%	4	6:58	90	90%
Norfolk	Richmond - Main Street									6	1:35	90	90%	3	1:38	79	90%				
	Washington, DC									5.5[4]	3:35	90	90%	3	4:00	79	90%				
	New York, NY									5.5[4]	6:31	90	90%	3	7:31	79	90%				
	Charlotte, NC [3]									3	6:37	90	90%	2	8:19	79	90%				

[1] MAS - Maximum Authorized Speed
[2] OTP - On Time Performance
[3] Trips to Charlotte are via connection in Richmond or Petersburg. Riders from Newport News to Charlotte always transfer in Richmond. Riders from Norfolk to Charlotte transfer in Petersburg in Alternatives 1 and 2a.
[4] Statistical calculation produced an additional half trip. Operating plan provided an extra frequency in one direction.
There is not a feasible transfer to Charlotte for every Hampton Roads-Richmond train; therefore there are fewer frequencies to Charlotte than other cities.
Notes:
-In the low-end ridership forecasts, OTP for all alternatives is assumed to be 72%.
-In Alternatives 1 and 2a Newport News and Norfolk are served by two separate rail routes.
-Blank cells indicate no service between the station pairs for the specific alternative.
Source: Travel Demand Methodology and Results, revised March 2008.

Table 3-3: Summary of Station-to-Station Round Trips for Alternatives (110 mph)

		79 mph Status Quo				79 mph No Action				Southside/NS Alternative 1				Peninsula/CSXT Alternative 2a				Peninsula/CSXT Alternative 2b			
Station 1	**Station 2**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**	**Daily Round Trips**	**Travel Time**	**MAS[1] (mph)**	**OTP[2]**
Newport News-Existing Amtrak Station	Richmond - Main Street	2	1:25	79	72%	3	1:11	79	72%	3	1:11	79	72%								
	Washington, DC	2	4:13	79	72%	3	3:32	79	72%	3	3:32	79	72%								
	New York, NY	2	8:38	79	72%	3	7:03	79	72%	3	7:03	79	72%								
	Charlotte, NC [3]	1	11:07	79	72%	2	8:41	79	72%	2	8:41	79	72%								
Newport News - Downtown Station	Richmond - Main Street													6	0:57	110	90%	9	0:57	110	90%
	Washington, DC													5.5[4]	2:57	110	90%	8.5[4]	3:04	110	90%
	New York, NY													5.5[4]	5:53	110	90%	8.5[4]	6:13	110	90%
	Charlotte, NC [3]													4	7:05	110	90%	4	6:52	110	90%
Norfolk	Richmond - Main Street									6	1:27	110	90%	3	1:38	79	90%				
	Washington, DC									5.5[4]	3:27	110	90%	3	4:00	79	90%				
	New York, NY									5.5[4]	6:23	110	90%	3	7:31	79	90%				
	Charlotte, NC [3]									3	6:29	110	90%	2	8:19	79	90%				

[1] MAS - Maximum Authorized Speed
[2] OTP - On Time Performance
[3] Trips to Charlotte are via connection in Richmond or Petersburg. Riders from Newport News to Charlotte always transfer in Richmond. Riders from Norfolk to Charlotte transfer in Petersburg in Alternatives 1 and 2a.
[4] Operating plan provided an extra frequency in one direction. Statistical calculation produced an additional half trip.
There is not a feasible transfer to Charlotte for every Hampton Roads-Richmond train; therefore there are fewer frequencies to Charlotte than other cities.

Notes:
-In the low-end ridership forecasts, OTP for all alternatives is assumed to be 72%.
-In Alternatives 1 and 2a Newport News and Norfolk are served by two separate rail routes.
-Blank cells indicate no service between the station pairs for the specific alternative.

Source: Travel Demand Methodology and Results, revised March 2008.

Travel times were also estimated for representative automobile trips utilizing the 2025 highway network forecast. Table 3-4 summarizes the travel times for automobile trips originating in either downtown Norfolk or downtown Newport News and terminating in New York, Richmond or Washington, DC.

Table 3-4: Summary of Highway Travel Time for Automobile Trips (2025)

Origin	Destination	Miles	Travel Time	Average Speed
Newport News	Richmond	83	2:02	41 mph
	Washington, DC	188	4:35	41 mph
	New York, NY	370	8:54	42 mph
Norfolk	Richmond	100	2:28	40 mph
	Washington, DC	204	5:01	41 mph
	New York, NY	359	8:43	41 mph

Source: Travel Demand Methodology and Results, March 2008.

Tables 3-5 and 3-6 summarize the total travel time required for highway and passenger rail trips in certain markets among all of the alternatives. Table 3-5 provides the total travel times for the 90 mph alternatives, and Table 3-6 provides the travel times associated with the 110 mph alternatives. The total travel time includes two major components: rail travel time and access/terminal time. The rail travel time includes the time spent on the train, while the access/terminal time includes the automobile access time at both ends of the trip and the time spent at the rail station. In each market, the table provides the rail travel time, the access/egress time, the total time, and the rail station used on the Hampton Roads end of the trip. For comparison, the estimated 2025 highway travel time is provided for each market.

The Build alternatives save travelers time compared with highway travel in all cases, with time savings increasing as the trip length increases. For example, in Alternative 2b (90 mph) rail provides a 30-minute overall faster trip than automobile between Hampton and Richmond, but rail provides a two-and-a-half-hour time savings between Hampton and New York.

Though the total rail travel time is less than highway time in all the markets and alternatives, the attractiveness of rail is less in the shorter distance markets. In the shorter distance markets, the access/terminal time is a larger component of the total travel time than in the longer trips. Based on experience gained through traveler behavior research and intercity passenger rail studies for Amtrak and many states, travelers are much more sensitive to access/terminal time than to rail travel time, and are more likely to choose the automobile over rail in cases where a higher portion of the rail trip time is composed of access/terminal time.

Compared to the longer distance markets between Hampton Roads and the Northeast Corridor, the expected rail market share is lower in the Richmond/Hampton Roads study area. In shorter distance markets (50-100 miles), intercity rail service is much less competitive with the door-to-door automobile travel time. The following discussion summarizes the findings for each of the alternatives evaluated.

The option that includes an increase in speed from 90 mph to 110 mph does not improve travel time savings significantly due to factors such as speed-restricted zones[22] encountered along the routes and the fact that the amount of speed increase over the distance being analyzed results in a smaller ratio of time savings as compared to the time savings that could be achieved by other alternatives. This effect is illustrated in Tables 3-5 and 3-6, which indicate that more significant travel time savings could be achieved with improvements at 79 and 90 mph. In this analysis, the estimated potential travel time savings at 90 mph would have a significant positive effect on the competitive position of the Hampton Roads region within the broader statewide and national economy.

[22] Speed restricted zones are areas where operating speeds are reduced.

Table 3-5: Summary of Total Travel Time for Alternatives (90 mph)

Summary of Total Travel Time - 90 mph Alternatives (Year 2025)								
Origin	**Destination**		**Highway**	**79 mph Status Quo**	**79 mph No Action**	**Alternative 1**	**Alternative 2a**	**Alternative 2b**
Norfolk	Richmond	Rail Travel Time		1:25	1:11	1:35	1:38	1:03
		Access/Terminal Time		1:20	1:20	0:41	0:41	1:13
		Total Time	2:38	2:45	2:31	2:16	2:19	2:16
		HR Station		NPN	NPN	NFK	NFK	NND
	Washington, DC	Rail Travel Time		4:13	3:32	3:35	4:00	3:10
		Access/Terminal Time		1:24	1:24	0:45	0:45	1:17
		Total Time	5:10	5:37	4:56	4:20	4:45	4:27
		HR Station		NPN	NPN	NFK	NFK	NND
	New York, NY	Rail Travel Time		8:38	7:03	6:31	7:31	6:19
		Access/Terminal Time		1:26	1:26	0:47	0:47	1:19
		Total Time	8:38	10:04	8:29	7:18	8:18	7:38
		HR Station		NPN	NPN	NFK	NFK	NND
Hampton	Richmond	Rail Travel Time		1:25	1:11	1:11	1:03	1:03
		Access/Terminal Time		0:34	0:34	0:34	0:28	0:28
		Total Time	2:00	1:59	1:45	1:45	1:31	1:31
		HR Station		NPN	NPN	NPN	NND	NND
	Washington, DC	Rail Travel Time		4:13	3:32	3:32	3:03	3:10
		Access/Terminal Time		0:38	0:38	0:38	0:32	0:32
		Total Time	4:33	4:51	4:10	4:10	3:35	3:42
		HR Station		NPN	NPN	NPN	NND	NND
	New York, NY	Rail Travel Time		8:38	7:03	7:03	5:59	6:19
		Access/Terminal Time		0:40	0:40	0:40	0:34	0:34
		Total Time	9:00	9:18	7:43	7:43	6:33	6:53
		HR Station		NPN	NPN	NPN	NND	NND

Rail Station Codes:
NPN - Existing Newport News Amtrak Station
NND - Proposed Downtown Newport News Station
NFK - Proposed Downtown Norfolk Station

Table 3-6: Summary of Total Travel Time for Alternatives (110 mph)

Summary of Total Travel Time - 110 mph Alternatives (Year 2025)								
Origin	**Destination**		**Highway**	**79 mph Status Quo**	**79 mph No Action**	**Alternative 1**	**Alternative 2a**	**Alternative 2b**
Norfolk	Richmond	Rail Travel Time		1:25	1:11	1:27	1:38	0:57
		Access/Terminal Time		1:20	1:20	0:41	0:41	1:13
		Total Time	2:38	2:45	2:31	2:08	2:19	2:10
		HR Station		NPN	NPN	NFK	NFK	NND
	Washington, DC	Rail Travel Time		4:13	3:32	3:27	4:00	3:04
		Access/Terminal Time		1:24	1:24	0:45	0:45	1:17
		Total Time	5:10	5:37	4:56	4:12	4:45	4:21
		HR Station		NPN	NPN	NFK	NFK	NND
	New York, NY	Rail Travel Time		8:38	7:03	6:23	7:31	6:13
		Access/Terminal Time		1:26	1:26	0:47	0:47	1:19
		Total Time	8:38	10:04	8:29	7:10	8:18	7:32
		HR Station		NPN	NPN	NFK	NFK	NND
Hampton	Richmond	Rail Travel Time		1:25	1:11	1:11	0:57	0:57
		Access/Terminal Time		0:34	0:34	0:34	0:28	0:28
		Total Time	2:00	1:59	1:45	1:45	1:25	1:25
		HR Station		NPN	NPN	NPN	NND	NND
	Washington, DC	Rail Travel Time		4:13	3:32	3:32	2:57	3:04
		Access/Terminal Time		0:38	0:38	0:38	0:32	0:32
		Total Time	4:33	4:51	4:10	4:10	3:29	3:36
		HR Station		NPN	NPN	NPN	NND	NND
	New York, NY	Rail Travel Time		8:38	7:03	7:03	5:53	6:13
		Access/Terminal Time		0:40	0:40	0:40	0:34	0:34
		Total Time	9:00	9:18	7:43	7:43	6:27	6:47
		HR Station		NPN	NPN	NPN	NND	NND

Rail Station Codes:
NPN - Existing Newport News Amtrak Station
NND - Proposed Downtown Newport News Station
NFK - Proposed Downtown Norfolk Station

With the programmed track and other capacity improvements in the Richmond/Hampton Roads study area, service reliability and on-time performance should approach the 90 percent level, a significant improvement over the existing 72 percent level in the study area.

3.1.4.3 Status Quo Alternative

The Status Quo Alternative assumes that the existing passenger rail service remains at two daily round-trip trains operating at conventional speeds along the Peninsula/CSXT route. Annual projected ridership for 2025 for the Status Quo Alternative is expected to increase by approximately 100,000 from 2007 levels to between 245,500 to 262,300 riders. Table 3-1 summarizes 2025 ridership estimates. 2007 ridership data is provided in Appendix G. The 2025 OTP is expected to remain at 72 percent. See Tables 3-5 and 3-6 for projected OTP.

Future highway travel times between Richmond and Hampton Roads and the Northeast Corridor are predicted to increase, which enhance the attractiveness of rail, increases the overall rail mode share, and decrease the attractiveness of highway travel. Coupled with the uncertainty of automobile fuel costs in the future (though not taken into account in the modeling process), rail travel in this study area could be a very competitive choice.

3.1.4.4 No Action Alternative

Annual projected ridership for 2025 for the No Action Alternative is expected to range from 425,700 to 464,800 riders (see Table 3-1 for range of ridership). This represents a significant increase compared to estimated Status Quo ridership. OTP is expected to remain at 72 percent. As stated for the Status Quo Alternative, highway travel times between Richmond, Hampton Roads and the Northeast Corridor are expected to increase. This makes rail a competitive choice within this area. See Tables 3-5 and 3-6 for projected OTP.

3.1.4.5 Alternative 1 Peninsula Conventional/Southside Higher Speed

Annual projected ridership for 2025 for Alternative 1 is expected to range from 939,600 to 1,162,200 riders. (This range incorporates the low end annual ridership for trains operating at 90 mph and the high end of trains operating at 110 mph as shown in Table 3-1).

OTP was evaluated for conventional speeds for the Peninsula/CSXT route and for both the 90 mph and 110 mph scenarios for the Southside/NS route. The projected results are presented below:

Scenario	Peninsula/CSXT Route	Southside/NS Route
▪ Conventional Speed (79 mph)	72%	--
▪ 90 mph	--	90%
▪ 110 mph	--	90%

As stated for the Status Quo Alternative, highway travel times between Richmond, Hampton Roads and the Northeast Corridor are expected to increase. This makes rail a competitive choice within this area.

3.1.4.6 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a assumes six daily round-trip trains operating at higher speeds along the Peninsula/CSXT route and three daily round-trip trains operating at conventional speeds along the Southside/NS route. Annual projected ridership for 2025 for Alternative 2a is expected to range from 924,700 to 1,161,400 riders. (This range incorporates the low end annual ridership for trains operating at 90 mph and the high end of trains operating at 110 mph as shown in Table 3-1).

As stated for the Status Quo Alternative, highway travel times between Richmond, Hampton Roads and the Northeast Corridor are expected to increase. This makes rail a competitive choice within this area.

OTP was evaluated for both the 90 mph and 110 mph scenarios for the Peninsula/CSXT route and conventional speeds for the Southside/NS route. The projected results are presented below:

Scenario	Peninsula/CSXT Route	Southside/NS Route
▪ Conventional Speed (79 mph)	--	90%
▪ 90 mph	90%	--
▪ 110 mph	90%	--

3.1.4.7 Alternative 2b Peninsula/CSXT Higher Speed Only

Alternative 2b assumes nine daily round-trip trains operating at higher speeds along the Peninsula/CSXT route only; no passenger rail service would be provided along the Southside/NS route. Annual projected ridership for 2025 for Alternative 2b is expected to range from 897,800 to 1,147,000 riders. (This range incorporates the low end annual ridership for trains operating at 90 mph and the high end of trains operating at 110 mph as shown in Table 3-1).

OTP was evaluated for both the 90 mph and 110 mph scenarios for the Peninsula/CSXT route only. The projected results are presented below:

Scenario	Peninsula/CSXT Route	Southside/NS Route
▪ Conventional Speed (79 mph)	--	--
▪ 90 mph	90%	--
▪ 110 mph	90%	--

For both operational speeds, OTP is projected to be 90 percent. See Tables 3-2 and 3-3 for projected OTP. As stated for the Status Quo Alternative, highway travel times between Richmond, Hampton Roads and the Northeast Corridor are expected to increase. This makes rail a competitive choice within this area.

3.1.4.8 Impacts on Competing Modes

Table 3-7 below demonstrates the impacts of the proposed rail alternatives across all modes of transportation. The table represents the incremental travel trips across all modes compared to the Status Quo alternative, based on the 90 mph/high end forecasts. With the increased rail service provided in Alternatives 1, 2a, and 2b, both total automobile and air travel trips decrease. Most of the new rail travel trips are diverted from automobile, with approximately 400,000 automobile trips diverted to rail (Note: since average automobile occupancy is above 1, the actual automobiles removed from roads are fewer than the automobile trips presented).

As shown in Table 3-7, the total incremental rail trips are higher than the trips diverted from automobile. The difference represents new (or induced) trips resulting from the new passenger rail service provided. In the three Build alternatives, the induced rail trips represent over 300,000 of the incremental rail trips.

Table 3-7: Summary of Incremental Travel Trips Across All Modes

2025 Travel Trip Increment Compared to Status Quo (90 mph/High End Forecasts)			
	Auto	**Air**	**Rail**
Status Quo Alternative	0	0	0
No Action Alternative	-104,000	-24,000	202,500
Alternative 1	-393,000	-135,000	847,800
Alternative 2a	-410,000	-125,000	862,000
Alternative 2b	-393,000	-124,000	838,800

3.1.5 Potential Mitigation Strategies

Section 3.1 analyzes the project in the context of the existing travel conditions to determine how the benefit of improved rail service would affect existing travel conditions. Hence, no potential mitigation strategies are proposed. Once a preferred alternative is selected, more detailed analysis of ridership in the context of existing and future travel conditions would be conducted and included in the Tier II documentation.

3.1.6 Subsequent Analysis

Upon the selection of a preferred alternative, more detailed analyses could be performed in order to address details not considered in this Tier I Draft EIS. The most important task related to travel demand would be the development of an optimized rail timetable for the preferred alternative. The analysis would be an iterative process which would address the optimal frequency and time of day requirements by market, while also considering the cost required to provide the service. The analysis would have implications on the project's ridership, capital costs and operating costs. The timetable optimization process should be coordinated with the latest SEHSR plans, Richmond-Washington rail plans, and other rail corridor initiatives within Virginia.

Additionally, depending on the amount of time that passes between the completion of this Tier I Draft EIS and additional analyses, updated travel market data, demographic data and forecasts should be included in the travel demand model. The update should include the latest MPO base year and future year highway networks; the latest MPO, statewide, and national socio-economic data and forecasts; and the latest Amtrak and air travel market data. New license plate surveys would not be necessary, but on-board rail surveys should be considered.

3.2 Regional Highway and Localized Traffic Impacts

This section presents the regional highway and localized traffic impacts, as well as the potential parking impacts of the Richmond/Hampton Roads Passenger Rail Project. Highway, passenger transportation service (e.g., intercity bus, rail, multimodal and transit facilities), freight shipment, and parking issues were evaluated in this analysis.[23]

3.2.1 Methodology

The traffic, transit, circulation and parking analyses for this Tier I Draft EIS focused on a broad comparison of potential impacts on intercity travel demand, traffic, transit, circulation and parking along the routes and at stations for the Rail Build Alternatives. The potential impacts for each of these alternatives were compared to the No Action and Status Quo Alternatives.

3.2.1.1 Determination of Traffic and Regional Vehicle Miles Traveled (VMT)

Regional and corridor impacts on highway congestion are measured through changes in vehicle miles traveled (VMT), levels of service for freeways, street lanes and intersections. The Status Quo Alternative and the No Build Alternative highway networks are the baseline for all evaluations of the impacts of the Rail Build Alternatives. Average daily traffic volumes were identified using the Virginia Department of Transportation (VDOT) *Average Daily Traffic Volumes* publication for 2004. A description of the methodology for estimating travel demand, or ridership, used in this analysis is contained in the *Travel Demand Methodology and Results Report*, April 2004, revised March 2008.

3.2.1.2 Localized Traffic Impacts at Rail Stations

The traffic and transportation impacts for each rail station were determined by examining the total annual ridership. However, the ridership forecast does not examine mode of access/egress and, therefore, does not differentiate between park-and-ride trips and drop-off trips. Drop-off trips impart additional traffic onto the roadway network because each drop-off consists of a trip to the rail station and a trip from the rail station, whereas a park-and-ride trip consists of only a single trip at the time of departure. Based on the mode of access survey prepared by Amtrak for the Hampton Roads region in 1995, it was assumed that 70 percent of riders' trips would either be dropped-off by auto or taxi.

Average daily auto trips were computed by assuming an average automobile mode share of 90 percent; that is, 90 percent of passengers would arrive in a vehicle that would add an auto trip to the highway network, which includes taxis. Trips not included in this 90 percent include walking trips, transit trips, bicycle trips and others.

[23] The planning horizon year for the analysis is 2025 based on available data from MPO long range plans.

Average peak-hour auto trips were calculated by assuming that 15 percent of the daily trips would occur during the peak hour. This figure is somewhat higher than typical of suburban areas, but a conservatively high figure was used due to the periodic trip peak characteristics caused by train arrivals and departures.

It should be noted that by definition, the average daily auto trips will be exceeded approximately half the time, so this discussion is intended for planning purposes only and is not intended as a substitute for a comprehensive analysis of the rail station's traffic characteristics. The exact location of all rail stations has not yet been determined. Generalized locations are discussed. More detailed local rail station area traffic and parking analysis would be deferred to the Tier II analysis when the specific route alignment has been selected.

3.2.2 Regulatory Requirements

The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts (FRA Docket No EP-1, Notice 5, May 26, 1999), under the topic of transportation states, "The EIS should assess the impacts on both passenger and freight transportation, by all modes, from local, regional, national and international perspectives. The EIS should include a discussion of both construction period and long-term impacts on vehicular traffic congestion."

3.2.3 Existing and Future Traffic and Regional Vehicle Miles Traveled (VMT)

The ability of the Rail Build Alternatives to alter travel patterns on a regional basis can be evaluated through the number of auto trips taken and corresponding changes in VMT. Auto trips include park-and-ride and drop-off trips to rail stations.

Most of the traffic in the region is related to daily commutes. The travel market served by high-speed intercity passenger rail service attracts different types of trips. It is unlikely that the additional rail trips generated by the Build Alternatives would cause a measurable reduction in automobile traffic on major highways such as Interstates 64 and 95 (I-64 and I-95, respectively), but they do contribute capacity to the respective transportation corridors. According to the ridership forecast presented in Section 3.1, the Build Alternatives would generate an incremental increase of between 652,300 and 899,900 rail passenger trips annually when compared to the Status Quo Alternative, or an average of approximately 2,000 additional riders per day. When compared to the No Action Alternative, the Build Alternatives would generate an incremental increase in rail passenger trips of between 472,100 and 697,400 annually, or an average of approximately 1,400 riders.

Some of these riders would likely be traveling by rail instead of by automobile along I-64, U.S. 460, and I-95, but these riders would make up a small fraction of the total travel trips in these corridors. Long-distance travelers are more likely than commuters to travel in multiple-occupant vehicles, and some of these trips may use routes other than I-64 and I-95, depending on their ultimate origins and destinations. It is unlikely that half of the riders would divert vehicles from the interstate routes, but in order to fully assess the potential effects of highway-rail diversion, a 50 percent rate is assumed for the purposes of this discussion. According to the license plate survey conducted as part of the 2004 Richmond/Hampton Roads Passenger Rail Study, the average vehicle occupancy rate along U.S. Route 460 and I-64 was 1.75 people across all trip purposes, thus for every 1,750 passengers, the Build Alternatives would divert 1,000 vehicles.

According to the VDOT *Average Daily Traffic Volumes* 2004 publication, I-64 carried approximately 126,000 vehicles per day across the Hampton/Newport News city limit in 2004. Assuming even a moderate ½-percent-per-year growth rate, the volume would be expected to increase to approximately 140,000 vehicles per day by 2025. A reduction of 1,000 vehicles (estimated from the approximate measure of 2,000 new rail riders per day) caused by diversion to rail would amount to only approximately seven-tenths of one percent. This fraction is small enough that the resultant decrease in traffic would not be measurable, given the normal daily and seasonal fluctuations in traffic volume.

The section of I-64 with the lowest traffic volume is between Route155 and Route 33 in New Kent County. In this section, traffic volume measured approximately 40,000 vehicles per day in 2004 and might be expected to increase to approximately 45,000 per day by 2025. The reduction of 1,000 vehicles would amount to a larger fraction of the total, approximately 2.3 percent in this portion of I-64. However, the lowest-volume

section is also the least congested section, so the reduction would be of less benefit to the remaining through traffic.

The effects on I-95 would be even less pronounced. I-95 carried 145,000 vehicles per day at the I-64 interchange in 2004 and could increase to 160,000 per day by 2025. The 1,000-vehicle diversion would amount to a reduction of only approximately 0.6 percent.

Furthermore, there is a well established tendency for traffic to rebalance itself to account for changes in traffic conditions. If a travel time savings did occur on the I-64 or I-95 routes, the savings likely would be immediately offset by the induced demand of additional vehicles that would divert to the affected routes.

3.2.4 Localized Traffic Impacts at Rail Stations

This section describes the potential traffic impacts at the rail stations proposed along each of the Build Alternative routes, Peninsula/CSXT and Southside/NS.

3.2.4.1 Peninsula/CSXT Route Stations

Newport News Amtrak Station - The existing Newport News Amtrak Station would remain open under the Status Quo and No Action Alternatives, as well as Alternative 1. There would be no change to the existing traffic characteristics around the existing Newport News Amtrak Station under the Status Quo Alternative and Alternative 1. Traffic volumes would increase around the station in the No Action Alternative due to the proposed increase in service. The station is assumed to be closed in Alternatives 2a and 2b. Build Alternatives 2a and 2b would shift some or all of the baseline traffic and parking demand away from the existing Newport News Amtrak Station, which would improve traffic and parking conditions in its vicinity.

Newport News Downtown Rail Station - The Newport News Downtown Rail Station proposed as part of Alternatives 2a and 2b could be sited between 26th and 28th Streets northeast of Warwick Boulevard in Newport News. The Newport News Downtown traffic forecast is presented in Table 3-8. The auto mode share was estimated at 85 percent instead of 90 percent, accounting for the slightly greater likelihood that patrons would arrive at the station by transit.

The forecast shows that the proposed Newport News Downtown Station would generate approximately 208 peak hour trips in Alternative 2a and 265 trips in Alternative 2b at 90 mph, with slightly more trips when rail service operates at 110 mph. The proposed Newport News Downtown Station is estimated to attract more trips than any other station.

Table 3-8: Proposed Newport News Downtown Station Trip Forecast

Alternative		Annual Ons and Offs, 2025	Annual Trips Generated[1]	Average Daily Auto Trips[2]	Average Peak-Hour Auto Trips[3]
Status Quo		0	0	0	0
No Action		0	0	0	0
90 mph	Alt. 1	0	0	0	0
	Alt. 2a	594,545	891,817	2,077	208
	Alt. 2b	758,335	1,137,503	2,649	265
110 mph	Alt. 1	0	0	0	0
	Alt. 2a	638,460	957,689	2,230	223
	Alt. 2b	794,001	1,191,002	2,774	277

Notes:
1. Assumes half park-and-ride trips (one trip per rider) and half drop-off trips (two trips per rider).
2. Assumes auto mode share of 85 percent.
3. Assumes 10 percent of daily traffic during peak hour.
Source: Travel Demand Methodology and Results, AECOM, March 2008.

Vehicular Access/Egress - Access to the rail station is proposed to occur from 25th Street, along a new roadway under the 26th Street bridge. The access roadway would provide access from a new intersection at the far northeast end of 25th Street, near the existing access point to the marine terminal. Further study of this intersection would be needed to determine whether it could support the peak-hour traffic demands of the marine terminal and the rail station in its existing configuration. Geometric changes or additional traffic controls may be indicated. The unsignalized intersection of 25th Street and Warwick Boulevard should also be investigated to determine its suitability to support increased traffic generated by the rail station.

The broader access provided by the one-way pair of Huntington Avenue and Warwick Boulevard appears to be sufficient to accommodate rail station traffic. The one-way pair operates with excellent signal coordination and appears to have some reserve capacity.

Pedestrian Access/Egress - A sufficient pedestrian route is also needed at the Downtown Newport News Station; this function could likely be fulfilled using sidewalks adjacent to the access roadways.

Williamsburg Amtrak Station - In Alternatives 2a and 2b, the existing Williamsburg Amtrak Station is proposed to be expanded with additional facilities to accommodate an increased passenger load.

Traffic Forecast - Few trips are expected from any non-auto mode at the Williamsburg Amtrak Station, but carpool trips are expected to be significant. It is likely that carpool trips would cause the auto mode share to drop below 90 percent, but 90 percent was used for this analysis to avoid underestimating the number of automobile trips. The traffic forecast for the Williamsburg Amtrak Station is presented in Table 3-9.

Table 3-9: Williamsburg Amtrak Station Trip Forecast

Alternative		Annual Ons and Offs, 2025	Annual Trips Generated[1]	Average Daily Auto Trips[2]	Average Peak-Hour Auto Trips[3]
Status Quo		93,248	139,872	326	33
No Action		154,398	231,597	539	54
90 mph	Alt. 1	148,332	222,498	518	52
	Alt. 2a	314,173	471,259	1,097	108
	Alt. 2b	329,637	494,455	1,151	151
110 mph	Alt. 1	148,041	222,062	517	52
	Alt. 2a	324,127	486,191	1,132	113
	Alt. 2b	340,087	510,130	1,188	119

Notes:
1. Assumes half park-and-ride trips (one trip per rider) and half drop-off trips (two trips per rider).
2. Assumes auto mode share of 90 percent.
3. Assumes 15 percent of daily traffic during peak hour.
Source: Travel Demand Methodology and Results, AECOM, March 2008.

Williamsburg is the only rail station that supports rail ridership in every alternative, including the Status Quo and No Action Alternatives. However, the trip totals in Alternative 1 are roughly equal to the No Action Alternative, approximately 52 trips in the peak hour. Only in Alternatives 2a and 2b are the No Action trip totals exceeded. The totals approach 151 trips per hour at their peak for the 90 mph speed option.

Vehicular Access/Egress - Existing access to the Williamsburg Amtrak Station is provided from the south, along Armistead Avenue and Boundary Street north of Lafayette Street. The proposed station improvements include a second access point from the north, via a driveway intersecting Henry Street just north of the railroad crossing.

The ability to access the station from multiple points is a traffic operational advantage because it helps reduce trip length and disperses trips among more than one access point. However, the proposed Henry Street access point must be carefully integrated with the existing driveway nearby to avoid traffic conflicts. It may be appropriate to consolidate the rail station driveway and the existing driveway onto a new roadway.

VDOT's 2004 *Average Daily Traffic Volumes* publication shows that Lafayette Street (Route 5) carries approximately 10,000 vehicles per day east of Henry Street, and that Henry Street (Route132) carries 5,400 vehicles per day south of Lafayette Street and approximately 6,800 vehicles per day north of Lafayette Street. The modest volume entering the rail station, coupled with the multiple access points, would not suggest the need for intrusive traffic controls at a new Henry Street driveway intersection; however, further traffic control analysis is recommended.

Near the Williamsburg Amtrak Station, the new intersection created on Henry Street north of Lafayette Street may present safety challenges due to its proximity to the railroad, the adjacent private parking lot, and the signalized intersection of Henry and Lafayette Streets. Changes to the cross-section of Henry Street may be needed at this location.

Pedestrian Access/Egress - Existing pedestrian access to the rail station occurs from the south, and it is likely that all pedestrian access would occur from the south under any alternative. The lack of pedestrian facilities on Henry Street north of the railroad crossing suggests that pedestrian access to the station from the north would be of limited value.

3.2.4.2 Southside/NS Route Stations

Downtown Norfolk Rail Station - The proposed Norfolk Rail Station is sited on the north bank of the Elizabeth River just east of the Harbor Park baseball stadium. Access would be provided from Park Avenue. The total number of trips to and from the rail station was computed as shown in Table 3-10.

The auto mode share in Norfolk was estimated at 85 percent instead of 90 percent, accounting for the slightly greater likelihood that patrons would arrive at the station by transit. The rail station would be located adjacent to a proposed Hampton Roads Transit light rail transit station as well as the downtown bus circulator. In addition, the share of daily auto trips that would occur in the peak hour was set at 10 percent due to the more urban character of the site.

The traffic forecast shows a higher number of trips than at the proposed Bowers Hill Rail Station (see the following subsection), approximately 250 peak-hour trips in Alternative 1 and approximately 40 in Alternative 2a. In Alternative 1, there are slightly more trips expected with 110 mph train service, and in Alternative 2a, there are slightly less trips expected with the faster rail service on the Peninsula/CSXT Route.

Vehicular Access/Egress - Access to the rail station is complicated by the presence of the parking lot for the Harbor Park stadium. It is expected that access to the rail station would occur from the existing stadium access point, along Park Avenue just west of Holt Street. However, the access point may need to be reconfigured to permit safe and efficient use by both rail and stadium patrons. It may be desirable to reconfigure the access point so that it is directly opposite Holt Street. This would permit the intersection to be signalized more efficiently if needed, and it would avoid the traffic operational problem of interlocking left-turns on Park Avenue.

Table 3-10: Norfolk Rail Station Trip Forecast

Alternative		Annual Ons and Offs, 2025	Annual Trips Generated[1]	Average Daily Auto Trips[2]	Average Peak-Hour Auto Trips[3]
Status Quo		0	0	0	0
No Action		0	0	0	0
90 mph	Alt. 1	633,111	949,667	2,212	221
	Alt. 2a	155,713	233,569	554	55
	Alt. 2b	0	0	0	0
110 mph	Alt. 1	681,131	1,021,697	2,379	238
	Alt. 2a	141,055	211,583	493	50
	Alt. 2b	0	0	0	0

Notes:
1. Assumes half park-and-ride trips (one trip per rider) and half drop-off trips (two trips per rider).
2. Assumes auto mode share of 85 percent.
3. Assumes 10 percent of daily traffic during peak hour.

Source: Travel Demand Methodology and Results, AECOM, March 2008

Park Avenue carries one lane westbound and two lanes eastbound in the vicinity of the site. With this configuration, a single vehicle stopped in the westbound lane waiting to turn left into the parking lot would block all westbound traffic on the street. Depending on future traffic volume forecasts, it may be desirable to reconfigure Park Avenue with a westbound left-turn pocket in the vicinity of Holt Street.

Pedestrian Access/Egress - Care should be taken to ensure that an adequate access route to the rail station exists for pedestrians, cyclists, and persons with disabilities. They may comprise a small fraction of the total trips, but due to the urban nature of the site, some passengers would likely access the rail station using non-motorized modes.

Bowers Hill Rail Station - A proposed Bowers Hill Rail Station could be sited to provide access via Military Highway, which carries US-13 and US-460 in the vicinity of the station. A preliminary trip forecast for the Bowers Hill Rail Station was prepared based on rail ridership estimates. The trip forecasts are presented in Table 3-11 and discussed further below.

Table 3-11: Bowers Hill Rail Station Trip Forecast

Alternative		Annual Ons and Offs, 2025	Annual Trips Generated[1]	Average Daily Auto Trips[2]	Average Peak-Hour Auto Trips[3]
Status Quo		0	0	0	0
No Build		0	0	0	0
90 mph	Alt. 1	241,917	362,876	845	85
	Alt. 2a	45,738	68,607	160	16
	Alt. 2b	0	0	0	0
110 mph	Alt. 1	247,109	370,663	863	86
	Alt. 2a	43,745	65,618	153	15
	Alt. 2b	0	0	0	0

Notes:
1. Assumes half park-and-ride trips (one trip per rider) and half drop-off trips (two trips per rider).
2. Assumes auto mode share of 90 percent.
3. Assumes 15 percent of daily traffic during peak hour.

Source: Travel Demand Methodology and Results, AECOM, March 2008.

At the proposed Bowers Hill Rail Station, the traffic forecast shows approximately 85 peak-hour trips in Alternative 1 and 16 peak-hour trips in Alternative 2a. The faster 110 mph rail service would cause the trip

totals to increase very slightly in Alternative 1, but would cause trips to decrease slightly in Alternative 2a. At the proposed Bowers Hill Rail Station, few trips are expected from any non-auto mode, but carpool trips are expected to be significant. It is likely that carpool trips would cause the auto mode share to drop below 90 percent, but 90 percent was used for this analysis to avoid underestimating the number of automobile trips.

Vehicular Access/Egress - Even the largest trip forecast, 85 trips per hour, is fairly modest and traffic volumes at this level would not generally indicate the need for a traffic signal at the rail station entrance. Military Highway carries approximately 7,600 vehicles per day in the vicinity of the proposed station, according to VDOT's 2004 *Average Daily Traffic Volumes* publication. This traffic level appears to be well within the roadway's capacity; initial observations suggest that the addition of an access point to the proposed Bowers Hill Rail Station would not adversely affect capacity on the highway. However, a complete traffic signal warrant analysis should be conducted as design progresses.

Military Highway is a four-lane, undivided cross-section in the vicinity of the rail station and the grade-separated crossing of the railroad. Well away from the railroad crossing, the highway widens to a four-lane divided cross-section. The wide grass median in the divided portion of the highway permits the use of left-turn pockets at intersections. It is recommended that the highway be reconfigured in the vicinity of the proposed Bowers Hill Station to provide a left-turn pocket for northwest-bound traffic entering the rail station. Such a facility would improve the safety and traffic operational characteristics of the station access point. It may also be desirable to consider a right-turn deceleration lane into the rail station for southeast-bound traffic. To avoid the need to reconstruct the bridge over the railroad, the station's access point should be situated well away from the bridge. This would allow the roadway to fully taper back to an undivided cross-section before reaching the bridge.

Pedestrian Access/Egress - The suburban location of the Bowers Hill Rail Station suggests that virtually all approaching and departing trips would occur by car. The station's access to Military Highway would be at least 1,000 feet away from the nearest intersection on either side, and approaching traffic volume is forecast to be relatively low. As noted earlier, it would be desirable to construct a left-turn storage lane on northwest-bound Military Highway for traffic entering the station; this improvement would have a large public safety benefit. The rail station's access roadway design should also account for the crest vertical curve of the highway as it crosses the railroad; this vertical curvature may impede sight distance for traffic both entering and exiting the rail station.

3.2.5 Local Parking Impacts

There should be very minimal to no negative impacts on existing parking spaces by construction of the passenger rail alternatives. There is no anticipated loss of existing parking spaces in front of existing businesses and residences. Each rail station would be constructed or modified to enhance existing rail station parking and facilities or add parking spaces where none currently exist within safe, convenient walk access of the station. Rail station parking would be sized in accordance with estimated passenger demand for each station in order to avoid and minimize parking spill-over into neighborhoods or commercial areas adjacent to the station area. Table 3-12 summarizes the parking requirements forecast for each rail station and the sections below describe the potential parking impacts for the stations along each route.

Table 3-12: Parking Requirements at Rail Stations

Alternative		Rail Station			
		Bowers Hill	Norfolk	Newport News Downtown	Williamsburg
Status Quo		0	0	0	49
No Action		0	0	0	49
90 mph	Alt. 1	94	252	0	46
	Alt. 2a	14	46	242	111
	Alt. 2b	0	0	292	116
110 mph	Alt. 1	97	270	0	46
	Alt. 2a	13	41	259	115
	Alt. 2b	0	0	306	120

Notes:
1. Only Hampton Roads residents would park at stations.
2. 52 percent of all trips are made by Hampton Roads residents (Source: 2004 License Plate Survey).
3. 29 percent of all Hampton Roads residents park at the station (Source: 1995 Amtrak Survey).
4. Average trip duration is 3 days (Source: 1995 Amtrak Survey).
5. Average Vehicle occupancy by trip purpose: 1.4 businesses, 2.1 recreation, 1.6 other (Source: 2004 License Plate Survey).
6. Parking at Williamsburg Station is currently constrained and would remain constrained under the Status Quo Alternative, the No Action Alternative and Alternative 1.

Source: Travel Demand Methodology and Results, March 2008.

3.2.5.1 Peninsula/CSXT Route Rail Stations

Newport News Amtrak Station - In the Status Quo Alternative and Alternative 1, service along the Peninsula/CSXT Route would remain the same. No changes to parking at the existing Newport News Amtrak Station are warranted. In the No Action Alternative, additional parking demand would be generated by increased ridership. The station would be removed and relocated under Alternatives 2a and 2b.

Newport News Downtown Rail Station - The parking forecast, shown in Table 3-12, estimates an average parking demand of approximately 250 parking spaces for Alternative 2a and approximately 300 spaces for Alternative 2b for the proposed Newport News Downtown Rail Station. In both cases, parking demand is slightly higher for 110-mph rail service than for 90-mph service. The proposed station site consists of a vacant parcel of land of approximately 1.4 acres. This parcel, even if fully developed into a surface parking lot, would only accommodate approximately 200 parking spaces. The parcel also must accommodate other station facilities, further reducing its ability to provide sufficient parking.

As such, in both Alternatives 2a and 2b, not all of the parking supply could be served on-site by a surface parking lot. There are numerous parking facilities surrounding the proposed rail station in both lots and garages. It is possible that the City of Newport News would be willing to designate spaces in a city-owned facility for passenger rail use. It would also be possible to allow private parking facilities to fulfill the parking demand. Other options that would provide additional parking supply near the station include the following:

- Evaluate the possibility of expanding the surface parking beyond the original 1.4-acre parcel to include adjacent vacant land, particularly to the northwest and southeast.
- Consider a multi-level parking structure on a portion of the 1.4-acre parcel.

Further analysis of parking demand at the proposed Newport News Downtown Rail Station is recommended as the project progresses.

Williamsburg Amtrak Station - The existing Williamsburg Amtrak Station offers very limited parking at up to 49 spaces. In this constrained condition, the parking supply is not sufficient to meet the demands of the either the Status Quo Alternative, the No Action Alternative or Alternative 1 as shown in the forecast in Table 3-12. Additional parking demand would increase to between 110 and 120 spaces under Alternatives 2a and 2b.

One possible option for additional space is a vacant parcel approximately one acre in size north of the Williamsburg Amtrak Station that could be used for expanded parking and station facilities. The peak average demand of 120 spaces could be served by a surface parking lot on a parcel this size, but it would use approximately 85 percent of the parcel. It may be desirable to enlarge the parcel slightly if additional space is needed for other station facilities. The parking demand forecast and parking facilities at the Williamsburg Amtrak Station should be subjected to more refined analysis if the Peninsula/CSXT Route is selected.

3.2.5.2 Southside/NS Route Stations

Downtown Norfolk Rail Station - As noted in Table 3-12, the Downtown Norfolk Rail Station was estimated to require an average of approximately 250 parking spaces in Alternative 1 with 90-mph service, increasing to approximately 270 spaces with 110-mph service. There is limited vacant land available for construction of new surface parking near the proposed Downtown Norfolk Rail Station. However, significant parking exists in the stadium's parking lot, and there are a total of approximately 2,000 parking spaces, owned by the City of Norfolk, within walking distance of the stadium. Some of these nearby parking spaces could potentially be designated by the city for the use of rail passengers.

Conflicting demands for parking would occur during events at Harbor Park. The stadium has a seating capacity of 12,067, and nearby parking facilities are often stressed during stadium events. Designating 250 to 270 spaces for rail passengers would make approximately 13 percent of the nearby parking spaces unavailable for stadium patrons, further stressing supply during stadium events.

It would be possible to permit rail passengers to use the Harbor Park parking lot without specifically designating the spaces for rail use. This would permit the spaces to be used by either rail passengers or stadium patrons as needed. However, when train arrivals or departures coincide with stadium events, this approach would likely mean that rail passengers would be unable to locate appropriate long-term parking nearby.

It would also be possible, although costly, to construct a multi-level parking garage on the site of the existing surface parking lot between Harbor Park and the proposed rail station. The additional parking supply could be shared between the two uses or designated for individual uses.

In either case, if rail and stadium parking is provided in the same physical lot, the parking payment facilities must be carefully integrated. Currently, parking facilities near the stadium usually charge a flat $4.00 fee during stadium events; this rate is unlikely to be appropriate for rail passengers. Long-term parking rates are usually based on the length of the stay to discourage vehicles from parking for very long periods. Also, the parking payment system should be designed to avoid charging drivers who arrive at the rail station to drop off or pick up rail passengers, even during stadium events. It may be possible to configure an electronic parking payment system, using parking tickets or similar means, to correctly bill all three uses—stadium patrons, long-term rail passengers, and drop-off traffic—using a single lot and payment point. However, there are also advantages to maintaining completely separate parking facilities for rail passengers.

In Alternative 2a, the estimated average parking demand is 46 vehicles with 90-mph rail service or 41 vehicles with 110-mph rail service. This level of parking demand would only affect approximately two percent of the parking supply in the surrounding area, greatly limiting the impact on parking demand during stadium events. However, the same concerns about parking co-location would occur no matter how many spaces would be needed for rail use. Further analysis of parking demand will be required if this route alternative is selected.

Bowers Hill Rail Station - As shown in Table 3-12, the average parking demand at the Bowers Hill Rail Station would be approximately 100 cars in Alternative 1 and approximately 15 cars in Alternative 2a. At the proposed Bowers Hill Rail Station, a parcel of land approximately 2.5 acres in area has been designated for station facilities. The site is currently vacant and could easily accommodate a surface parking lot.

In surface parking lots, one acre of land can usually accommodate approximately 140 parking spaces. As such, the 100 spaces in Alternative 1 would require approximately 0.7 acre, well within the 2.5-acre parcel

proposed for the station facilities. The minimal parking demand forecast for Alternative 2a could be accommodated with a very small parcel of land, approximately 0.1 acre.

Further analysis of parking demand would be required to refine the parking demand estimates at the proposed Bowers Hill Rail Station. Average parking demand is sufficient for high-level planning, but the parking supply should exceed average demand to satisfy above-average demand levels.

3.2.6 Potential Mitigation Strategies

Mitigation strategies that minimize the project's impact on highways, local roads, and parking would vary depending on the nature of the impact. For example, physical improvements could be made to intersections and roadways. For existing intersections with traffic signals and where rights-of-way are available, additional turning lanes and through lanes could be added.

Peak hour traffic impacts at stations would be minimal. Intercity rail travel demand does not have the same peak traffic characteristics as commuter rail systems. Hence, it is expected that access/egress traffic impacts would be evenly spread out over the entire service period and would occur when trains arrive and depart.

Additional methods to improve the capacity of highway intersections and arterials without physical improvements are possible. These methods are typically called Transportation Systems Management (TSM) improvements. Transportation system assessments typically find that the highway system, while appearing to be saturated, is operating at less than peak efficiency. Minor investments could either preserve the system for future needs or enhance the operation to a more optimal level. This would be desirable since these actions can assist day-to-day travel and forestall the time when major investments will be more urgently required. Additionally, other strategic investments for specific new facilities or programs could be made that relieve existing problems. These types of actions can include provisions for bike facilities or actions to reduce travel through incentives for transit and carpooling. Congestion management and incident management programs also could help reduce delay.

Elevated pedestrian walkways could be provided to eliminate the pedestrian traffic conflicts with turning and crossing vehicles. This would also help reduce delays to vehicular traffic.

Station, parking lot and maintenance facility designs could include operational and geometric improvements that maintain, wherever reasonably possible, traffic conditions at acceptable levels of service. In general, mitigation would include the realignment of local traffic patterns and the creation of additional parking.

Bus routes and other feeder systems could be rerouted to serve the passenger rail stations in addition to normal routes. It is expected that the impact to other modes of transit would be insignificant.

Measures would be established to encourage and promote access to passenger rail stations by high-occupancy vehicle modes as well as by pedestrian access and non-motorized vehicles. These measures could include bicycle facilities, convenient pedestrian access, pedestrian scale enhancements, cooperative agreements with transit and private shuttle services. System design and layout would accommodate multimodal transfers by providing means of direct access to other transit modes and by making multimodal connections convenient and safe.

3.2.7 Subsequent Analysis

Subsequent Tier II analysis for the recommended alternative would include the following:

- Traffic signal warrant analysis
- Parking demand analysis
- Pedestrian and bicycle access and safety analysis
- Traffic demand and control analysis at station locations

3.3 Grade Crossing Safety Impacts and Railroad Operations

This section describes the safety concerns at highway-rail grade crossings and pedestrian safety associated with higher speed rail service and railroad operations. These concerns were examined in more general terms given the broad scope of this Tier I Draft EIS. Other issues regarding passenger safety, security and operational safety will be addressed in the Tier II analyses once a Preferred Alternative has been selected for more detailed study.

3.3.1 Methodology

All existing public and private highway-rail grade crossings along the Peninsula/CSXT and Southside/NS Routes were identified. Where train speeds are projected to exceed 90 mph, a reasonable assumption as to the percentage of highway-rail grade crossing closures for each route was identified. These assumptions were based on prior corridor studies performed for FRA, Amtrak, states and regional authorities. This analysis does not identify particular grade crossings that would merit closure. Additional design analysis and consultations with citizens and elected officials along each route would precede the identification of crossing closures and separations and would be identified during Tier II analysis.

Potential impacts to pedestrian safety related to grade crossings and at stations have been evaluated at a high level. For this Tier I Draft EIS, only general areas of potential conflict were identified. More detailed study would be required for Tier II analyses.

Effects on rail operations were identified through the engineering feasibility analysis completed for the Richmond to Hampton Roads Alternatives Analysis (*Engineering Feasibility Analysis Technical Memorandum, November 2005*). This analysis focused on areas along the existing rail lines that would have capacity restrictions related to either increased train frequencies or operational speeds.

3.3.2 Regulatory Framework

The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts (64 Fed. Reg. 28545 (May 26, 1999)), under the topic of transportation states, "The EIS should assess the impacts on both passenger and freight transportation, by all modes, from local, regional, national and international perspectives. The EIS should include a discussion of both construction period and long-term impacts on vehicular traffic congestion." Under the topic of public safety, the docket states, "The EIS should assess the transportation or use of any hazardous materials which may be involved in the alternatives, and the level of protection afforded residents of the affected environment from construction period and long-term operations associated with the alternatives."

Both FRA and the Federal Highway Administration (FHWA) have responsibility for highway-rail grade crossing safety. The FRA regulates the aspects of grade crossing safety related specifically to train activated warning devices. The FHWA is responsible for public grade crossing issues that affect highway safety. Title 49 of the U.S. Code covers enacted federal legislation pertaining to railroads. Specifically, Chapters 51, 201, 203, 205, 207, 209, 211, and 213 pertain to safety related issues.

On their Web site, the FRA provides guidance pertaining to highway-rail crossings through several publications, such as "Highway-Rail Grade Crossings – A Guide to Crossing Consolidation and Closure" and "Guidance on Traffic Control Devices at Highway-Rail Grade Crossings." The FRA has also published the "Compilation of State Laws and Regulations on Matters Affecting Highway-Rail Crossings." This compilation provides information on various state laws and regulations pertaining to safety issues and railroads. This addresses the Commonwealth of Virginia's policies. In Virginia, the Commonwealth Transportation Board has statutory authority over elimination or consolidation of multiple grade crossings. Virginia has outlined specific safety-related regulations that are required of railroads. As planning for the project progresses, consideration should be given to these policies.

The FHWA provides regulations guiding highway traffic control devices such as circular advance warnings, crossbucks, pavement markings, bells, gates and flashing lights. The FHWA provides guidance for traffic controls at highway-rail crossings in the "*Manual on Uniform Traffic Control Devices for Streets and Highway, Part 8 Traffic Controls for Highway-Rail Grade Crossings*, *November 2003*."

3.3.3 Affected Environment

3.3.3.1 Peninsula/CSXT Route

Grade Crossings - Numerous public and private crossings are located along this route. Private crossings are mostly related to farms; however, they can be related to residential, recreational or industrial properties. Table 3-13 shows the number and types of crossings along the Peninsula/CSXT route. Current safety measures at public crossings include stand-alone flashers, flashers with gates, and crossbucks. Flashers with gates currently do not protect private crossings along this route.

Pedestrian Safety - Along the Peninsula/CSXT Route, three Amtrak stations exist today, including the Richmond Main Street, Williamsburg, and Newport News Amtrak Stations. Only one station, the proposed Newport News Downtown Rail Station, is included in the higher speed options in Alternatives 2a and 2b. Richmond Main Street Station is elevated and pedestrian safety is not considered an issue. Pedestrian safety concerns related to the stations along this route include the proposed park-and-ride lot at the Williamsburg Amtrak Station and the proposed Newport News Downtown Rail Station. Since space is limited around the Williamsburg Amtrak Station, one site being considered for a park-and-ride lot is on the opposite side of the tracks from the station. In terms of the proposed location of the Newport News Downtown Rail Station, the site currently backs up to developed land with pedestrian activity to the west (rail yards are located to the east). Additionally, the existing freight and passenger rail lines for this route run through some small towns and cities. Based on field reviews, limited fencing exists to prevent pedestrians from trespassing on the tracks at potentially dangerous locations.

Table 3-13: Inventory of Existing Highway-Rail Grade Crossings

Segment	Line	Miles	Number of Public Crossings	Public Crossings per Mile	Number of Private Crossings	Private Crossings per Mile	Total Crossings	Total Crossings per Mile
Peninsula/CSXT Route								
City of Richmond	Richmond to Newport News	1.26	0	0	0	0	0	0
Henrico County	Richmond to Newport News	13.74	5	0.36	1	0.07	6	0.44
Charles City County	Richmond to Newport News	4	2	0.5	2	0.5	4	1
New Kent County	Richmond to Newport News	13	6	0.46	16	1.23	22	1.69
James City County	Richmond to Newport News	12.3	3	0.24	8	0.65	11	0.89
City of Williamsburg	Richmond to Newport News	6.1	2	0.33	0	0	2	0.33
York County	Richmond to Newport News	2.4	0	0	0	0	0	0
James City County	Richmond to Newport News	1.45	0	0	0	0	0	0
City of Newport News	Richmond to Newport News	19.65	4	0.2	1	0.05	5	0.25
Route Sub-Total		**73.9**	**22**	**0.3**	**28**	**0.38**	**50**	**0.68**
Southside/NS Route								
City of Petersburg	Petersburg-Kilby	1.55	0	0	0	0	0	0
Prince George County	Petersburg-Kilby	10.3	5	0.49	3	0.29	8	0.78
Sussex County	Petersburg-Kilby	16.85	6	0.36	5	0.3	11	0.65
Southampton County	Petersburg-Kilby	8.36	1	0.12	4	0.48	5	0.6
Isle of Wight County	Petersburg-Kilby	9.19	6	0.65	2	0.22	8	0.87
City of Suffolk	Petersburg-Kilby	5.45	3	0.55	0	0	3	0.55
City of Suffolk	Kilby Connection	1.5	0	0	0	0	0	0
City of Suffolk	Virginian - Kilby to Algren	9.81	7	0.71	9	0.92	16	1.63
City of Chesapeake	Virginian - Kilby to Algren	1.21	2	1.65	0	0	2	1.65
City of Chesapeake	Virginian - Algren to S. Norfolk	10.18	10	0.98	3	0.29	13	1.28
City of Chesapeake	NS Main Line	1.64	3	1.83	0	0	3	1.83
City of Norfolk	NS Main Line	1.26	3	2.38	2	1.59	5	3.97
Route Sub-Total		**77.3**	**46**	**0.6**	**28**	**0.36**	**74**	**0.96**

Rail Operations - The Peninsula/CSXT Route alternatives would utilize former Chesapeake and Ohio (C&O) right-of-way from Richmond Main Street Station to Downtown Newport News. CSX Transportation (CSXT) is the successor in interest to the C&O railroad. Amtrak is the National Railroad Passenger Corporation and is the only operator of passenger trains along this route.

The CSXT Main Line between Richmond Main Street Station (milepost CA84.9) and the present Newport News Amtrak Station (milepost CAE14) is a combination of single and double track segments, nearly 71 miles long. Current maximum freight train speed on the line is 50 mph. This track presently is maintained to FRA Class 4[24] standards that allow passenger train operating speeds of 79 miles per hour. There are currently several sections of double track and only one signal-controlled siding on the line between Richmond and Newport News.

3.3.3.2 Southside/NS Route

Grade Crossings - Similar to the Peninsula/CSXT route, numerous public and private crossings exist along the Southside/NS route. Table 3-13 also shows the number and types of crossings along the Southside/NS Route. Current safety measures at public crossings include stand-alone flashers, flashers with gates, and crossbucks. Flashers with gates are not included at any private crossings along this route today.

Pedestrian Safety – The passenger rail stations currently in operation along the Southside/NS route are the Richmond Main Street station and the Ettrick station in Chesterfield County. Richmond Main Street Station is elevated and pedestrian safety is not considered an issue. Traffic impacts around the Ettrick station are being evaluated as part of the Southeast High-Speed Rail (SEHSR) Tier II analysis. Many small towns exist along the route. Based on limited field reviews, there appears to be limited fencing to keep pedestrians from trespassing on the tracks at potentially dangerous locations.

Rail Operations - The Southside/NS route between Richmond and Norfolk would utilize segments of the existing CSXT "A" Line between Richmond and Petersburg, which is the former Atlantic Coast Line Railroad. The Southside/NS Route between Petersburg and Downtown Norfolk would use portions of the former Norfolk & Western Railway and Virginian Railroad right-of-way. (Improvements to the CSXT "A" Line between Richmond and Petersburg and connections between the CSXT "A" Line and the former Norfolk & Western Railway in Petersburg are the subject of the SEHSR Tier II analysis). Norfolk Southern (NS) is the successor in interest to the former Norfolk & Western Railway. Segments of the Virginian Railway are abandoned but the right-of-way is intact.

Initiation of high-speed rail service between Richmond and Norfolk utilizing the Southside/NS route would require a connection between the north-south Richmond to Charlotte and Florida route and the east-west Petersburg to Norfolk route. The connection between the two routes has yet to be determined. The connection will be determined following the selection of the SEHSR Alignment through Petersburg. SEHSR will determine preliminary engineering for the Richmond to Petersburg section. Once the SEHSR alignment is finalized, this project and subsequent analyses will determine in detail the necessary engineering to provide the connection.

The NS Main Line is a high-volume double track mainline between Petersburg (Poe), and Brico (Kilby) (where the NS line crosses the CSXT Portsmouth Subdivision), 51 miles long, with no curves. Current freight train speed on the line is 60 mph for intermodal trains and 50 miles per hour for other freight trains. There is currently one passing track on the line between Poe and Kilby and it is slightly more than one-half-mile long.

It is proposed that the higher speed rail service would utilize the former Virginian (VGN) route between Kilby and South Norfolk, rather than the entire length of the NS main line between Kilby and South Norfolk. This is to avoid the high level of traffic and train activity in the vicinity of Portlock Yard and the operation of high-speed

[24] Following a series of major derailments in the 1970s, the Federal Railroad Administration was given statutory authority to define track safety standards for all U.S. railroads (49 Code of Federal Regulations 213.9). These standards defined nine track classes, with Class 1 being the lowest and Class 9 the highest. Specific geometry and condition standards were established for each class of track, and speed limits (defined separately for freight and passenger traffic) also were defined. Specific signal and train control standards also were developed for higher-speed track.

trains through downtown Suffolk on the NS line. The VGN route also has the advantage of a suburban station site at the proposed Bowers Hill Rail station. The line's favorable geometry makes it a good candidate for higher speed rail service; however, the numerous grade crossings present potential problems that would need to be mitigated.

The corridor of the former VGN Jarratt Subdivision - Algren to South Norfolk would be upgraded to connect with the NS main line at South Norfolk (milepost V 5.2) where the VGN crosses the N&W on its way to the Sewells Point Terminal. The proposed route would continue on the NS main line to the proposed Downtown Norfolk Rail station near Harbor Park Stadium. The station tracks would be located west of the Park Avenue grade crossing. Station platforms would be located on the west, or downtown Norfolk side of the double-track NS Lamberts Point Line. Two station tracks would be located adjacent to the line, and the platform would be located between them.

3.3.4 Environmental Consequences

3.3.4.1 Status Quo Alternative

The Status Quo Alternative involves continuing the current passenger rail operations along the Peninsula/CSXT route. This involves two daily round-trip trains operating at conventional speeds. Existing operational relationships between passenger and freight service would remain. No infrastructure improvements, other than routine maintenance, would be provided under this alternative.

At-grade railroad crossings with highways, trains and automobiles are exposed to the risk of collision. The risk for such incidences would remain the same under the Status Quo Alternative. Because higher speed rail would not be operating on this route, no high-speed related grade crossing improvements would be implemented. If such improvements are proposed by other projects within the study area, then an analysis of impacts associated with those improvements and mitigation strategies would be the responsibility of the implementing agency.

Furthermore, the potential for effects on pedestrian safety would remain the same as it is today. Given that the majority of the existing tracks along both corridors are at-grade, the risk of pedestrians crossing the tracks illegally is always a concern. Since no infrastructure improvements are considered as part of the Status Quo Alternative, there would be no impacts to railroad operations other than for routine maintenance.

3.3.4.2 No Action Alternative

The No Action Alternative includes planned improvements by Amtrak to add one additional round-trip train, operating at conventional speeds, along the Peninsula/CSXT route. In total, three round-trip daily trains would be provided.

Under the No Action Alternative, it is assumed that the existing conditions would remain the same except for the addition of one daily train. Existing operational relationships between passenger and freight service would remain. Because higher speed rail would not be operating on this route, no high-speed related grade crossing improvements would be implemented. If such improvements are proposed by other projects within the study area, then an analysis of impacts associated with those improvements and mitigation strategies would be the responsibility of the implementing agency.

Furthermore, the potential for effects on pedestrian safety would remain the same as it is today. Given that the majority of the existing tracks along both corridors are at-grade, the risks of pedestrians crossing the tracks illegally are always a concern. Since no infrastructure improvements are considered as part of the No Action Alternative, there would be no impacts to railroad operations other than for routine maintenance.

3.3.4.3 Build Alternative 1 Peninsula Conventional/Southside Higher Speed

Build Alternative 1 combines the No Action Alternative (one additional daily train initiated by Amtrak on the Peninsula/CSXT route) with higher speed passenger rail service along the Southside/NS route. Thus, three daily round-trip trains operating at conventional speeds would operate along the Peninsula/CSXT route and six daily round-trip trains operating at either 90 or 110 mph would operate along the Southside/NS route.

If this alternative is selected, operational relationships between passenger and freight rail service would be assessed during Tier II analysis if this alternative is selected. Appropriate infrastructure would be provided to enable operations without conflicts between freight and passenger rail services.

The increase in rail traffic frequency and the higher speeds associated with this alternative would increase the risk exposure for automobile collisions with trains at highway-rail crossings. Improved passenger rail service can and should be accompanied by reduced risk of motor vehicle/train collisions. To reduce this exposure to collision, the number of at-grade crossings should be reduced to improve safety. Accordingly, this study has developed a preliminary program to manage the approximately 124 public and private crossings on the active and abandoned rail lines that have been identified as potential passenger rail routes. These measures and considerations are discussed in Section 3.3.5 Potential Mitigation Strategies.

For speeds up to 90 mph, it is estimated that 17 percent of the public grade crossings and 42 percent of private grade crossings potentially would be closed on the Southside/NS route. Table 3-14 presents a preliminary count of the crossings that would remain open. Additional design analysis and consultations with citizens and elected officials in each route would precede the identification of grade crossing closures and separations. For grade crossings that would likely remain open, the higher speed rail service implementation program would install safety enhancements to effectively create a sealed corridor 25. Detailed analysis of grade crossing closures and required safety measures to mitigate specific impacts of the closures, including costs, would be conducted during the Tier II analysis of the Preferred Alternative.

For speeds of 110 mph, it is estimated that 45 percent of the public grade crossings and 71 percent of private grade crossings potentially would be closed on the Southside/NS route. Additional design analysis and consultations with citizens and elected officials in each route would precede the identification of grade crossing closures and separations. Table 3-15 indicates the number of public and private crossings under the assumption of 110-mph operating speeds. For grade crossings that would likely remain open, the higher speed rail service implementation program would install safety enhancements to effectively create a sealed corridor. Detailed analysis of grade crossing closures and required safety measures to mitigate specific impacts of the closures, including costs, would be conducted during Tier II analysis of the Preferred Alternative.

Some areas along the Southside/NS route affected by higher speed passenger rail service would likely experience greater potential for impacts to pedestrian routes and safety. These areas are the proposed Bowers Hill Rail Station and Downtown Norfolk Rail Station, because rail stations do not currently exist in these areas. As planning for the project progresses, specific pedestrian and safety concerns and measures would need to be identified. The Tier I Draft EIS has assumed that ten percent of each route would be fenced. Potential mitigation strategies for improved pedestrian safety are provided in Section 3.3.5.

Effects on the railroad would result from construction activities and operational changes related to increased passenger rail frequencies. Construction of the higher speed rail system would involve a limited number of changes in the railroad corridor and the upgrade of existing track and facilities within the railroad owned right-of-way. An initial broad range of improvements has been defined as necessary to provide adequate track structure and sufficient capacity to reliably operate freight rail, support the introduction of higher speed passenger rail service, and provide the same level of service and operational capacity for freight operations that presently exists along the analyzed routes. Some of the related enhancements that would occur as a result of implementing higher speed passenger rail service may provide a benefit to freight operations.

The types of improvements that would be included are projects to:

- Upgrade the track structure,
- Upgrade signal systems,
- Realign selected curves to permit higher operating speeds and reduce trip time,

[25] A "sealed corridor" is defined by the FRA as innovative, low-cost techniques to significantly reduce or eliminate incidents of highway vehicles bypassing crossing gates, which would virtually eliminate grade crossing incidents.

Table 3-14: Number of Grade Crossings That Will Remain Open – 90 mph Train Speeds

Segment	Line	Miles	Number of Public Crossings	Public Crossings per Mile	Number of Private Crossings	Private Crossings per Mile	Total Crossings	Total Crossings per Mile
Southside/NS Route								
City of Petersburg	Petersburg-Kilby	1.55	0	0.00	0	0.00	0	0.00
Prince George County	Petersburg-Kilby	10.3	2	0.19	1	0.10	3	0.29
Sussex County	Petersburg-Kilby	16.85	6	0.36	3	0.18	9	0.53
Southampton County	Petersburg-Kilby	8.36	1	0.12	3	0.36	4	0.48
Isle of Wight County	Petersburg-Kilby	9.19	4	0.44	1	0.11	5	0.54
City of Suffolk	Petersburg-Kilby	5.45	3	0.55	0	0.00	3	0.55
City of Suffolk	Kilby Connection	1.5	0	0.00	0	0.00	0	0.00
City of Suffolk	Virginian - Kilby to Algren	9.81	6	0.61	3	0.31	9	0.92
City of Chesapeake	Virginian - Kilby to Algren	1.21	2	1.65	0	0.00	2	1.65
City of Chesapeake	Virginian - Algren to S. Norfolk	10.18	8	0.79	3	0.29	11	1.08
City of Chesapeake	NS Main Line	1.64	3	1.83	0	0.00	3	1.83
City of Norfolk	NS Main Line	1.26	3	2.38	2	1.59	5	3.97
Route Sub-Total		**77.3**	**38**	**0.49**	**16**	**0.21**	**54**	**0.70**
Peninsula/CSXT Route								
City of Richmond	Richmond to Newport News	1.26	0	0.00	0	0.00	0	0.00
Henrico County	Richmond to Newport News	13.74	5	0.36	1	0.07	6	0.44
Charles City County	Richmond to Newport News	4	2	0.50	2	0.50	4	1.00
New Kent County	Richmond to Newport News	13	6	0.46	16	1.23	22	1.69
James City County	Richmond to Newport News	12.3	3	0.24	8	0.65	11	0.89
City of Williamsburg	Richmond to Newport News	6.1	2	0.33	0	0.00	2	0.33
York County	Richmond to Newport News	2.4	0	0.00	0	0.00	0	0.00
James City County	Richmond to Newport News	1.45	0	0.00	0	0.00	0	0.00
City of Newport News	Richmond to Newport News	19.65	4	0.20	1	0.05	5	0.25
Route Sub-Total		**73.9**	**22**	**0.30**	**28**	**0.38**	**50**	**0.68**

Table 3-15: Number of Grade Crossings That Will Remain Open – 110 mph Train Speeds

Segment	Line	Miles	Number of Public Crossings	Public Crossings per Mile	Number of Private Crossings	Private Crossings per Mile	Total Crossings	Total Crossings per Mile
Southside/NS Route								
City of Petersburg	Petersburg-Kilby	1.55	0	0	0	0	0	0
Prince George County	Petersburg-Kilby	10.3	0	0	0	0	0	0
Sussex County	Petersburg-Kilby	16.85	0	0	0	0	0	0
Southampton County	Petersburg-Kilby	8.36	0	0	0	0	0	0
Isle of Wight County	Petersburg-Kilby	9.19	0	0	0	0	0	0
City of Suffolk	Petersburg-Kilby	5.45	3	0.55	0	0	3	0.55
City of Suffolk	Kilby Connection	1.5	0	0	0	0	0	0
City of Suffolk	Virginian - Kilby to Algren	9.81	6	0.61	3	0.31	9	0.92
City of Chesapeake	Virginian - Kilby to Algren	1.21	2	1.65	0	0	2	1.65
City of Chesapeake	Virginian - Algren to S. Norfolk	10.18	8	0.79	3	0.29	11	1.08
City of Chesapeake	NS Main Line	1.64	3	1.83	0	0	3	1.83
City of Norfolk	NS Main Line	1.26	3	2.38	2	1.59	5	3.97
Route Sub-Total		**77.3**	**25**	**0.32**	**8**	**0.1**	**33**	**0.43**
Peninsula/CSXT Route								
City of Richmond	Richmond to NPN	1.26	0	0	0	0	0	0
Henrico County	Richmond to NPN	13.74	3	0.22	0	0	3	0.22
Charles City County	Richmond to NPN	4	2	0.5	1	0.25	3	0.75
New Kent County	Richmond to NPN	13	3	0.23	8	0.62	11	0.85
James City County	Richmond to NPN	12.3	2	0.16	6	0.49	8	0.65
City of Williamsburg	Richmond to NPN	6.1	1	0.16	0	0	1	0.16
York County	Richmond to NPN	2.4	0	0	0	0	0	0
James City County	Richmond to NPN	1.45	0	0	0	0	0	0
City of Newport News	Richmond to NPN	19.65	2	0.1	0	0	2	0.1
Route Sub-Total		**73.9**	**13**	**0.18**	**15**	**0.2**	**28**	**0.38**

- Reconfigure, relocate, eliminate or install interlockings,
- Construct additional trackage,
- Restore abandoned track,
- Improve safety at the highway-rail grade crossings,
- Install right-of-way fencing, and
- Improve stations.

Both freight and passenger train operations could be affected during construction of any of the rail Build Alternatives between Richmond and Newport News and Petersburg and Kilby. The construction of a Southside/NS Alternative could affect freight operations on NS tracks between Petersburg and Kilby and between South Norfolk and Norfolk and operations between Petersburg and Richmond on CSXT. The construction of the Peninsula/CSXT Alternative could affect freight and Amtrak operations on the CSXT tracks between Richmond and Newport News. The impacts would consist of speed restrictions on operations through construction zones and possible track downtime to allow for construction of connections and upgrades of existing tracks. However, mitigation measures and best practices would be implemented to minimize significant adverse impacts during construction. Freight rail and intercity passenger rail traffic would be maintained throughout the construction period. Coordination with the railroads would minimize any adverse effects. The following describes the critical locations of potential conflicts:

The primary locations for potential operational conflicts along the Peninsula/CSXT route are the following:

- The longer segment between Fulton Yard and Toppings, and
- The combination of the single track east of Oriana and the Newport News Terminal area where coal cars are moved to and from the coal piers.

Three strategies have been identified for the design of the features and operations of these locations to minimize the probability of schedule conflicts, as follows:

1. Add additional segments of double track, modify interlockings and make additional operational improvements that would:
    a) Minimize freight and passenger train conflicts, and
    b) Provide sufficient lengths of double track where a passenger train could overtake and pass a slower train without either train being required to stop.
2. Design passenger schedules so that trains traveling in opposite directions pass at locations where freight operations would not be disrupted, and
3. Recommend operating strategies that would minimize conflicts in congested yard and terminal areas.

The primary locations for potential operational conflicts along the Southside/NS route are the following:

- The CSXT S Line from Main Street Station to Centralia,
- The CSXT S Line from Centralia to Colonial Heights,
- The CSXT A Line from Centralia to Petersburg,
- Petersburg,
- NS Main Line between Petersburg and Suffolk, and
- Suffolk to Norfolk Terminal.

A direct rail connection at Petersburg from Richmond to Norfolk has not existed for many years. Ongoing environmental studies of the SEHSR project managed by the FRA, NCDOT and DRPT are addressing the issues described in the first four bullets above. A subsequent effort will address the selection of the

recommended route to Raleigh, NC and the connection between the CSXT main line through Petersburg and the NS main line to Norfolk.

This Tier I Draft EIS concentrates primarily on the issues related to intercity passenger and freight rail operations between Petersburg and Norfolk. Consequently, the environmental impacts associated with the alternatives between Richmond and Petersburg are being studied by the SEHSR and are incorporated into this report by reference.

NS requires that any higher speed passenger rail service that operates at speeds greater than 90 mph within their corridor be operated on separate dedicated tracks. However, Section 24308 of Title 49 of the United States Code provides that if a rail carrier refuses to allow accelerated speeds on their tracks by trains operated by or for Amtrak, Amtrak may apply to the Secretary of Transportation (Secretary) for an order requiring the carrier to allow the accelerated speeds. The Secretary is charged with determining whether the accelerated speeds are safe or unsafe and which improvements would be required to make accelerated speeds safe and practicable. After an opportunity for a hearing on the matter, the Secretary shall establish the maximum allowable speeds of Amtrak trains on terms the Secretary decides are reasonable.

3.3.4.4 Build Alternative 2a Peninsula Higher Speed/Southside Conventional

Build Alternative 2a would provide higher speed passenger rail service along the Peninsula/CSXT route and conventional speed passenger rail service along the Southside/NS route.

Operational relationships between passenger and freight rail service on the Peninsula would be assessed during Tier II analysis. Appropriate infrastructure would be provided to enable operations without conflicts between freight and passenger rail services.

Increasing existing rail speeds up to 90 mph would not necessarily require closure of additional at-grade crossings on the Peninsula/CSXT route. Detailed analysis of potential grade crossing closures requested by communities and other required safety measures to mitigate specific impacts of the closures, including costs, would be conducted during the Tier II analysis.

For speeds of 110 mph, DRPT estimates that 40 percent of the public grade crossings and 25 percent of private grade crossings potentially would be closed on the Peninsula/CSXT route. Additional design analysis and consultations with citizens and elected officials in each route would precede the identification of crossing closures and separations. Table 3-15 indicates the number of public and private grade crossings under the assumption of 110 mph maximum speeds. For grade crossings that would likely remain open, the higher speed rail service implementation program would install safety enhancements to effectively create a sealed corridor. Detailed analysis of grade crossing closures and required safety measures to mitigate specific impacts of the closures, including associated costs, would be conducted during Tier II analysis.

The passenger rail service along the Southside/NS route associated with this alternative would not require the closing of any at-grade crossings due to the service operating at conventional speeds.

Some areas along the Peninsula/CSXT route affected by higher speed passenger rail service would likely experience a greater potential for impacts to pedestrian safety. These areas principally are associated with two stations, the existing Williamsburg Amtrak Station and the proposed new Downtown Newport News Rail Station. At the Williamsburg Amtrak Station, a park-and-ride facility is planned. One option for this facility may be to add a park-and-ride facility north of the tracks, opposite the station. This could pose a potential hazard with pedestrians trying to access the station by crossing active railroad tracks. Currently no station exists in Downtown Newport News. The addition of this facility may create potential pedestrian safety concerns. Additional pedestrian safety concerns include people trying to cross the tracks at random locations along the route. As planning for the project progresses, specific safety concerns and measures would need to be identified in the Tier II analysis. The Tier I Draft EIS has assumed that ten percent of each route would be fenced.

Some areas along the Southside/NS route will be affected by the introduction of conventional speed passenger rail service. Due to the additional train frequencies associated with implementing passenger rail

service along this route, pedestrian conflicts could increase with people randomly crossing the tracks along the route. In addition, the proposed Bowers Hill Rail Station and the proposed Downtown Norfolk Rail Station may pose additional pedestrian safety concerns because stations do not currently exist in these areas.

The potential operational conflicts resulting from Build Alternative 2a would be of the same nature as described for Alternative 1.

3.3.4.5 Build Alternative 2b Higher Speed Peninsula Only

Build Alternative 2b provides nine daily round-trip trains along the Peninsula/CSXT route operating at higher speeds of 90 or 110 mph. No passenger rail service would be provided to the Southside/NS route.

Operational relationships between passenger and freight rail service on the Peninsula would be assessed during Tier II analysis. Appropriate infrastructure would be provided to enable operations without conflicts between freight and passenger rail services.

Increasing existing rail speeds up to 90 mph would not necessarily require closure of additional at-grade crossings on the Peninsula/CSXT route. Detailed analysis of potential grade crossing closures requested by communities and other required safety measures to mitigate specific impacts of the closures, including costs, would be conducted during the Tier II analysis of the Preferred Alternative.

For speeds of 110 mph, DRPT estimates that 40 percent of the public grade crossings and 25 percent of private grade crossings potentially would be closed on the Peninsula/CSXT route. Additional design analysis and consultations with citizens and elected officials in each route would precede the identification of grade crossing closures and separations. Table 3-15 indicates the number of public and private grade crossings that would remain open under the assumption of 110 mph maximum speeds. For grade crossings that would likely remain open, the higher speed rail service implementation program would install safety enhancements to effectively create a sealed corridor. Detailed analysis of grade crossing closures and required safety measures to mitigate specific impacts of the closures, including associated costs, will be conducted during Tier II analysis

Some areas along the Peninsula/CSXT route affected by higher speed passenger rail service would likely experience a greater potential for impacts to pedestrian safety. These areas are principally associated with two stations, the existing Williamsburg Station and the proposed new Downtown Newport News Station. At the Williamsburg Station, a park-and-ride facility is planned. One option for this facility may be to add a park-and-ride facility north of the tracks, opposite the station. This could pose a potential hazard with pedestrians trying to access the station by crossing active railroad tracks. Currently no station exists in Downtown Newport News. The addition of this facility may create potential pedestrian safety concerns. Additional pedestrian safety concerns exist where pedestrians may choose to cross the tracks at random locations along the route. If this alternative is selected, as planning for the project progresses, specific safety concerns and measures would need to be identified in the Tier II analysis if this alternative is selected. For example, fencing may be a possible solution to address pedestrian safety concerns. The Tier I Draft EIS has assumed that ten percent of each route would be fenced.

The potential railroad operating conflicts resulting from Build Alternative 2b would be the same as described for Alternative 2a for the Peninsula/CSXT route, and perhaps to a greater extent given that there would be an additional nine daily round-trip trains along the CSXT line. There would be no effects to the Southside/NS route.

3.3.5 Potential Mitigation Strategies

Grade Crossings - Potential mitigation strategies would need to be identified through discussion and coordination with the freight and passenger rail operators, the FRA, the FHWA along with appropriate state and local authorities, and the community. Typical mitigation measures include grade separation or elimination, where warranted, and the construction of access roads that would provide access to a location where either a fully protected four-quadrant gate or grade separation is warranted. A more detailed analysis after the selection of a specific alternative will identify specific concerns and appropriate mitigation. The Tier II analysis will address the more detailed analysis.

Implementation of higher speed rail service for the Richmond/Hampton Roads Passenger Rail Project would result in higher train speeds and frequencies over existing rail lines and could involve restoration of train service on the now abandoned Virginian Railway line in Suffolk. For these reasons, highway-rail crossing safety would require concerted attention as the planning and design process continues. In particular, each crossing would require study, both individually and in combination with neighboring crossings, to assess the degree of risk that it poses, the opportunities for mitigating that risk, and the cost-effectiveness of the various treatment options. Risk assessment depends on a host of factors including the geometry of the crossing; the type, speed, and volume of motor vehicle and rail traffic; and the protective devices in place or available. Community needs, including access to nearby properties such as hospitals and health care facilities, require particular attention.

Grade crossing hazards can be eliminated through grade separations and crossing closures. Crossing hazards can be reduced through safety measures including four-quadrant gates, barriers that have longer gate arms and median barriers. These measures have been implemented by numerous states to treat the different types of crossings across a specific route. The North Carolina Sealed Corridor Initiative[26], for example, serves as a model for grade crossing hazard elimination through the use of creative, cost-effective solutions. Video surveillance at specific unimproved and improved crossings has proven that advanced highway-rail crossing protection systems, such as four-quadrant gates and median barriers, reduce driver "run-around" violations by as much as 98 percent and thus significantly reduce the risk of train/auto collisions.

The elimination of grade crossings to achieve higher speed passenger rail service would require mitigation measures to avoid potential negative impacts on localized traffic congestion and emergency response time as well as access and egress to businesses and residences. A detailed analysis of the environmental consequences of grade crossing closures will be necessary when a specific alternative has been identified. Such detailed technical analysis of grade crossing closure impacts can be deferred to Tier II after an alignment is selected.

Any comprehensive grade crossing plan needs to address the full range of improvement options. These include consolidating groups of crossings, grade-separating heavily used crossings, closing selected crossings and applying known techniques for reducing hazards at the remaining open crossings. In addition, proper treatments must be applied to private crossings where fatalities can and do occur despite the infrequency of use by motor vehicles.

Specific Grade Crossing Considerations[27] - Many engineering and operational considerations would affect the ultimate details of a comprehensive grade crossing plan. The considerations are discussed in the following subsections.

Train Speeds - All other things being equal, the highest level of protection would be provided at remaining grade crossings through which passenger trains would operate at speeds greater than 90 mph.

Constant Warning Times - Higher train speeds would require the timing in the track circuits (which actuate grade crossing gates and flashing lights) to be held down for a longer period of time to initiate warnings sufficiently in advance of the arrival of the faster trains. The warning time at crossings with fixed circuits must be set for the fastest possible train. However, this creates a potential problem when a slow train approaches the crossing and the gates are held down for an inordinate amount of time. Some motorists lose patience with the situation, and drive around the gate at the risk of a collision. Constant Warning Time circuits could offset this problem by automatically adjusting the length of the warning to a time appropriate to the speed of each individual oncoming train.

Four-Quadrant Gates and Median Barriers – A barrier system where at-grade crossings can remain open may be implemented through a system of four-quadrant gates wherein four gates, instead of two, are lowered across the traffic lanes blocking both directions of traffic on both sides of the rail line and median barriers are placed down the center of the roadway. The FRA's recent experience has shown that four-quadrant gates

[26] http://www.bytrain.org/Safety/sealed.html.
[27] The information in the following sections is based on material initially developed for the 2004 *Transportation Planning for the Richmond-Charlotte Corridor Report,* published by the FRA.

and median barriers effectively obstruct motor vehicle operators from driving around the gates after they are lowered.

Effect on Train Speed of Crossings Located on Curves - Raising the maximum authorized speed on a curve containing a grade crossing creates serious concerns. Mitigation measures might not be practical on a heavily traveled street or highway and may require that these crossings be closed or grade-separated. Analysis will be required to develop a recommendation for each crossing.

Sidings and Crossings - Railroad sidings, either to be constructed or extended, should be in place to minimize the number of grade crossings that would be blocked by stopped freight or passenger trains waiting to pass by another train. Planning for grade crossing improvements needs to take into consideration the location of sidings. Community needs for access by emergency motor vehicles demand careful attention in locating, treating, or eliminating highway-rail grade crossings.

Contemplated Grade Crossing Program - Based on all the considerations described above, the DRPT has developed a potential list of grade crossing actions that would support the trip-time goals and safety prerequisites of high-speed rail development in the corridor. The contemplated options include:

- Eliminating grade crossings, which can be accomplished by:
  - Closing the crossing to vehicular traffic,
  - Providing a grade separation, or
  - Relocating the railroad;
- Upgrading protection devices, for example from crossbucks to gates and flashing lights, or from gates that cover only half the road in each direction to four-quadrant gate barriers that cover the entire road to block drivers from “running around” the crossing. For speed options higher than 90 mph, the corridor should be sealed using grade separations and four-quadrant gate barriers;
- Keeping crossings as-is in areas where the level of protection is already appropriate for the contemplated train speeds and road traffic levels;
- Reopening abandoned crossings with upgraded protection;
- Expanding or moving crossings to comply with the engineering improvements described in other sections of this document (e.g.: new sidings or changes to curves); or
- Adding well-protected crossings where they do not exist today. The ratio of crossing eliminations (closures, separations and relocations) to crossing additions for the corridor as a whole is projected as four to one.

Pedestrian Safety Mitigation - Potential mitigation strategies will need to be identified through discussion and coordination with the freight and passenger rail operators, the FRA, and the FHWA along with appropriate state and local authorities. Typical mitigation measures include pedestrian grade separation, where warranted, and the construction of protective fencing to separate pedestrian pathways and activities from the railroad right-of-way and near locations where trespassing is likely to occur such as schools, churches, and other facilities that attract pedestrian traffic. As more detailed analysis is conducted when a specific route and related station sites are selected, specific concerns and appropriate mitigation will be identified. This will be addressed during the Tier II environmental impact analysis.

Strategies to Mitigate Freight Railroad and Amtrak Impacts - Three strategies have been identified for the design of features and operations to increase service efficiency along these routes:

1. Create track connections, modify interlockings, and make additional operational improvements that would result in segments of track where freight and passenger train conflicts would be minimized in Petersburg (west end) and at Suffolk (east end);
2. Provide a passing siding (second or third track) of sufficient length in the most effective location so that passenger trains could pass slower trains without either train being required to stop;

3. Design passenger schedules so that trains traveling in opposite directions "meet" in terminals or pass at locations where freight and passenger rail operations would not be disrupted.

3.3.6 Subsequent Analysis

Subsequent analysis would include collecting more detailed information pertaining to grade crossings, pedestrian safety and rail operations for the Preferred Alternative. As mentioned in Section 3.3.5 Potential Mitigation, community outreach and meetings with local officials, rail operators, the FRA and the FHWA would have to occur to determine specific highway-rail crossing closures or safety improvements. In addition, statistics pertaining to safety and other specific areas of potential concern could be identified and appropriate mitigation proposed. Greater coordination with the FRA, rail operators, and Amtrak would also be undertaken to determine specific effects of the project on current freight and passenger rail service operations.

3.4 Air Quality

An air quality evaluation was conducted to identify the potential impacts related to the proposed alternatives. In general, however, the proposed high-speed rail project is expected to contribute to the region's long-term attainment of clean air goals by contributing to an overall reduction in vehicle emissions. The results of the air quality evaluation are described in the following sections.

3.4.1 Methodology

3.4.1.1 Relevant Pollutants

"Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, or reducing human or animal health. Regulations for air pollutant emissions exist to protect human health and welfare, and the environment.

The federal agency that develops and enforces the regulations that help govern air quality is the Environmental Protection Agency (EPA). The 1970 Federal *Clean Air Act* established *National Ambient Air Quality Standards* (NAAQS) to protect the public health. Eight air pollutants have been identified by the EPA as being of concern nationwide: carbon monoxide, sulfur oxides, hydrocarbons, nitrogen oxides, ozone, particulate matter sized 10 microns or less, particulate matter with a size of 2.5 microns or less and lead. The sources of these pollutants, their effects on human health, and their concentrations in the atmosphere vary considerably. A brief description of each pollutant is given below.

Carbon Monoxide - Carbon monoxide (CO) is a colorless and odorless gas that is a product of incomplete combustion. In most areas, motor vehicles are responsible for the major portion of ambient CO levels. CO is absorbed by the lungs and reacts with hemoglobin to reduce the oxygen-carrying capacity of the blood. At low concentrations, CO has been shown to aggravate the symptoms of cardiovascular disease. It can cause headaches and nausea, and at sustained high concentration levels, can lead to coma and death.

Sulfur Oxides - Sulfur Oxides (SO_X) constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of great importance. The health effects of SO_X include respiratory illness, damage to the respiratory tract, and aggravation of respiratory diseases such as asthma, bronchitis and emphysema. Motor fuels, particularly diesel fuel, contain small amounts of sulfur that are oxidized and emitted in vehicle exhaust.

Hydrocarbons - Hydrocarbons (HC) include a wide variety of organic compounds emitted principally from the storage, handling and use of fossil fuels. Hydrocarbons are evaluated, along with NO, for their primary role in the formation of ozone.

Nitrogen Oxides - When combustion temperatures are extremely high, as in motor vehicle engines, atmospheric nitrogen may combine with oxygen to form various oxides of nitrogen. These pollutants are generally referred to as NOx. Of these, nitric oxide (NO) and nitrogen dioxide (NO_2) are the most significant compounds. Nitric oxide is a colorless and odorless gas. It is relatively harmless to humans and quickly converts to NO_2. NOx, like HC, is of concern primarily because of its role in the formation of ozone.

Ozone - Ozone (O_3) is a strong oxidizing agent and a pulmonary irritant that affects the respiratory mucous membranes, other lung tissues and respiratory functions. These effects are directly related to the total ozone concentration and can occur at very low exposure levels. Exposure to ozone can result in symptoms such as tightness in the chest, coughing, and wheezing, and can ultimately result in asthma, bronchitis, and emphysema. Volatile Organic Compounds (VOCs) are a general class of hydrocarbons (compounds containing hydrogen and carbon) and are a precursor to the formation of the pollutant ozone. When VOCs and nitrogen oxides accumulate in the atmosphere and are exposed to the ultraviolet component of sunlight, formation of ozone occurs. While concentrations of VOCs in the atmosphere are not generally measured, ozone is measured and used to assess potential health effects.

Particulate Matter - Particulate matter (PM), is composed of small solid particles and liquid droplets. Suspended particulates refer to particles less than 100 micrometers (or microns) in nominal aerodynamic diameter, and PM10 refers to particulate matter with a diameter of 10 microns and smaller. Particulates enter the body by way of the respiratory system. Particulates over 10 microns in size remain in the nose and throat and are readily expelled. Particles 10 microns and smaller can reach the air ducts (bronchi) and the air sacs (alveoli). These fine particulates have been associated with increased respiratory diseases such as asthma, bronchitis, and emphysema; cardiopulmonary disease (heart attack); and cancer. In general, the particulates may include dust, soot, and smoke which may be irritating but not usually poisonous. Particulates may also include bits of solid or liquid substances that may be highly toxic. Of particular concern are those particles that are smaller than or equal to 10 microns and 2.5 microns in size, PM10 and PM2.5, respectively. The data collected through many nationwide studies indicates that most of the PM10 is the product of fugitive dust, wind erosion and agricultural and forestry sources, while a small portion is the product of fuel combustion processes. In the case of PM2.5, the combustion of fossil fuels accounts for a significant portion of this pollutant. Airborne particulate matter has a negative impact on the respiratory system.

Lead - Lead (Pb) is no longer considered to be a pollutant of concern for transportation-related projects. The major source of lead in ambient air was from motor vehicles burning fuels containing lead additives. However, lead emissions from these sources have been nearly eliminated as unleaded gasoline has replaced leaded gasoline nationwide.

3.4.1.2 Pollutants of Concern

The pollutants that are most important for this air quality impact analysis are those that can be traced principally to motor vehicle engines and electrical power plants. In the study area, ambient concentrations of CO and O_3 are predominantly influenced by roadway motor vehicle activity. Emissions of HC, NOx and PM10/2.5 come from both mobile and stationary sources while emissions of SO_X and Pb are associated mainly with various stationary sources. Pollutant emissions from diesel locomotives are expected to be minor. This is partly due to the small proportion of existing and expected future train activity in the project study area compared with existing and expected roadway motor vehicle activity as well as the higher speed at which trains travel. In addition, EPA locomotive emission regulations are anticipated to result in a gradual reduction in the level of emissions generated by train activity in the foreseeable future.

CO is the primary pollutant used to indicate the potential for adverse air quality impacts from motor vehicles in general, and at roadway intersections in particular. This is because roadway motor vehicles produce most of the ambient CO, and emission rates of CO from vehicles are relatively high compared to emissions of other pollutants. The federal and state ambient air quality standards are set up in such a way that, should adverse impacts occur, the CO standard would most likely be exceeded first. Accordingly, CO is the main pollutant of concern for the air quality analysis.

Similarly, because ozone is a regional pollutant that is formed in the presence of VOC and NO_X, ozone is evaluated indirectly through its precursors. However, because the CO standard would be exceeded first before either NO_2 or VOC, only CO is included in the modeling analysis. As a result, concentrations of ozone are typically measured directly in the atmosphere rather than through modeling predictions.

3.4.2.2 Legal and Regulatory Context

The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts (FRA Docket No EP-1, Notice 5, May 26, 1999), states under the topic of Air Quality, “There should be an assessment of

the consistency of the alternatives with Federal and State plans for the attainment and maintenance of air quality standards."

The *Clean Air Act* of 1970, as amended, is the basis for most federal air pollution control programs. The EPA under the Clean Air Act regulates air quality nationally. The EPA delegates authority to the Virginia Department of Environmental Quality (VDEQ) for monitoring and enforcing air quality regulations in the Commonwealth of Virginia. The *Virginia State Implementation Plan* (SIP), developed in accordance with the Clean Air Act, contains the major Commonwealth-level requirements with respect to transportation in general. VDEQ is responsible for preparing the SIP and submitting it to the EPA for approval. VDEQ also works with local and regional agencies that have air quality responsibilities.

.Under the authority of the Clean Air Act, the EPA established a set of *National Ambient Air Quality Standards* (NAAQS) for various "criteria" air pollutants. The NAAQS and the *Virginia Ambient Air Quality Standards*, which are identical, are listed in Table 3-16[28]. Presently, there are NAAQS for six criteria pollutants: O_3, CO, NO_2, SO_2, PM of diameter 10 microns or less (PM10) and 2.5 microns or less (PM2.5), and Pb. Compliance with these standards must be achieved by any project to be constructed in the Commonwealth of Virginia.

Table 3-16: National and Virginia Ambient Air Quality Standards

Pollutant	Standard Type	Averaging Period	Standard Value
Carbon Monoxide (CO)	Primary and Secondary[b] Primary and Secondary	8-Hour average 1-Hour average	9 ppm (10 mg/m^3)[c] 35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO2)	Primary and Secondary	Annual arithmetic mean	0.053 ppm (100 µg/m^3)[c]
Ozone (O3)	Primary and Secondary	1-Hour average 8-Hour average	0.12 ppm (235 µg/m^3)[d] 0.08 ppm (155 µg/m^3)
Particulate Matter (PM10)	Primary and Secondary	Annual arithmetic mean 24-Hour average	50 µg/m^3 [e] 150 µg/m^3
Particulate Matter (PM2.5)	Primary and Secondary	Annual arithmetic mean 24-Hour average	15 µg/m^3 65 µg/m^3
Lead (Pb)	Primary and Secondary	Quarterly mean	1.5 µg/m^3
Sulfur Dioxide (SO_2)	Primary Primary Secondary	Annual arithmetic mean 24-Hour average[f] 3-Hour average	0.03 ppm (80 µg/m^3) 0.14 ppm (365 µg/m^3) 0.50 ppm (1300 µg/m^3)

a Short-term standards (1 to 24 hours) are not to be exceeded more than once per calendar year.
b Former national secondary standards for carbon monoxide have been repealed.
c Pollutant concentrations are reported in parts per million (ppm), milligrams per cubic meter (mg/m^3) or micrograms per cubic meter (µg/m^3).
d Maximum daily 1-hour (8-hour) average. The ozone standard is attained when the expected number of days with maximum hourly (8-hourly) average concentrations above the value of the standard, averaged over a three-year period, is less than or equal to one.
e For each particle size, the annual PM standard is met when the three-year average of the annual mean concentration is less than or equal to the value of the standard. The 24-hour PM10 (PM2.5) standard is met when the three-year average of the annual 99th (98th) percentile values of the daily average concentrations is less than or equal to the value of the standard.
f National standards are block averages rather than moving averages.
Note: CO, NO_2, O_3, and PM are transportation related pollutants
Source: National (40 CFR 50) and Virginia (9 VAC 5, Chapter 30) Primary and Secondary Ambient Air Quality Standards.

The Clean Air Act also requires the EPA to specify geographic areas of the country that have measured pollutant concentrations exceeding the levels prescribed by the air quality standards (non-attainment areas). It classifies non-attainment areas and specifies compliance deadlines for these areas. The Richmond/Hampton Roads Passenger Rail Project is located in several counties and municipalities, which are located in the EPA defined Norfolk-Virginia Beach-Newport News (Hampton Roads) and Richmond-Petersburg air quality designation areas. The Richmond-Petersburg region is currently designated as marginal non-attainment areas for 8-hour ozone. However, both areas are in attainment for 1-hour ozone and all other pollutants including CO, particulate matter (PM10 and PM2.5), NO_2, SO_2, and Pb.

[28] 40 CFR 50, National Primary and Secondary Ambient Air Quality Standards.

The Hampton Roads and the Norfolk-Richmond areas, including the study area, are in attainment for CO. However, this region is considered a maintenance area due to past violations. Thus the SIP requirements do not apply to CO with respect to the project. Both areas are also in attainment for NO_2, SO_2, PM10, PM2.5 and Pb.

Under the authority of the CAA, Federal entities are prohibited from taking actions in nonattainment or maintenance areas which do not conform to the State implementation plan (SIP) for the attainment and maintenance of the NAAQS. The purpose of conformity is to ensure Federal activities do not interfere with the budgets in the SIPs, that Federal activities cause or contribute to new violations, and to ensure attainment and maintenance of the NAAQS. FRA actions are covered under General Conformity (58 Fed. Reg. 63214).

Because the study area is located in an ozone non-attainment area, a conformity determination is required. A project conforms to the SIP if it comes from a conforming metropolitan transportation plan. The transportation plans for the region include the Richmond Area 2026 Long-Range Transportation Plan (LRTP)[29] and the Hampton Roads 2030 Regional Transportation Plan (RTP)[30]. The passenger rail project is included in the Hampton Roads long-range plans, plans that have been found by VDOT to conform to the SIP. The EPA and the FRA have concurred in that conformity determination for the RTP. Therefore, the project conforms to the SIP.

3.4.3 Existing Conditions

This section summarizes measured ambient air quality data for the region including the study area. VDEQ maintains a statewide network of monitoring stations that routinely measure pollutant concentrations in the ambient air. These stations provide data to assess compliance with the NAAQS and to evaluate the effectiveness of pollution control strategies. The relevant monitored pollutants are ozone, NO_2, CO, PM, and SO_2.

3.4.3.1 Peninsula/CSXT Route

Table 3-17 presents the maximum measured concentrations for these pollutants measured at representative monitoring stations nearest to the study area, as reported by the VDEQ for 2005.

Table 3-17: 2005 Monitored Ambient Air Quality in the Vicinity of the Peninsula/CSXT Route

Pollutant	Monitor Location	Averaging Period	Maximum Concentration	Second Maximum Concentration
Carbon Monoxide (CO)	7341 Forest Hill Avenue, Richmond	1 Hour 8 Hours	3.2ppm 1.8 ppm	3.0 ppm 1.5 ppm
	158-W, Science Museum of VA, DMV & Leigh, Richmond	1 Hour 8 Hours	2.8 ppm 1.4 ppm	2.2 ppm 1.4 ppm
	700 Shell Road, Hampton	1 Hour 8 Hours	4.8 ppm 1.5 ppm	2.2 ppm 1.4 ppm
Nitrogen Dioxide (NO_2)	158-W, Science Museum of VA, DMV & Leigh, Richmond	Annual	0. 015 ppm	Not applicable
	Shirley Plantation, Route 5, Charles City Co.	Annual	0. 019 ppm	Not applicable
Ozone (O_3)	Shirley Plantation, Route 5, Charles City Co.	1 Hour 8 Hours	0.091 ppm 0.078 ppm	0.086 ppm 0.077 ppm
	2401 Hartman Street Math & Science Ctr., Henrico Co.	1 Hour 8 Hours	0.104ppm 0.087 ppm	0.097 ppm 0.082 ppm
	700 Shell Road, Hampton	1 Hour 8 Hours	0.086 ppm 0.078 ppm	0.086 ppm 0.075 ppm
Particulate Matter (PM10)	181-A1, NOAA Lot, 2nd St & Woodis Ave., Norfolk	24 Hours Annual	47 µg/m^3 22 µg/m^3	37 µg/m^3 Not applicable

[29] 2023 Long-Range Transportation Plan, Richmond Regional Planning District Commission, Richmond, VA, April 8, 2004, http://www.richmondregional.org/.

[30] 2030 Regional Transportation Plan, Hampton Roads Planning District Commission, Chesapeake, VA, December 2007, http://www.hrmpo.org/MPO_Reports.asp.

Pollutant	Monitor Location	Averaging Period	Maximum Concentration	Second Maximum Concentration
Particulate Matter (PM2.5)	Shirley Plantation, Route 5, Charles City Co.	24 Hours Annual	30 µg/m^3 11.8 µg/m^3	26 µg/m^3 Not applicable
	2401 Hartman Street Math & Science Ctr., Henrico Co.	24 Hours Annual	32 µg/m^3 12.9 µg/m^3	28 µg/m^3 Not applicable
	4949-A Cox Road, Glen Allen, Henrico Co.	24 Hours Annual	28 µg/m^3 12.8 µg/m^3	28 µg/m^3 Not applicable
	700 Shell Road, Hampton	24 Hours Annual	27 µg/m^3 12.6 µg/m^3	27 µg/m^3 Not applicable
Sulfur Dioxide	158-W, Science Museum of VA, DMV & Leigh, Richmond	3 Hours 24 Hours Annual	0.054 ppm 0.017 ppm 0.005 ppm	0.045 ppm 0.016 ppm Not applicable
	Shirley Plantation, Route 5, Charles City Co.	3 Hours 24 Hours Annual	0.065 ppm 0.016 ppm 0.005 ppm	0.059 ppm 0.015 ppm Not applicable
	700 Shell Road, Hampton	3 Hours 24 Hours Annual	0.044 ppm 0.012 ppm 0.003 ppm	0.038 ppm 0.012 ppm Not applicable

Source: VDEQ, as reported to U.S. Environmental Protection Agency AIRData website (http://www.epa.gov/air/data/geosel.html).

3.4.3.2 Southside/NS Route

Table 3-18 presents the maximum measured concentrations for these pollutants measured at representative monitoring stations nearest to the study area, as reported by VDEQ for 2005.

Table 3-18: 2005 Monitored Ambient Air Quality in the Vicinity of the Southside/NS Route

Pollutant	Monitor Location	Averaging Period	Maximum Concentration	Second Maximum Concentration
Carbon Monoxide (CO)	7341 Forest Hill Avenue, Richmond	1 Hour 8 Hours	3.2ppm 1.8 ppm	3.0 ppm 1.5 ppm
	158-W, Science Museum of VA, DMV & Leigh, Richmond	1 Hour 8 Hours	2.8 ppm 1.4 ppm	2.2 ppm 1.4 ppm
Nitrogen Dioxide (NO_2)	158-W, Science Museum of VA, DMV & Leigh, Richmond	Annual	0. 015 ppm	Not applicable
Ozone (O_3)	Beach, Intersection of Co. Roads 655 & 654, Chesterfield Co.	1 Hour 8 Hours	0.091 ppm 0.078 ppm	0.085 ppm 0.077 ppm
	Tidewater Comm. College, Frederic Campus, Suffolk	1 Hour 8 Hours	0.084 ppm 0.080 ppm	0.084 ppm 0.076 ppm
	Tidewater Research Station, Hare Road, Suffolk	1 Hour 8 Hours	0.090 ppm 0.079 ppm	0.089 ppm 0.079 ppm
Particulate Matter (PM10)	181-A1, NOAA Lot, 2nd St & Woodis Ave., Norfolk	24 Hours Annual	47 µg/m^3 22 µg/m^3	37 µg/m^3 Not applicable
Particulate Matter (PM2.5)	6700 Strathmore Road, Roof Of Armory, Chesterfield Co.	24 Hours Annual	29 µg/m^3 12.9 µg/m^3	26 µg/m^3 Not applicable
	181-A1, NOAA Lot, 2nd St & Woodis Ave., Norfolk	24 Hours Annual	26 µg/m^3 13.4 µg/m^3	26 µg/m^3 Not applicable
	5636 Southern Boulevard, Virginia Beach	24 Hours Annual	30 µg/m^3 11.7 µg/m^3	29 µg/m^3 Not applicable
Sulfur Dioxide	158-W, Science Museum of VA, DMV & Leigh, Richmond	3 Hours 24 Hours Annual	0.054 ppm 0.017 ppm 0.005 ppm	0.045 ppm 0.016 ppm Not applicable

Source VDEQ, as reported to U.S. Environmental Protection Agency AIRData website (http://www.epa.gov/air/data/geosel.html).

3.4.4 Environmental Consequences

In order to determine the potential effects on air quality, the estimated probable annual ridership for 2025 was used to ascertain the extent to which each alternative would attract ridership by rail versus automobile. For

this Tier I Draft EIS, an estimated range of probable ridership was calculated for the year 2025 and is discussed in detail in Chapter 6. It is assumed that emissions reduction would be highly correlated to ridership attraction. To the extent that the alternatives would reduce the number of autos on the road (seven-tenths of one percent of total I-64 traffic, as described in Section 3.2.3, for example), a reduction in regional emissions and concentrations of carbon monoxide, volatile organic compounds, nitrogen oxides and particulate matter would be expected.

Table 3-19 shows the estimated range of probable ridership for 2025. This data shows a substantial increase in ridership between the Status Quo Alternative and the No Action Alternative. An increase in probable ridership is expected up to nearly three times the Status Quo ridership in the Low range and up to nearly 3.5 times the Status Quo ridership in the High range for Alternatives 1, 2a and 2b. In terms of air quality, these ridership numbers for the Build Alternatives equate to eliminating substantial numbers of vehicles from roadways in the region and associated vehicular emissions.

Table 3-19: Estimated Range of Probable Ridership (2025)

Annual Ridership	Status Quo 79 mph	No Action 79 mph	Alt 1		Alt 2a		Alt 2b	
			90 mph	110 mph	90 mph	110 mph	90 mph	110 mph
High	262,300	464,800	1,110,100	1,162,200	1,124,200	1,164,400	1,101,100	1,147,000
Low	245,500	425,700	939,600	984,200	924,600	955,000	897,800	937,000
Difference from 79 mph Status Quo Alternative								
High		202,500	847,800	899,900	861,900	899,100	838,800	884,700
Low		180,200	694,100	738,700	679,100	709,500	652,300	691,500
Difference from 79 mph No Action Alternative								
High			645,300	697,400	659,400	696,600	636,300	682,200
Low			513,900	558,500	498,900	529,300	472,100	511,300

Source: Travel Demand Methodology and Results, as revised March 2008.

The following subsections describe the probable effects of each alternative on air quality in the context of probable ridership. A detailed air quality assessment will be conducted as part of the Tier II analysis once an alternative is selected and potential station locations are evaluated in detail. At that time, the role of locomotive emissions in regional air quality would be assessed. In addition, the potential effect of project-related motor vehicle emissions on local roadways in the vicinity of stations would be assessed.

3.4.4.1 Status Quo Alternative

The Status Quo Alternative is based on existing conditions and the funded and programmed transportation improvements that will be developed and in operation by 2030. All passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT Route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made other than routine maintenance.

The Status Quo Alternative does not provide any additional passenger rail service along the Peninsula/CSXT route or any passenger rail service on the Southside/NS route. The Southside/NS route would remain as a freight rail line only. The probable 2025 ridership estimates presented in Table 3-19 indicate that regional travel volumes will increase substantially. If passenger rail service is not available to absorb a portion of these volumes, an associated increase in regional traffic emissions can be expected. This alternative establishes the air quality baseline by which the Build Alternatives can be compared.

3.4.4.2 No Action Alternative

The No Action Alternative provides one additional round-trip train (three round-trip trains in all) to the existing Amtrak service that operates on the Peninsula/CSXT route. This additional trip would operate at conventional speeds. As shown in Table 3-19, the estimated range of probable ridership for the No Action Alternative would be 73 to 77 percent greater than the Status Quo Alternative ridership. As described in Section 3.4.4 above, it can be assumed that greater use of rail service as opposed to automobile would occur on a regional level. This attraction would eliminate associated vehicular emissions, thereby having a beneficial effect on regional air quality compared to current conditions and the Status Quo Alternative.

3.4.4.3 Build Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 has the potential to affect regional air quality on both sides of the James River by reducing regional automobile travel. Because Alternative 1 provides passenger rail service on both the Peninsula/CSXT and Southside/NS routes, based on the 2025 estimated probable ridership shown in Table 3-19, it can be assumed that greater use of rail service as opposed to automobile would occur on a regional level, thereby having a greater beneficial effect on regional air quality compared to the Status Quo and No Action alternatives.

Construction activities can result in short-term impacts on ambient air quality. These potential impacts include direct emissions from construction equipment and trucks, increased emissions from motor vehicles on the streets due to disruption of traffic flow, and fugitive dust emissions. These impacts would be temporary, and would affect only the immediate vicinity of the construction sites and their access routes. Emissions from project related construction equipment and trucks would be much less than the total emissions from other industrial and transportation sources in the region, and therefore, are expected to be insignificant with respect to compliance with the NAAQS.

Depending on the alternative selected, potential construction activities could include rail enhancements and structural improvements along existing track, as necessary, as well as construction of stations, parking facilities, and storage and maintenance facilities.

Roadway traffic disruption due to lane closures, detours, and construction vehicles accessing the sites can cause congestion, which can increase motor vehicle exhaust emissions. Fugitive dust emissions could occur during demolition, ground excavation, material handling and storage, movement of equipment at the site, and transport of material to and from the site. Fugitive dust would most likely be a problem during periods of intense activity and would be accentuated by windy and/or dry weather conditions.

3.4.4.4 Build Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would provide passenger rail service improvements on both sides of the James River. Consequently, as shown in Table 3-19, estimated ridership is higher for Alternative 2a than for the Status Quo and the No Action Alternatives. DRPT expects that greater use of rail service as opposed to automobile in Alternative 2a could have a substantially beneficial effect on regional air quality compared to that of the Status Quo and No Action Alternatives and possibly Alternative 1.

Construction impacts would be greater than as described for Alternative 1 because new infrastructure would be built on both sides of the James River.

3.4.4.5 Build Alternative 2b Higher Speed Peninsula Only

Alternative 2b would only provide higher speed passenger rail service on the Peninsula/CSXT route and no passenger service would be provided on the Southside/NS route. Alternative 2b would have a beneficial effect on regional air quality due to the diversion of automobile travel to rail service. Estimated annual ridership for Alternative 2b in Table 3-19 indicates that Alternative 2b would not have as great a beneficial effect on regional air quality as Alternatives 1 and 2a. Alternative 2b would have a greater beneficial effect on regional air quality than would the Status Quo and No Action Alternatives due to higher probable ridership.

Construction impacts would be less than as described for Alternatives 1 and 2a for the higher speed service located along the Peninsula/CSXT route.

3.4.4.6 Comparative Discussion of Alternatives

The probable 2025 ridership estimates presented in Table 3-19 indicate that regional travel volumes will increase substantially compared to current conditions. If increased passenger rail service is not available to absorb a portion of these volumes, as would be the case in the Status Quo Alternative, an associated increase in regional automobile emissions can be expected. The No Action Alternative and the Build Alternatives would each attract ridership that would otherwise travel by automobile, thereby having some beneficial effect on air quality by reducing vehicular emissions. The No Action Alternative would attract the least ridership, thereby having a higher beneficial impact on air quality compared to the Status Quo, but the

least beneficial impact compared with the Build Alternatives. Alternatives 1 and 2a would potentially have the highest beneficial effects on regional air quality as each would attract similarly high probable ridership. Alternative 2b would provide a less beneficial effect compared to the other Build Alternatives, but a greater benefit as compared with the No Action Alternative. In examining these results, the Build Alternatives of the Richmond/Hampton Roads Passenger Rail Project would benefit regional air quality by reducing regional vehicle travel by automobile.

3.4.5 Potential Mitigation

With respect to regional emissions and conformity, the project is included in the conforming Hampton Roads regional transportation plan. Moreover, probable ridership attraction in all alternatives except the Status Quo Alternative would have a beneficial effect on air quality by reducing automobile emissions. For these reasons, mitigation measures are not warranted with respect to compliance with the transportation conformity requirements and regional air quality.

Temporary direct emissions from construction equipment are not expected to produce adverse effects on local air quality provided that all equipment is properly operated and maintained. If required, traffic management techniques are available during the construction period that would mitigate increased emissions from traffic congestion due to lane closures, detours and construction vehicles accessing sites. Mitigation techniques could include development of site-specific traffic management plans; temporary signage and other traffic controls; designated staging areas, worker parking lots (with shuttle bus service if necessary), and truck routes; and prohibition of construction vehicle travel during peak traffic periods.

Potential fugitive dust impacts would be mitigated through good housekeeping practices such as water sprays during demolition; wetting, paving, or landscaping exposed earth areas; covering dust-producing materials during transport; limiting dust-producing construction activities during high wind conditions; and providing street sweeping and tire washes for trucks leaving the site.

3.4.6 Subsequent Analysis

Subsequent analysis would include a detailed air quality assessment as part of the Tier II analysis once an alternative is selected and potential station locations are evaluated in detail. At that time, the role of locomotive emissions in regional air quality would be assessed. As well, the potential effect of project-related motor vehicle emissions on local roadways in the vicinity of stations would be assessed.

3.5 Noise and Vibration

A noise and vibration assessment was conducted to identify the potential for impacts for each of the proposed alternatives. The noise and vibration assessment was conducted in accordance with the Federal Railroad Administration's (FRA) *High-Speed Ground Transportation Noise and Vibration Impact Assessment* guidelines[31], which specify the type of analysis appropriate for a Tier I Draft EIS. The results of the preliminary noise and vibration assessment are described in the following sections. Noise and vibration analysis would be updated in the Tier II analysis once an alternative is selected.

3.5.1 Methodology

3.5.1.1 Noise

During the preliminary phase of the project, when details of the alternatives are not fully developed, a screening assessment is conducted to estimate the potential for impact. Unlike the detailed assessment that is typically completed as part of a Tier II analysis, the screening assessment gives a conservative estimate of the potential impacts and helps define the areas along the routes within the study area where future impacts are most likely. More detailed assessments would be conducted during Tier II evaluations.

[31] This analysis is based on the *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, U.S. Department of Transportation, Federal Railroad Administration, Washington, DC, December 1998 standards, and does not reflect the October 2005 revision. Screening distances in the 2005 update are less than those established in the 1998 version; therefore the estimates provided in this screening assessment are conservative.

The FRA guidelines prescribe distances within which an impact may occur between a passenger rail noise source and existing land uses. Freight rail noise is not factored into this assessment. The FRA developed these distances based on factors relating to equipment type; in this procedure, operating factors such as speed are not relevant. Table 3-20 lists the distances for various land use categories and source types. For example, potential noise impacts at quiet suburban or rural residences from a route that shares an existing rail line could occur within approximately 900 feet as measured from the centerline of the rail route. The FRA screening distances take into account the noise impact criteria, the type of project and the sensitivity of the surrounding land uses to noise. Using the screening distances provided, a total area (in acres) of potentially impacted noise-sensitive land uses was calculated within the Peninsula/CSXT route and Southside/NS route study areas. The relative size of the areas of potential noise impact was then compared among the alternatives.

Table 3-20: Screening Distances for Noise Assessments (in feet)

Type of Project Route	Ambient Type	Steel-Wheeled
Shared with Existing Rail Line	Urban/Noisy Suburban	450
	Quiet Suburban/Rural	900
Shared with Existing Highway	Urban/Noisy Suburban	450
	Quiet Suburban/Rural	700
New Route (previously Undeveloped land)	Urban/Noisy Suburban	450
	Quiet Suburban/Rural	900

1. Measured from centerline of guideway or rail route

Source: High-Speed Ground Transportation Noise and Vibration Impact Assessment, U. S. Department of Transportation, Federal Railroad Administration, Washington, DC, December 1998.

3.5.1.2 Vibration

During the preliminary phase of the project, when details of the various alternatives are not fully developed, a screening assessment is conducted to estimate the potential for impact. Unlike the detailed assessment that is typically completed as part of a Tier II analysis, the screening assessment gives a conservative estimate of the potential impacts and helps define the areas within the study area where future impacts are most likely. More detailed assessments would be conducted during Tier II evaluations.

The FRA guidelines prescribe distances within which an impact may occur between a passenger rail vibration source and existing land uses. Freight-related vibration is not factored into this assessment. Table 3.21 lists the distances for various land use categories, source types and frequencies of service. For example, potential vibration impacts for residential land uses with infrequent train service of less than 40 events per day is 100 feet for high-speed trains traveling between 100 and 200 mph. The FRA screening distances take into account the vibration impact criteria, the type of project and the sensitivity of the surrounding land uses to vibration. Using the screening distances provided, a total area (in acres) of potentially impacted vibration-sensitive land uses was calculated within the Peninsula/CSXT route and Southside/NS route study areas. The relative size of the areas of potential vibration impact was then compared among the alternatives.

Table 3-21: Screening Distances for Vibration Assessments (in feet)

Receptor	Train Frequency[1]	Train Speed	
Land Use Category		Less than 100 mph	100 to 200 mph
Residential	Frequent	120	220
	Infrequent	60	100
Institutional	Frequent	100	160
	Infrequent	20	70

1. Frequent events include pass-bys greater than 70 per day, while infrequent events include pass-bys less than 70 per day.

Source: High-Speed Ground Transportation Noise and Vibration Impact Assessment, U. S. Department of Transportation, Federal Railroad Administration, Washington, DC, December 1998.

3.5.2 Legal and Regulatory Context

The noise assessment was conducted in accordance with the FRA *High-Speed Ground Transportation Noise and Vibration Impact Assessment* [32] guidelines. These guidelines, along with the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment* [33], form the basis for determining the potential noise impacts associated with high-speed and conventional-speed rail and transit projects. The FRA updated the noise and vibration guidelines for high-speed ground transportation studies in October 2005[34] after the surveys for this Tier I Draft EIS analysis were completed utilizing the 1998 guidance and standards. The effect of using the 1998 standards is to increase the area of potential effect. The 2005 standards are more specific. The 2005 standards will be utilized in the Tier II environmental analysis of the Preferred Alternative.

The FRA Procedures for Considering Environmental Impacts (FRA Docket No EP-1, Notice 5, May 26, 1999), under the topic of noise and vibration states, "The alternatives should be assessed with respect to applicable Federal, State, and local noise standards, especially those enforced by the FRA for railroad equipment, yards and facilities including 49 CFR Part 210 *Railroad Noise Emission Compliance Regulations*."

3.5.3 Affected Environment

3.5.3.1 Peninsula/CSXT Route

The existing ambient environment along the Peninsula/CSXT route is fairly typical of developed urban and suburban communities. The existing noise conditions along the Peninsula/CSXT route alignment include several ambient sources ranging from traffic noise along roadways to existing freight and passenger train activity. However, based on existing freight train activity, the ambient noise levels are dominated by CSXT freight trains particularly in the vicinity of at-grade crossings due to the federally mandated warning horn soundings. Ambient noise measurements and existing ground-borne vibration measurements were not conducted along the Peninsula/CSXT route as part of this Tier I Draft EIS.

3.5.3.2 Southside/NS Route

The existing ambient environment along the Southside/NS route is fairly typical of less developed rural communities divided by a heavily used freight rail route. The existing noise and vibration conditions along the Southside/NS route include several ambient sources ranging from traffic noise along roadways to existing freight train activity. However, based on existing freight train activity, the ambient noise and vibration levels are dominated by Norfolk Southern (NS) freight trains, particularly in the vicinity of at-grade crossings, due to the federally mandated warning horn soundings. Ambient noise measurements and existing ground-borne vibration measurements were not conducted along the Southside/NS route as part of this Tier I Draft EIS.

3.5.4 Environmental Consequences

3.5.4.1 Status Quo Alternative

The Status Quo Alternative is based on existing conditions and the funded and programmed transportation improvements that will be developed and in operation by 2030. All passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made other than routine maintenance.

Train warning horns are required at grade crossings, and fifty grade crossings exist along the Peninsula/CSXT route. It is expected that the Status Quo Alternative would not create any changes to noise and vibration levels as currently experienced.

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[32] *High-Speed Ground Transportation Noise and Vibration Impact Assessmen*t, U.S. Department of Transportation, Federal Railroad Administration, Washington, DC, December 1998.

[33] *Transit Noise and Vibration Impacts Assessment: Final Report*, Federal Transit Administration, Washington, DC, April 1995.

[34] *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, U. S. Department of Transportation, Federal Railroad Administration, Washington, DC; October 2005.

3.5.4.2 No Action Alternative

Noise - The No Action Alternative assumes that one additional round-trip train traveling at conventional speeds would be added to the Peninsula/CSXT route. No passenger rail service would be added to the Southside/NS route, where freight rail operations would continue as planned by NS. In comparison with the Status Quo Alternative which would provide the existing two daily roundtrips along the Peninsula/CSXT route, the No Action Alternative would increase rail operations in the corridor by 50 percent. Thus, the area of potential noise exposure would increase in size geographically by 50 percent. Based on the 900-foot screening distance listed in Table 3-20, the potential areas of noise exposure in the study area would range from none in Charles City County to over 478 acres in James City County. As shown in Table 3-22, approximately 1,544 acres of noise-sensitive land use would be potentially exposed as a result of the No Action Alternative.

Table 3-22: Potential Areas of Noise and Vibration Exposure (in acres) and Number of Grade Crossings for No Action Alternative

County/City	Noise Exposure Area[1] (acres)	Vibration Exposure Area[2] (acres)
Richmond	16.7	4.2
Henrico County	447.0	111.7
Charles City County	0.0	0.0
New Kent County	8.0	2.0
James City County	478.6	119.7
Williamsburg	86.1	21.5
York County	33.3	8.3
Newport News	474.6	118.6
Total Area for No Action Alternative	***1,544.2***	***386.1***
Total Grade Crossings for No Action Alternative	***50***	***NA***

1. The FRA screening distances of 900 feet was used to compute the potential areas of noise exposure.
2. The FRA screening distances of 100 feet was used to compute the potential areas of vibration exposure.

Source: DMJM Harris, October 2005.

Additionally, the No Action Alternative includes 50 grade crossings that would require the sounding of train warning horns. Due to the increased service, the sounding of train warning horns is expected to result in increased noise exposure at several sensitive receptor locations in the vicinity of the grade crossings.

Noise levels from construction activities, although temporary, could create a nuisance condition at nearby sensitive receptors. Exposure to excessive noise levels varies depending on the types of construction activity and the types of equipment used for each stage of work. Project construction activities may include track-laying and relocation, station stop construction and construction of commuter parking facilities.

Vibration - Based on the 100-foot screening distance for infrequent events listed in Table 3-21, the potential areas of vibration exposure are expected to range from no impacts in Charles City County to 119 acres in James City County. As shown in Table 3-22, almost 386 acres are expected to be potentially impacted due to vibration as a result of the No Action Alternative. In comparison with the Status Quo Alternative, vibration exposure under the No Action Alternative would be the same because vibration exposure is not measured cumulatively.

3.5.4.3 Build Alternative 1 Peninsula Conventional/Southside Higher Speed

Noise - Alternative 1 would provide the three round-trip train service described for the No Action Alternative and introduce passenger rail service (six round-trips) to the Southside along the NS freight line. Based on the 900-foot screening distance listed in Table 3-20, the potential areas of noise exposure are expected to range from no impacts in Charles City County to over 478 acres in James City County along the Peninsula/CSXT route. For the Southside/NS route, potential areas of noise exposure are expected to range from no impacts in Surry County to over 745 acres in Prince George County. As shown in Table 3-23, approximately 3,580 acres are expected to be potentially exposed due to noise as a result of Alternative 1. This total acreage is substantially larger in size (132%) than the impact area of the No Action Alternative due to the addition of operations on the Southside/NS route.

Table 3-23: Potential Areas of Noise and Vibration Exposure (in acres) and Number of Grade Crossings for Alternative 1

County/City	Noise Exposure Area[1] (acres)	Vibration Exposure Area[2] (acres)
Peninsula/CSXT Route		
Richmond	16.7	4.2
Henrico County	447.0	111.7
Charles City County	0.0	0.0
New Kent County	8.0	2.0
James City County	478.6	119.7
Williamsburg	86.1	21.5
York County	33.3	8.3
Newport News	474.6	118.6
Total Area for Peninsula/CSXT Route	*1,544.2*	*386.1*
Grade Crossings	*50*	*NA*
Southside/NS Route		
Prince George County	745.4	186.3
Sussex County	292.2	73.0
Surry County	0.0	0.0
Southampton County	364.6	91.1
Isle of Wight County	303.3	75.8
Suffolk	708.1	177.0
Chesapeake	196.4	49.1
Portsmouth	166.3	41.6
Norfolk	5.8	1.4
Total Area for Southside/NS Route	*2,036.7*	*509.2*
Grade Crossings	*74*	*NA*
Total Area for Alternative 1	***3,580.9***	***895.3***
Total Grade Crossings for Alternative 1	***124***	***NA***

1. The FRA screening distances of 900 feet was used to compute the potential areas of noise exposure.
2. The FRA screening distances of 100 feet was used to compute the potential areas of vibration exposure.
Source: DMJM Harris, October 2005.

Alternative 1 is expected to include 124 at-grade crossings that would require the sounding of warning horns. For this Tier I Draft EIS it has not been determined which grade crossings would be closed or potentially grade separated. The sounding of warning horns is expected to result in increased noise impacts at several sensitive receptor locations in the vicinity of the grade crossings.

Noise levels from construction activities, although temporary, could create a nuisance condition at nearby sensitive receptors. Exposure to excessive noise levels varies depending on the types of construction activity and the types of equipment used for each stage of work. Project construction activities may include track-laying and relocation, station stop construction and construction of parking facilities.

Vibration - Based on the 100-foot screening distance for infrequent events listed in Table 3-21, the potential areas of vibration exposure are expected to range from no impacts in Charles City County and 119 acres in James City County along the Peninsula/CSXT route. For the Southside/NS route, potential areas of impact for vibration are expected to range from no impacts in Surry County to almost 190 acres in Prince George County. As shown in Table 3-23, almost 895 acres are expected to be potentially exposed due to vibration as a result of Alternative 1. This total acreage is substantially larger in size (132%) than the exposure area of the No Action Alternative and Status Quo Alternative due to the addition of passenger rail operations on the Southside/NS route.

Vibration levels from construction activities for Build Alternative 1, although temporary, could create a nuisance condition at nearby sensitive receptors. Exposure to excessive vibration levels varies depending on the types of construction activity and the types of equipment used for each stage of work. Project construction activities may include track-laying and relocation, station stop construction and construction of parking facilities.

3.5.4.4 Build Alternative 2a Peninsula Higher Speed/Southside Conventional

Noise - Alternative 2a would improve passenger rail service on both sides of the James River by introducing higher speed passenger rail service on the Peninsula/CSXT route (six round-trip trains per day) and by adding conventional speed passenger rail service to the Southside/NS route (three round-trip trains per day). Based on the 900-foot screening distance listed in Table 3-20, the potential areas of noise exposure are expected to range from no impacts in Charles City County to over 478 acres in James City County along the Peninsula/CSXT route. For the Southside/NS route, potential areas of noise exposure are expected to range from no impacts in Surry County to over 745 acres in Prince George County. As shown in Table 3-24, approximately 3,580 acres are expected to be potentially exposed to noise as a result of Alternative 2a. This total acreage is the same as that for Alternative 1, but substantially larger in size (132%) than the impact area of the No Action Alternative due to the addition of passenger rail operations on the Southside/NS route.

Table 3-24: Potential Areas of Noise and Vibration Exposure (in acres) and Number of Grade Crossings for Alternative 2a

County/City	Noise Exposure Area[1] (acres)	Vibration Exposure Area[2] (acres)
Peninsula/CSXT Route		
Richmond	16.7	4.2
Henrico County	447.0	111.7
Charles City County	0.0	0.0
New Kent County	8.0	2.0
James City County	478.6	119.7
Williamsburg	86.1	21.5
York County	33.3	8.3
Newport News	474.6	118.6
Total Area for Peninsula/CSXT Route	*1,544.2*	*386.1*
Grade Crossings	*50*	*NA*
Southside/NS Route		
Prince George County	745.4	186.3
Sussex County	292.2	73.0
Surry County	0.0	0.0
Southampton County	364.6	91.1
Isle of Wight County	303.3	75.8
Suffolk	708.1	177.0
Chesapeake	196.4	49.1
Portsmouth	166.3	41.6
Norfolk	5.8	1.4
Total Area for Southside/NS Route	*2,036.7*	*509.2*
Grade Crossings	*74*	*NA*
Total Area for Alternative 2a	***3,580.9***	***895.3***
Total Grade Crossings for Alternative 2a	***124***	***NA***

1. The FRA screening distances of 900 feet was used to compute the potential areas of noise exposure.
2. The FRA screening distances of 100 feet was used to compute the potential areas of vibration exposure.

Source: DMJM Harris, October 2005.

Additionally, Alternative 2a is expected to include 124 grade crossings that would require the sounding of warning horns. The sounding of warning horns is expected to result in increased noise impacts at several sensitive receptor locations in the vicinity of the grade crossings.

Construction effects would be similar to those described in Alternative 1.

Vibration - Based on the 100-foot screening distance for infrequent events listed in Table 3-21, the potential areas of vibration exposure are expected to range from no impacts in Charles City County to 119 acres in James City County along the Peninsula/CSXT route. For the Southside/NS route, potential areas of vibration exposure are expected to range from no impacts in Surry County to almost 190 acres in Prince George County. As shown in Table 3-24, almost 895 acres are expected to be potentially exposed due to vibration as a result of Alternative 2a. This total acreage is the same as that for Alternative 1, but substantially larger in

size (132%) than the impact area of the No Action Alternative due to the addition of passenger rail operations on the Southside/NS route.

Vibration levels from construction activities for Alternative 2a, although temporary, could create a nuisance condition at nearby sensitive receptors. Exposure to excessive vibration levels varies depending on the types of construction activity and the types of equipment used for each stage of work. Project construction activities may include track-laying and relocation, station stop construction and construction of parking facilities.

3.5.4.5 Build Alternative 2b Higher Speed Peninsula Only

Noise - Alternative 2b would improve passenger rail service on the north side of the James River by introducing higher speed service on the Peninsula/CSXT route. Based on the 900-foot screening distance listed in Table 3-20, the potential areas of noise exposure are expected to range from none in Charles City County to almost 478 acres in James City County along the Peninsula/CSXT route. As shown in Table 3-25, over 1,544 acres along the Peninsula/CSXT route are expected to be potentially exposed to noise as a result of Alternative 2b. This total acreage is substantially smaller than that for Alternatives 1 and 2a (57%), but the same size as the impact area of the No Action Alternative.

Table 3-25: Potential Areas of Noise and Vibration Exposure (in acres) and Number of Grade Crossings for Alternative 2b

County/City	Noise Exposure Area[1] (acres)	Vibration Exposure Area[2] (acres)
Richmond	16.7	4.2
Henrico County	447.0	111.7
Charles City County	0.0	0.0
New Kent County	8.0	2.0
James City County	478.6	119.7
Williamsburg	86.1	21.5
York County	33.3	8.3
Newport News	474.6	118.6
Total Area for Alternative 2b	***1,544.2***	***386.1***
Grade Crossings	***50***	***NA***

1. The FRA screening distances of 900 feet was used to compute the potential areas of noise exposure.
2. The FRA screening distances of 100 feet was used to compute the potential areas of vibration exposure.

Source: DMJM Harris, October 2005.

Additionally, Alternative 2b is expected to include 50 grade crossings that would require the sounding of warning horns. The sounding of warning horns is expected to result in increased noise impacts at several sensitive receptor locations in the vicinity of the grade crossings.

Construction effects would be similar to those described in Alternative 2a for the introduction of higher speed passenger rail service on Peninsula/CSXT route.

Vibration - Based on the 100-foot screening distance for infrequent events listed in Table 3-21, the potential areas of exposure for vibration are expected to range from none in Charles City County to almost 120 acres in James City County along the Peninsula/CSXT route. As shown in Table 3-25, almost 390 acres along the Peninsula/CSXT route are expected to be potentially exposed due to vibration as a result of Alternative 2b. This total acreage is substantially smaller than that for Alternatives 1 and 2a (57%), but the same size as the exposure area of the No Action Alternative.

Vibration levels from construction activities for Alternative 2b, although temporary, could create a nuisance condition at nearby sensitive receptors. Exposure to excessive vibration levels varies depending on the types of construction activity and the types of equipment used for each stage of work. Project construction activities may include track-laying and relocation, station stop construction and construction of parking facilities.

3.5.4.6 Comparison of Alternatives

Noise - In this Tier I analysis, potential noise exposure was determined based on the number of train trips and the location of the trips, i.e., along the Peninsula/CSXT route and/or along the Southside/NS route. The Status Quo Alternative would provide the existing two daily round-trips along the Peninsula/CSXT route. The No Action Alternative would increase operations in the corridor by 50 percent. Thus, the area of potential noise exposure would increase in size geographically by 50 percent (to a total of 1,544 acres) under the No Action Alternative.

Alternative 1 would provide the new three round-trip train service described for the No Action Alternative and introduce passenger rail service (six round-trips) to the Southside along the NS freight line. A total area of approximately 3,580 acres is expected to be potentially exposed due to noise as a result of Alternative 1. This area is substantially larger in size (132%) than the impact area of the No Action Alternative due to the addition of operations on the Southside/NS route.

Alternative 2a would improve passenger rail service in the corridor on both sides of the James River by introducing higher speed service on the Peninsula/CSXT route (six round-trip trains per day) and by adding conventional speed passenger rail service to the Southside/NS route (three round-trips per day). Approximately 3,580 acres are expected to be potentially exposed to noise as a result of Alternative 2a. This total acreage is the same as that for Alternative 1, but substantially larger in size (132%) than the impact area of the No Action Alternative due to the addition of operations on the Southside/NS route.

Alternative 2b would improve passenger rail service only on the north side of the James River by introducing higher speed service on the Peninsula/CSXT route. Approximately 1,544 acres along the Peninsula/CSXT route are expected to be potentially exposed to noise as a result of Alternative 2b. This total acreage is substantially smaller than that for Alternatives 1 and 2a (57%), but the same size as the impact area of the No Action Alternative.

Vibration - The potential areas of vibration exposure under the Status Quo and No Action Alternatives are expected to range from no exposure in Charles City County to 119 acres in James City County. Approximately 386 acres are expected to be potentially exposed due to vibration as a result of the No Action Alternative. In comparison with the Status Quo Alternative, vibration exposure under the No Action Alternative would be the same because vibration exposure is not measured cumulatively. Approximately 895 acres are expected to be potentially exposed due to vibration as a result of Alternative 1 or Alternative 2a. This total acreage is substantially larger in size (132%) than the exposure area of the No Action Alternative and Status Quo Alternative due to the addition of operations on the Southside/NS route. Approximately 390 acres along the Peninsula/CSXT route are expected to be potentially exposed due to vibration as a result of Alternative 2b. This total acreage is substantially smaller than that for Alternatives 1 and 2a (57%) due to the absence of potential exposure along the Southside/NS route. However, the exposure area of Alternative 2b would be the same size as the exposure area of the No Action Alternative.

3.5.5 Potential Mitigation

Detailed noise analysis would be conducted during Tier II evaluations when an alternative has been selected for more detailed technical analysis. At that time, strategies to avoid or minimize noise impacts would be examined for feasibility and incorporated into the project design, and strategies to mitigate the remaining unavoidable impacts would be examined. Noise control and mitigation strategies that could be examined include:

- Selection and maintenance of equipment, such as ballast mats and wheel truing;
- Operational controls such as reducing train horn noise in compliance with the Quiet Zone requirements in FRA's whistle ban regulation[35]; and
- Installation of noise buffers, barriers and screening.

[35] Final Rule on the Use of Locomotive Horns at Highway-Rail Grade Crossings, August 17, 2006, 49 Code of Federal Regulations, 222 and 229.

During the construction phase, noise control measures may be required to ensure compliance with all federal and local guidelines and noise limits. For example, noise specifications could require contractors to use properly maintained and operated equipment, including the use of exhaust mufflers according to the equipment manufacturer's specifications. Additional noise control measures could be incorporated into the construction specification documents as determined to be necessary during final design. Several areas of potential noise control during construction include:

- Temporary noise barriers erected between noisy activities and noise-sensitive receptors;
- Use of sonic/vibratory pile-drivers rather than impact pile-driving near noise-sensitive receptors; and
- Rerouting construction traffic along roadways that minimize noise impacts at nearby noise-sensitive receptors.

3.5.6 Potential Mitigation

Detailed vibration analysis would be conducted during Tier II evaluations when an alternative has been selected for more detailed technical analysis. At that time, strategies to avoid or minimize vibration impacts would be examined for feasibility and incorporated into the project design, and strategies to mitigate remaining unavoidable impacts would be examined. Vibration control and mitigation strategies that could be examined include:

- Selection of least vibration-producing equipment and construction techniques;
- Operational controls such as restricting vibration-inducing activities to locations with no potentially affected receptors or restricting vibration-producing activities to less sensitive times of day.

Vibration control measures would be considered during the preparation of the Tier II analysis of the selected alternative and future construction to ensure compliance with all federal and local construction limits. For example, vibration specifications could require contractors to use alternative construction methods and equipment, including the use of vibratory pile drivers rather than impact pile drivers. Additional vibration control measures could be incorporated into the construction specification documents as determined to be necessary during final design.

The areas for potential vibration control during construction include:

- Utilizing alternative construction methods that avoid impact pile driving near vibration-sensitive receptors, such as residences, schools and hospitals. Whenever possible, use of drilled piles or sonic/vibratory pile drivers to reduce excessive vibration;
- Rerouting truck traffic away from vibration-sensitive receptors; and
- Requiring contractors to use Best Available Control Technologies (BACT) to limit excessive vibration.

3.5.7 Subsequent Analysis

Subsequent analysis would be undertaken during Tier II analysis to determine specific noise and vibration impacts. Subsequent analysis would include the following:

- Measuring ambient conditions;
- Analyzing future operations;
- Determining impacts; and
- Determining appropriate mitigation.

3.6 Energy

A preliminary energy assessment was conducted to estimate the potential energy needs and savings for each of the alternatives. This section examines the proposed project's potential energy needs by alternative and its effects on the region's energy resources. Implementation of the proposed project would be expected to result in changing dynamics of all vehicle classes with regard to vehicle miles traveled (VMT). Changes in VMT, in turn, would affect energy consumption. The results of the preliminary energy assessment are described in the following sections.

3.6.1 Methodology

Since diesel-powered locomotives are expected to be used for the selected alternative, the energy consumption rates utilized in this preliminary assessment are based on diesel-powered locomotives. For this assessment, annual energy consumption was determined based on the number of round-trip train miles traveled annually for each alternative. Using the low and high annual ridership estimates for the project, energy use per passenger-mile was also determined for each alternative.

In these calculations, energy use factors for intercity rail reported in the Department of Energy's *Transportation Energy Data Book*, 26th Edition, were used. These included annual energy use in British Thermal Units (BTUs) and BTU per passenger mile. A BTU is a unit of measure that describes the amount of energy or heat consumed. Technically, one BTU is the amount of energy needed to raise one pound of water one degree Fahrenheit. One BTU is also the energy produced by burning one wooden match.

Based on the analysis presented in Section 3.1, the project is not expected to result in a substantial diversion of automobiles to rail; therefore, potential diversion is not considered in the energy consumption equation.

3.6.2 Legal and Regulatory Context

Several federal regulations are applicable when considering the energy needs of any federally-funded high-speed rail project, including the following:

The FRA Procedures for Considering Environmental Impacts (FRA Docket No EP-1, Notice 5, May 26, 1999), under the topic of production and consumption of energy, state, "The EIS shall assess in detail any irreversible or irretrievable commitments of energy resources likely to be involved in each alternative and any potential energy conservation, especially those alternatives likely to reduce the use of petroleum or natural gas, consistent with the policy outlined in Executive Order 12185."

Executive Order 12185, Conservation of Petroleum and Natural Gas (December 17, 1979, 44 F.R. § 75093), encourages additional conservation of petroleum and natural gas by recipients seeking federal funding.

The 2005 Safe, Accountable, Flexible and Efficient Transportation Act: A Legacy for Users (SAFETEA-LU) builds on the initiatives established in the 1998 Transportation Equity Act for the 21st Century (TEA21) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). ISTEA identified planning factors for use by Metropolitan Planning Organizations (MPO) in developing transportation plans and programs. Under the ISTEA, MPOs are required to "protect and enhance the environment, promote energy conservation, and improve quality of life" and are required to consider the consistency of transportation planning with federal, state and local energy goals (U.S. Department of Transportation 2002b). SAFETEA-LU provides new requirements for the statewide and metropolitan planning process.

3.6.3 Affected Environment

The *Transportation Energy Data Book: Edition 26-2007*, reported that highway vehicles were responsible for approximately 80 percent of all transportation energy use in 2005. Non-highway modes (air, water, pipeline, rail) account for the remaining 20 percent, with air travel accounting for nearly half of the non-highway energy use. Rail accounts for approximately two percent of transportation energy use. Traveling by rail is one of the most fuel efficient modes of transportation due to factors such as aerodynamics and the low rolling resistance of steel wheels on steel rails.

3.6.3.1 Peninsula/CSXT Route

The estimated round-trip train mileage between the Richmond Main Street Station and the existing Newport News Station is approximately 150 miles. Currently, Amtrak operates two round-trip trains daily along the Peninsula/CSXT route, which is equivalent to approximately 5.8 billion BTUs annually.

3.6.3.2 Southside/NS Route

Currently, there is no passenger rail service along the Southside/NS route. The rail line supports freight operations only. The estimated round-trip train mileage between the Richmond Main Street Station and Norfolk is approximately 196 miles.

3.6.4 Environmental Consequences

Based on the analysis provided in Section 3.1, it is unlikely that the additional rail trips generated by the Build alternatives would cause a measurable reduction in automobile traffic on major roadways such as Interstates 64 and 95. According to the ridership forecast, the Build alternatives would generate an incremental increase of between 652,300 and 899,100 rail passenger trips annually when compared to the Status Quo, or an average of less than 2,100 riders per day.

Some of these riders would likely be using rail in lieu of an automobile trip along I-64, U.S. 460 and I-95, but these riders would be a small fraction of the total trips in the corridors. Long-distance travelers are more likely than commuters to travel in multiple-occupant vehicles, and some of these trips may use routes other than I-64 and I-95, depending on their ultimate origins and destinations. It is unlikely that as many as half of the incremental riders would divert a vehicle from the Interstate routes, but in order to fully assess the potential effects of highway-rail diversion, that rate is assumed for the purpose of this discussion. According to the license plate survey, the average vehicle occupancy rate along U.S. 460 and I-64 is 1.75 across all trip purposes, thus for every 1,750 passengers, the project would only divert 1,000 vehicles.

For both I-64 and I-95, it is expected that only a small fraction of vehicles would divert to rail. Given the normal daily and seasonal fluctuations in traffic volumes, this would not be a measurable reduction in traffic volume along these corridors. Thus, the number of vehicles diverting to rail would likely be negligible in terms of energy savings.

Annual energy consumption was determined for each alternative based on the number of round-trip train miles traveled annually. Daily train mileage for each alternative was converted to annual energy use by dividing annual train miles by the Department of Energy's annual intercity rail energy use factor. Table 3-26 shows the resulting annual energy use estimate for each alternative in year 2025. The Status Quo Alternative would use 6 billion BTUs, while the No Action Alternative would use 9 billion BTUs per year. Energy uses would be 31, 28 and 26 BTUs annually for Alternatives 1, 2a, and 2b, respectively.

Table 3-26: Energy Use Estimates

Route/Trips/Train Mileage	Status Quo	No Action	Alternative 1	Alternative 2a	Alternative 2b
Peninsula # of trips/day	2	3	3	6	9
Peninsula # of miles/day	300	450	450	900	1,350
Southside # of trips/day	0	0	6	3	0
Southside # of miles/day	0	0	1,176	588	0
Total trip mileage/day	300	450	1,626	1,488	1,350
Total trip mileage/year	109,500	164,250	593,490	543,120	492,750
% trips greater than the Status Quo	NA	50%	442%	396%	350%
% trips greater than the No Action	NA	NA	261%	231%	200%
Annual Energy Use (reported in billions BTUs)[1]	**6**	**9**	**31**	**28**	**26**
% annual energy use greater than the Status Quo	NA	50%	417%	367%	333%

Route/Trips/Train Mileage	Status Quo	No Action	Alternative 1	Alternative 2a	Alternative 2b
% annual energy use greater than the No Action	NA	NA	244%	211%	189%
Annual ridership (High)	262,300	464,800	1,110,100	1,124,200	1,101,100
Annual passenger miles (High)(reported in millions)	39	70	201	193	165
BTU/passenger mile (High)	**145**	**122**	**154**	**152**	**155**
Annual ridership (Low)	245,500	425,700	939,600	924,600	897,800
Annual passenger miles (Low)(reported in millions)	37	64	178	153	135
BTU/passenger mile (Low)	**154**	**134**	**182**	**185**	**190**

[1]Multiplier based on Table 2.12 of the Transportation Energy Data Book, 26th Edition.
Note: numbers may vary in calculation due to rounding.

Annual energy use directly correlates with the number of trips. For example, a 50 percent increase in trips between the No Action and Status Quo Alternatives would yield a 50 percent increase in energy use. Increasing the trip rate from two in the Status Quo Alternative to nine under any one of the Build alternatives would result in an approximately 333 to 417 percent increase in energy use depending on route mileage.

Energy use per passenger mile (expressed as BTU/passenger mile) was calculated for each alternative. This value was calculated for both the Low and High annual ridership estimates for the project. The results presented in Table 3-26 demonstrate relatively small differences in energy use among the alternatives. For example, some economy would occur in the No Action Alternative (145 BTUs High and 154 BTUs Low) compared to the Status Quo Alternative (122 BTUs High and 134 BTUs Low) due to a higher ratio of ridership to the number of trips in the No Action Alternative.

Under the High ridership scenario for the Build alternatives, energy use per passenger mile (152 to 155 BTUs) would be only slightly higher than the Status Quo Alternative (145 BTUs), meaning that the ratios of ridership to trips in the Build alternatives would be fairly similar to that of the Status Quo Alternative. In the Low ridership scenario, energy use per passenger mile (182 to 190 BTUs) would be higher than the Status Quo Alternative (154 BTUs), meaning that the ratios of ridership to trips in the Build alternatives would be lower than that of the Status Quo Alternative. In other words, in the Low ridership scenario, lower ridership would yield higher energy use per passenger mile.

Discussions of estimated energy use by each alternative are provided below.

3.6.4.1 Status Quo

The Status Quo Alternative assumes that the existing two round-trips along the Peninsula/CSXT route would remain and no passenger service would be provided on the Southside/NS route. Energy consumption would remain the same as required for the existing service, at approximately six billion BTUs annually as shown in Table 3-26. Annual energy use would be lower than the No Action and Build alternatives as the Status Quo Alternative would provide the fewest trips.

Energy use per passenger mile would be approximately 154 BTUs in the Low ridership scenario and 145 BTUs in the High ridership scenario. Energy use per passenger mile would be higher than that of the No Action Alternative, but lower than those of the Build alternatives.

3.6.4.2 No Action Alternative

The No Action Alternative assumes three round-trip trains along the Peninsula/CSXT route. Annual energy use (nine billion BTUs) would be approximately 50 percent higher than the Status Quo Alternative as the No Action Alternative would provide 50 percent more trips. For the same reason, annual energy use would be lower than that of the Build alternatives which would provide more trips.

As shown in Table 3-26, energy use per passenger mile would be approximately 134 BTUs in the Low ridership scenario and 122 BTUs in the High ridership scenario. Energy use per passenger mile would be lower than that of the Status Quo and the Build alternatives due to a higher ratio of ridership to trips.

If construction in some areas is required to make accommodations for the additional round-trip train on the Peninsula/CSXT route, some additional energy would be expended on a short-term basis.

3.6.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 would provide service to both routes by combining the No Action Alternative with higher speed passenger rail service on the Southside/NS route. Three daily round-trip trains would operate along the Peninsula/CSXT route and six daily round-trip trains would operate along the Southside/NS route. Annual energy use would be approximately 31 BTUs, or approximately 417 percent more energy than the Status Quo Alternative and approximately 244 percent more energy than the No Action Alternative. Alternative 1 would provide approximately 442 percent more trips than the Status Quo Alternative and approximately 261 percent more trips than the No Action Alternative. Annual energy use would be higher than that of Alternatives 2a and 2b, each of which would provide the same number of trips as Alternative 1. The additional energy consumption would be due to the greater mileage on the Southside/NS route where all new trips would be located.

As shown in Table 3-26, energy use per passenger mile would be approximately 182 BTUs in the Low ridership scenario and 154 BTUs in the High ridership scenario. Energy use per passenger mile would be higher than that of the Status Quo Alternative, particularly in the Low ridership scenario, and that calculated for the No Action Alternative. Energy use would be similar to that of Alternatives 2a and 2b.

During construction of the project, additional energy would be expended beyond what would be used for the normal operation. This additional energy would be consumed on a short-term basis by construction of improvements required to implement the service and by construction-related delays to existing freight and passenger rail service.

3.6.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would also provide service to both routes. Higher speed passenger rail service would be provided along the Peninsula/CSXT route (six daily round-trip trains) while conventional speed service would be provided to the Southside/NS route (three daily round-trip trains). Annual energy use would be approximately 28 BTUs, or approximately 367 percent more energy than the Status Quo Alternative and approximately 211 percent more energy than the No Action Alternative. Alternative 2a would provide approximately 396 percent more trips than the Status Quo Alternative and approximately 231 percent more trips than the No Action Alternative. Annual energy use would be slightly higher than that of Alternative 2b, but slightly lower than Alternative 1, even though all three alternatives would each provide the same number of trips. The difference in energy consumption among these alternatives is due to the greater mileage on the Southside/NS route where some new trips would be located for Alternatives 1 and 2a.

As shown in Table 3-26, energy use per passenger mile would be approximately 185 BTUs in the Low ridership scenario and 152 BTUs in the High ridership scenario. Energy use per passenger mile would be higher than that of the Status Quo Alternative, particularly in the Low ridership scenario, and the No Action Alternative. Energy use would be similar to those of Alternatives 1 and 2b.

An increased expenditure of short-term energy use during construction would occur. This additional energy would be consumed on a short-term basis by construction of improvements required to implement the service and by construction-related delays to existing freight and passenger rail service.

3.6.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b would provide higher speed passenger service to the Peninsula/CSXT route only. No passenger service would be provided on the Southside/NS route. Nine daily round-trip trains would be provided along the Peninsula/CSXT route. Annual energy use would be approximately 26 BTUs, or approximately 333 percent more energy than the Status Quo Alternative and approximately 189 percent more

energy than the No Action Alternative. Alternative 2b would provide approximately 350 percent more trips than the Status Quo Alternative and approximately 200 percent more trips than the No Action Alternative. Annual energy use would be slightly lower than that of Alternatives 1 and 2a even though all three alternatives would each provide the same number of trips. The lower energy consumption for Alternative 2b is due to the lower mileage on the Peninsula/CSXT route where all new trips would be located.

As shown in Table 3-26, energy use per passenger mile would be approximately 190 BTUs in the Low ridership scenario and 155 BTUs in the High ridership scenario. Energy use per passenger mile would be higher than that of the Status Quo Alternative, particularly in the Low ridership scenario, and the No Action Alternative. Energy use would be slightly lower than those of Alternatives 1 and 2a.

An increased expenditure of short-term energy use during construction would occur. This additional energy would be consumed on a short-term basis by construction of improvements required to implement the service and by construction-related delays to existing freight and passenger rail service.

3.6.5 Potential Mitigation During Construction

Energy conservation measures could be considered during construction to minimize overall project energy needs. For example, an energy plan could be implemented that would encourage contractors to adopt several construction energy conservation measures including, but not limited to, the following:

- Use energy-efficient equipment;
- Incorporate energy-saving techniques during construction;
- Avoid unnecessary idling of construction equipment;
- Consolidate material delivery whenever possible to ensure efficient vehicle utilization;
- Schedule delivery of materials during non-rush hours to minimize fuel use lost to traffic congestion and thereby maximize overall vehicle fuel efficiency;
- Encourage project employees and contractors to carpool; and
- Maintain equipment and machinery in good working condition, especially those using fossil fuels.

3.6.6 Subsequent Analysis

Subsequent analysis will include more detailed analysis on energy consumption for the selected alternative.

3.7 Land Use

This section describes the existing and future land use characteristics along each of the proposed alignments, determines the consistency of each alternative with local planning and describes the potential effects on land use of possible land conversions due to new right-of-way acquisition for each alternative.

3.7.1 Methodology

The potential compatibility of the proposed alternatives with existing land uses was evaluated based on the sensitivity of various land uses to the changes that may occur with the introduction of conventional or high-speed passenger rail service and associated infrastructure. For example, homes and schools are more sensitive to proposed changes that may result in increased noise and vibration or increased levels of traffic congestion. Industrial uses are typically less sensitive to these types of changes because noise and vibration, and to some extent traffic, tend to interfere less with normal industrial activities. For the purposes of this study, potential impacts were considered low if existing land uses within a proposed alignment or station area were found to be compatible with the land use changes that may result from the proposed project.

The type of improvement that would be associated with each of the alternatives would also affect the level of potential impact. Improvements such as potential widening of an existing right-of-way or the need for new right-of-way were considered to have a low compatibility with agricultural land. Conversely, if the improvement were to be contained within the existing right-of-way, the alternative was considered to be

compatible with agricultural land. Summarized below are the generalized potential compatibility ratings of existing and planned land use types with the alternatives, including potential alignment and station options.

- **Low Compatibility** - Single-family residential, neighborhood park, habitat conservation area, elementary/middle school, agricultural (new right-of-way needed).
- **Medium Compatibility** - Moderate density multifamily residential, high schools, community parks, low intensity industrial, hospitals.
- **High Compatibility** - Business park/regional commercial, high density multifamily residential, existing or planned transit center, high intensity industrial park, service commercial, commercial recreation, college, transportation/utilities, high intensity government facilities, airport or train station, agricultural (no new right-of-way needed).

Future land use compatibility was evaluated based on a review of all land use and transportation plans adopted by the cities/counties located within the study area. The documents were examined to assess an alternative's potential consistency with the goals and objectives defined therein. The project was considered compatible if any of the project alternatives was located in areas planned for transportation multimodal centers or corridor development, redevelopment, economic revitalization or transit-oriented development. Compatibility was considered low if any of the alternatives was potentially inconsistent with local or regional planning documents.

3.7.2 Legal and Regulatory Context

The U.S. Council on Environmental Quality's (CEQ's) regulations for implementing the procedural provision of NEPA (40 CFR 1500-1508) state that the "'Human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." The Federal Highway Administration (FHWA) publication, *Community Impact Assessment: A Quick Reference for Transportation*, specifically identifies land use and the potential for changes to patterns of development as a facet of community impact assessment.

3.7.3 Affected Environment

This section describes the current land use patterns within 300 feet on either side of each route and within ½-mile of each station. This land use study area is sufficiently sized to enable existing and future land uses to be characterized, to determine project consistency with local planning in the vicinity of the alternatives, and to assess the potential effects of possible land use conversions resulting from right-of-way acquisition for the project. It also provides a review of land use plans identified for each study route.

3.7.3.1 Existing Land Use Patterns

The following section describes the existing land uses for each city/county included in each of the proposed alignments.

Peninsula/CSXT Route - The primary land uses along the Peninsula/CSXT route include agricultural, commercial/office space industrial, residential and undeveloped. Developed land uses along the Peninsula/CSXT route are concentrated in Richmond, Henrico, Williamsburg and Newport News. Figure 3-1 shows the lands uses along the route. Land uses within each jurisdiction located along the Peninsula/CSXT route are described below:

- **City of Richmond** - The City of Richmond makes up approximately six percent of the Peninsula/CSXT study area. The proposed route would use the existing Main Street Station. Land use along the route in Richmond is primarily characterized by commercial/office space and industrial. Other land uses in this urban setting include government, institutional, parks, recreation, and open space, and residential. Approximately seven percent of the area along the route is undefined.

  Current land uses surrounding the Main Street Station are 43 percent commercial and office space, 34 percent industrial, and 11 percent institutional and government. The remaining land uses are residential and parks and open space.

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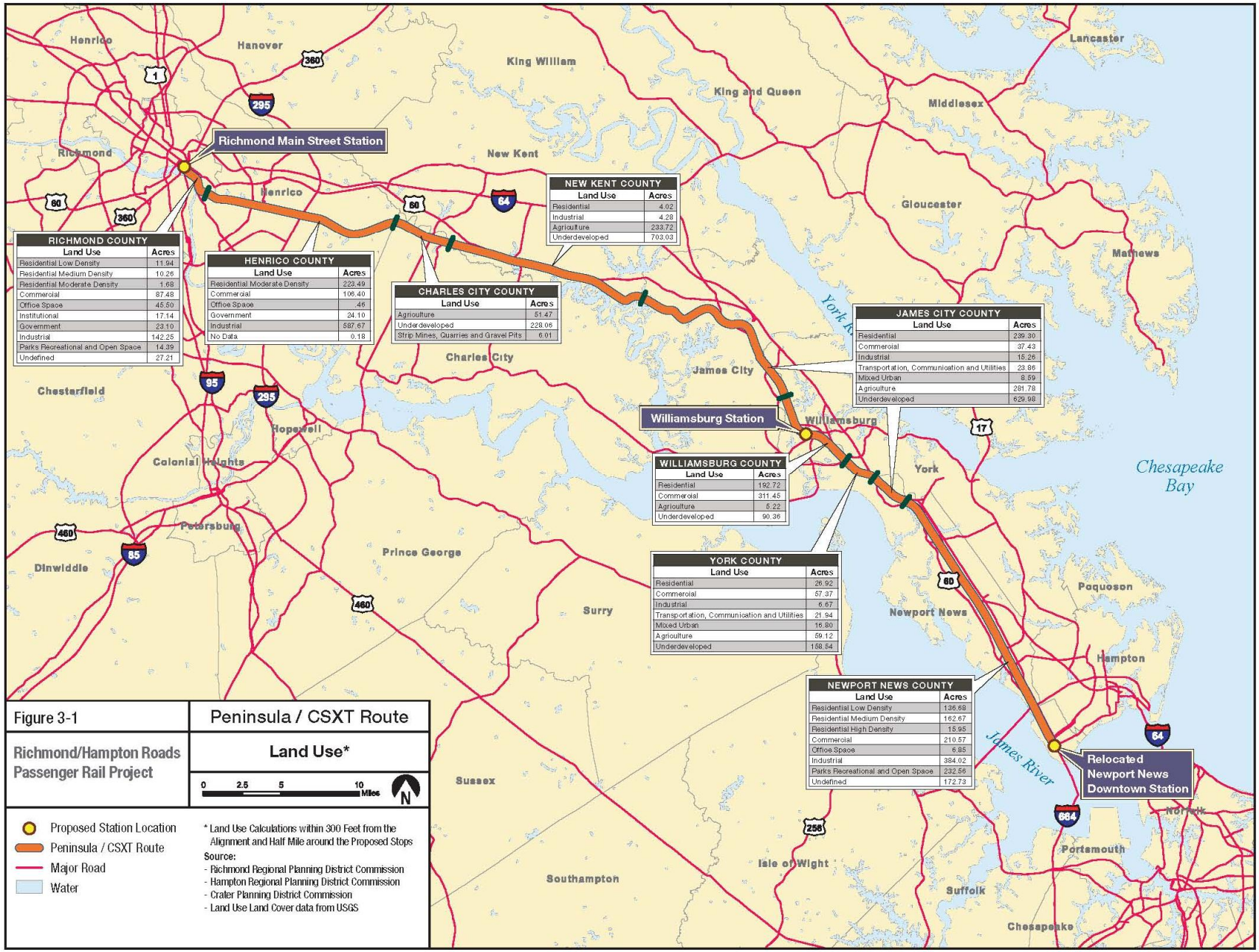
Richmond Main Street Station
Williamsburg Station
Relocated Newport News Downtown Station
RICHMOND COUNTY
Land Use | Acres
Residential Low Density | 11.94
Residential Medium Density | 10.26
Residential Moderate Density | 1.68
Commercial | 87.48
Office Space | 45.50
Institutional | 17.14
Government | 23.10
Industrial | 142.25
Parks Recreational and Open Space | 14.39
Undefined | 27.21
HENRICO COUNTY
Land Use | Acres
Residential Moderate Density | 223.49
Commercial | 106.40
Office Space | .46
Government | 24.10
Industrial | 587.67
No Data | 0.18
CHARLES CITY COUNTY
Land Use | Acres
Agriculture | 51.47
Underdeveloped | 228.06
Strip Mines, Quarries and Gravel Pits | 6.01
NEW KENT COUNTY
Land Use | Acres
Residential | 4.02
Industrial | 4.28
Agriculture | 233.72
Underdeveloped | 703.03
JAMES CITY COUNTY
Land Use | Acres
Residential | 239.30
Commercial | 37.43
Industrial | 15.26
Transportation, Communication and Utilities | 23.86
Mixed Urban | 8.59
Agriculture | 281.78
Underdeveloped | 629.98
WILLIAMSBURG COUNTY
Land Use | Acres
Residential | 192.72
Commercial | 311.45
Agriculture | 5.22
Underdeveloped | 90.36
YORK COUNTY
Land Use | Acres
Residential | 26.92
Commercial | 57.37
Industrial | 6.67
Transportation, Communication and Utilities | 21.94
Mixed Urban | 16.80
Agriculture | 59.12
Underdeveloped | 158.54
NEWPORT NEWS COUNTY
Land Use | Acres
Residential Low Density | 136.68
Residential Medium Density | 162.67
Residential High Density | 15.95
Commercial | 210.57
Office Space | 6.85
Industrial | 384.02
Parks Recreational and Open Space | 232.56
Undefined | 172.73
Henrico
Hanover
King William
King and Queen
Middlesex
Lancaster
Richmond
New Kent
Gloucester
Mathews
Chesterfield
Charles City
James City
Hopewell
Colonial Heights
Williamsburg
York
Chesapeake Bay
Petersburg
Prince George
Dinwiddie
Surry
Sussex
Poquoson
Newport News
Hampton
Norfolk
Portsmouth
Isle of Wight
Southampton
Suffolk
Chesapeake
James River
York River
Figure 3-1
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Land Use*
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
* Land Use Calculations within 300 Feet from the Alignment and Half Mile around the Proposed Stops
Source:
- Richmond Regional Planning District Commission
- Hampton Regional Planning District Commission
- Crater Planning District Commission
- Land Use Land Cover data from USGS

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- **Henrico County** - Henrico County makes up approximately 16 percent of the study area. Primary land uses along the route within this county are mainly characterized by industrial and residential. Other land uses in this area include commercial/office space and government.
- **Charles City County** - Charles City County makes up approximately four percent of the study area. Land uses in this area are mainly agricultural and undeveloped. A small percentage of the land use along the route is characterized as strip mines, quarries and gravel pits.
- **New Kent County** - Approximately 16 percent of the study area is located within New Kent County. As in Charles City County, the land uses in New Kent County are chiefly agriculture and undeveloped. A small percentage of the land use is industrial and residential.
- **James City County** - James City County makes up about 20 percent of the study area. Within this section of the route, land uses are primarily characterized by agricultural, residential and undeveloped land. A smaller percentage of the area land use is commercial, industrial, mixed urban, or transportation, communications, and utilities.
- **City of Williamsburg** - Approximately ten percent of the study area is located in Williamsburg. Land uses along this part of the route are mostly commercial and residential with a small percentage undeveloped or agricultural.

  The use of the existing Williamsburg Amtrak Station is proposed for all of the alternatives considered using the Peninsula/CSXT Route. An expanded park-and-ride lot is also proposed for this station location. The land uses around this station are 36 percent residential and 41 percent commercial. The remaining land uses are undeveloped or agricultural.
- **York County** - York County makes up about 6 percent of the study area. Almost half of the land uses in York County are undeveloped. Other primary land uses in this area of the route include agriculture and commercial. A smaller percentage of the land uses are comprised of industrial, mixed urban, residential, and transportation, communications, and utilities.
- **City of Newport News** - Approximately 22 percent of the study area is located within Newport News. Land uses in this area are mostly industrial and residential, with some commercial/office space, parks, recreation, and open space, and a smaller undefined area.

  The existing Amtrak Station in Newport News would be used as part of the Status Quo Alternative, the No Action Alternative and Alternative 1. Land uses in this area are 36 percent residential, 23 percent parks and open space, 20 percent commercial, 26 percent. The remaining uses are office and undefined.

As part of Alternatives 2a and 2b, a new station is proposed between 25th and 27th Streets within a primarily industrial area. A park-and-ride lot is also proposed for this station, and existing parking structures may be used. Land uses in this area are 39 percent commercial, 28 percent industrial, and 22 percent residential. The remaining uses are parks and open space and undefined.

Southside/NS Route - The primary land uses along the Southside/NS Route include agricultural, industrial, residential and undeveloped. Developed land uses, which include industrial, commercial, and residential, along the Southside/NS route are concentrated in Prince George County, the City of Chesapeake, the City of Portsmouth, and the City of Norfolk. Figure 3-2 shows the land uses along the route. Land uses within each jurisdiction located along the Southside/NS route are described below:

- **Prince George County** - Prince George County makes up approximately ten percent of the Southside/NS study area. Land use along the route in Prince George County is primarily residential and industrial with a small percentage of land utilized for commercial and office space.
- **City of Sussex** - The City of Sussex makes up about 22 percent of the Southside/NS study area. Land uses along the route in this area are mostly agricultural and undeveloped. Other uses include residential and, to a lesser extent, commercial.
- **Surry County** - Surry County makes up less than one percent of the Southside/NS study area. Land use for this portion of Surry County is classified as undeveloped.

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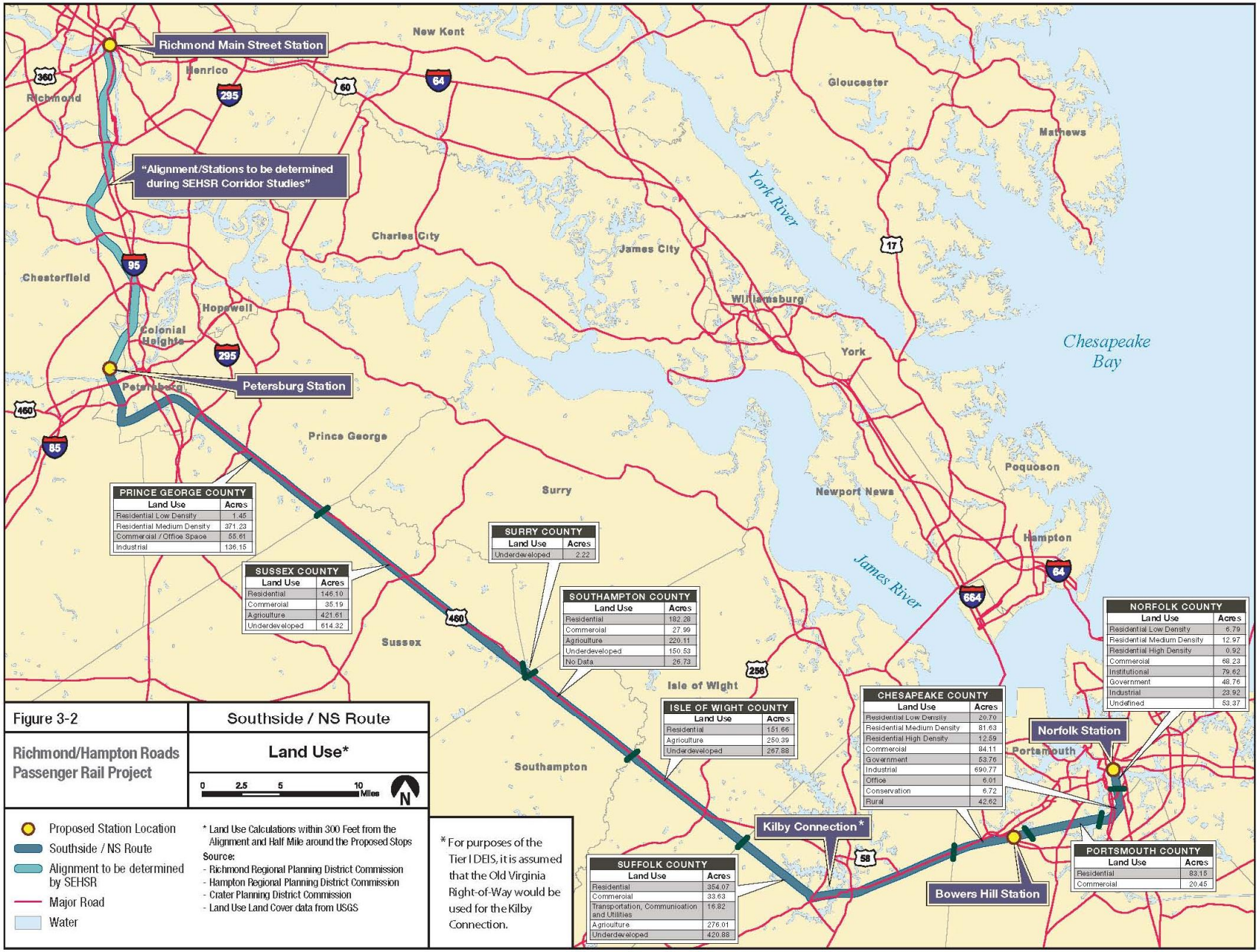
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
New Kent
Henrico
Richmond
Chesterfield
Colonial Heights
Hopewell
Prince George
Surry
Sussex
Charles City
James City
Williamsburg
York
Gloucester
Mathews
Poquoson
Newport News
Hampton
Chesapeake Bay
York River
James River
Isle of Wight
Southampton
Portsmouth
Norfolk Station
Kilby Connection*
Bowers Hill Station
PRINCE GEORGE COUNTY
Land Use | Acres
Residential Low Density | 1.45
Residential Medium Density | 371.23
Commercial / Office Space | 55.61
Industrial | 136.15
SUSSEX COUNTY
Land Use | Acres
Residential | 146.10
Commercial | 35.19
Agriculture | 421.61
Underdeveloped | 614.32
SURRY COUNTY
Land Use | Acres
Underdeveloped | 2.22
SOUTHAMPTON COUNTY
Land Use | Acres
Residential | 182.26
Commercial | 27.99
Agriculture | 220.11
Underdeveloped | 150.53
No Data | 26.73
ISLE OF WIGHT COUNTY
Land Use | Acres
Residential | 151.66
Agriculture | 250.39
Underdeveloped | 267.88
SUFFOLK COUNTY
Land Use | Acres
Residential | 354.07
Commercial | 33.63
Transportation, Communication and Utilities | 16.82
Agriculture | 276.01
Underdeveloped | 420.88
CHESAPEAKE COUNTY
Land Use | Acres
Residential Low Density | 20.70
Residential Medium Density | 81.63
Residential High Density | 12.59
Commercial | 84.11
Government | 53.76
Industrial | 690.77
Office | 6.01
Conservation | 6.72
Rural | 42.62
NORFOLK COUNTY
Land Use | Acres
Residential Low Density | 6.79
Residential Medium Density | 12.97
Residential High Density | 0.92
Commercial | 68.23
Institutional | 79.62
Government | 48.76
Industrial | 23.92
Undefined | 53.37
PORTSMOUTH COUNTY
Land Use | Acres
Residential | 83.15
Commercial | 20.45
Figure 3-2
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Land Use*
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
* Land Use Calculations within 300 Feet from the Alignment and Half Mile around the Proposed Stops
Source:
- Richmond Regional Planning District Commission
- Hampton Regional Planning District Commission
- Crater Planning District Commission
- Land Use Land Cover data from USGS
* For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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- **Southampton County** - Southampton County makes up about 11 percent of the Southside/NS study area. Land uses along the route in this area are mostly agricultural, residential and undeveloped. A small percentage of the land uses in this area is commercial.
- **Isle of Wight County** - Isle of Wight County makes up about 12 percent of the Southside/NS study area. Land uses along the route in Isle of Wight County are agricultural, residential and undeveloped.
- **City of Suffolk** - Approximately 20 percent of the study area is located in the City of Suffolk. Land uses in this section of the route are chiefly agricultural, residential and undeveloped. A small percentage of the land uses in this area are commercial and transportation, communication, and utilities.

  A station is proposed in the vicinity of Bowers Hill, just off of Military Highway, for Alternatives 1 and 2a. Land uses surrounding the proposed Bowers Hill Rail Station location are 87 percent industrial and 13 percent commercial.
- **City of Chesapeake** - Approximately 18 percent of the study area is located in the City of Chesapeake. Land uses in this section of the route are primarily industrial. Other land uses include commercial/office space, government, residential and agricultural/rural. A very small percentage of the area is a conservation area.
- **City of Portsmouth** - Approximately two percent of the study area is located in the City of Portsmouth. Land uses in this section of the route are primarily residential and commercial. A very small percentage of the area is an agricultural area.
- **City of Norfolk** - Approximately five percent of the study area is located in the City of Norfolk. Land uses in this section of the route are mainly institutional, government and commercial. Other land uses include industrial and residential. A moderate portion of the land uses in this area is undefined.

A station is proposed in this section of the Southside/NS route near the Harbor Point Stadium for Alternatives 1 and 2a. A park-and-ride facility is also proposed for this station. Land uses surrounding the proposed station area are 47 percent government and institutional, 24 percent commercial, 7 percent residential, 16 percent undefined and 5 percent industrial.

3.7.3.2 Review of Land Use Plans

As part of the land use analysis, comprehensive and long-range plans were reviewed for localities located within the project corridors. Several of the plans have elements that relate specifically to the Richmond/Hampton Roads Passenger Rail Project or passenger rail in general. The most recent plans and their objectives are listed in Table 3-27.

Table 3-27: Land Use Plans and Transportation Objectives

Plan	Transportation Objectives
State Plans	
Virginia Department of Transportation. 2004. *VTrans 2025, Virginia's Statewide Multimodal Long-Range Transportation Plan (LRTP) Phase 3 and Final report to the General Assembly*	The plan does not specifically address the Richmond/Hampton Roads Passenger Rail Project; however, the plan supports the development of transit networks in the state and specifically addresses the Richmond to Hampton Roads Passenger Mobility Multimodal Investment Network.
Virginia Department of Rail and Public Transportation. 2004. *The Virginia State Rail Plan, A Multimodal Strategy to Meet the Commonwealth's Passenger and Freight Transportation Needs through 2025*	The plan describes the two proposed routes of the Richmond/ Hampton Roads Passenger Rail Project.
Peninsula/CSXT Route	
Richmond Area Metropolitan Planning Office (MPO). 2004. *2026 Long-Range Transportation Plan*	Objectives stated in the plan that relate to the proposed project include: supporting efforts to provide expanded passenger rail service, including high-speed rail, to and through the Richmond region; supporting local and regional efforts to plan for commuter rail in the Richmond region; and securing a reliable and dedicated source of funds for public transportation and intercity rail.
City of Richmond. *City of Richmond's Master Plan 2000-2020*	The plan calls for the development of high-speed passenger rail service connecting Richmond to other areas in Virginia and along the East Coast. In the short-term, the plan calls for the preservation of right-of-way for potential transit routes for elements of the plan that are not to be implemented in the near future.
City of Richmond. 2004. *Downtown Plan Richmond*	The Richmond Downtown Plan specifies that "appropriate track upgrades should be made to maximize the use of the Main Street Station as the regional rail transit hub," which includes "improvements to or elimination of grade crossings that would facilitate future high-speed rail service to Newport News."
Henrico County. 2006. *Vision 2026 – Draft Comprehensive Plan*	The plan lists the following policies to guide the provision of rail services in the County. (1) Participate in regional efforts to monitor and evaluate the potential demand for passenger trains within the County. (2) Consider potential station locations in the design of mixed-use development, particularly in areas where preferred routes have been identified.
New Kent County. 2003. *Vision 2020: New Kent County Comprehensive Plan*	The plan supports the development and expansion of passenger rail services between Richmond and Hampton Roads along the CSXT route, including reestablishing passenger rail service at Providence Forge.
Richmond Regional Planning District Commission (RRPDC). 2003. *Village Visions: New Kent County Providence Forge*.	The Richmond/Hampton Roads Passenger Rail Project is supported by the plan and includes a possible rail stop at Providence Forge.
Hampton Roads Planning District Commission. 2007. *Hampton Roads 2030 Long-Range Transportation Plan*.	This plan does not include the Richmond/Hampton Roads Passenger Rail Project. It does support the expansion of rail transit service in portions of this project's study area.
James City County. *2003 Comprehensive Plan*	The Plan specifically addresses the Richmond/Hampton Roads Passenger Rail Project and supports plans for the CSXT route. The plan supports the continuation of feasibility and impact studies to develop a high-speed rail system preferably utilizing the CSXT route.
Williamsburg. 2006. *The City of Williamsburg 2006 Comprehensive Plan.*	The plan supports the development and implementation of improved high-speed rail service, with the Williamsburg Transportation Center serving as the regional hub.
York County. 2005. Draft *Charting the Course to 2025, The Comprehensive Plan.*	The York County Comprehensive Plan supports the development of enhanced rail service on the Peninsula, including higher speed rail service along the CSXT route, and encourages further feasibility studies of high-speed rail.

Plan	Transportation Objectives
City of Newport News. 2000. *Framework for the Future*	The plan does not address the Richmond/Hampton Roads Passenger Rail Project specifically; however, the plan concludes that "high-speed rail should be extended to Norfolk and Virginia Beach through the Third Crossing of Hampton Roads."
City of Hampton. 2005. Draft *Hampton's Community Plan - Land Use & Community Design and Transportation Summary of Recommendations*	The plan states in the Transportation Element that the city will "maintain and enhance passenger rail connections between the city and the rest of the country."
Southside/NS Route	
Crater Planning District Commission (CPDC). 2004. *Tri-Cities Area Year 2026 Transportation Plan*	The Richmond/Hampton Roads Passenger Rail Project is cited as an example of how passenger rail service could be implemented to improve connections between modes.
CPDC. 2005. *Tri-Cities Area MPO Unified Transportation Planning Work Program (UTPWP) FY 2006*	Objectives of the plan are to monitor the Richmond/Hampton Roads Passenger Rail Project and to coordinate study progress with local governments particularly focusing on land use impacts, at-grade crossings safety and land parcel access.
Hampton Roads Planning District Commission. 2007. *Hampton Roads 2030 Long-Range Transportation Plan*	As stated above, this plan does not include the Richmond/Hampton Roads Passenger Rail Project. It does support the expansion of rail transit service in portions of this project's study area.
Hampton Roads Planning District Commission. 2007. *Vision 2020: The Southampton County Comprehensive Plan*	Transportation goals of the plan include recognizing and promoting the value of rail and encouraging the improvement of such facilities.
City of Suffolk. 2006. *Comprehensive Plan for 2026*	The plans states that exploration of exclusive right-of-way for new rail service should be considered.
Chesapeake County. 2006. *2026 Comprehensive Plan*	City will preserve railroad right-of-way along corridors where passenger rail may be a future consideration.
City of Virginia Beach. 2003. *2003 Comprehensive Plan Policy Document Master Transportation Plan*	The plan calls for the city to "continue to pursue high-speed rail connections to Southside Hampton Roads." Of the two routes presented in the Richmond/Hampton Roads Passenger Rail Project, the city prefers the Southside/NS route.
City of Portsmouth. 2005. *Destination 2025: Setting a Bold New Course, A Comprehensive Plan*	Policy #7 of the Transportation Element is to connect the land use pattern to a supportive, multimodal transportation system. Plan does not address the Richmond/Hampton Roads Passenger Rail Project.
City of Norfolk. 2002. *A Vision for the Next Decade Norfolk 2010*	Plan includes a multimodal transfer facility serving a high-speed rail system and development oriented toward transit.

3.7.4 Environmental Consequences

3.7.4.1 Status Quo Alternative

The Status Quo Alternative is based on existing conditions and the funded and programmed transportation improvements that will be developed and in operation by 2030. All passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made other than routine maintenance.

Land use and local communities will change between 2008 and 2030 as a result of population growth and changes of economic activity in towns and cities within the study area. Although some changes in land use compatibility with passenger rail service may result from these changes in economic activity in the study area and/or from the projects in the Status Quo Alternative, it was assumed that projects included in the Status Quo Alternative would include typical design and construction practices to avoid or minimize potential impacts. Moreover, these projects would be subject to a separate project-level environmental review process to identify potential impacts and to include feasible measures to avoid, minimize or mitigate potential impacts. It is not expected that any conversion of existing land uses to transportation would be required for the Status Quo Alternative as no additional right-of-way would be required.

The Status Quo Alternative would not be consistent with some of the land use plans reviewed for the study routes because it would not meet specified goals and objectives related to transportation, regional connectivity and economic growth.

3.7.4.2 No Action Alternative

Under the No Action Alternative, trains would continue to operate at a maximum of 79 mph between Newport News and Richmond. One additional daily round-trip would be added. Trains would serve the existing Newport News Amtrak Station, Williamsburg Amtrak Station, and Richmond Main Street Station. The same land use effects described for the Status Quo Alternative would also occur with the No Action Alternative, i.e. land use and local communities will change as a result of population growth and changes in economic activity within the study area, and/or from land use effects related specifically to passenger rail operations.

The No Action Alternative would not be consistent with some of the land use plans reviewed for the study routes because it would not meet specified goals and objectives related to transportation, regional connectivity and economic growth. It is not expected that any conversion of existing land uses to transportation would be required for the No Action Alternative as no additional right-of-way would likely be required.

3.7.4.3 Build Alternative 1 Peninsula Conventional/Southside Higher Speed

Under Alternative 1, existing Amtrak service would remain the same along the Peninsula/CSXT route. The alternative would combine the No Action Alternative with higher speed passenger rail service on the Southside/NS route. Alternative 1 would primarily utilize existing rail lines and keep within the railroad rights-of-way within affected counties and cities with the exception of one area near Kilby, VA and two others in the vicinity of the proposed Bowers Hill and Norfolk stations, which would require additional right-of-way. Since the stations proposed for the Peninsula/CSXT route are the existing Amtrak stations and no improvements are proposed, no adverse land use impacts are expected in the areas surrounding them.

A portion of the Southside/NS route would use part of the abandoned Virginian Railway between Kilby and Bowers Hill. In order to make this connection between the existing Norfolk Southern line and the Virginian, a small segment of new rail right-of-way may be required in the vicinity of Kilby. In the vicinity of the proposed Bowers Hill Station on the Southside/NS route, the land use is predominantly industrial with some commercial. The location is considered highly compatible with existing land uses because industrial land uses would be insensitive to potential aesthetic and noise and vibration effects of the proposed project. Land uses in the vicinity of the proposed Norfolk Station are primarily institutional, government, and commercial. The location is considered highly compatible with the existing land uses because of the high intensity of governmental, institutional and commercial development. Given the need for additional right-of-way, there would likely be a conversion of the existing land use to a transportation use. These potential conversions would be investigated further during Tier II analysis.

The introduction of passenger rail service would be consistent with policies and actions stated in plans for cities located along the study routes. Each plan emphasizes the development of intercity rail service, reducing the reliance on cars for transportation and transit-oriented development. No potentially adverse land use impacts are anticipated.

The proposed station locations for the Southside/NS route would be consistent with the Suffolk *Comprehensive Plan for 2026* (Suffolk 2006), *A Vision for the Next Decade Norfolk 2010* (Norfolk 2002), and the *Hampton Roads 2030 Long-Range Transportation Plan* (HRPDC 2007), which place a high priority on strengthening and restoring the downtown areas, including the development of a multimodal transit center.

3.7.4.4 Build Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would primarily use existing rail lines and stay within existing railroad rights-of-way for both the Peninsula/CSXT and the Southside/NS routes, with the exception of areas that would require additional right-of-way for track expansion, new stations and potentially expanded parking areas. In these areas, a conversion of land use may occur. These areas would be investigated further during Tier II analysis.

Alternative 2a would primarily use existing rail lines and stay within existing railroad rights-of-way along the Peninsula/CSXT route; however, several areas have been identified that would need additional right-of-way. Two areas may require additional right-of-way with the expansion of the Williamsburg Amtrak Station parking area and the relocation of the Newport News Station to downtown in the vicinity of 25th and 27th Streets. Because the area in the vicinity of the Williamsburg Amtrak Station is mostly built out, an open parcel of land north of the tracks is being considered for parking. More detailed analysis of this site will occur during the Tier I analysis.

Land uses surrounding the Williamsburg Amtrak Station, locally referred to as the Williamsburg Transportation Center, are primarily commercial and medium-density residential. Planned land uses are essentially the same. Around the proposed Downtown Newport News Station, land uses are predominately commercial, industrial and residential. Each of the station locations would be moderately to highly compatible with current land uses. No adverse land use impacts are anticipated.

The introduction of higher speed passenger rail service on the Peninsula/CSXT route would be consistent with policies and actions stated in plans for cities located along the study route. Each plan emphasizes the development of intercity passenger rail service, reducing the reliance on cars for transportation, and transit-oriented development.

The existing Williamsburg Amtrak station location is consistent with *The City of Williamsburg 2006 Comprehensive Plan* (Williamsburg 2006). The plan "supports the development and implementation of improved high-speed rail service, with the Williamsburg Transportation Center serving as the regional hub." The proposed Downtown Newport News Station is not specifically mentioned in any area plans. However, service to the area would be consistent with transportation goals of the Newport News *Framework for the Future Plan* (2000) to improve rail transit that would support economic development goals. Coordination with local jurisdictions would be required.

Implementation of conventional service on the Southside/NS route would require similar infrastructure improvements as proposed for higher speed rail service along the route in Alternative 1. Thus, the impacts described for land uses along the Southside/NS route for implementing passenger rail service would be similar to those described for Alternative 1.

3.7.4.5 Build Alternative 2b Higher Speed Peninsula Only

Alternative 2b rail operations would primarily use existing rail lines and keep within the railroad rights-of-way along the Peninsula/CSXT route. Two areas along the route may require additional right-of-way for the proposed expansion of the Williamsburg Amtrak Station parking area and the proposed relocation of the Newport News Station, as described in Alternative 2a. These actions may result in a conversion of land use in these specific areas. Further investigations of land use conversions would occur during Tier II analysis.

The impacts described for land uses along the Peninsula/CSXT route would be similar to those described for Alternative 2a. If selected as the Preferred Alternative, the Peninsula/CSXT route would be consistent with the various land use plans reviewed for the route. The rail route would meet the goals and objectives related to transportation, regional connectivity and economic growth outlined in these plans.

3.7.5 Potential Mitigation

Land use variances may be required by affected localities; therefore, coordination with affected localities would be performed. Mitigation measures would be site specific and would be determined in consultation with localities during the Tier II analysis.

3.7.6 Subsequent Analysis

Environmental evaluations of the preferred alternative should address the following in the Tier II analysis:

- Land use studies for the specific alignment and station areas potentially impacted, including evaluation of potential land use conversion, potential growth and potential community benefits.

- Relocation impact analysis for potentially displaced housing and businesses.

3.8 Community Impacts and Environmental Justice

This section provides a summary of the demographics of the study area and evaluates the potential impacts of the proposed project on population and employment. This section also addresses environmental justice in accordance with the provisions of Executive Order (EO) 12898.

3.8.1 Methodology

3.8.1.1 Population and Employment

The defined study area for the demographic analysis consists of 300 feet on either side of the centerline of each of the routes and a 5-mile radius from each of the proposed stations. The information and data presented in this section were obtained from the U.S. Census 2000 data. Population and employment projection data were obtained from the Richmond Regional Planning District Commission (RRPDC)[36], the Crater Planning District Commission (CPDC), and the Hampton Roads Planning District Commission (HRPDC). The RRPDC and CPDC provided 2000 data and 2031 projections, while the HRPDC provided 2000 data and 2030 projections. For consistency, the data reported here are for the year 2025.

3.8.1.2 Environmental Justice

The environmental justice analysis is based on identifying the presence of minority and low income populations within the defined study area. Concentrations of minorities and other special population groups in the study area were identified through analysis of U.S. Census 2000 data at both the county and the census tract level. The individual tract data were compared to the countywide data to determine if any of the tracts would qualify as having large concentrations of minority or low income populations. The federal guidance for evaluating environmental justice issues is found in *Guidance for Federal Agencies on Key Terms in Executive Order 12898*, which was developed by the Interagency Working Group on Environmental Justice, August 1995. Based on this guidance, a tract in this study is categorized as having a large concentration of either minority or low income population if:

- At least 50 percent of the population in the census tract is minority or low income; or
- The minority or low income population in the tract is at least 10 percent greater than the average of the minority or low income population in the county.

3.8.1.3 Communities and Community Facilities

This section describes the types of community facilities that occur along both study routes and the potential impacts of the proposed alternatives on these facilities. Through field visits and using satellite imaging made publicly available by Google Earth (v4.2), an initial inventory of community facilities was conducted within a half-mile of each station or within 300-feet of the railroad right-of-way.

This section does not discuss the specific impacts of the alternatives; rather, it discusses these topics in general terms. For example, a potential impact on a community could be the creation of a new physical barrier that would isolate one part of an established community from another, and thereby potentially result in a physical disruption to community cohesion. More detailed analysis on these types of facilities and communities would be conducted during the Tier II analysis.

3.8.2 Legal and Regulatory Context

The FRA Procedures for Considering Environmental Impacts (FRA Docket No. EP-1, Notice 5, May 26, 1999) states that an environmental assessment should identify the probable impacts of a project on the community and its facilities, socioeconomic impacts, and the potential for disproportionate adverse impacts on minority

[36] Data provided by the Richmond Regional Planning Commission do not cover the entire jurisdiction for Charles City County and New Kent County. Data reported here are for the portion of each locality included under the planning commission.

and low income populations within the community, pursuant to Executive Order No. 12898 Environmental Justice. This section provides a qualitative assessment of the potential impacts of the alternatives on the community and includes an Environmental Justice evaluation. Tier II analysis will include a more detailed examination of potential impacts of the preferred alternative, including a detailed evaluation of means to avoid or minimize impacts through design and mitigation strategies to offset remaining unavoidable impacts.

3.8.2.1 Demographics, Communities and Community Facilities

The FRA Procedures were promulgated pursuant to the National Environmental Policy Act (NEPA), which requires any federal government agency to assess impacts of any proposed action that could significantly affect the quality of the natural and human environment. Further, the U.S. Council on Environmental Quality's (CEQ's) Regulations for implementing the procedural provision of NEPA (40 CFR 1500-1508) state that the "[h]uman environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment."

3.8.2.2 Environmental Justice

EO 12898 requires that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low income populations." The federal guidance for evaluating environmental justice issues is found in *Guidance for Federal Agencies on Key Terms in Executive Order 12898*, which was developed by the Interagency Working Group on Environmental Justice, August 1995.

When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

- Whether there will be an impact to the natural or physical environment that significantly and adversely affects a minority or low income population. Such effects may include ecological, cultural, human health, economic or social impacts on minority communities or low income communities when those impacts are interrelated with impacts on the physical environment;
- Whether environmental effects are significant and have, or may have, an adverse impact on minority populations or low income populations that appreciably exceeds, or is likely to appreciably exceed, those to the general population or other appropriate comparison group; and
- Whether the environmental effects occur or would occur in a minority population or low income population affected by cumulative or multiple adverse exposures from environmental hazards.

3.8.3 Affected Environment – Population and Employment Characteristics

3.8.3.1 Population

Peninsula/CSXT Route - The population within the Peninsula/CSXT route study area grew eight percent from 1990 to 2000 and is projected to increase by approximately 23 percent by 2025. The station areas where the greatest population growth is expected are at the Williamsburg Amtrak Station at 48 percent, and at the Newport News Amtrak Station at 11 percent. The greatest concentrations of population along this route are within the cities of Richmond and Newport News. Table 3-28 shows the population growth data for areas surrounding the stations within the Peninsula/CSXT route study area.

Southside/NS Route - In general, the population of the communities within the Southside/NS route study area grew by approximately six percent from 1990 to 2000 and is projected to increase by approximately 16 percent by 2025. Population growth around the proposed Bowers Hill and Norfolk Downtown stations is projected to be 20 and four percent, respectively. Table 3-28 shows the population growth data for areas surrounding the stations within the Southside/NS route study area.

Table 3-28: Study Route Population Data

Station	For Year 2000		For Year 2025		Percent Change	
	½ Mile	5 Mile	½ Mile	5 Mile	½ Mile	5 Mile
Peninsula/CSXT Route						
Richmond Main Street	3,407	249,115	4,846	275,553	42.2 %	10.6 %
Williamsburg Amtrak	8,440	52,473	9,995	77,455	18.4 %	47.6 %
Newport News Amtrak	7,403	177,891	6,617	197,714	-10.6 %	11.1 %
Proposed Newport News Downtown	6,777	118,528	7,449	116,408	9.9 %	-1.8 %
Totals	**26,027**	**598,007**	**28,907**	**667,130**	**59.9 %**	**67.5 %**
Southside/NS Route						
Proposed Bowers Hill	3,362	132,935	4,652	160,058	38.4 %	20.4 %
Proposed Norfolk Downtown	8,842	299,466	8,490	312,405	- 4.0 %	4.3 %
Totals	**12,204**	**432,401**	**13,142**	**472,463**	**34.4 %**	**24.7 %**

Source: 2026 Long Range Plan for Crater Planning District Commission, Hampton Roads Planning District Commission and Richmond Regional Planning District Commission.

3.8.3.2 Employment

Peninsula/CSXT Route - From 1990 to 2000, employment within the Peninsula/CSXT route study area increased by approximately nine percent, and is expected to increase by 18 percent by 2025. Employment growth over the same period in the areas surrounding the Williamsburg and Newport News Amtrak stations is expected to be the greatest at 24 and 19 percent, respectively. Table 3-29 shows the projected employment growth for each of the station areas within the Peninsula/CSXT route.

Employment in the study area is primarily located in the City of Richmond (42 percent). Twenty percent is located in the City of Newport News, 25 percent is located in Henrico County and the City of Hampton, and the remaining employment is located in the rest of the counties and cities.

Southside/NS Route - From 1990 to 2000, employment within the Southside/NS route study area increased by 13 percent, and is expected to increase by ten percent by 2025. Over the same period, employment is expected to increase by 47 percent in the proposed Bowers Hill Station area and 15 percent in the Norfolk Downtown Station area. Table 3-29 shows the projected employment growth for each of the station areas within the Southside/NS route study area.

Along this route, 40 percent of employment is located in the City of Norfolk, 30 percent is in the City of Chesapeake and 22 percent is in the City of Portsmouth. The last eight percent is located in the remaining counties.

Table 3-29: Study Route Employment Data

Station	For Year 2000		For Year 2025		Percent Change	
	½ Mile	5 Mile	½ Mile	5 Mile	½ Mile	5 Mile
Peninsula/CSXT Route						
Richmond Main Street	63,926	261,964	61,483	265,447	- 3.8 %	1.3 %
Williamsburg Amtrak	18,323	55,336	14,630	68,618	- 20.2 %	24.0 %
Newport News Amtrak	5,926	121,849	5,838	145,317	- 1.5 %	19.2 %
Proposed Newport News Downtown	25,831	79,456	28,579	90,056	10.6 %	13.3 %
Totals	**114,006**	**518,605**	**110,530**	**569,438**	**-14.9 %**	**57.8 %**
Southside/NS Route						
Proposed Bowers Hill	4,799	45,327	6,780	66,717	41.2 %	47.2 %
Proposed Norfolk Downtown	11,185	250,358	10,505	287,121	- 6.1 %	14.7 %
Totals	**15,984**	**295,685**	**17,285**	**353,838**	**35.1 %**	**61.9 %**

Source: 2026 Long Range Plan for Crater Planning District Commission, Hampton Roads Planning District Commission and Richmond Regional Planning District Commission.

3.8.3.3 Race and Ethnicity

Peninsula/CSXT Route - In 2000, the racial mix by Census Tract in the Peninsula/CSXT route study area was relatively consistent with the counties located within the study area. Table 3-30 shows the percentage of

minorities within the study area by county/city compared to the counties/cities as a whole. In this Tier I Draft EIS analysis, qualifying minority populations within the defined study area occurred in the City of Richmond, Henrico County, the City of Newport News and the City of Hampton. At the Census Tract level, qualifying minority population percentages, i.e. 81 to 100 percent, occurred around the Richmond Main Street, Williamsburg, and Newport News stations. Figure 3-3 shows the areas within the Peninsula/CSXT route study area with the greatest concentrations of minorities.

Table 3-30: Minority Population along the Peninsula/CSXT Route

Location	Percent Minority	Percent Minority in Study Area
Virginia	**30%**	**n/a**
City of Richmond	64%	64%
Hanover County	13%	8%
Henrico County	34%	70%
Charles City County	65%	47%
New Kent County	21%	14%
James City County	20%	17%
City of Williamsburg	23%	20%
York County	23%	24%
City of Newport News	51%	58%
City of Hampton	53%	59%
Isle of Wight County	28%	18%
Total Study Area	**37%**	**38%**

Source: U.S. Bureau of the Census, Census 2000.

Southside/NS Route - The racial mix in the Southside/NS route study area by Census Tract is relatively consistent with the counties as a whole. Table 3-31 shows the percentage of minorities located within the study area by county/city compared to the counties/cities as a whole. In this Tier I analysis, qualifying minority populations within the defined study area occurred in Chesterfield County, Dinwiddie County, the City of Colonial Heights, the City of Petersburg, the City of Sussex, Surry County, the City of Suffolk, the City of Portsmouth, and the City of Norfolk. Figure 3-4 shows the areas within the Southside/NS route study area with the greatest concentrations of minorities. At the Census Tract level, qualifying minority population percentages, i.e. 81 to 100 percent, occurred around the proposed Petersburg, Bowers Hill and Norfolk Stations.

Table 3-31: Minority Population along the Southside/NS Route

Location	Percent Minority	Percent Minority in Study Area
Virginia	**30%**	**n/a**
Chesterfield County	23%	48%
Dinwiddie County	35%	39%
City of Colonial Heights	11%	11%
City of Petersburg	80%	82%
Prince George County	38%	41%
City of Sussex	63%	64%
Surry County	53%	52%
Southampton County	44%	37%
Isle of Wight County	28%	21%
City of Suffolk	45%	54%
City of Chesapeake	32%	42%
City of Portsmouth	53%	56%
City of Norfolk	50%	61%
City of Virginia Beach	26%	38%
Total Study Area	**36%**	**53%**

Source: U.S. Bureau of the Census, Census 2000.

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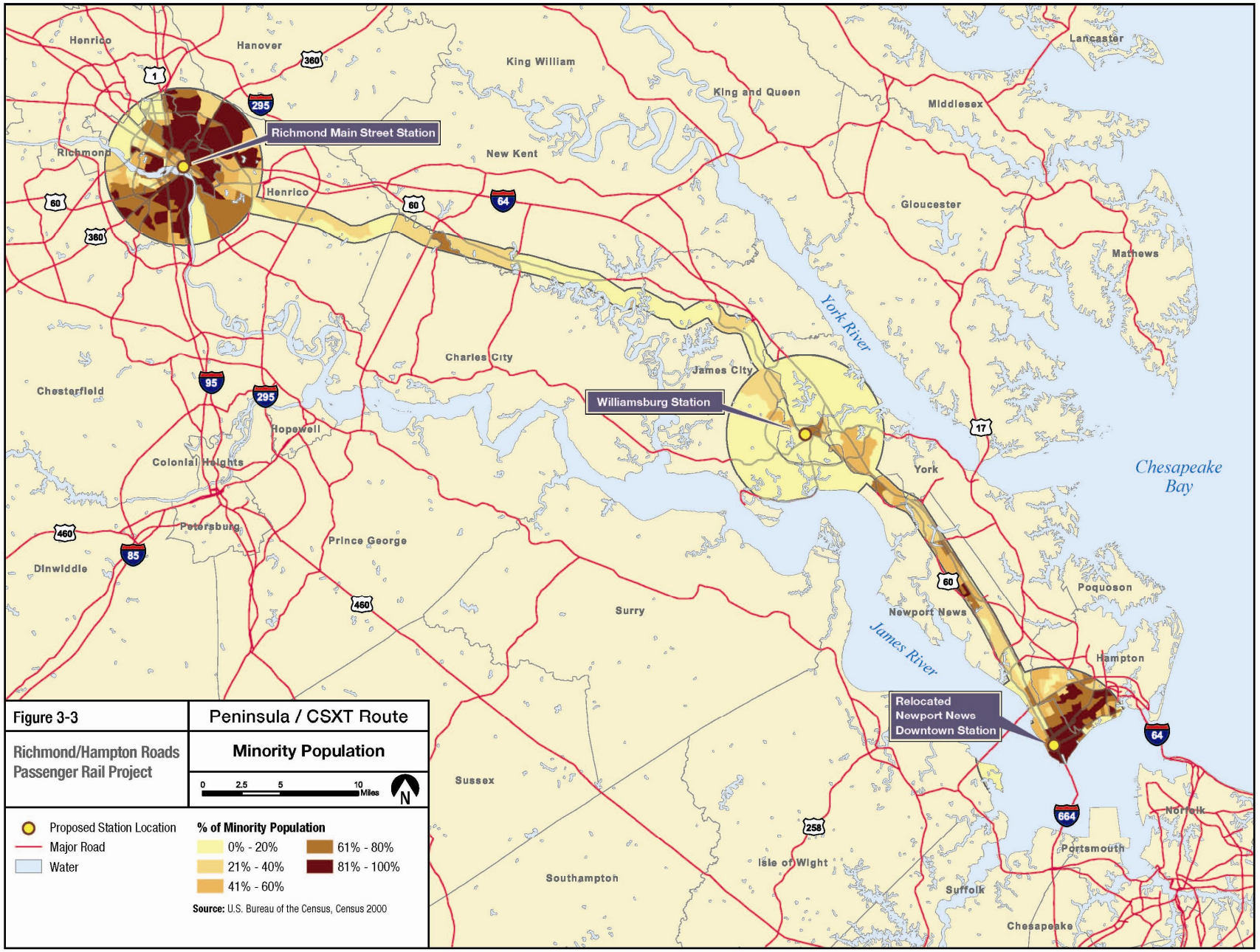
Richmond Main Street Station
Williamsburg Station
Relocated Newport News Downtown Station
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
New Kent
Gloucester
Mathews
York River
Charles City
James City
Chesterfield
Hopewell
Colonial Heights
York
Chesapeake Bay
Petersburg
Prince George
Dinwiddie
Surry
Newport News
James River
Poquoson
Hampton
Sussex
Isle of Wight
Southampton
Suffolk
Portsmouth
Norfolk
Chesapeake
Richmond
Figure 3-3
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Minority Population
0 2.5 5 10 Miles
N
Proposed Station Location
Major Road
Water
% of Minority Population
0% - 20%
21% - 40%
41% - 60%
61% - 80%
81% - 100%
Source: U.S. Bureau of the Census, Census 2000

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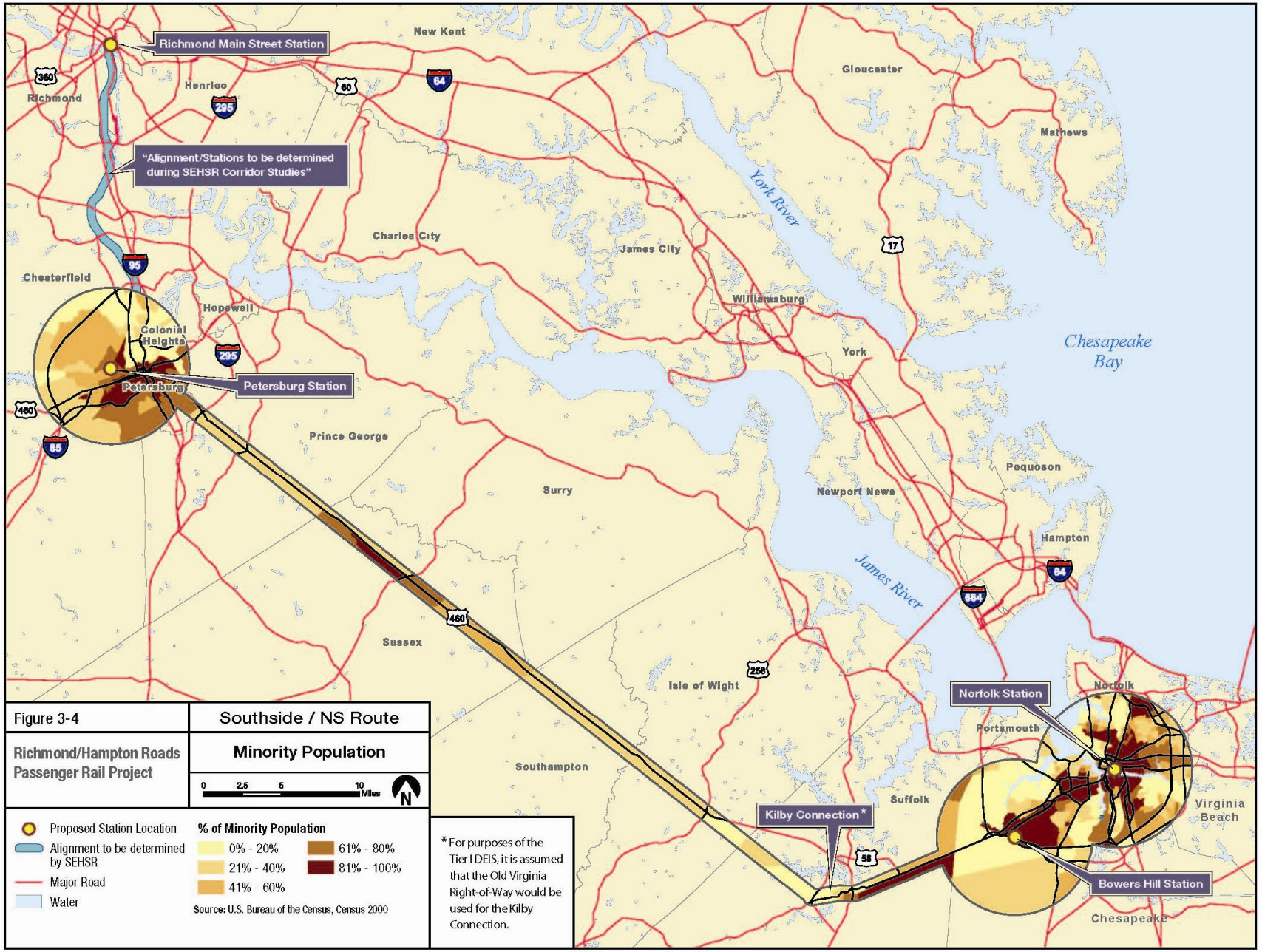
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
Kilby Connection*
Norfolk Station
Bowers Hill Station
New Kent
Gloucester
Mathews
Henrico
Richmond
Chesterfield
Hopewell
Colonial Heights
Petersburg
Charles City
James City
Williamsburg
York
York River
Chesapeake Bay
James River
Prince George
Surry
Sussex
Isle of Wight
Southampton
Suffolk
Newport News
Poquoson
Hampton
Norfolk
Portsmouth
Virginia Beach
Chesapeake
Figure 3-4
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Minority Population
0 2.5 5 10 Miles
N
Proposed Station Location
Alignment to be determined by SEHSR
Major Road
Water
% of Minority Population
0% - 20%
21% - 40%
41% - 60%
61% - 80%
81% - 100%
Source: U.S. Bureau of the Census, Census 2000
*For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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3.8.3.5 Income and Poverty

According to the Council on Environmental Quality's Environmental Justice Guidance under the National Environmental Policy Act (1997), "Low income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports." Thus, the poverty data reported in this Tier I Draft EIS are directly from Census 2000 tables and are calculated on a per capita basis.

Peninsula/CSXT Route - Of the areas within the Peninsula/CSXT route study area, the City of Richmond and the City of Newport News have the highest concentrations of low income populations. Twenty-three percent of the City of Richmond portion and 22 percent of the City of Newport News portion of the study area are below the poverty level. However, for the purposes of this study, these areas do not fit the criteria for an environmental justice area since the portion of the study area is neither 50 percent low income nor 10 percent greater than the county average. In this Tier I Draft EIS analysis, no populations within the study area met the criteria as low income populations. Table 3-32 and Figure 3-5 shows the concentrations of low income populations within the Peninsula/CSXT route study area.

Table 3-32: Income and Poverty along the Peninsula/CSXT Route

Location	Median Household Income	Percent Below Poverty Level	Percent Below Poverty Level within Study Area
Virginia	$46,677	9%	n/a
City of Richmond	$31,121	20%	23%
Henrico County	$49,185	6%	11%
Hanover County	$59,223	4%	3%
Charles City County	$42,745	11%	6%
New Kent County	$53,595	5%	6%
James City County	$55,594	6%	7%
City of Williamsburg	$37,093	11%	11%
York County	$57,956	4%	5%
City of Newport News	$36,597	13%	21%
City of Hampton	$39,532	10%	12%
Isle of Wight County	$45,387	8%	4%
Total	**$46,184**	**10%**	**18%**

Source: U.S. Bureau of the Census, Census 2000

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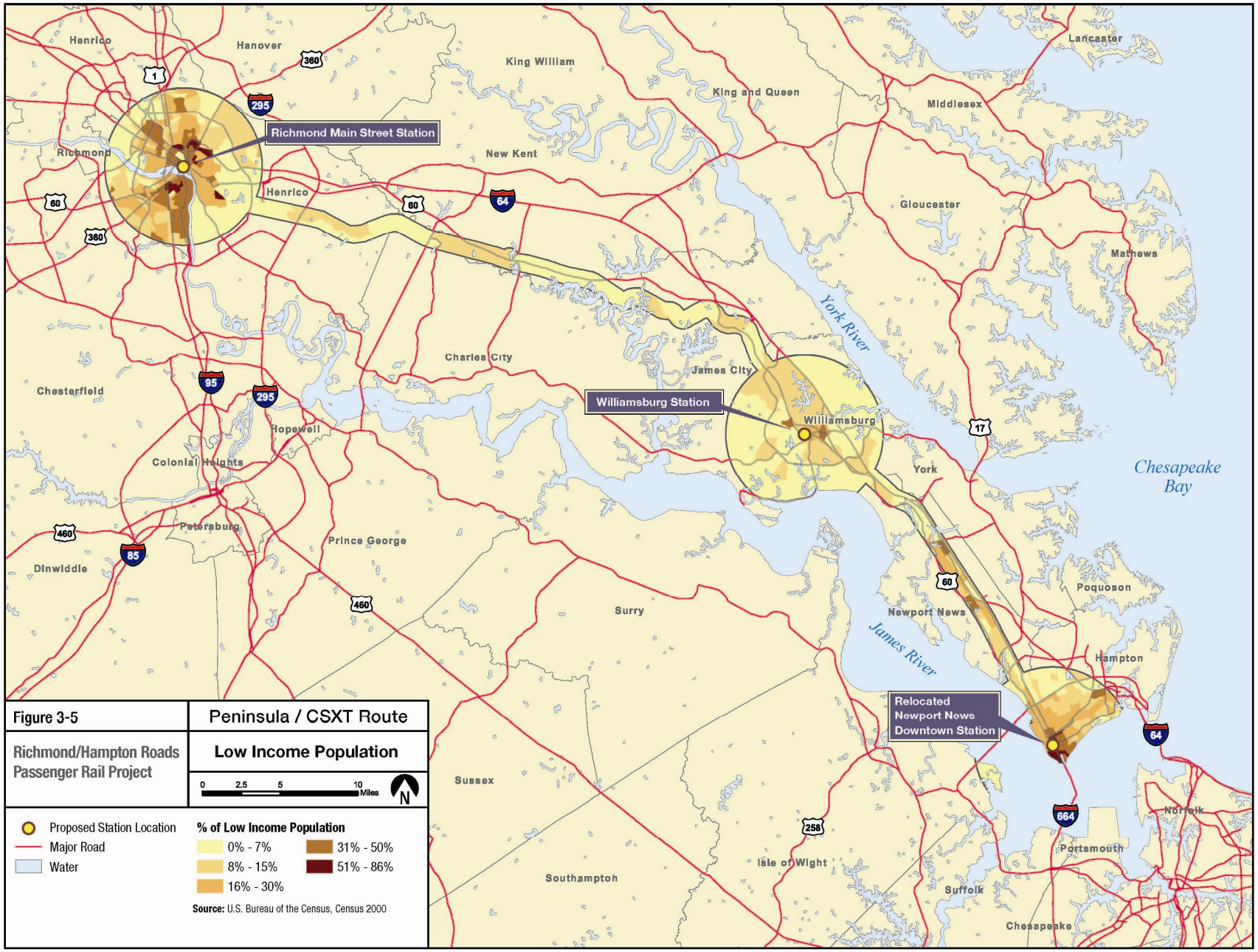
Richmond Main Street Station
Williamsburg Station
Relocated Newport News Downtown Station
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
Richmond
New Kent
Gloucester
Mathews
York River
Charles City
James City
Chesterfield
Hopewell
Williamsburg
Colonial Heights
York
Chesapeake Bay
Petersburg
Prince George
Dinwiddie
Surry
Poquoson
Newport News
James River
Hampton
Sussex
Norfolk
Portsmouth
Isle of Wight
Southampton
Suffolk
Chesapeake
Figure 3-5
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Low Income Population
0 2.5 5 10 Miles
N
Proposed Station Location
Major Road
Water
% of Low Income Population
0% - 7%
8% - 15%
16% - 30%
31% - 50%
51% - 86%
Source: U.S. Bureau of the Census, Census 2000

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Southside/NS Route - The percentage of the population living below the level of poverty within the Southside/NS route study area is relatively consistent with the counties as a whole. The areas within the study area with the highest concentrations of low income are Surry County, the City of Suffolk, and the City of Norfolk. Twenty-five percent of the population in the Surry County portion of the study area was living below the level of poverty in 2000, as opposed to 10 percent for the county as a whole. Similarly, 21 percent of the City of Suffolk portion of the study area was living below the level of poverty, as opposed to 13 percent of the city as a whole. Twenty-two percent of the study area population within the City of Norfolk was living below the poverty level as opposed to 17 percent of the entire city. However, for the purposes of this study, these areas do not fit the criteria for an environmental justice area since the portion of the study area is neither 50 percent low income nor 10 percent greater than the county average. In this Tier I Draft EIS analysis, no populations within the study area met the criteria as low income populations. Table 3-33 and Figure 3-6 show the concentrations of low income populations within the Southside/NS route study area.

Table 3-33: Income and Poverty along the Southside/NS Route

Location	Median Household Income	Percent Below Poverty Level	Percent Below Poverty Level within Study Area
Virginia	$46,677	9%	--
Chesterfield County	$58,537	5%	8%
Dinwiddie County	$41,582	9%	10%
City of Colonial Heights	$43,224	6%	6%
City of Petersburg	$28,851	19%	13%
Prince George County	$49,877	7%	6%
City of Sussex	$31,007	13%	18%
Surry County	$37,558	11%	25%
Southampton County	$33,995	13%	14%
Isle of Wight County	$45,387	8%	8%
City of Suffolk	$41,115	13%	21%
City of Chesapeake	$50,743	7%	11%
City of Portsmouth	$33,742	15%	18%
City of Norfolk	$31,815	17%	22%
City of Virginia Beach	$48,705	6%	5%
Total	**$39,345**	**11%**	**17%**

Source: U.S. Bureau of the Census, Census 2000.

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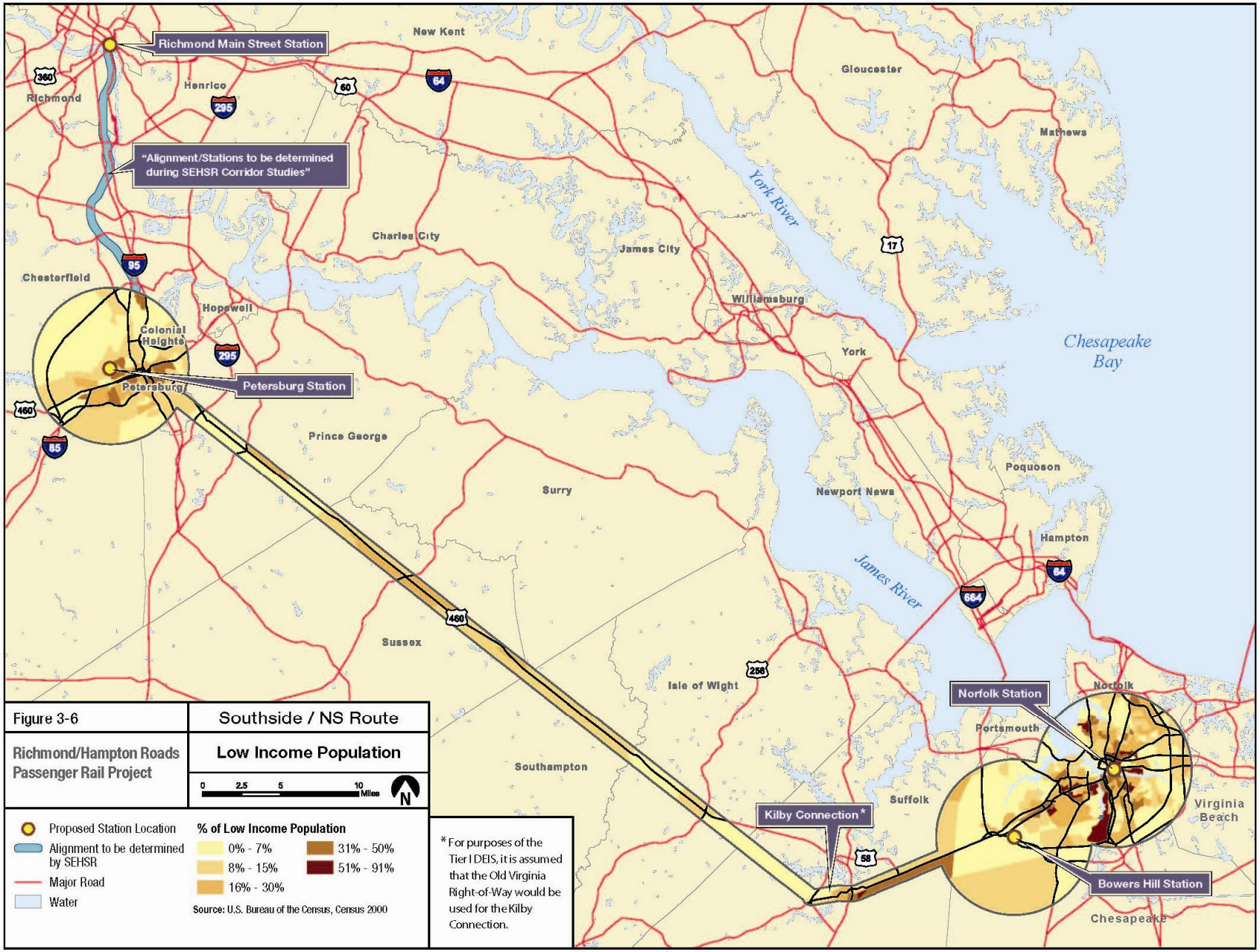
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
Norfolk Station
Kilby Connection*
Bowers Hill Station
New Kent
Gloucester
Mathews
Henrico
Richmond
Chesterfield
Colonial Heights
Hopewell
Petersburg
Charles City
James City
Williamsburg
York
York River
Chesapeake Bay
James River
Prince George
Surry
Sussex
Isle of Wight
Southampton
Suffolk
Newport News
Poquoson
Hampton
Norfolk
Portsmouth
Virginia Beach
Chesapeake
Figure 3-6
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Low Income Population
0 2.5 5 10 Miles
N
Proposed Station Location
Alignment to be determined by SEHSR
Major Road
Water
% of Low Income Population
0% - 7%
8% - 15%
16% - 30%
31% - 50%
51% - 91%
Source: U.S. Bureau of the Census, Census 2000
*For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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3.8.3.6 Communities and Community Facilities

Peninsula/CSXT Route

Community Facilities - Community facilities that exist within the study area include emergency response facilities, such as fire and rescue, hospitals, government and community centers, schools, museums and places of worship (to include all structures related to all denominations). Table 3-34 below lists the number of facilities from the initial inventory conducted as part of this Tier I Draft EIS. In addition to those facilities listed for Richmond Main Street Station, there are several historical sites and parks in the vicinity of the station. The table shows the number of facilities located within a half-mile radius of each station or within 300 feet of the railroad right-of-way.

Table 3-34: Number of Community Facilities along the Peninsula/CSXT Route

Location	Type of Facility	Number
Richmond Main Street Station	Church	3
	Government	3
	Hospital	2
	Museum	1
	School	2
Town of Providence Forge	Fire Department	1
	Church	1
City of Williamsburg	Church	4
	School	4
Williamsburg Amtrak Station	Church	5
	Fire Department	1
	School	4
	Stadium	1
	Visitor Center	1
City of Newport News	Church	2
	Hospital	1
	School	1
Newport News Amtrak Station	Church	6
	School	3
Proposed Downtown Newport News Station	Church	5
	Fire Department	1

Source: USGS Topographic Quadrangles for cities/counties within study areas, Google Earth.

Communities - The Peninsula/CSXT route study area is more developed than the Southside/NS route. Towns and cities along the Peninsula/CSXT route include Richmond, Sandston, Roxbury, Providence Forge, Lanexa, Toano, Norge, Lightfoot, Williamsburg and Newport News. The area between the City of Richmond and the City of Williamsburg is relatively rural with development concentrates around towns. Scattered residential properties and farms exist between towns. Areas of the route closer to and within the City of Williamsburg and the City of Newport News are increasingly more suburban to urban.

Southside/NS Route

Community Facilities - The community facilities located within the study area are primarily hospitals, recreation areas/centers, schools and places of worship (to include all structures related to all denominations). Table 3-35 lists the number of facilities from the initial inventory conducted as part of this Tier I Draft EIS. The table shows the number of facilities located within a half-mile radius of each station or within 300 feet of the railroad right-of-way.

Table 3-35: Number of Community Facilities along Southside/NS Route

Location	Facility	Type of Facility
Richmond Main Street Station	3	Church
	3	Government
	2	Hospital
	1	Museum
	2	School
Town of Disputanta	1	School
Town of Waverly	1	Church
Town of Zuni	1	Church
Town of Windsor	1	School
	1	Church
City of Suffolk	5	Church
City of Chesapeake	1	Church
Proposed Bowers Hill Station	0	None
City of Norfolk	1	Church
Proposed Norfolk Station	7	Church
	1	Entertainment
	1	Recreation Center
	7	School

Source: USGS Topographic Quadrangles for cities/counties within study areas, Google Earth.

Communities - Several small towns and cities are located within the Southside/NS route study area, including Disputanta, Waverly, Wakefield, Ivor, Zuni, Windsor, Suffolk, Chesapeake and Norfolk. Most of these are rural with the exception of the Cities of Chesapeake and Norfolk, which are fairly urbanized. For most of the small towns, there is a town center with businesses and other commercial properties along a main street with residential properties and farmland surrounding them.

3.8.4 Environmental Consequences

This section summarizes the findings of the Tier I Draft EIS analysis of potential environmental effects of the construction and operation of the Status Quo, No Action, and Build Alternatives. A refined assessment of potential effects on communities and environmental justice will be undertaken in the Tier II analysis after selection of a preferred alternative.

3.8.4.1 Status Quo Alternative

Under this alternative, no major improvements are proposed. It includes two daily round-trip trains on the Peninsula/CSXT route only. Trains would continue to operate at a maximum of 79 mph between Newport News and Richmond. The trains would continue to serve the existing Newport News Amtrak Station, Williamsburg Amtrak Station and Richmond Main Street Station.

Population and Employment - Under the Status Quo Alternative, existing and proposed population and employment would likely remain the same given that no higher speed passenger rail improvements would be made. The benefits of improved mobility options and greater accessibility to other cities that could affect population and employment would not occur.

Environmental Justice - Environmental justice populations identified along the Peninsula/CSXT route would not be adversely or disproportionately impacted by the Status Quo Alternative. Those environmental justice populations identified along the Southside/NS route would be unaffected since no passenger rail service would be provided. Under the Status Quo Alternative, no environmental justice populations or other community would benefit from improved mobility options and greater accessibility to other cities that would occur under the Build Alternatives and to some extent the No Action Alternative.

Communities and Community Facilities - Under the Status Quo Alternative, no improvements to passenger rail service would be implemented and therefore, no impacts to community facilities or community cohesion would result.

3.8.4.2 No Action Alternative

The No Action Alternative includes the addition of one daily round-trip train on the Peninsula/CSXT route only, for a total of three daily round-trip trains. Trains would continue to operate at a maximum of 79 mph between Newport News and Richmond. They would serve the Newport News Amtrak Station, Williamsburg Station, and Richmond Main Street Station. No passenger rail service would be provided to the Southside/NS route.

Population and Employment - Under the No Action Alternative, population and employment levels along the Peninsula/CSXT route may increase slightly as a result of the mobility benefit of the additional conventional speed train service. This benefit is anticipated to be less than the benefit that could be achieved by higher speed and more frequent passenger rail service, but higher than the Status Quo Alternative.

Environmental Justice - Implementing additional passenger rail service along the Peninsula/CSXT route could create both beneficial and adverse impacts on all populations, including environmental justice populations. Increased service would provide a mobility benefit, while also likely increasing noise from train warning horns at existing at-grade crossings. These noise impacts would not likely be considered disproportionate since horn blows are required for all grade crossings. Environmental justice populations identified along the Peninsula/CSXT route would not be adversely or disproportionately impacted by the No Action Alternative.

Along the Southside/NS route, all populations, including environmental justice populations, would experience no change in mobility and no new impacts due to the project as no new passenger rail service would be provided under the No Action Alternative.

Communities and Community Facilities - The addition of one daily round-trip train along the Peninsula/CSXT route would likely have a negligible impact on communities, community facilities and community cohesion. The site-specific effects of the one additional train and subsequently more frequent horn blows have not been fully evaluated as part of this Tier I Draft EIS and will be evaluated during Tier II analysis. Communities, community facilities and community cohesion would not be affected along the Southside/NS route given that no passenger rail service would be provided.

3.8.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 would serve both the Peninsula and the Southside routes with three daily round-trip trains on the Peninsula/CSXT route and six daily round trip-trains on the Southside/NS route. The Peninsula service would remain the same as described for the No Action Alternative, with three 79 mph maximum speed daily round-trip trains between Newport News and Richmond, serving the existing Newport News, Williamsburg and Richmond stations.

The Southside service would include six daily round-trip trains operating at speeds of 90 mph to 110 mph between the proposed Downtown Norfolk, the proposed Bower's Hill, Petersburg, and Richmond Main Street Stations. The Southside service would require infrastructure improvements—additional right-of-way would be required for track expansion, the proposed rail connection at Kilby and the two proposed stations at Bowers Hill and Downtown Norfolk.

Population and Employment - Similar to the No Action Alternative, population and employment levels along the Peninsula/CSXT route under Alternative 1 may increase slightly as a result of the mobility benefit of the additional conventional speed train service. This benefit is anticipated to be less than the benefit that could be achieved by higher speed and more frequent passenger rail service (Alternatives 2a or 2b), but higher than the Status Quo Alternative.

On the Southside/NS route, population and employment levels under Alternative 1 may increase as a result of the mobility benefit of the additional conventional speed train service. This benefit is anticipated to be more than the benefit that could be achieved by conventional speed and less frequent passenger rail service

(Alternative 2a). The specific effects of the proposed rail service on population and employment growth rates and subsequent housing demand have not been identified at this Tier I Draft EIS level of environmental review. These issues will be further investigated during the Tier II analysis.

Environmental Justice - Similar to the No Action Alternative, implementing additional, conventional speed passenger rail service along the Peninsula/CSXT route in Alternative 1 could create both beneficial and adverse impacts on all populations, including environmental justice populations. Increased service would provide a mobility benefit, while additional service would likely increase noise from train warning horns at existing at-grade crossings. Some areas may also receive beneficial impacts of reduced freight horn noise and crossing safety at road crossings due to grade separations which may be undertaken. Noise impacts would not likely be considered disproportionate since horn blows are required for all grade crossings.

All populations within the Southside/NS route study area, though, would likely experience both benefits and impacts from new passenger rail service. All populations have the potential to experience more impacts than those within the Peninsula/CSXT route study area due to the introduction of a new service to the Southside/NS route. Possible adverse impacts to all populations, including environmental justice populations, would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly near at-grade crossings. Information pertaining to barrier effects is discussed in the following section, potential visual and aesthetic effects is discussed in Section 3.11, and a preliminary noise and vibration impact assessment is included in Section 3.5. Grade crossing safety is discussed in Section 3.3. In this Tier I Draft EIS analysis, a disproportionate impact on environmental justice populations is not anticipated since all populations in the study area may be affected.

In contrast, all populations including environmental justice populations within the Southside/NS route study area would benefit from improved mobility options and greater accessibility that would be provided by new passenger rail service. Moreover, much of the route under Alternative 1 would be located within the existing right-of-way, which would serve to reduce the potential for adverse effects regarding land conversions to rail use.

Communities and Community Facilities - Negligible impacts on communities, community facilities or community cohesion are expected as a result of Alternative 1 for the Peninsula/CSXT route.

Impacts on community cohesion have not been fully evaluated as part of this Tier I Draft EIS; however, potential impacts have been assessed. Currently, there is no passenger rail service along the Southside/NS route. Given that under Alternative 1 higher speed passenger rail service is proposed along the Southside/NS route, it is likely that some grade crossing closures would occur and community cohesion may be affected. More detailed analysis of community cohesion impacts will be evaluated as part of the Tier II analysis.

It is unlikely that community facilities within the Southside/NS Route study area would be adversely impacted as a result of introducing higher speed passenger rail service. The most likely effects to these resources would be proximity effects, such as an altered visual setting at stations and the potential increase in noise and vibration due to increased train frequencies and speeds. Community facilities that have the greatest potential to be impacted would be those closest to the proposed stations. More detailed analysis is warranted to determine specific impacts to community facilities with the study area, and would be carried out as part of the Tier II analysis.

The other potential impact that may occur would be related to potential grade crossing closures. Depending on the relationship of some community facilities to potential closures, there may be some impact on access to community facilities. Of particular concern would be how the potential closures might affect emergency response times and other persons trying to access emergency facilities. More detailed analysis of grade crossing closures and the proximity to emergency routes and facilities would be undertaken during the Tier II analysis.

3.8.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would involve infrastructure improvements to both the Peninsula/CSXT and Southside/NS routes in some areas where additional rail right-of-way would be needed. Additional right-of-way may also be required in some areas for track bed expansion.

As described in Alternative 1, the Southside/NS route would need infrastructure improvements to accommodate passenger rail service. While Alternative 2a proposes conventional service along the Southside/NS route and not higher speed passenger rail, it would still require many of the same infrastructure improvements, including a new rail connection at Kilby and new stations at Bowers Hill and downtown Norfolk.

Population and Employment - Under Alternative 2a, population and employment levels may increase at a higher rate than predicted along both the Peninsula/CSXT and Southside/NS routes, especially around existing and proposed stations. The transit benefit on the Peninsula/CSXT route is anticipated to be higher under Alternative 2a than the benefit that could be achieved by conventional, less frequent passenger rail service (Alternative 1), and higher than the No Action and Status Quo Alternatives.

The benefits of increased mobility and accessibility with the introduction of passenger rail service along the Southside/NS route may result in higher employment and population growth rates in the area. This benefit in Alternative 2a is anticipated to be less than the benefit that could be achieved by higher speed and more frequent passenger rail service (Alternative 1), and higher than the No Action and Status Quo Alternatives. The specific effects of the proposed rail service on population and employment growth rates and subsequent housing demand have not been identified at this stage of the project. These issues would be further investigated during the Tier II analysis.

Environmental Justice - Implementing higher speed passenger service along the Peninsula/CSXT route in Alternative 2a could create both beneficial and adverse impacts on all populations, including environmental justice populations. Increased service would provide a mobility benefit, while additional service would likely increase noise from train warning horns at existing at-grade crossings. Some areas may also receive beneficial impacts of reduced freight horn noise and crossing safety at road crossings due to grade separations which may be undertaken. Noise impacts would not likely be considered disproportionate since horn blows are required for all grade crossings.

All populations within the Southside/NS route study area, though, would likely experience both benefits and impacts from new passenger rail service. All populations have the potential to experience more impacts than those within the Peninsula/CSXT route study area due to the introduction of a new service to the Southside/NS route. Possible adverse impacts to all populations, including environmental justice populations, would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly near at-grade crossings. Information pertaining to barrier effects is discussed in the following section, potential visual and aesthetic effects is discussed in Section 3.11, and a preliminary noise and vibration impact assessment is included in Section 3.5. Grade crossing safety is discussed in Section 3.3. In this Tier I Draft EIS analysis, a disproportionate impact on environmental justice populations is not anticipated since all populations in the study area may be affected.

In contrast, all populations, including environmental justice populations within the Southside/NS route study area, would benefit from improved mobility options and greater accessibility that would be provided by new passenger rail service under Alternative 2a. Moreover, much of the route under Alternative 2a would be located within the existing right-of-way, which would serve to reduce the potential for adverse effects regarding land conversions to rail use.

Communities and Community Facilities - The passenger rail services proposed as part of Alternative 2a may cause effects to community facilities along the Peninsula and Southside routes. Potential impacts to these facilities would be similar in nature as described for Alternative 1, including noise and vibration and aesthetic effects due to proximity to stations. Another potential impact would be related to potential grade crossing closures and separations. Depending on the relationship of some community facilities to potential closures and separations, there may be some impact on access to these facilities, both adverse and

beneficial. Of particular concern would be how the potential closures might affect emergency response times and other persons trying to access emergency facilities. Beneficial impacts would be achieved through improved access in areas that would otherwise be immobilized by passing trains and through reduced horn noise on sensitive receptors. More detailed analysis of grade crossing closures and the proximity to emergency routes and facilities needs to be undertaken during subsequent analysis.

Impacts on community cohesion have not been fully evaluated as part of this Tier I Draft EIS; however potential impacts have been assessed. Currently, there is no passenger rail service along the Southside/NS route. Related grade crossing closures could potentially disrupt community cohesion of these small towns. Should road crossing consolidations and separations occur, they may result in a benefit to communities by creating safer and more accessible routes between residential areas, businesses and other community facilities.

3.8.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b provides higher speed passenger rail service along the Peninsula/CSXT route. No passenger rail service would be provided along the Southside/NS route; therefore no project-related beneficial or adverse impacts along the Southside/NS would occur.

Population and Employment - Under Alternative 2b, population and employment may increase at a higher rate than predicted along the Peninsula/CSXT route, especially around existing and proposed stations. The transit benefit on the Peninsula/CSXT route is anticipated to be higher in Alternative 2b than the benefit that could be achieved under Alternative 2a, and higher than Alternative 1 or the No Action and Status Quo Alternatives. The specific effects of the proposed rail service on population and employment growth rates and subsequent housing demand have not been identified at this stage of the project. These issues would be further investigated during the Tier II analysis.

Environmental Justice - Implementing higher speed passenger service along the Peninsula/CSXT route in Alternative 2b could create both beneficial and adverse impacts on all populations, including environmental justice populations. Increased service would provide a mobility benefit, while additional service would likely increase noise from train warning horns at existing at-grade crossings. Some areas may also receive beneficial impacts of reduced freight horn noise and crossing safety at road crossings due to grade separations which may be undertaken. Noise impacts would not likely be considered disproportionate since horn blows are required for all grade crossings.

Communities and Community Facilities - Potential impacts would be similar to those described for Alternative 2a, with the exception that there would be no impacts to the Southside/NS route study area, as the existing freight service would remain the only service provided. Community disruption would be similar to that discussed for Alternative 2a.

3.8.5 Potential Mitigation

Any adverse impacts to the identified populations'/communities' quality of life could require mitigation. Possible mitigation measures could include the use of sound barriers, enhanced protection at grade crossings, pedestrian overpasses and alternative construction methods to lessen the temporary effects on populations. As planning for the project progresses, more detailed mitigation measures will be identified and evaluated.

Given that specific facilities and communities, as well as impacts, have not been identified, it would be premature to evaluate potential mitigation. However, potential mitigation might include implementing measures that would reduce the impacts of noise and vibration, and coordinating with the localities to determine primary transportation routes and emergency routes.

3.8.6 Subsequent Analysis

The subsequent environmental evaluations for the Preferred Alternative would address the need for the following studies:

- Evaluation of the project's effect on population and employment growth.
- Evaluation of potential land use conversion and community benefits.
- Review of potential localized impacts on neighborhoods and communities, in addition to potential community enhancements and benefits of the project.
- Relocation impact analysis for potentially displaced housing and businesses.
- Pedestrian and vehicular circulation studies.
- Evaluation of potential disproportionate effects on environmental justice populations.

3.9 Federally Owned Land, Open Space, Parklands, State Forests, Wildlife Refugees and Conservation Easements

This section identifies federally owned land, open space, parklands, state forests, wildlife refugees and conservation easements within the study area and describes potential impacts to these resources.

3.9.1. Methodology

In order to identify recreation lands within the study area, research was conducted using various federal, state and local websites. All recreational resources were identified within 300 feet from either side of the centerline of both the Peninsula/CSXT and Southside/NS routes. Acreage of parklands within the 600-foot study area was calculated to indicate the potential for impacts. More detailed evaluation of actual impacts would be carried out during the Tier II environmental analysis.

In order to identify any potential Section 6(f) resources within the study area, a review of the U.S. Department of the Interior, National Park Service (NPS), Land & Water Conservation Fund (L&WCF), and Detailed Listing of Grants by County were reviewed online at the L&WCF website.

3.9.2 Legal and Regulatory Context

Section 4(f) of the U.S. Department of Transportation Act of 1966 and Section 6(f) of the U.S. Land and Water Conservation Fund Act provide protection to parklands, recreation areas, historic areas wildlife and waterfowl refuges. Section 4(f) protects these lands from acquisition and conversion to transportation uses. Section 6(f) preserves, develops and assures the quality and quantity of outdoor recreation resources through the purchase and improvement of recreational lands and requires that certain conditions be met before conversion of these resources can occur. Use of these lands requires a Section 4(f) Evaluation to determine the extent of impacts, avoidance alternatives and measures to minimize harm to these resources.

The Virginia General Assembly enacted the Open Space Land Act in 1966 and authorized state/local agencies and conservation groups in Virginia to use easements for conservation purposes. An easement consists of a legal agreement between a landowner and a state/local agency or conservation group. Conversion or diversion of a conservation easement under the Virginia Outdoors Foundation (VOF) must be approved by the VOF Board. State agencies do not have the power of eminent domain over open-space easements.

3.9.3. Affected Environment

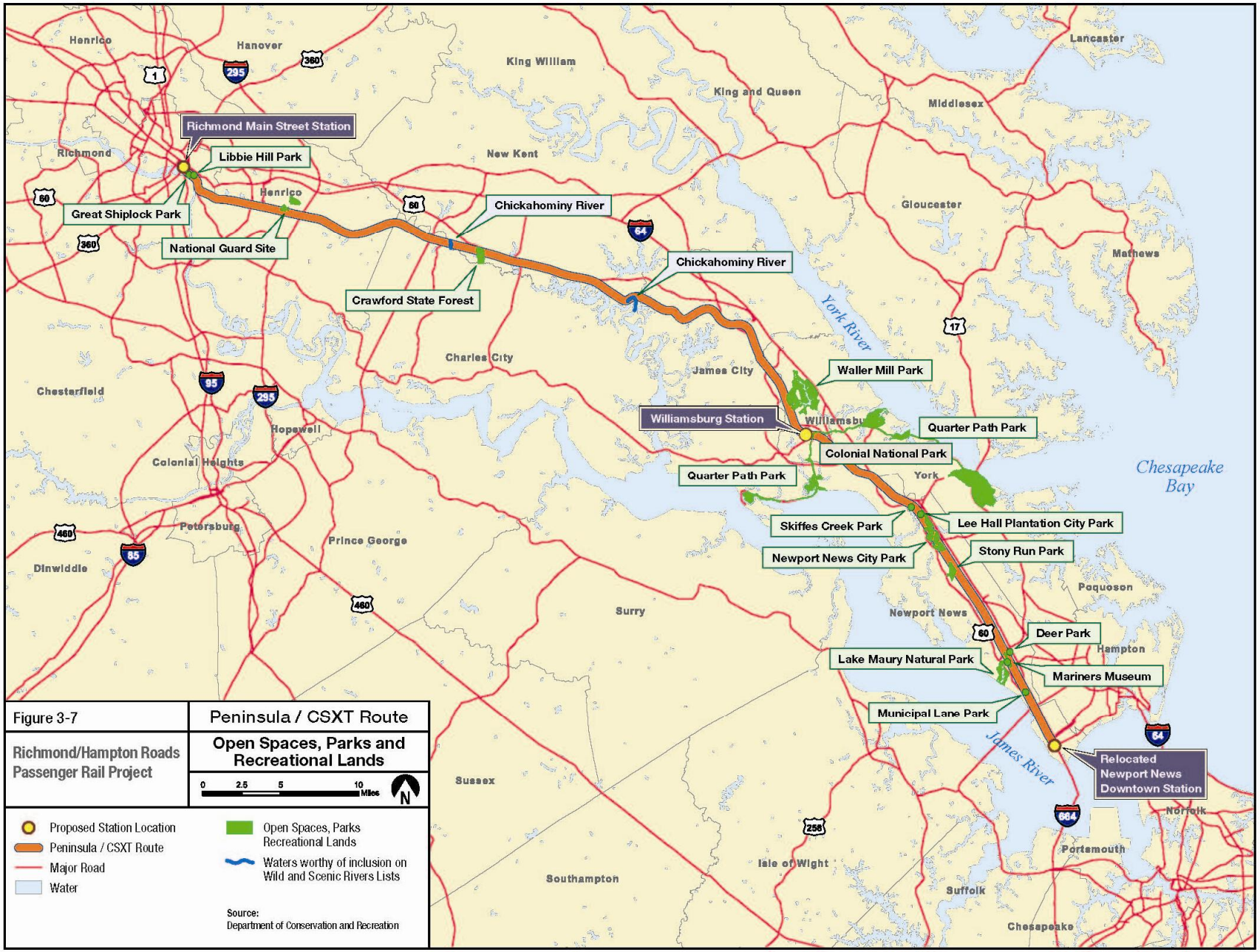
3.9.3.1 Peninsula/CSXT Route

Twenty recreation and federally owned resources have been identified along the Peninsula/CSXT route. According to the U.S. Department of the Interior Land & Water Conservation Fund Act detailed listing of grants by county, Waller Mill Park in the City of Williamsburg has been purchased or enhanced with Land & Water Conservation Funds. This means that this park is eligible for protection under Section 6(f). The recreation and federally owned resources are listed in Table 3-36. See Figure 3-7 for a map of open space, parks and recreational lands along the Peninsula/CSXT route.

Table 3-36: Recreation and Federally Owned Resources along the Peninsula/CSXT Route

Resource	Type	Ownership	Public Access	Location	Acreage within Study Area
Great Shiplock Park	City Park	City of Richmond	Yes	City of Richmond	4.44
Libbie Hill Park	City Park	City of Richmond	Yes	City of Richmond	0.22
National Guard Site	Military Installation	National Guard	No	Henrico County	5.50
VOF Open Space Easement	Conservation Easement	VOF	No	New Kent County	37.89
Crawford State Forest	State Forest	VOF	Yes	New Kent County, Charles City County	37.85
Waller Mill Park	Local Park	City of Williamsburg	Yes	City of Williamsburg	1.30
Colonial Williamsburg National Historical Park	Historical Park	NPS	Yes	James City County, City of Williamsburg, York County	4.75
Quarterpath Park	Local Park	City of Williamsburg	Yes	City of Williamsburg	0.05
Lee Hall Plantation City Park	City Park	City of Newport News	No-presumed closed	City of Newport News	4.73
Newport News City Park	City park	City of Newport News	Yes	City of Newport News	112.69
Skiffes Creek Park	Local Park	City of Newport News	Yes	City of Newport News	1.58
Stony Run Park	Local Park	City of Newport News	Yes	City of Newport News	23.50
Deer Park	City Park	City of Newport News	Yes	City of Newport News	1.05
Lake Maury Natural Park	Local Park	City of Newport News	Yes	City of Newport News	36.75
Municipal Lane Park	Local Park	City of Newport News	Yes	City of Newport News	2.58
Mariners Museum Park	Private Museum/Estate	Mariners Museum	Yes	City of Newport News	0.03
Total					**274.91**

Source: National Park Service, Virginia Department of Conservation and Recreation, Virginia Department of Forestry and local jurisdictions.


Richmond Main Street Station
Libbie Hill Park
Great Shiplock Park
National Guard Site
Chickahominy River
Crawford State Forest
Chickahominy River
Waller Mill Park
Williamsburg Station
Quarter Path Park
Colonial National Park
Quarter Path Park
Skiffes Creek Park
Lee Hall Plantation City Park
Newport News City Park
Stony Run Park
Deer Park
Lake Maury Natural Park
Mariners Museum
Municipal Lane Park
Relocated Newport News Downtown Station
York River
James River
Chesapeake Bay
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
Richmond
New Kent
Gloucester
Mathews
Charles City
James City
Chesterfield
Hopewell
Colonial Heights
Petersburg
Prince George
Dinwiddie
Surry
Sussex
Southampton
Isle of Wight
Suffolk
Chesapeake
Portsmouth
Norfolk
Newport News
Hampton
Poquoson
York
Figure 3-7
Richmond/Hampton Roads Passenger Rail Project
Peninsula / CSXT Route
Open Spaces, Parks and Recreational Lands
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Open Spaces, Parks Recreational Lands
Waters worthy of inclusion on Wild and Scenic Rivers Lists
Source:
Department of Conservation and Recreation

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3.9.3.2 Southside/NS Route

Four recreation and federally owned resources have been identified along the Southside/NS route. None of these were identified as being Section 6(f) resources. The recreation and federally owned resources are listed in Table 3-37. See Figure 3-8 for a map of open space, parks and recreational lands for the Southside/NS route.

Table 3-37: Recreation and Federally Owned Resources along the Southside/NS Route

Resource	Type	Ownership	Public Access	Location	Acreage Study Area
Lake Kilby Park	Local Park	City of Suffolk	Yes	City of Suffolk	0.98
Great Dismal Swamp	National Wildlife Refuge	National Park Service	Yes	City of Suffolk	47.75
Town Point Park/Harbor Point Park Civic Facility	City Park	City of Norfolk	Yes	City of Norfolk	9.01
U.S. Ammunition Depot	U.S. Ammunition Depot	U.S. Department of the Navy	No	City of Chesapeake	21.20
Total					**78.94**

Source: National Park Service, Virginia Department of Conservation and Recreation, Virginia Department of Forestry and local jurisdictions.

3.9.4 Environmental Consequences

3.9.4.1 Status Quo Alternative

Under the Status Quo Alternative, there would be no additional passenger rail service on the Peninsula/CSXT route. The existing passenger rail service of two round-trip trains per day would remain. The Southside/NS route would be continued for use by freight operations only as planned by Norfolk Southern. Since no physical or operational improvements would occur under the Status Quo Alternative to either route, no impacts to the recreation or federally-owned land listed in Tables 3-36 and 3-37 would occur.

3.9.4.2 No Action Alternative

Under the No Action Alternative, one additional passenger rail train would be added to the existing Peninsula/CSXT route and would operate at a maximum speed of 79 mph. In total, there would be three daily round-trip trains operating between Richmond and Newport News. Potential impacts to parklands could occur from property acquisition, physical alterations to property, or proximity effects, such as noise or visual impacts. It is expected that any necessary infrastructure improvements required to support this additional round-trip train would be accommodated within the existing right-of-way. No additional right-of-way would be required.

Parklands can be considered as potentially sensitive land use categories, depending on the designated use and purpose of the property, in determining potential noise and vibration impacts. For this Tier I Draft EIS, a screening level assessment for noise and vibration was conducted and specific noise and vibration impacts were not identified. Site-specific impacts related to noise and vibration will be assessed during Tier II analysis of the Preferred Alternative. No new visual elements, other than the additional train, would be added along the Peninsula/CSXT route. This alternative includes no activities or alterations to the Southside/NS route, therefore recreation or federally owned resources identified for that route would not be impacted. Based on the analysis conducted for this Tier I Draft EIS, no physical impacts to recreation or federally owned resources would occur under the No Action Alternative. Proximity effects, such as noise, vibration, or visual effects, while unlikely, would be determined during Tier II analysis.

Waller Mill Park in the City of Williamsburg has been identified as having received grant funds from the L&WCF, and the property is considered a Section 6(f) resource. Under the No Action Alternative, it is not anticipated that any additional right-of-way would be required, and therefore no conversion of land at this property is likely to occur.

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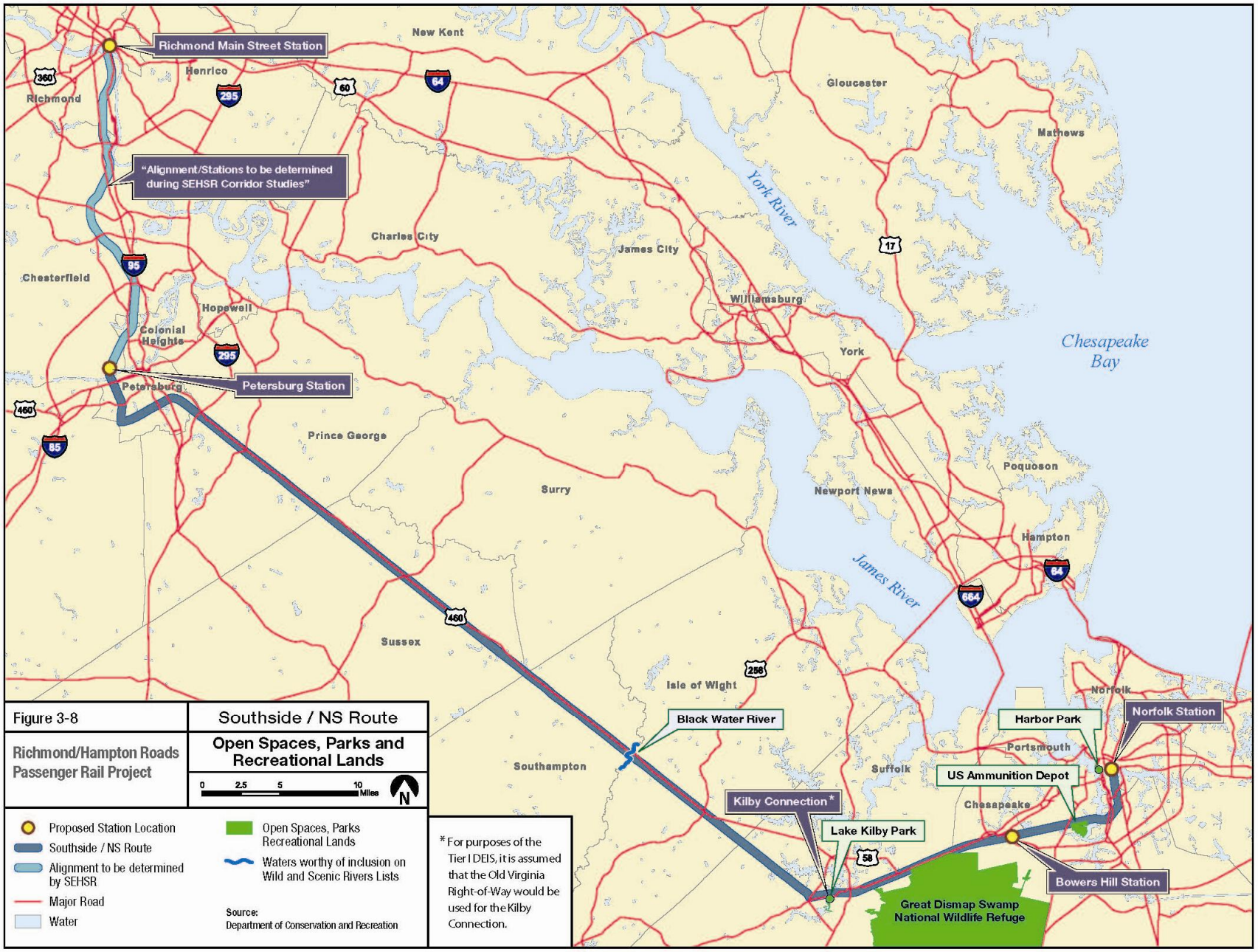
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
New Kent
Henrico
Richmond
Gloucester
Mathews
Charles City
James City
Chesterfield
Hopewell
Colonial Heights
Petersburg
Williamsburg
York
Chesapeake Bay
York River
James River
Prince George
Surry
Poquoson
Newport News
Hampton
Sussex
Isle of Wight
Norfolk
Norfolk Station
Harbor Park
Portsmouth
US Ammunition Depot
Black Water River
Southampton
Suffolk
Chesapeake
Kilby Connection*
Lake Kilby Park
Bowers Hill Station
Great Dismap Swamp National Wildlife Refuge
Figure 3-8
Richmond/Hampton Roads Passenger Rail Project
Southside / NS Route
Open Spaces, Parks and Recreational Lands
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Open Spaces, Parks Recreational Lands
Waters worthy of inclusion on Wild and Scenic Rivers Lists
Source: Department of Conservation and Recreation
* For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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Likely construction effects may include temporary use of property for staging equipment and temporary disturbances to access and activities. Construction effects may also include temporary land disturbances, such as impacts to vegetation and increased sediment and erosion. If construction staging or access is proposed in or adjacent to a recreation or federally owned land, then coordination with the property owner would be required. A Section 4(f) evaluation would also need to be completed for any potential use of Section 4(f) resources.

3.9.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 would combine the No Action Alternative with higher speed passenger rail service on the Southside/NS route. The potential types of impacts to recreation and federally owned lands would be the same as described under the No Action Alternative. Potential impacts could include property acquisition, physical alternations to property, or proximity effects, such as noise or visual impacts.

Impacts for the Peninsula/CSXT route would be as described for the No Action Alternative. It is expected that any necessary infrastructure improvements required to support the additional round-trip train on the Peninsula/CSXT route would be accommodated within the existing right-of-way and no additional right-of-way would be required. As noted for the No Action Alternative, proximity effects related to noise and vibration or visual effects from the additional round-trip train are unlikely, but should be investigated further during the Tier II analysis if the Peninsula/CSXT route is part of the Preferred Alternative.

In areas where recreation and federally owned resources have been identified along the Southside/NS route, improvements outside the existing rail right-of-way that would impact these resources would be avoided where possible. The majority of rail improvements would take place within the existing railroad right-of-way. New right-of-way could be required for track bed expansion and would be required for the Kilby rail connection, the Bowers Hill Station, and the Downtown Norfolk Station. Based on the available mapping used for this analysis, additional right-of-way needs do not coincide with identified recreation or federally owned lands. However, proximity effects, such as noise and vibration from an increase in trains passing, may occur. As stated for the No Action Alternative, only a screening level analysis for noise and vibration was conducted for this Tier I Draft EIS. More detailed analysis is needed to determine if proximity effects would occur and the severity of those effects on the resources identified.

Although the proposed Southside/NS route would pass through both Lake Kilby Park and Town Point Park, the route would use existing tracks. It is not anticipated that any additional right-of-way would be required; if additional right-of-way is needed, then a permanent use of these properties could result. Town Point Park may also have the potential to be affected temporarily for construction of the proposed station and related facilities in downtown Norfolk. A determination of park boundaries is needed to determine if a permanent or temporary adverse use would occur.

In areas where station and parking facilities are proposed, some minor visual impacts may occur. Table 3-38 summarizes the potential effects to recreation and federally owned resources along the Southside/NS route for Alternative 1. As the project progresses, more detailed research on the types of activities conducted at each resource, public access and exact property boundaries would be conducted to determine the extent of any potential impacts. Section 3.18 of this Tier I Draft EIS discusses the potential impacts and potential Section 4(f) and Section 6(f) implications.

Table 3-38: Potential Effects to Recreation and Federally Owned Resources for Alternative 1 for the Southside/NS Route

Resource	Relation to Rail Route	Potential Effects
Lake Kilby Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds
Great Dismal Swamp	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds
Town Point Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds, minor visual impacts from proposed station/parking, temporary construction impacts possible
U.S. Ammunition Depot	Tracks are adjacent to resource	Unlikely to be affected

Source: DMJM Harris, October 2005

Likely construction effects may include temporary use of property for staging equipment and temporary disturbances to access and activities. Construction effects may also include temporary land disturbances, such as impacts to vegetation and increased sediment and erosion. If construction staging or access is proposed in or adjacent to a recreation or federally owned land, then coordination with the property owner would be required. A Section 4(f) evaluation would also need to be completed for any potential use of Section 4(f) resources.

3.9.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would require infrastructure improvements to both rail routes. The existing Peninsula/CSXT route would need to be upgraded to accommodate higher speed passenger rail and increased train frequencies. As part of this alternative, parking would be added at the existing Richmond Main Street Station and Williamsburg Amtrak Station. The existing Newport News Station would be relocated closer to the Downtown Newport News area on new right-of-way. Conventional passenger rail service is proposed for the Southside/NS route and would require the following infrastructure improvements that would likely require additional rail right-of-way: track bed expansion, a new rail connection at Kilby, a new Bowers Hill Station and a new Downtown Norfolk Station.

It is unlikely that the recreation and federally owned resources identified would be physically impacted for either route, as the majority of rail improvements would take place within the existing railroad right-of-way. Improvements would not coincide with resources identified in Tables 3-36 and 3-37. However, proximity effects such as noise and vibration from increased train movements may occur along both routes. In areas where stations and parking facilities are proposed, some minor visual impacts may occur.

Since Waller Mill Park in the City of Williamsburg has been identified as having received grant funds from the L&WCF, the property is considered a Section 6(f) resource. Any right-of-way impacts to this resource, which are considered unlikely, would require coordination with the U.S. Department of the Interior.

Although the proposed Southside/NS route would pass through both Lake Kilby Park and Town Point Park, the route would use existing tracks. It is not expected that any additional right-of-way would be required; if additional right-of-way is needed, then a permanent use of these properties could result. Town Point Park may also have the potential to be affected temporarily for construction of the proposed station and related facilities in downtown Norfolk. A determination of park boundaries is needed to determine if a permanent or temporary adverse use would occur. A Section 4(f) evaluation would also be conducted as required.

Likely construction effects may include temporary use of property for staging equipment and temporary disturbances to access and activities. Construction effects may also include temporary land disturbances, such as impacts to vegetation and increased sediment and erosion. If construction staging or access is proposed in or adjacent to a recreation or federally owned land, then coordination with the property owner would be required. Section 4(f) would be addressed, if appropriate.

Table 3-39 summarizes the potential effects to recreation and federally owned resources for Alternative 2a. As the project progresses, more detailed research on the types of activities conducted at each resource,

public access and exact property boundaries would be conducted to determine the extent of any potential impacts. Chapter 3.18 of this Tier I Draft EIS discusses the potential impacts and potential Section 4(f) and Section 6(f) implications.

Table 3-39: Potential Effects of Alternative 2a to Recreation and Federally Owned Resources

Resource	Relation to Rail Route	Potential Effects
Peninsula/CSXT Route		
Great Shiplock Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Libbie Hill Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
National Guard Site	Tracks are adjacent to resource	Unlikely to be affected.
VOF Open Space Easement	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Crawford State Forest	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Waller Mill Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely. Park has been developed using L&WCF grants.
Colonial Williamsburg National Historical Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Quarterpath Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
Lee Hall Plantation City Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Newport News City Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Skiffes Creek Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
Stony Run Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Deer Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Lake Maury Natural Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Municipal Lane Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Mariners Museum Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
Southside/NS Route		
Lake Kilby Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Great Dismal Swamp	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.

Resource	Relation to Rail Route	Potential Effects
Town Point Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds, minor visual impacts from proposed station/parking, temporary construction impacts possible. Adverse effects unlikely.
U.S. Ammunition Depot	Tracks are adjacent to resource	Unlikely to be affected.

Source: DMJM Harris, October 2005

3.9.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b would only provide higher speed passenger rail service to the Peninsula/CSXT route; no improvements would occur along the Southside/NS route. As previously stated for alternatives using the Peninsula/CSXT route, physical impacts to recreation and federally owned resources are unlikely. Proximity effects may occur. Since Waller Mill Park in the City of Williamsburg has been identified as having received grant funds from the L&WCF, the property is considered a Section 6(f) resource. Any impacts to this resource would require coordination with the U.S Department of the Interior.

Likely construction effects may include temporary use of property for staging equipment and temporary disturbances to access and activities. Construction effects may also include temporary land disturbances, such as impacts to vegetation and increased sediment and erosion. If construction staging or access is proposed in or adjacent to a recreation or federally owned land, then coordination with the property owner would be required, and Section 4(f) would need to be addressed as appropriate.

Table 3-40 summarizes the potential effects to recreation and federally owned resources along the Peninsula/CSXT route for Alternative 2a. As the project progresses, more detailed research on the types of activities conducted at each resource, public access and exact property boundaries should be conducted to determine the extent of any potential impacts. Chapter 3.18 of this Tier I Draft EIS discusses the potential impacts and potential Section 4(f) and Section 6(f) implications.

Table 3-40: Potential Effects of Alternative 2b to Recreation and Federally Owned Resources

Resource	Relation to Rail Route	Potential Effects
Great Shiplock Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Libbie Hill Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
National Guard Site	Tracks are adjacent to resource	Unlikely to be affected.
VOF Open Space Easement	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Crawford State Forest	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Waller Mill Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely. Park has been developed using L&WCF grants.
Colonial Williamsburg National Historical Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Quarterpath Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
Lee Hall Plantation City Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Newport News City Park	Tracks pass through resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.

Resource	Relation to Rail Route	Potential Effects
Skiffes Creek Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.
Stony Run Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Deer Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Lake Maury Natural Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Municipal Lane Park	Tracks are adjacent to resource	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Mariners Museum Park	Tracks are adjacent, but separated by roadway	Unlikely to be affected.

Source: DMJM Harris, October 2005

3.9.5. Potential Mitigation

As the project progresses, specific impacts will be identified and appropriate mitigation measures determined by coordinating with the resource owner. Potential mitigation might include use of best management practices during construction activities and specific park enhancements or potential land replacement for long-term adverse impacts. Proximity effects to parks could be mitigated through context sensitive design, plantings and sound barriers. Should these resources be affected temporarily during construction activities, public access would remain and construction activities would be conducted in a manner that would least disturb the use of these facilities. The resources, if impacted, would be restored to pre-construction or better conditions after construction activities are complete.

3.9.6. Subsequent Analysis

During the Tier II analysis of the selected alternative, more detailed research on the types of activities conducted at each resource, public access and exact property boundaries would be conducted to determine the extent of any potential impacts. The analyses would include:

- Descriptions of the uses and functions of each of the resources and identification of resource boundaries; total size of resources; specific services and facilities; and access.
- Specific potential impacts on each resource, including property acquisition, if any; physical impacts, proximity impacts and temporary impacts resulting from proposed operations and infrastructure improvements to accommodate higher speed passenger rail service.
- Documentation of consultation with the affected federal, state and local jurisdictions and owners/operators of the identified resources.

3.10 Farmlands and Agriculture

This section describes the farmlands and agricultural uses along each of the proposed routes and summarizes the potential effects that could occur as a result of the proposed improvements associated with the introduction and addition of conventional and high-speed passenger rail service between Richmond and Hampton Roads.

3.10.1 Methodology

Literature research was the principal method used to gather information about the geologic resources within the study area. Soil and prime farmland data were compiled from the U.S. Environmental Protection Agency (EPA) and the Natural Resources Conservation Service (NRCS), under the U.S. Department of Agriculture (USDA). Additional information was obtained from websites, review of aerial mapping, local and regional plans, and communications with representatives from various federal, state and local agencies.

3.10.2 Regulatory Requirements

The USDA defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oil seed crops that is also available for these uses. Prime farmland can be cropland, pastureland, forestland, or other land but not urban built-up land or water. Land designated as prime farmland has the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods. Similarly, soils that do not necessarily meet the criteria to be listed as prime farmland, but produce high yields of crops when treated and managed according to acceptable farming methods, are considered soils of statewide importance.

The protection of prime farmland is promulgated under Title 7 of the U.S. Code (USC), Chapter 73—the Farmland Protection Policy. The purpose of the policy is to minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses and to assure that federal programs are compatible with state, local and private programs and policies to protect farmland.

In addition to prime farmlands, the Commonwealth of Virginia has Agricultural and Forestal Districts (AFDs) that protect and enhance agricultural and forestal land as economic and environmental resources. The AFD was enacted by the Virginia General Assembly in 1977. AFDs consist of large tracts of forested land or farmland conserved for the production of food, crop, timber and other agricultural and forestal products. It is a special land use set up and administered by localities, similar to zoning. Landowners who form AFDs qualify for lower tax rates, avoid nuisance ordinance restrictions and protect their land from governmental or other actions that encourage development.

Acquisition of land is restricted within an AFD, and eminent domain cannot be utilized as long as the land is part of an AFD. Conversion of an AFD to other uses is a lengthy process requiring public notice and ruling by the locality's governing body, such as a Board of Supervisors.

3.10.3 Affected Environment

3.10.3.1 Peninsula/CSXT Route

Prime farmland information obtained from the City of Richmond, Henrico County, James City County, York County, and the City of Newport News indicates that, in general, these localities have isolated parcels of prime farmland and farmland of statewide importance located within the Peninsula/CSXT route study area. Larger parcels of prime farmland are concentrated in the center of the Henrico County portion of the study area.

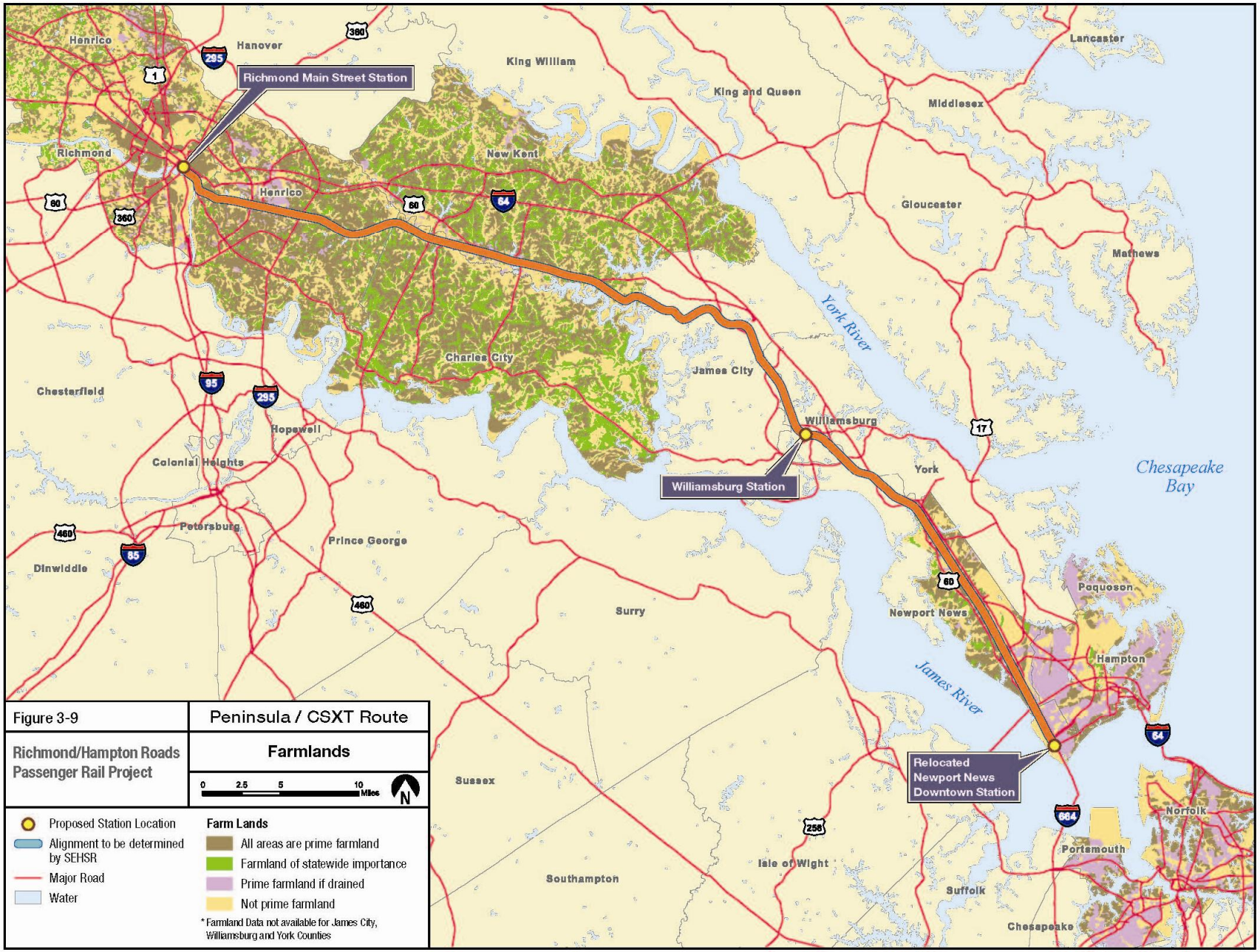
According to the Soil Survey of James City and York counties, most soil types in the portion of the route within these areas are considered prime farmland soils with the exception of the City of Williamsburg.

Within the northern portion of the City of Newport News, prime farmland is common in the study area. In the center of the City of Newport News, the study area crosses a relatively large area of farmland of statewide importance. In the southern portion of the City of Newport News, prime farmland and farmland of statewide importance is sparse within the study area. Table 3-41 quantifies, by city/county, the types of farmland within 300 feet of the centerline of the Peninsula/CSXT route. Figure 3-9 is a map of farmlands within the Peninsula/CSXT route study area.

Table 3-41: Farmland Soils within the Study Area of the Peninsula/CSXT Route (Acres)

City/County*	Prime Farmland	Farmland of Statewide Importance	Prime Farmland, If Drained
Richmond	3	11	0
Henrico	305	21	20
Charles City	56	13	0
New Kent	290	58	115
Newport News	498	76	12

*Specific areas of prime farmland soils are not available for York County, James City County, and the City of Williamsburg.


Richmond Main Street Station
Williamsburg Station
Relocated Newport News Downtown Station
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
Richmond
New Kent
Gloucester
Mathews
Charles City
James City
York River
Chesterfield
Hopewell
Williamsburg
Colonial Heights
York
Chesapeake Bay
Petersburg
Prince George
Dinwiddie
Surry
Poquoson
Newport News
Hampton
James River
Sussex
Norfolk
Portsmouth
Isle of Wight
Southampton
Suffolk
Chesapeake
Figure 3-9
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Farmlands
0 2.5 5 10 Miles
N
Proposed Station Location
Alignment to be determined by SEHSR
Major Road
Water
Farm Lands
All areas are prime farmland
Farmland of statewide importance
Prime farmland if drained
Not prime farmland
* Farmland Data not available for James City, Williamsburg and York Counties

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Agricultural and Forestal Districts - AFDs have been identified within the Peninsula/CSXT route study area and are listed in Table 3-42 and mapped in Figure 3-10.

Table 3-42: Agricultural and Forestal Districts within the Peninsula/CSXT Route Study Area

AFD Name	Location	Acres within 300 feet
Mill Creek AFD-7-86	James City County	84.20
Hill Pleasant AFD-3-86	James City County	27.20
Mount Castle AFD	New Kent County	1.25
East Providence AFD	New Kent County	14.98
Osborn AFD	New Kent County	4.40

Source: Virginia Department of Conservation and Recreation

3.10.3.1 Southside/NS Route

Prime farmland information along the Southside/NS route was obtained for the City of Petersburg, Prince George County, the City of Sussex, Southampton County, Isle of Wight County, the City of Suffolk, and the City of Chesapeake. Most of the soil in the Southside/NS route within the localities of Petersburg, Prince George, and Sussex is considered prime farmland or farmland of statewide importance. Most of the areas that are not prime farmland are associated with streams and tributaries. There are isolated areas of prime farmland if drained.

A majority of the land in the Southside/NS route within Isle of Wight County is not considered prime farmland; however, there are a few isolated areas of prime farmland in the portion of the study area located within the county. In the southern portion of Isle of Wight County, western and eastern portions of the City of Suffolk, and the western portion of the City of Chesapeake, there are relatively large areas of soil considered to be prime farmland if drained. In the center of Isle of Wight County in the study area, there are a few isolated areas of prime farmland, but most of the soil is considered not prime farmland. The developed areas within the eastern end of the study area in the City of Chesapeake are not considered prime farmland. Table 3-43 quantifies, by location, the types of farmland within 300 feet of the centerline of the Southside/NS route. Figure 3-11 is a map of farmlands along the Southside/NS route.

Table 3-43: Farmland Soils within Study Area of the Southside/NS Route (Acres)

Location*	Prime Farmland	Farmland of Statewide Importance	Prime Farmland, If Drained
Prince George	365	217	73
Southampton	456	3	66
Isle of Wight	172	1	240
Suffolk	254	18	288
Chesapeake	32	0	211
Hampton	7	0	115

*Specific areas of prime farmland soils are not available for the City of Sussex.

Agricultural and Forestal Districts - There are no AFDs within the Southside/NS route study area.

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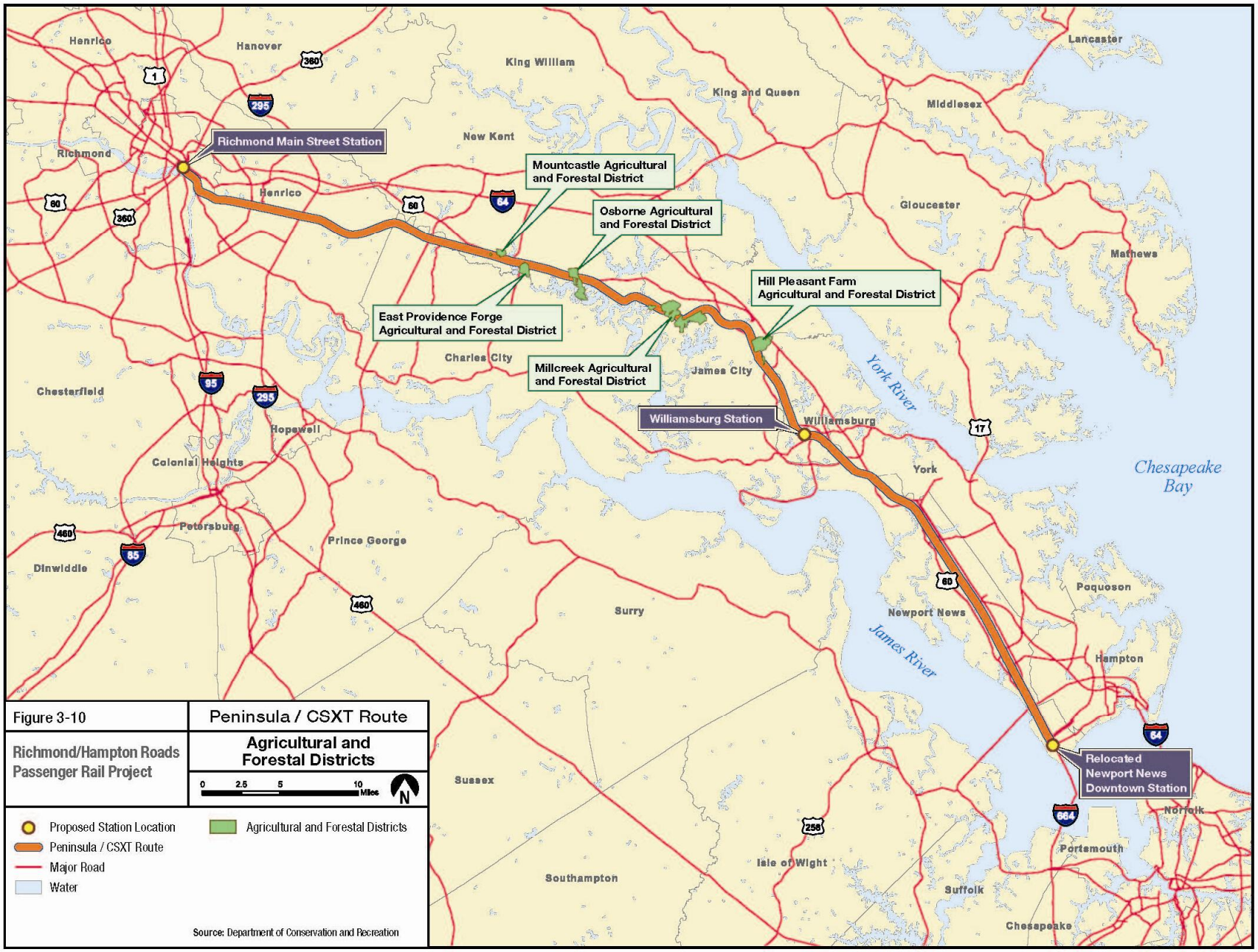
Richmond Main Street Station
Mountcastle Agricultural and Forestal District
Osborne Agricultural and Forestal District
East Providence Forge Agricultural and Forestal District
Millcreek Agricultural and Forestal District
Hill Pleasant Farm Agricultural and Forestal District
Williamsburg Station
Relocated Newport News Downtown Station
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
New Kent
Richmond
Gloucester
Mathews
Charles City
James City
York River
Chesterfield
Hopewell
Williamsburg
Colonial Heights
York
Chesapeake Bay
Petersburg
Prince George
Dinwiddie
Poquoson
Surry
Newport News
James River
Hampton
Sussex
Norfolk
Portsmouth
Isle of Wight
Southampton
Suffolk
Chesapeake
Figure 3-10
Peninsula / CSXT Route
Agricultural and Forestal Districts
Richmond/Hampton Roads Passenger Rail Project
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Agricultural and Forestal Districts
Source: Department of Conservation and Recreation

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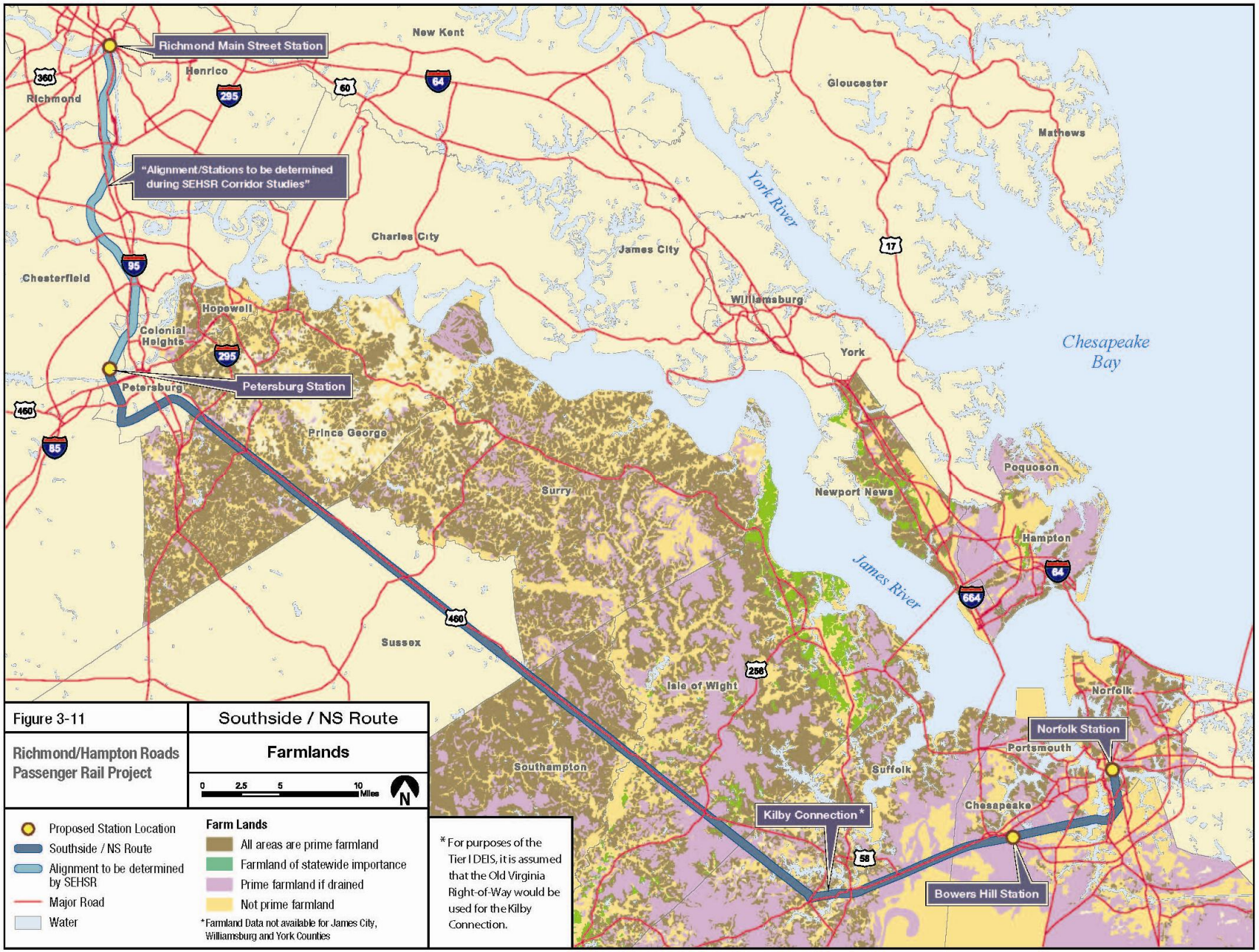
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
Norfolk Station
Kilby Connection*
Bowers Hill Station
New Kent
Henrico
Richmond
Gloucester
Mathews
York River
Charles City
James City
Chesterfield
Hopewell
Colonial Heights
Petersburg
Williamsburg
York
Chesapeake Bay
Prince George
Surry
Poquoson
Newport News
Hampton
James River
Sussex
Isle of Wight
Norfolk
Portsmouth
Suffolk
Southampton
Chesapeake
Figure 3-11
Southside / NS Route
Farmlands
Richmond/Hampton Roads Passenger Rail Project
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Farm Lands
All areas are prime farmland
Farmland of statewide importance
Prime farmland if drained
Not prime farmland
*Farmland Data not available for James City, Williamsburg and York Counties
*For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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3.10.4 Environmental Consequences

3.10.4.1 Status Quo Alternative

Under the Status Quo Alternative, all passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made, other than routine maintenance. There would be no impacts to farmlands or AFDs associated with the Status Quo Alternative.

3.10.4.2 No Action Alternative

Under the No Action Alternative, one round-trip train would be added to the Peninsula/CSXT route for a total of three daily round-trip trains operating at maximum speeds of 79 mph between Newport News and Richmond. Given that no physical improvements would be made to accommodate the additional passenger rail service beyond existing rail right-of-way, no impacts to farmlands or AFDs are expected under the No Action Alternative.

3.10.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Under Alternative 1, conventional speed passenger rail service would be maintained on the Peninsula/CSXT route and new higher speed passenger service would be added to the Southside/NS route. Since there is no passenger rail service currently running along the Southside/NS route, infrastructure improvements would be required to accommodate the addition of passenger rail; therefore the potential for physical impacts is greater for those Build alternatives including this improvement.

As part of Alternative 1, no upgrades to the Peninsula/CSXT route would be required that would extend beyond existing rail right-of-way. Parking at Main Street Station in Richmond may be improved and it is unknown at this point if this would require additional right-of-way. Prime farmland and AFDs exist within the Peninsula/CSXT route study area; however, given that improvements would not likely require additional right-of-way, no impacts to farmlands or AFDs would be expected to occur. The area surrounding Main Street Station is all urban developed land and if additional right-of-way is required, it would not impact prime farmland, soils of statewide importance, or any AFD.

Upgrades to the existing Southside/NS route track would be required in order to accommodate higher speed passenger rail service. Currently only freight rail operates along this line. New stations with parking facilities would be provided at the proposed Bowers Hill location and Downtown Norfolk. Upgrades would also include a new rail connection in the vicinity of Kilby.

There are no AFDs adjacent to the Southside/NS route, but prime farmlands and soils of statewide importance have been identified. While the majority of improvements would take place within the existing rail right-of-way, potential impacts to prime farmlands and soils of statewide importance may occur where additional right-of-way is likely required. Prime farmland and soils of statewide importance exist in the vicinity of the proposed Kilby rail connection, the proposed Bowers Hill Station and Downtown Norfolk. Given that Downtown Norfolk is an urban environment, it is unlikely prime farmlands would be impacted by the proposed Norfolk station.

Construction related impacts may occur associated with grading, earth removal and construction of new embankments or alterations of existing embankments at bridge approaches. No expansive excavation is anticipated. Any impacts to agriculturally designated soils will be coordinated with relevant state and local agencies. Geotechnical investigations and subsurface studies will be conducted prior to any construction activities to assess site specific soil characteristics.

3.10.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would provide higher speed passenger rail service on the Peninsula/CSXT route and would also add conventional speed passenger rail service to the Southside/NS route. In addition to right-of-way needs for infrastructure improvements similar to those described for Alternative 1, Alternative 2a proposes a relocated passenger rail station in Newport News. The types of potential impacts to farmlands and AFDs

would be similar to those described in Alternative 1. According to Natural Resources Conservation Service (NCRS), the proposed Newport News Station is within an area where soils are designated as prime farmland if drained soil conditions[37] exist. However, the area in which the proposed Newport News Station would likely be located is within an urban area and is not actively farmed.

Any impacts to agriculturally designated soils will be coordinated with relevant state and local agencies. Geotechnical investigations and subsurface studies will be conducted prior to any construction activities to assess site specific soil characteristics.

3.10.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b proposes to provide higher speed passenger rail service along the Peninsula/CSXT route only. As with Alternative 2a, potential impacts to farmland and AFDs would only occur in areas where additional right-of-way may be required for Alternative 2b. Alternative 2b is expected to incur fewer impacts on farmland than Alternative 2a as no Southside/NS route passenger rail operations are proposed.

3.10.5 Potential Mitigation

For any conversion of prime farmlands, a Farmland Impact Rating Form, as required by the Farmland Protection Policy Act, would be completed and appropriate mitigation would be determined. Farmland conversion mitigation may include providing permanent protection of comparable farmland or paying a fee to protect farmland. It is unlikely that any active or inactive farm would be adversely affected; however, coordination with appropriate local and state agencies would be conducted to determine impacts and site-specific mitigation as appropriate. Potential impacts resulting from construction would be mitigated through the use of best management practices. In accordance with local requirements, erosion and sediment control plans would be prepared and implemented.

3.10.6 Subsequent Analysis

Subsequent analysis for the selected alternative may include:

- Additional coordination with the NRCS to determine the extent and specific locations of prime and soils of statewide importance in areas where additional right-of-way would be required; and
- Subsurface testing to ascertain specific soils conditions in areas where additional right-of-way would be required.

3.11 Visual and Aesthetic Quality

This section describes the visual and aesthetic quality and the potential to alter the visual characteristics of both routes through the implementation of higher speed rail service and related amenities.

3.11.1 Methodology

An overall general visual assessment of the existing aesthetic conditions was conducted for each route. Each route was driven to get an understanding of the aesthetic conditions along the route and to identify if potentially visually sensitive resources or viewers were present. In addition to driving the routes, photographs taken along the rail routes (via hi-rail vehicles) and maps were used to ascertain the visual characteristics of the study routes. This assessment is not intended to be a detailed visual assessment. More detailed analysis would be conducted during the Tier II analysis.

3.11.2 Legal and Regulatory Context

The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts (FRA Docket No EP-1, Notice 5, May 26, 1999), under the topic of aesthetic environmental and scenic resources, states, "The EIS should identify any significant changes likely to occur in the natural landscape and in the developed

[37] According to the NCRS, some soils that flood or those that are poorly drained may meet the requirements for prime farmland if certain conditions are met that allow crops to grow and be cultivated during the growing season.

environment. The EIS should also discuss the consideration given to design quality, art and architecture in project planning and development as required by DOT Order 5610.4." Consideration of local community design guidelines would be part of the Tier II analysis when detailed engineering and architectural information would be developed for the selected alternative.

3.11.3 Affected Environment

3.11.3.1 Peninsula/CSXT Route

The Peninsula/CSXT route follows existing CSXT railroad tracks between Richmond and Newport News. The tracks are currently used for both freight and passenger service. The Main Street Station in downtown Richmond is at the western end of the study area. The surrounding area is densely developed with a mix of commercial, industrial and transportation uses. Adjacent to the station, I-95 is elevated as are the tracks coming into and leaving the station. The tracks remain elevated as they parallel the James River and Kanawaha Canal, eventually becoming at-grade.

After leaving Main Street Station, the tracks veer east into Henrico County. Development patterns along the alignment transition from urban residential-commercial to more industrial and sparse residential development accented with agricultural crop fields. As the route continues east into New Kent County, the study area becomes more agricultural and residential consisting of mostly single family dwellings. The landscape is relatively flat, with the exception of slight variations in elevation near creeks and rivers, such as the Chickahominy River. This general landscape theme continues into Charles City County.

As the route moves into James City County, it approaches several small towns, including Toano, Norge and then the City of Williamsburg. Mostly industrial-type buildings and residential structures are located adjacent to the tracks through Toano and Norge. Through the City of Williamsburg, the route runs along the north side of the historic district. The Williamsburg Amtrak Station is adjacent to municipal buildings. Some undeveloped, forested land exists on the north side of the tracks at the station. Also, a hotel used as off-site dormitories for the College of William and Mary is located north of the tracks near the station.

The aesthetic character changes as the route leaves historic downtown Williamsburg to a more suburban setting. Major roadways parallel the tracks on either side of the route. Scattered along the railroad tracks is a mix of residential and commercial properties.

Continuing southeast into the City of Newport News, the area becomes very densely developed with a mix of commercial properties, industrial buildings and residential neighborhoods. As the route approaches downtown Newport News, the area becomes mostly residential for a while before it becomes dominated by industrial properties. The route terminates within the rail yard behind a multilevel parking garage.

Potentially Sensitive Views/Resources/Viewers - Potentially sensitive views and resources within the study area would likely include some of the recreational and cultural resources identified along the route, as described in Sections 3.9 and 3.14, respectively. No other particularly sensitive views or resources have been identified as part of this Tier I Draft EIS. Potentially sensitive viewers along the route would likely include any visitors to cultural resources or recreation areas, and residents that live adjacent to any proposed improvements such as new stations or parking facilities. More detailed study would be conducted during the Tier II analysis to determine if other potentially sensitive views, resources or sensitive viewers exist within the study route.

3.11.3.2 Southside/NS Route

From Petersburg, the existing tracks run southeast through the counties of Prince George, Sussex, and Southampton. These counties consist of large plots of farm land where peanuts, tobacco, cotton and other crops are grown. Toward the eastern section of Prince George County, the existing tracks pass through the small town of Disputanta. Residences and community facilities lie in extremely close proximity to the existing tracks. As the tracks run southeast over relatively flat terrain, the landscape consists of single family homes or commercial properties such as the large solid waste disposal facility and landfill in Sussex. A rock quarry and feed and fertilizer plants are the only industrial properties along an otherwise completely rural stretch of land that leads into Southampton County.

The existing tracks continue to directly parallel Route 460 through farmland. As the route approaches the eastern county line of Southampton, agricultural fields give way to densely forested land around the Blackwater River.

The tracks running through Isle of Wight County cut through a rural landscape which remains primarily undeveloped. Many low-lying, swampy areas exist within the Southside/NS Route study area. The landscape is similar in Suffolk County, where the existing tracks cross over Lake Kilby before heading east through the Great Dismal Swamp, a large national wildlife refuge which lies between the cities of Suffolk and Chesapeake. A station is proposed for Bowers Hill, a small town that lies on the western side of the City of Chesapeake. In the vicinity of this proposed station are single family homes on the southern side of the existing tracks and a trucking storage and cargo loading facility on the northern side of Military Highway.

From Bowers Hill, the route crosses the Elizabeth River and cuts through the City of Chesapeake before coming to an end on the northern bank of the Elizabeth River in Norfolk. Currently, the proposed location of the station in Downtown Norfolk is north of the Elizabeth River in between I-264 to the west and U.S. 460 to the east near what is currently a parking lot for the adjacent Harbor Park baseball stadium.

Potentially Sensitive Views/Resources/Viewers - Potentially sensitive views and resources within the Southside/NS route study area would likely include some of the recreational and cultural resources identified along the route, as described in Sections 3.9 and 3.14 respectively. No other particularly sensitive views or resources have been identified as part of this Tier I Draft EIS evaluation. Potentially sensitive viewers along the route would likely include any visitors to cultural resources or recreation areas and residences that live adjacent to any proposed improvements such as new stations or parking facility. More detailed study would be conducted during the Tier II analysis to determine if other potentially sensitive views, resources or sensitive viewers exist within the study route.

3.11.4. Environmental Consequences

3.11.4.1 Status Quo Alternative

Under the Status Quo Alternative, all passenger rail service conditions would remain the same along the Peninsula/CSXT route. Only freight rail operations would operate along the Southside/NS route. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made other than routine maintenance; thus, there would be no changes to the rail line that would introduce new visual elements or alter the visual and aesthetic characteristics described. Therefore no visual or aesthetic effects are expected to occur.

3.11.4.2 No Action Alternative

Under the No Action Alternative, one additional passenger rail train would be added to the existing Peninsula/CSXT route and would operate at a maximum speed of 79 mph. Only freight rail operations would operate along the Southside/NS Route. In total, there would be three daily round-trip trains operating between Richmond and Newport News along the Peninsula/CSXT route. No infrastructure improvements related to higher speed passenger rail service would occur. There would be no changes to the rail line that would introduce new visual elements or alter the visual and aesthetic characteristics described. A particularly sensitive visual resource along this route is Colonial Williamsburg and the Colonial Parkway, both in the Williamsburg area. However, no improvements are planned in this area. Therefore no visual or aesthetic effects are expected to occur.

3.11.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 combines the No Action Alternative with higher speed passenger rail on the Southside/NS route. As described for the No Action Alternative, no elements would be added to the current landscape along the Peninsula/CSXT route that would have impacts to visual or aesthetic resources. However, necessary infrastructure improvements along the Southside/NS route would introduce new visual elements to the existing landscape.

Potentially sensitive views or resources along the Southside/NS route include recreational and cultural resources, as described in Sections 3.9 and 3.14, respectively. One potential particularly sensitive resource along the Southside would be the Dismal Swamp, a designated National Wildlife Refuge. However, an existing rail bed runs through the swamp. The proposed route would use the same rail bed; therefore, it is not expected that any new visual element would be introduced that would alter the surrounding landscape.

New elements along the Southside/NS route would include a new rail connection at Kilby and the proposed Bowers Hill and Downtown Norfolk stations and associated parking. The new rail connection at Kilby would have a minimal effect on the surrounding landscape because it would be at-grade with the existing rail lines in the area. Additionally, grade separations and consolidations of roadways would be expected along the proposed route and would result in road or rail overpasses along the corridor. The location of potential grade separations will be identified in the Tier II analysis, and therefore, potential visual impacts can not be assessed at this time.

The proposed station facilities at Bowers Hill and Downtown Norfolk would introduce new visual elements to the existing landscape. The station at Bowers Hill is near the intersection of Interstates 64 and 264 along Military Highway. A large parcel of land on the northern side of Military Highway is currently used as a cargo staging area where large, rectangular metal boxes are loaded onto and off of passing trains. Also adjacent to the proposed location are some residential properties. The addition of a new station would alter the existing visual setting and may impact residential properties near the site. The Downtown Norfolk station is in the vicinity of a baseball stadium and a large surface parking lot. North of the site are many roadways, including I-264, which is elevated in the vicinity of the project. Given the surrounding visual character of this area, it is unlikely that introducing a station in this general location would have a negative visual effect on the area. Context-sensitive design features could be used to make the station fit into the surrounding architectural styles.

3.11.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would add new visual elements along both rail routes. Along the Peninsula/CSXT route, a relocated Newport News passenger rail station would add a new visual element in the downtown portion of Newport News. The station would not be expected to have an adverse impact on the existing landscape. As currently planned, the station would be located near a railroad yard behind existing multilevel structures and surrounded by I-664 and U.S. 60. Context-sensitive design features could be used to make the station fit into the surrounding architectural styles.

Expanded parking is proposed at both the Richmond Main Street Station and Williamsburg Amtrak Station. The Richmond Main Street Station is surrounded by developed land and a surface parking facility already exists. The Williamsburg Amtrak Station currently exists adjacent to Colonial Williamsburg and the Colonial Parkway, both sensitive resources. No new station or improvements to that station are proposed. The parking expansion for the Williamsburg Amtrak Station is planned to be a surface parking lot outside of both of the aforementioned areas. Given that the station already exists and the proposed parking would be a surface lot, it is unlikely to contribute to the degradation of the visual quality of the area.

New visual elements and potential impacts with the Southside/NS route study area would be the same as described for Alternative 1 with the exception that grade separation of road and rail crossings would occur along the Peninsula and not the Southside.

3.11.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b would have similar impacts to the existing landscape as described for the Peninsula/CSXT route portion of Alternative 2a. This alternative would be expected to have more grade separations of road and rail crossings. As discussed above, these potential impacts would be discussed in the Tier II analysis. A new visual element would be introduced with the relocated Newport News Station, but would not have an adverse impact on the existing landscape given the surrounding characteristics. Expanded parking at the Richmond Main Street Station and Williamsburg Amtrak Station is also proposed. As previously mentioned, Colonial Williamsburg and the Colonial Parkway are adjacent to the Williamsburg Amtrak Station. The proposed parking expansion would unlikely affect the visual or aesthetic character surrounding these areas as they would be surface level parking.

3.11.5 Potential Mitigation

More detailed analysis is needed to determine the extent of adverse impacts on the visual and aesthetic quality of the study routes that may require mitigation. However, impacts to the visual environment could be minimized through context-sensitive design and plantings around new facilities. Detailed mitigation measures would be defined during Tier II analysis.

3.11.6 Subsequent Analysis

Detailed analysis would be performed for the preferred alternative to identify potential visual intrusions into residential, park and open space areas. For each of the proposed station sites, further analysis would be conducted in consultation with local agencies to develop an understanding of the relationship of the proposed station architecture, parking lots, lighting systems and other features to the surrounding natural and manmade settings and the historic context of the surrounding landscape setting. The analysis would identify the potential for blockage of valued views, the areas where shadows would be cast and the areas where the scale, form, line and color of project facilities could be designed to complement the surrounding landscape. The analysis would be used to provide a basis for considering specific measures that could be integrated into the final station designs to reduce the visual impacts of the stations on their surroundings. Similar analyses would be completed for grade separations where appropriate.

3.12 Utilities

This chapter describes the utilities that likely occur and could be affected by the Richmond/Hampton Roads Passenger Rail Project. Potential impacts to those utilities are discussed. This is not intended to be a complete inventory of utilities along the routes, but rather this serves as a preliminary investigation of potential utilities and potential impacts associated with the construction and operation of the alternatives.

3.12.1 Methodology

For this Tier I EIS, the types of likely utilities and potential impacts were identified for the study area. The presence of utilities were identified through a review of aerial photographs, mapping available from several internet sites, site-specific photographs taken by project staff, random field visual inspections, review of local government websites, and documentation contained in the Southeast High Speed Rail (SEHSR) Tier I EIS relative to possible utility owners in the study area.

The study team evaluated the various recommended site-specific and linear improvements to determine whether they would remain within the existing railroad rights-of-way or require enhancements to land adjacent to the rail line. In the limited number of occasions when land was not owned by a railroad company, the aerial photographs were evaluated to determine any potential impacts.

3.12.2 Legal and Regulatory Context

The National Environmental Policy Act (NEPA) requires that all major federal actions assess potential impacts to the built and natural environment. Utilities are considered to be a commodity or service for public use and therefore require consideration in the environmental process. Utilities can have a major impact on the design and planning of facilities and therefore must also be considered as planning and design of the project progresses.

3.12.3 Affected Environment

Utilities are, by definition, a commodity or service provided for public use. The Study Area for both routes contain infrastructure for water treatment and supply, sanitary sewer collection and treatment, storm water collection and discharge, electric generation and distribution, communication facilities and cabling, natural gas storage and distribution, petroleum storage and trans-flo facilities, solid waste collection and management facilities, and interstate pipelines. Many utilities run adjacent to roadway and rail rights-of-way. Initial coordination efforts with utility providers/companies were not undertaken as part of this Tier I EIS.

3.12.3.1 Peninsula/CSXT Route

Water and Sewer - Cities and most towns within the Peninsula/CSXT route study area maintain and operate water treatment and supply facilities. Some of the rural counties and communities have joined to form regional water authorities that function similar to municipal water systems. The infrastructure for water systems varies throughout the study areas. Each system may include different combinations of major structures such as treatment plants, pumping stations, and water towers/tanks. Most water systems will include minor structures, i.e., fire hydrants, meters, valves and back-flow preventers. A network of underground pipes interconnects these major and minor structures. These pipes may also be attached to bridges to cross natural or manmade features.

As with water treatment and supply, sanitary sewer collection and treatment facilities exist in the cities and most towns within the study areas. There are a limited number of regional sewer authorities. With the exception of treatment plants and certain types of pump stations, most sanitary sewer infrastructure is subsurface. Manholes for system access or air-release provide surface evidence of the sanitary sewer system. Sanitary sewer pipes may be seen at aerial crossings of streams or when attached to bridges crossing natural or man-made features.

Storm water collection and discharge occur throughout the study area regardless of population or development. These underground systems may be as simple as a single pipe carrying drainage underneath the roadbed or as complicated as a network of pipes connecting drainage inlets designed to collect and detain drainage from heavily developed areas.

Electric - Dominion Virginia Power provides and maintains the majority, if not all, of the electric generation and distribution systems within the study areas for the alternatives. Power plants within the study areas are generally located near rivers or bodies of water with generators powered by hydraulics, coal-fired or nuclear energy. The distribution system from these plants include high voltage lines on towers, substations, transmission lines both above and below ground, ground and pole-mounted transformers, and service lines.

Communication Facilities - Communication facilities along railroads began in the late 1800s with the installation of telegraph poles and cables. As technology improved, the communication facilities increased in importance. Communication facilities exist in all study areas ranging from microwave towers for train communications to fiber optics for national telecommunications. The communications infrastructure includes both freestanding and guyed towers (towers supported by cables), signal-boosting stations, and both aerial and underground cabling.

Natural Gas - Residences and businesses throughout Virginia use natural gas for cooking, space heating and water heating. The infrastructure that supplies natural gas consists of interstate distribution pipes, compressor stations, underground storage tanks, and distribution pipe systems. Cost-effective delivery of natural gas depends on volume sales that require the location of distribution systems in centers of population or industry.

Petroleum Products - Refined petroleum products used in vehicles, home heating, and industry are delivered by rail and by interstate pipelines to trans-flo facilities located in Portsmouth, Petersburg, and Richmond[38]. These products are stored in large tanks that are grouped in “tank farms.” Photos reviewed did not indicate the presence of any tank farms within the study limits. Distribution of the petroleum products from these tank farms is generally by tanker truck crossing railroads at-grade. This presents a safety issue and also creates an impact to this utility since the tank farms must be accessible by both rail and truck traffic.

Solid Waste Collection - Most municipalities within the Study Area either manage their own solid waste collection program or contract with a private enterprise to manage a program for the municipality. These programs determine a system of collection and disposal of solid waste that ranges from large household trash cans emptied into carts or trucks to facilities for sorting waste into large dumpsters or compactors. Based on the type of solid waste, the container of waste is emptied at either a landfill or a recycling facility.

[38] http://www.transflo.net/?fuseaction=terminal.find

3.12.3.2 Southside/NS Route

It is expected that utilities within the Southside/NS route study area are similar to the kinds of utilities identified for the Peninsula/CSXT route study area.

3.12.4 Environmental Consequences

3.12.4.1 Status Quo Alternative

The Status Quo Alternative would not provide any improvements other than routine maintenance to the existing passenger rail service along the Peninsula/CSXT route. Similarly, there would be no change in the Southside/NS route; it would continue to operate freight trains only. No impacts to utilities would occur.

3.12.4.2 No Action Alternative

The No Action Alternative would provide one additional passenger service round-trip operating at conventional speeds along the Peninsula/CSXT route. It is likely that multiple utilities run within or adjacent to the existing railroad right-of-way. Any infrastructure improvements that would be required to accommodate the additional round-trip would likely occur within the existing rail right-of-way. Temporary disturbances to utilities could occur under the No Action Alternative; however, these disturbances would be coordinated with utility operators so that they would occur during non-peak usage. Services would return to normal once any construction activity affecting them is completed. No long-term impacts on utilities are expected.

3.12.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

As part of Alternative 1, both routes would have passenger rail service. Alternative 1 combines the No Action Alternative (on the Peninsula/CSXT route, the current two trains per day plus the planned additional train) with higher speed passenger service to the Southside/NS route. It is likely that multiple utilities run within or adjacent to the existing railroad right-of-way along both the Peninsula/CSXT and Southside/NS routes. Many factors, such as location, depths, and criticality of utilities will need to be identified in order to make determinations on potential disruptions and relocations of utilities. As stated for the No Action Alternative, no long-term impacts are expected along the Peninsula/CSXT route.

Alternative 1 would require infrastructure improvements mostly to the Southside/NS route. Additional right-of-way would be required along the Southside/NS route. Areas that could potentially have the most affect on utilities would be where track bed widening is required, where potential grade separations may occur, and in proximity to the Kilby connection, the proposed Bowers Hill Station and the Downtown Norfolk Station. Coordination with utility operators would be needed to ascertain which utilities exist in these locations as well as to determine connections to water, sewer, etc., for new facilities such as the proposed Bowers Hill Station and Downtown Norfolk Station. As a result, some utility lines may need to be relocated. It is expected that any disruptions in service would be temporary and normal service would resume upon completion of construction activities.

3.12.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would provide passenger rail service to both the Peninsula/CSXT and Southside/NS routes. Higher speed rail service would be implemented along the Peninsula/CSXT route while conventional service would be added along the Southside/NS route. As stated with Alternative 1, most infrastructure improvements would occur within existing rail right-of-way. Alternative 2a proposes augmented parking at the Richmond and Williamsburg Stations along the Peninsula/CSXT route, a relocated Newport News Station, and road crossing grade separations. The relocated station would require new right-of-way. New right-of-way would also be required for the Kilby connection, the proposed Bowers Hill Station, and the Downtown Norfolk Station for the passenger service along the Southside/NS route. As stated for Alternative 1, disruptions in service could occur but would return to normal after construction is complete. No long-term effects on utilities are anticipated. Once a Preferred Alternative is selected, coordination with utility providers will occur to determine utility locations and develop plans to minimize utility impacts.

3.12.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b would only provide higher speed passenger rail service to the Peninsula. Impacts would be similar to those described in Alternative 2a for the Peninsula/CSXT route. During construction, disruptions in service could occur, but would return to normal after construction is complete. No long-term effects on utilities are anticipated. Once a Preferred Alternative is selected, coordination with utility providers will occur to determine utility locations and develop plans to minimize utility impacts.

3.12.5 Potential Mitigation

Specific impacts to utilities have not been identified and, therefore, precise mitigation measures can not be recommended at this time. However, it should be possible to minimize most impacts through utility operator/owner involvement during preliminary design of a Preferred Alternative. If utilities are impacted then coordination with municipalities and utility owners would be conducted to develop relocation and construction phasing plans around peak usage hours to minimize utility disruptions.

3.12.6 Subsequent Analysis

The subsequent analyses required for project environmental documentation would focus on project-specific impacts that reflect more precise definitions of the right-of-way, the proposed station locations, and operations. Areas of further study should include the following:

- Determine which utilities exist;
- Coordination with utility providers determine utility locations; and
- Develop plans to minimize utility impacts.

3.13 Contaminated and Hazardous Materials

The section identifies and provides an overview of known sources and/or potential suspected sources of contaminated and hazardous materials that may exist within the study area.

3.13.1 Methodology

The greatest potential to disturb contaminated or potentially contaminated and hazardous waste sites is in areas where new rail right-of-way may be acquired and where more significant earth disturbing activities would likely occur, such as at proposed station locations and the Kilby rail connection along the Southside/NS route. A database records search was completed by screening specific federal and state on-line databases of sites located within and proximate to a half-mile radius of each of the existing and proposed rail stations to identify the presence of any potential or existing sources of contaminated/hazardous materials. A similar search was conducted for the vicinity of the Kilby rail connection. Research regarding the study area was confined to the previous investigations, as detailed later in this section. The government database sources reviewed for the proposed stations include:

- The EPA's Comprehensive Emergency Response Compensation and Liabilities Information System (CERCLIS) Website at http://www.epa.gov/superfund/sites/cursites/index.htm
- The EPA's Envirofacts Data Warehouse Website at http://www.epa.gov/enviro/
- The VDEQ Reported Releases Website at http://www.deq.virginia.gov/tanks/dwnllib.html#petdbf
- The VDEQ Registered Tanks - Website at http://www.deq.virginia.gov/tanks/dwnllib.html#petdbf
- The VDEQ Volunteer Remediation Cleanup Sites (Completed and Planned) Website at http://www.deq.virginia.gov/vrp/pubrecord.html
- The VDEQ Solid Waste Facilities Website at http://www.deq.virginia.gov/waste/s-waste.html

The above databases should provide the necessary preliminary information to ascertain the potential presence of contaminated sites that are within and surround the specified project area(s). Upon selection of an alternative and/or station location(s), a more detailed Phase I Environmental Assessment in accordance

with ASTM Standard E1528-00 will be conducted as part of any subsequent analysis to determine the presence and/or extent of any known contaminated sites that may impact the project.

The information in the databases was provided on a statewide basis. The required information from each database was subsequently refined from the statewide listings to a city-wide level. Each of these databases was further reduced to street levels by identifying all streets, roadways, highways, etc., that were known to be located within a ½-mile of the proposed rail stations. Using Yahoo®, Mapquest®, or similar software, each listing was then located via the provided address to identify if the site is present within (or proximal) to a ½-mile of the proposed rail stations. Given the limitations of these mapping programs, sites that were identified to be located immediately adjacent to the ½-mile radius of the proposed rail stations have been conservatively included. A field survey that cross-references the annotated databases would be required to more accurately plot their respective locations.

In addition, selected information from the Tier I EIS for the Southeast High-Speed Rail Project, the I-64 Major Investment Study and the Route 460 Location Study Draft EIS were reviewed for areas surrounding each proposed station to further identify any potential areas of concern on the Peninsula/CSXT and Southside/NS routes.

3.13.2 Legal and Regulatory Context

The regulations of the United States Environmental Protection Agency (EPA), VDEQ, and the Virginia Waste Management Board govern the activities that surround the generation, handling, and disposal of hazardous materials and wastes. In addition, these agencies, in part, regulate the identification, investigation and remediation of contaminated sites in the Commonwealth of Virginia.

The governing EPA regulations include: the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act, including the Superfund Amendments and Reauthorization Act; the Toxic Substances Control Act; and the Hazardous and Solid Waste Amendments of 1984, as codified in 40 CFR et al.

3.13.3 Affected Environment

A variety of source activities or materials at and/or surrounding the proposed routes and stations could result in contaminant concentrations exceeding the respective VDEQ clean up criteria. Some of these influences may include:

- Current and historic railroad operations,
- Current or historic retail petroleum operations,
- Current and former industrial processes and properties,
- Underground storage tanks at or near a proposed route,
- Heating oil storage facilities and/or emergency generators,
- Military installations and activities,
- Motor vehicle (auto and truck) releases and emissions,
- Waste oils and maintenance activities,
- Landfills and illegal/improper disposal activities,
- Historic fill material,
- Naturally occurring compounds and metals,
- Current or historic farming activities, and
- Regional or localized contamination.

Using the on-line databases detailed in Section 3.13.1, information regarding potentially contaminated sites was collected and refined in context to the specific proposed stations. The complete findings of these efforts

are included in Appendix E. The types of listings and locations are summarized in the tables below. It should also be noted that the nature (e.g. types of contaminants, etc.) and extent of each listing is not known as it was not provided in the databases, but rather only locations of known occurrences are identified. Based on the information gathered, it does not appear that any of these known occurrences would result in a "fatal flaw"[39] for the Richmond/Hampton Roads Passenger Rail Project. Further investigation would be needed to provide more detailed information during the Tier II evaluations for the Preferred Alternative.

Upon selection of a Preferred Alternative and exact station locations, a Phase I Environmental Assessment in accordance with ASTM Standard E1528-00, inclusive of field surveys, would be conducted as appropriate to determine the presence of any known contaminated site that may impact the project.

3.13.3.1 Peninsula/CSXT Route

Sites that potentially could contain contaminated and/or hazardous materials were identified within the study area. The majority of these sites were located near or within the more urbanized and industrial areas proximal to the Richmond Main Street Station and the Newport News Downtown Station. Contaminated and/or hazardous material sites were identified at a lesser frequency surrounding the Williamsburg Amtrak Station. The types of listings and locations are summarized on Table 3-44.

Table 3-44: Potentially Contaminated/Hazardous Material Sites Within a Half-Mile of the Proposed Peninsula/CSXT Route Stations

Existing/ Proposed Stations	Government Database								
	EPA CERCLIS Sites		VDEQ Reported Releases		VDEQ Registered Storage Tanks	VDEQ Volunteer Remediation Cleanup Program		VDEQ Solid Waste Facilities	
	On the NPL	Not on NPL	Case Open	Case Closed	# of Facilities	Planned	Completed	Active	Closed
Richmond	0	1	1	37	59	1	0	1	6
Williamsburg	0	1	0	28	21	1	0	0	3
Newport News	0	0	1	31	36	1	1	1	2

NPL: Nationally Priority List

Additionally, the I-64 Major Investment Study closely paralleled the Peninsula/CSXT route. According to the findings of the I-64 Study, numerous potential contaminant sources were identified that may pose an impact to that project which may also affect the Richmond/Hampton Roads Passenger Rail Project. However, based on the level of analysis conducted for this Tier I Draft EIS, it does not appear that any of these known occurrences would be a "fatal flaw"[40] for the Richmond/Hampton Roads Passenger Rail Project. Further investigations of potential contamination and contaminated sites would be conducted during Tier II analysis for the Preferred Alternative.

3.13.3.2 Southside/NS Route

Sites that potentially could contain contaminated and/or hazardous materials were identified within the study area. As detailed in Table 3-45, the locations of a majority of these sites were identified to be near or within the more urbanized and industrial areas of the project area that surround the Norfolk Downtown Station. Contaminated and/or hazardous material sites were identified at a lesser frequency surrounding the proposed station at Bowers Hill.

[39] A site constituting a "fatal flaw" would include an identified contaminated area that would require extensive remediation, such as an EPA CERCLIS Site on the National Priority List. No such sites were identified within the study area in this Tier I Draft EIS analysis. Further investigations would occur during subsequent analysis.

Additionally, a review of the Route 460 Location Study Draft EIS prepared by the Virginia Department of Transportation indicates that 15 potentially contaminated sites may warrant further evaluation due to the proximity of the respective sites to the project route. The majority of these sites are contained along the route immediately north of Waverly, and between the Blackwater River and Route 256 near Windsor.

Table 3-45: Potentially Contaminated/Hazardous Material Sites within a Half-Mile of the Proposed Southside/NS Route Stations

Existing/ Proposed Station	Government Databases								
	EPA CERCLIS Sites		VDEQ Reported Releases		VDEQ Registered Storage Tanks	VDEQ Volunteer Remediation Cleanup Program		VDEQ Solid Waste Facilities	
	On the NPL	Not on NPL	Case Open	Case Closed	# of Facilities	Planned	Completed	Active	Closed
Petersburg[1]	0	0	0	9	22	1	2	3**	9
Bowers Hill	0	1	1	3	4	0	0	1	1
Norfolk	0	0	1	18	30	0	0	1*	1

1. For purposes of analysis, the existing Amtrak Station at Ettrick was included to ascertain existing conditions along this portion of the Southside/NS route. The location of this station is not part of the Tier I Draft EIS.
NPL: National Priority List
*: Includes Un-Permitted Facilities
**: Includes Non-Constructed Facilities

The area between Kilby and Algren along the Southside/NS route was also searched to identify potential contaminated/hazardous materials sites using the EPA's Envirofacts Data Warehouse. A new rail connection between the NS line and CSXT Portsmouth subdivision line would be required to accommodate passenger rail service on this route. This connection would require new rail right-of-way. No Superfund, toxic releases or water dischargers were identified in the vicinity of the proposed connection. One hazardous waste site was identified approximately ½-mile south of the proposed connection area.

3.13.4 Environmental Consequences

3.13.4.1 Status Quo Alternative

Currently, Amtrak operates two round-trip trains daily along the Peninsula/CSXT route at conventional speeds. The Status Quo Alternative does not include any improvements, other than routine maintenance, to the existing Amtrak service on the Peninsula. It is not expected that this alternative would disturb any areas of potential or known contaminated materials within the Peninsula/CSXT route.

3.13.4.2 No Action Alternative

The No Action Alternative would provide one additional round-trip train, for a total of three daily round-trip trains, at conventional speeds along the Peninsula/CSXT route. It is expected that any infrastructure improvements needed to accommodate this additional train would be minor. It is unlikely that the No Action Alternative would have any impact on, or exacerbate any areas of potential or known contaminated materials concerns identified during this investigation.

3.13.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 serves both the Peninsula/CSXT and Southside/NS routes as it combines the No Action Alternative (three round-trip trains daily) with higher speed passenger service (six round-trip trains daily) along the Southside/NS route. As stated for the No Action Alternative, impacts to contaminated/hazardous materials sites are unlikely along the Peninsula/CSXT route. However, improvements along the Southside/NS route carry a greater potential for impact because more infrastructure improvements would be needed to provide higher speed passenger rail service along the existing NS freight line. Major improvements to the Southside/NS route requiring new right-of-way include a new rail connection at Kilby, the Bowers Hill Station, and the Downtown Norfolk Station.

Contaminated and hazardous materials sites are known to exist within the ½-mile radius established around existing and proposed stations and in the vicinity of the Kilby rail connection. However, based on the information gathered for this Tier I Draft EIS evaluation, no specific areas of contamination that would create a "fatal flaw" were identified. More in-depth investigations are required, especially in areas where new right-of-way is to be acquired, to determine the presence and to what extent contamination exists. The selection of this, or any Build Alternative, may require the mitigation and/or remediation of contaminated sites or materials. Where possible, contaminated sites or materials encountered during construction would be addressed as they are detected.

Encountering contaminated sites or materials during construction could potentially impact the schedule and cost of the project. Additionally, the nature and extent of the contaminated sites or materials would require developing specific environmental health and safety planning with regard to the workers, the surrounding communities and the environment. Material handling plans, personal protection, workplace monitoring, alternative designs and methods of construction would need to be evaluated and adjusted to limit the impact from contaminated materials.

3.13.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would also serve both the Peninsula/CSXT and Southside/NS routes with passenger rail service. Improvements to the Peninsula/CSXT route would be required to accommodate increased train frequencies as well as higher speeds. Passenger rail service proposed for the Southside/NS route would be at conventional speeds but would still require similar infrastructure improvements as those required for the passenger rail service described for Alternative 1. New right-of-way would be required for a relocated Newport News Station along the Peninsula/CSXT route. For the Southside/NS route, new right-of-way would be required for the Kilby rail connection, the Bowers Hill Station and the Norfolk Station.

Contaminated and hazardous materials sites are known to exist within the ½-mile radius established around existing and proposed stations and in the vicinity of the Kilby rail connection. As stated for Alternative 1, no areas that trigger a "fatal flaw" were identified during this preliminary analysis. More in-depth investigations are required, especially in areas where new right-of-way is to be acquired, to determine the presence and to what extent contamination exists. The selection of this, or any Build Alternative, may require the mitigation and/or remediation of contaminated sites or materials.

The potential exists to encounter contaminated sites or materials during construction. Where possible, contaminated sites or materials encountered during construction would be addressed as they are detected through specific environmental health and safety procedures to protect workers, the surrounding communities and the environment. Material handling plans, personal protection, workplace monitoring, alternative designs and methods of construction would need to be evaluated and adjusted to limit the impact from contaminated materials.

3.13.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b would only provide higher speed passenger rail service to the Peninsula. No passenger rail service would be provided to the Southside. As previously stated, contaminated and hazardous materials sites are known to exist within the ½-mile radius established around existing and proposed stations. No contaminated areas were identified during this preliminary analysis that would make the project infeasible. More in-depth investigations are required, especially in areas where new right-of-way is to be acquired, to determine the presence and to what extent contamination exists. The selection of this, or any Build Alternative, may require the mitigation and/or remediation of contaminated sites or materials.

The potential exists to encounter contaminated sites or materials during construction. Where possible, contaminated sites or materials encountered during construction would be addressed as they are detected through specific environmental health and safety procedures to protect workers, the surrounding communities and the environment. Material handling plans, personal protection, workplace monitoring, alternative designs and methods of construction would need to be evaluated and adjusted to limit the impact from contaminated materials.

3.13.5 Potential Mitigation Measures

Encountering any contaminated materials would require mitigation, remediation and/or removal, as well as protection from those contaminants during the construction of the project.

Once an alternative and the station locations are determined, a Preliminary Site Investigation (PSI) prior to the design and construction of the proposed improvements should be conducted. This PSI would include a more thorough review of the potential areas of concern and could include sampling of the soils and groundwater along the proposed route and station stops. Sampling protocol would be biased toward the improvements emphasizing deeper (more prominent) excavations (e.g. footers, stormwater retention areas, utilities, etc.), and toward known areas of concern and/or specific properties. This data would confirm the presence/absence of any contaminated materials.

Additional remedial investigations or actions would depend on the types, frequencies and amounts of contamination encountered (if any). Impacted media or materials that could be encountered include the site soils, groundwater, underground or above ground storage tank systems, and asbestos containing materials (should any buildings or structures require demolition).

Any work with regard to contaminated or hazardous materials undertaken as part of a preliminary investigation, design or construction of a Build Alternative should be completed in accordance with all local, state, and federal regulatory requirements.

3.13.6 Subsequent Analysis

Subsequent analysis for contaminated and hazardous materials sites could include the following:

- Site reconnaissance,
- Conducting environmental site assessments,
- Additional database research,
- Review of historical land uses for the Preferred Alternative, and
- Review of agency records and agency consultation.

3.14 Cultural Resources

This section describes historic resources previously identified by the Virginia Department of Historic Resources (VDHR) and potential resources identified during limited field reviews of the study area that have the potential to be affected.

3.14.1 Methodology

Historic resources were identified for the Peninsula/CSXT and Southside/NS routes through the use of existing documentation, such as the Route 460 Location Study conducted by the Virginia Department of Transportation (VDOT), VDHR Data Sharing System (DSS) and a review of the National Register of Historic Places (NRHP). As determined in consultation with VDHR, the area of potential effect was determined to be 500 feet on either side of the centerline of each rail route (for a total of 1,000 feet). A Phase I archaeological or architectural study was not conducted for this Tier I Draft EIS. More detailed evaluation would be conducted in the Tier II environmental analysis of the Preferred Alternative.

In addition to research conducted on the VDHR DSS, a windshield survey was conducted for the Peninsula/CSXT route. This was done so that both routes could be evaluated more fairly. Due to other studies in the region, the same level of documentation is not available for the Peninsula/CSXT route as is for the Southside/NS route. Furthermore, in a September 2005 meeting between DRPT and VDHR, it was decided that it was highly likely that both rail routes under evaluation have elements, or have been associated with events, that may deem them eligible for listing on the NRHP and warrant further investigation of the CSXT Railroad. The NS Railroad within the study area, as previously discussed, has been documented and evaluated during the Route 460 Location Study conducted by VDOT.

Initial coordination with the VDHR, which is the Commonwealth's State Historic Preservation Office (SHPO), was conducted to discuss the approach for this Tier I Draft EIS regarding the known and potential resources along both routes. In addition to coordination with VDHR, the Virginia Council on Indians was contacted to determine the presence of Native American tribes within the study area. (See Appendix B Agency Correspondence.)

3.14.2 Legal and Regulatory Context

Federal agencies are required to take into account the effects of their undertakings on historic properties by Section 106 of the National Historic Preservation Act, 16 U.S.C. 47 (f), as amended in addition to NEPA requirements (Section 101(b)(4)). Under Section 106, federal agencies are also required to provide an opportunity for the Advisory Council on Historic Preservation, the SHPO, and other interested parties to comment on federal undertakings.

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

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

In addition to the aforementioned regulations, historic properties are also protected under Section 4(f) of the U.S. Department of Transportation Act, as amended (49 U.S.C. 303(c)). Section 4(f) states that the U.S. Department of Transportation may not approve the use of land from a publicly owned park, recreation area, wildlife or waterfowl refuge, or historic site of national, state or local significance unless there is no prudent and feasible alternative to the use of that land. If such land is required, then all possible measures to minimize harm must be employed. A discussion of Section 4(f) resources is included in Section 3.18 of this Tier I Draft EIS.

Sacred Native American Lands - Under Section 101(d)(6)(A) of the National Historic Preservation Act, properties of traditional religious and cultural significance to an Indian tribe or Native Hawaiian organization may be eligible for listing on the NRHP. In addition to the protection afforded by the Act, Executive Order 13007 "Indian Sacred Sites" requires federal managing agencies to accommodate access to and ceremonial use of sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites. It also requests that when possible, the confidentiality of those sites be maintained. Agencies are also required by Executive Order 13007 to develop procedures for reasonable notification of proposed actions or land management policies that may restrict access to, ceremonial use of, or adversely affect sacred sites.

3.14.3 Affected Environment

3.14.3.1 Peninsula/CSXT Route

According to the VDHR DSS, a total of 48 architectural resources have previously been identified for the Peninsula/CSXT route. Of those, 12 have been recommended eligible for listing or are currently listed on the NRHP. The remaining 36 are either not recommended eligible for listing on the NRHP, or the historic significance has been undetermined. Forty-one archaeological sites were identified along the route. Table 3-46 summarizes the architectural resources that have been previously identified as being recommended eligible for listing or listed on the NRHP and Table 3-47 summarizes the archaeological resources. A complete list of all resources identified by the DSS for the Peninsula/CSXT route is provided in Appendix C Historic Resources. Figure 3-12 is a map of known cultural resources along the Peninsula/CSXT route. It

should be noted that the figure does not include those resources for which historic significance is undetermined.

Table 3-46: Architectural Resources Eligible or Listed in the National Register of Historic Places along the Peninsula/CSXT Route

VDHR ID #	Property Name	Date	Location	County/City	Date Listed on NRHP *(if known)*	Date Listed on VA Landmarks Registry *(if known)*
121-0171-0002	Warehouse (Site), James River Canal	N/A	Gamble's Hill	Richmond		
127-0192	Saint John's Church Historic District	1800s	22nd Street on west, Marshall Street on east	Richmond		
127-0171	James River and Kanawha Canal Historic District	1800ca	Peach Street to intersection of Sleepy Hollow Road	Richmond/ Henrico	8/26/71	9/9/69
043-0439	Aviation General Supply Depot	1917	508 Bickerstaff Road	Henrico		
043-0306	The Cedar Works Warehouse	1885 ca	Old Osborne Turnpike, Route 5	Henrico		
063-0218	Little Roxbury	1920	Route 615	New Kent	9/15/70 Expansion Accepted: 1/17/91	6/2/70 Expanded: 4/17/90
047-0034	Norge Historic District	Post 1840	Richmond Road, Peninsula Street, Peach Street	James City		
121-0043	North End Historic District	1900	Near Shipyard	Newport News	8/28/86	6/17/86
121-0009	Hilton Village Historic District	1918	Adjacent to east bank of James River, approximately 2 miles north of Newport News Shipbuilding and Dry Dock	Newport News	6/23/69	11/5/68
121-0050	Lee's Mill Earthworks	1862	280 Rivers Ridge Circle	Newport News	6/23/03	3/19/03
121-0016	Lee Hall	1859	163 Yorktown Road	Newport News	12/5/72	8/15/72
121-5068	Village of Lee Hall Historic District	1881	Near Intersections of Warwick Boulevard (Rt. 60) and Ripley Street	Newport News		

Source: VDHR DSS, September 2005

Table 3-47: Archaeological Resources Identified Along the Peninsula/CSXT Route

VDHR Site #	City/County	Site Class	Cultural Designation	Temporal Designation
44HE0082	Henrico	Terrestrial, open air	Indeterminate	19th century
44HE0057	Henrico	Terrestrial, open air	Native American	Middle Archaic
44HE0058	Henrico	Terrestrial, open air	Native American/Indeterminate	Woodland, 20th/19th Century
44HE0981	Henrico	Terrestrial, open air	African American, Euro-American	19th Century
44HE0764	Henrico	Terrestrial, open air	Native American	Prehistoric/Unknown
44HE0328	Henrico	Terrestrial, open air	N/A	N/A
44HE0890	Henrico	Terrestrial, open air	Indeterminate	19th century: 1st half
44HE0929	Henrico	Terrestrial, open air	Native American	Prehistoric/Unknown
44HE0930	Henrico	Terrestrial, open air	Native American	Prehistoric/Unknown
44HE0702	Henrico	Terrestrial, open air	N/A	N/A
44HE0681	Henrico	Terrestrial, open air	Indeterminate	19th century: 3rd quarter
44HE0873	Henrico	Terrestrial, open air	Indeterminate	19th Century: 4th quarter
44CC0021	Charles City	Terrestrial, open air	Native American	Woodland
44NK0031	New Kent	Terrestrial, open air	Indeterminate	17th Century: 1st Half
44NK0021	New Kent	Terrestrial, open air	Indeterminate	18th Century
44JC0018	James City	Terrestrial, open air	Native American	Prehistoric
44JC0006	James City	Terrestrial, open air	Native American	Prehistoric
44JC0003	James City	Terrestrial, open air	Native American	Woodland
44JC0272	James City	Terrestrial, open air	Indeterminate	Roughly 19th Century
44JC1124	James City	Terrestrial, open air	Euro-American	19th Century
44YO0313	York	Terrestrial, open air	Indeterminate	18th Century
44YO0753	York	Terrestrial, open air	N/A	N/A
44YO0751	York	Terrestrial, open air	Indeterminate	19th Century: 4th quarter
44YO0754	York	Terrestrial, open air	Indeterminate	20th Century
44YO0378	York	Terrestrial, open air	Indeterminate	18th Century
44YO0377	York	Terrestrial, open air	Indeterminate	18th Century
44YO0379	York	Terrestrial, open air	N/A	N/A
44WB0014	Williamsburg	Terrestrial, open air	Euro-American	17th Century: 4th quarter
44WB0015	Williamsburg	Terrestrial, open air	Euro-American	17th Century: 4th quarter
44JC0300	James City	Terrestrial, open air	N/A	N/A
44JC0059	James City	Terrestrial, open air	Indeterminate	19th Century: 3rd quarter
44JC1041	James City	Terrestrial, open air	N/A	N/A
44JC1044	James City	Terrestrial, open air	Euro-American	19th Century: 2nd half
44JC0063	James City	Terrestrial, open air	Indeterminate	20th Century
44NN0327	Newport News	Terrestrial, open air	Euro-American	19th Century: 3rd quarter
44NN0326	Newport News	Terrestrial, open air	Euro-American	19th Century
44NN0062	Newport News	Terrestrial, open air	Native American	Prehistoric/Unknown
44NN0037	Newport News	Terrestrial, open air	Euro-American	N/A
44NN0081	Newport News	Terrestrial, open air	Indeterminate	18th Century
44NN0309	Newport News	Terrestrial, open air	Native American	Late Woodland 17th Century: 4th quarter
44NN0308	Newport News	Terrestrial, open air	Native American	Middle Woodland 17th Century: 4th quarter

Source: VDHR DSS, September 2005

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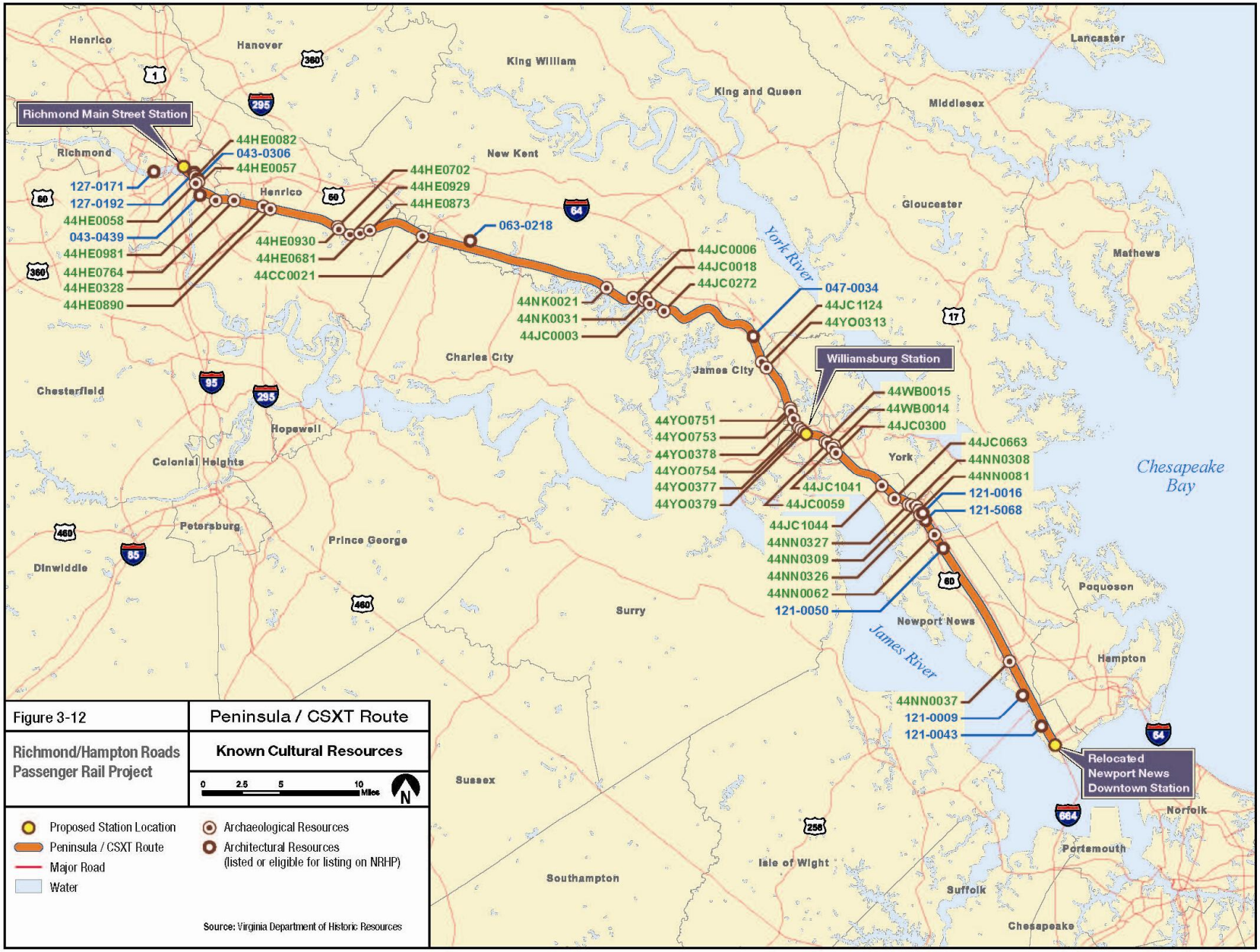
Richmond Main Street Station
Williamsburg Station
Relocated Newport News Downtown Station
44HE0082
043-0306
44HE0057
127-0171
127-0192
44HE0058
043-0439
44HE0981
44HE0764
44HE0328
44HE0890
44HE0702
44HE0929
44HE0873
063-0218
44HE0930
44HE0681
44CC0021
44NK0021
44NK0031
44JC0003
44JC0006
44JC0018
44JC0272
047-0034
44JC1124
44YO0313
44YO0751
44YO0753
44YO0378
44YO0754
44YO0377
44YO0379
44WB0015
44WB0014
44JC0300
44JC0663
44NN0308
44NN0081
121-0016
121-5068
44JC1041
44JC0059
44JC1044
44NN0327
44NN0309
44NN0326
44NN0062
121-0050
44NN0037
121-0009
121-0043
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
New Kent
Gloucester
Mathews
York River
Charles City
James City
York
Chesterfield
Hopewell
Colonial Heights
Petersburg
Prince George
Dinwiddie
Surry
Sussex
Southampton
Isle of Wight
Suffolk
Chesapeake
Portsmouth
Norfolk
Newport News
Hampton
Poquoson
James River
Chesapeake Bay
Figure 3-12
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Known Cultural Resources
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Archaeological Resources
Architectural Resources (listed or eligible for listing on NRHP)
Source: Virginia Department of Historic Resources

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During the cursory windshield survey, 22 additional resources of potential historic significance were identified along the rail route. No in-depth research of these areas was conducted to provide an eligibility determination. More detailed evaluation of these areas may be warranted in the Tier II environmental analysis of the Preferred Alternative. These areas are identified in Table 3-48.

Table 3-48: Areas of Potential Historic Significance along the Peninsula/CSXT Route

General Location	Description of Resource
City of Richmond; Dock Street and 26th Street	Bascule lift bridge along south side of canal
City of Richmond; along north side of Dock Street	Converted warehouses to residential properties
City of Richmond; Orleans Street	Switch house
Henrico County; north of Cedar works	Rail yard
Henrico County; Bickerstaff Road	Air Reduction Sales Company AIRCO (now used as Central Virginia Concrete Corporation)
Henrico County; 1100 block of Bickerstaff Road	Three houses circa 1900
Henrico County; Miller Road	Farmhouse circa 1850
Charles City County; White Oak Swamp vicinity of Elko Road and CSXT tracks	Area part of Seven Days Battlefields (June 20-30, 1862)
New Kent County; Providence Forge	Town includes several elements that warrant investigation such as a 1920s tourist camp, freight building at railroad and Route 155, Courthouse and Route 155 old hotel
New Kent County; Webers and SR 1101 along Route 60	Country Store
New Kent County; Route 60 and Rockahock Road	Patsy's Diner
New Kent County; Allen Road and Rockahock Road	Hotel
James City County	Diascund Village circa 1850s, several structures adjacent to railroad dating to the late 19th century
James City County; Berkley Town Road	Early 20th century housing
City of Williamsburg; between Penniman Road and CSXT tracks	Odd area of open land, may indicate potential for archaeological site
City of Williamsburg; 609 Penniman Road	1920s house
City of Williamsburg; Monument Drive (off of Penniman)	Collection of single family homes dating over 50 years; architectural style is Colonial Revival residential
City Williamsburg; Along Penniman Road near intersection of Route 199	Four properties dating to the early 20th century
City of Williamsburg; Along Route 199	Five houses
James City County; Between Howard and Jackson Street	Four early 20th century houses
City of Newport News	Several old railroad depots that have been destroyed (archaeological potential)
City of Newport News; Warwick Street between 47th and 50th Streets	Housing along south side of tracks warrant investigation

Source: DMJM Harris windshield survey, September 2005

*It has not been determined if these resources are included in the VDHR DSS. These findings only indicate areas that may merit further investigation and documentation. These resources should be further investigated during subsequent analysis.

Based upon its continued use as a railroad since 1881, its location on or adjacent to its original route, and its historical importance tied to the transportation of coal to market, as well as the important transportation function it served as the major embarkation route and point during World War II and its association with an important individual, it is possible that the Peninsula Branch of the CSXT Railroad would be eligible for the NHRP. It may potentially meet Criterion A for its historical importance, Criterion B for its association with Colis Huntington, and potentially Criterion C, for its engineering and design features.

CSXT Railroad - The project route would use the existing facilities now owned and operated by the CSXT Railroad, between the City of Richmond and the City of Newport News. This line is actively used by Amtrak to provide passenger rail service and also by CSXT for freight rail service.

History - The CSXT line was originally constructed between 1880 and 1882 by the Chesapeake & Ohio Railway Company (C&O). The C&O traces its origins to the Louisa Railroad of Louisa County, Virginia, begun in 1836, and the James River & Kanawha Canal Company (1785). By 1850, the Louisa Railroad had been built east to Richmond and west to Charlottesville, and renamed the Virginia Central. The railroad kept

extending its reach westward through the mountains of the Alleghany Plateau, and by the late 1850s almost completed the lines through to Charleston and the Kanawha River. However, the Civil War brought a halt to the expansion.

During the Civil War, the Virginia Central was one of the Confederacy's most important lines, carrying food from the Shenandoah region to Richmond, and transporting troops and supplies back and forth. By the end of the war, most of the railroad had been destroyed by the fighting.

After the war, the company rebounded, solicited outside support and successfully engaged Collis P. Huntington of New York to become involved in the project. Huntington was well known as one of the key participants involved in building the Central Pacific portion of the Transcontinental Railroad. He had a vision of a railroad that would run from coast to coast under one management, and he saw the Virginia Central as a way to achieve that goal. He funded the construction efforts, and the line was rebuilt and completed westward to the Ohio River. The intent was to link the Tidewater coast of Virginia with the "Western Waters." By 1873 the line was open and functioning to Hawks Nest, West Virginia.

Although the intent of the system was to link the east with Huntington's Western and Mid-Western holdings, the line stopped at the Ohio River, where it linked with packet boats to transport the goods on the river. The mineral resources in the region were not fully accessible to the market yet, and when the financial panic of 1873 hit, the railroad also suffered and went into receivership in 1878. When reorganized, it was renamed the Chesapeake & Ohio Railway Company. After that time, coal resources began to be realized in the west and were shipped eastward. To reach the Virginia coast, in 1881 the Peninsula Subdivision was built from Richmond to the new city of Newport News, located in Hampton Roads, the east's largest ice-free port.

Transportation of coal to Newport News, where it was loaded and transported to the Northeast, became a staple of the C&O's business at this time. In the later 1880s this line, as well as much of the C&O system, was rebuilt with ballasted roadbed, enlarged and lined tunnels, steel bridges, heavier steel rails, and new, larger, railcars and locomotives. With coal coming from southern West Virginia and eastern Kentucky, the fortunes of the company and the Peninsula line continued to rise.

The C&O continued to expand its regional scope by acquiring new branches and companies through the first half of the twentieth century, and even during the Great Depression when many other railroads were collapsing. During the 1930s, many lines were double tracked, bridges were rebuilt, rail was upgraded, roadbeds enhanced and other improvements were made.

During World War II, the C&O played a major role in transporting troops and materiel to the ports. The railroad transported tens of thousands of soldiers, equipment and armaments as the U.S. used the Hampton Roads Port of Embarkation as a principal departure point for the European Theater. The invasion of North Africa was staged and loaded here, using the C&O facilities at Hampton Roads.

The C&O continued to grow and prosper in the years following the war, bringing innovations and improvements that changed the face of rail engineering and travel during the 1950s and early 1960s. In 1963, the company affiliated with the Baltimore & Ohio Railroad Company, and under the leadership of Hays T. Watkins, the C&O, B&O and Western Maryland became the Chessie System, taking the name that had been used unofficially for many years. The Chessie System then merged with many other railroads of the southeast to form CSX.

The CSX line today, extending from Richmond to Hampton Roads, for the most part follows the same historic route as it was first planned in 1881. Historically, stations were built during the late 19th century at Providence Forge, Norge, Willamsburg, Lee Hall, Amoco, Hampton Roads Transfer, Old Point Junction and Newport News. Most of these locations had frame passenger stations, some combined with freight stations, and some had brick freight houses as well. The railroad was carried across the numerous streams and waterways along the Peninsula by a variety of bridges, both steel and concrete, most of which have likely been replaced over the years. Currently, the line still functions carrying freight and passengers between Richmond and Hampton Roads.

3.14.3.2 Southside/NS Route

According to the VDHR DSS, a total of 59 architectural resources have previously been identified for the Southside/NS route. Of those, 10 are recommended eligible for listing or are listed on the NRHP, while the remaining 49 are either not recommended eligible for listing on the NRHP or the historic significance is undetermined. Seven archaeological sites were identified along the route. Table 3-49 summarizes the architectural resources previously identified as being recommended eligible or listed on the NRHP and Table 3-50 summarizes the archaeological resources. A complete list of all resources identified by the DSS for the Southside/NS route is provided in Appendix C of this Tier I Draft EIS. Figure 3-13 is a map of known historic resources along the Southside/NS route. It should be noted that the figure does not include those resources for which historic significance is undetermined.

Table 3-49: Architectural Resources Eligible or Listed in the National Register of Historic Places along the Southside/NS Route

VDHR ID #	Property Name	Date	Location	County/City	Date Listed on the NRHP *(if known)*	Date Listed on the VA Landmarks Registry *(if known*
091-5098	Norfolk & Petersburg Railroad	ca 1858	Parallel to Route 460 as it extends southeast to northwest across Isle of Wight, Southampton, Sussex and Prince George Counties.	Isle of Wight Southampton Sussex Prince George		
046-5101	Hobbs Property/6635 Windsor Blvd	1933	6635 Windsor Boulevard	Isle of Wight Zuni		
328-0001	Windsor Railroad Station/Windsor Depot/Norfolk and Western Railroad	1866	15 West Railroad Street	Isle of Wight Windsor		
133-5138	Joel E. Harrell and Sons/Smithfield Packing Company Plant No. 5	ca 1941	110 Virginia Ham Drive	Suffolk Magnolia		
133-0072	Suffolk Historic District and Expansions	Post 1742	Bank Street Market Street Clay Street Poplar Street N&W Railroad Tracks County Street Central Avenue Grayson Court Liberty Street Hill Street Pinner Street Chestnut Street North Street Pine Street W. Washington Street	Suffolk		
133-5040	West End Historic District and Boundary Expansion	1865	The West End neighborhood is roughly bounded by the Seaboard Coast Line Railroad to the north, the Norfolk and Western Railroad (N & W) to the south, Linden Avenue, Wellons Street and Pender Street to the east, and Brewer Street and Causey Avenue on the west.	Suffolk	1/16/04 Expansion Accepted: 11/27/04	
131-0055	South Norfolk Historic District	Post 1890	Northern end of the City of Chesapeake in the area	Chesapeake	1/27/89	12/2/87

VDHR ID #	Property Name	Date	Location	County/City	Date Listed on the NRHP *(if known)*	Date Listed on the VA Landmarks Registry *(if known*
			generally known as South Norfolk			
131-5325	Sunray Agricultural (Rural) Historic District	1908	Biernot Road/I-64/Carlise Road/Compaz Road/Danberry Street/East Road/Hertz Road/Homestead Road/Old State Road/ Peach Avenue/Seldon Road/Sondej Avenue/Sunray Avenue/Truitt Road	Sunray Chesapeake	Listing Pending	3/19/03
131-0389	House/604 Homestead	1923	604 Homestead Road	Sunray Chesapeake		
122-0590	Colonna's Shipyard	1920	400 Indian River Road	Norfolk		

Source: VDHR Data Sharing System, September 2005

Table 3-50: Archaeological Resources Previously Identified along the Southside/NS Route

VDHR ID #	City/County	Site Class	Cultural Designation	Temporal Designation
44PG0218	Prince George	Terrestrial, open air	Native American	Late Woodland
44PG0142	Prince George	Terrestrial, open air	Indeterminate Indeterminate	19th Century 20th Century
44PG0309	Prince George	Terrestrial, open air	Indeterminate	19th Century: 3rd Quarter
44PG0143	Prince George	Terrestrial, open air	Native American Indeterminate Indeterminate	Late Archaic 20th Century 19th Century
44SX0223	Sussex	Terrestrial, open air	Native American	Prehistoric/Unknown
44SX0320	Sussex	Terrestrial, open air	Historic	Unknown
44PM0050	Portsmouth	Terrestrial, open air	Native American	Woodland

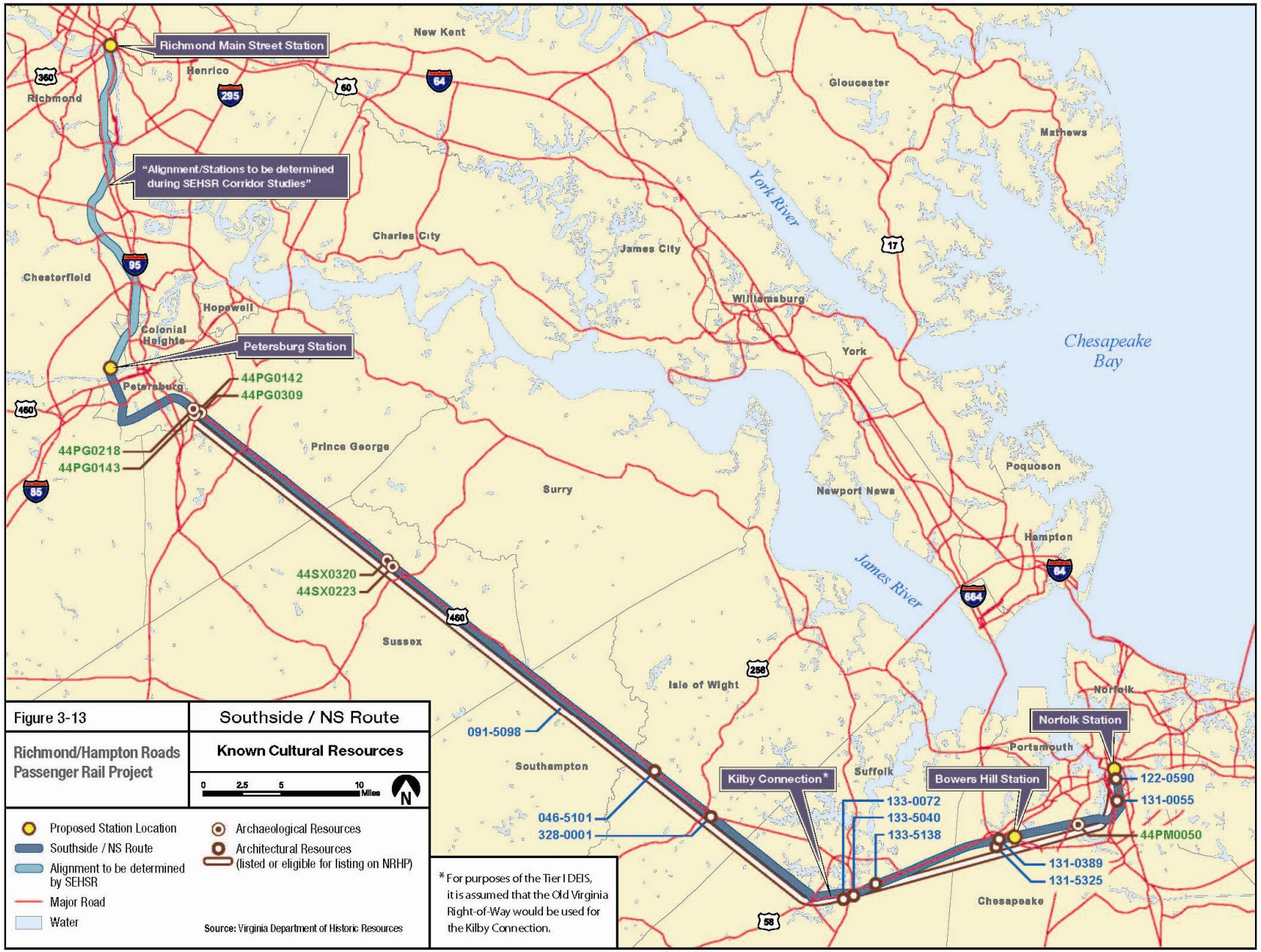
Source: VDHR Data Sharing System, September 2005

In addition to information provided by the VDHR DSS, information collected during the Route 460 Location Study[41] pertaining to the eligibility of the Norfolk Southern Railroad, formerly the Norfolk & Petersburg Railroad (VDHR #091-5098), was reviewed. The cultural resources component of the U.S. 460 Location Study was determined to be relevant to this Tier I Draft EIS as the study covered the geographic area of the Southside/NS route, contained sufficient detail regarding cultural resources to meet Tier I analysis needs and is current to date. For these reasons, the Location Study was used in lieu of the more general windshield survey methodology that was used for the portion of the project along the Peninsula/CSXT route.

Results of the VDHR study and coordination with VDHR determined that the Norfolk Southern Railroad has the potential to warrant inclusion in the National Register under Criterion A (association with events that have made a significant contribution to the broad patterns of our history) for its association with the region's economic and transportation history (VHDR correspondence with VDOT February 22, 2005 and March 9, 2005 regarding Route 460 Location Study).

The Virginian Railway - A portion of the abandoned Virginian Railway would be utilized by the Southside/NS route between Kilby and the proposed Bowers Hill station. Since this portion of the rail line was abandoned in 1959 as a result of the Virginian's takeover by Norfolk & Western, the abandoned property is now owned by the cities of Suffolk and Chesapeake.

[41] Virginia Department of Transportation, 2004. Route 460 Location Study and Draft Environmental Impact Statement. On file at VDOT.


Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
44PG0142
44PG0309
44PG0218
44PG0143
44SX0320
44SX0223
091-5098
046-5101
328-0001
Kilby Connection*
Bowers Hill Station
Norfolk Station
122-0590
131-0055
44PM0050
131-0389
131-5325
133-0072
133-5040
133-5138
New Kent
Henrico
Richmond
Chesterfield
Colonial Heights
Hopewell
Petersburg
Prince George
Surry
Sussex
Charles City
James City
Williamsburg
York
Gloucester
Mathews
Poquoson
Newport News
Hampton
Isle of Wight
Southampton
Suffolk
Portsmouth
Norfolk
Chesapeake
York River
James River
Chesapeake Bay
Figure 3-13
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Known Cultural Resources
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Archaeological Resources
Architectural Resources (listed or eligible for listing on NRHP)
Source: Virginia Department of Historic Resources
* For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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History - The Virginian Railway was a Class I railroad located in Virginia and West Virginia. The line was created to transport coal from southern West Virginia to Hampton Roads. The railway was completed in 1909 by its founders William N. Page and Henry H. Rogers. The Virginian was operated on the premise of "paying up front for the best." This, combined with all new infrastructure and no debt, allowed the railway to operate more efficiently than its larger competitors. This is considered to be an accomplishment like no other in the history of U.S. railroading. The Virginian was able to do this because it used construction techniques that were not available when larger railroads had been built 25 years earlier. In addition, the work was funded using Henry Rogers' own personal fortune; therefore, there was no public debt. The railway soon became known as "The Richest Little Railroad in the World."

Part of this rail line played an important part in 20th century U.S. Naval history. During both World Wars, the Virginian carried high quality coal from the mountains of West Virginia to Sewell's Point, where a major naval station and airbase existed. The base was established in 1917. Part of this establishment at Sewell's Point included a coal pier that supplied coal to naval ships and submarines during both World Wars.

During World War I, the United States Railroad Administration (USRA) took over the operation of railroads in the United States in hopes of creating a more efficient rail system that could better support the war effort. Under this initiative, the Virginian was jointly operated with the Norfolk & Western Railway. After the wars, railroads were returned to their rightful owners and competitive status. The Norfolk & Western maintained an interest in the Virginian and made several attempts to acquire the Virginian Railway. In the late 1950s, the Interstate Commerce Commission (ICC) approved the Norfolk & Western and Virginian merger. This merger also played a historical role in the era of major railroad mergers. It is said to be the merger that began the movement for railways to merge so that they could become more competitive against highways, air travel and other modes of transport.

3.14.4 Environmental Consequences

3.14.4.1 Status Quo Alternative

Under the Status Quo Alternative, there would be no additional passenger rail service on the Peninsula/CSXT route. The existing passenger service of two round-trip trains per day would remain. The Southside/NS route would be continued for use by freight operations as planned by Norfolk Southern. No impacts to cultural resources associated with this alternative would occur.

3.14.4.2 No Action Alternative

Under the No Action Alternative, one additional passenger train would be added to the existing Peninsula service and would operate at a maximum speed of 79 mph. In total, there would be three daily round-trip trains operating between Richmond and Newport News. There would be no infrastructure improvements related to higher speed passenger rail and, therefore, no impacts to cultural resources are anticipated under the No Action Alternative.

3.14.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Cultural resources have been identified along both the Peninsula/CSXT and Southside/NS routes. No impacts on cultural resources are expected to occur along the Peninsula/CSXT route since the Amtrak service proposed (three daily round-trip trains) would not require major infrastructure improvements resulting in new rail right-of-way. Alternative 1 would provide higher speed passenger rail service (six daily round-trip trains) on the Southside/NS route. There is the potential to impact cultural resources along the Southside/NS route, given the proposed major infrastructure improvements and additional right-of-way required under this alternative. Additional right-of-way may be required for track expansion, the proposed rail connection at Kilby, and the two proposed stations at Bowers Hill and Downtown Norfolk. It is unlikely that any identified cultural resources along this route would be directly affected, but proximity effects to these resources may occur. Proximity effects may include altering the visual setting and increased noise and vibration due to increased train frequencies for resources within immediate vicinity of the proposed improvements.

Archaeological resources identified within the study area have less potential to be affected given that the majority of the study area has been disturbed over time. As the project progresses and the locations and

footprints of improvements are better defined, archaeological resources known to exist within those limits would be investigated to determine if impacts will occur.

As discussed above, it is possible that the Peninsula Branch of the CSXT Railroad may be eligible for the NRHP. A detailed field survey and historical assessment would have to be conducted prior to any formal determination of eligibility being prepared for the railroad resource. These activities would be carried out during the subsequent analysis if the Peninsula/CSXT route is part of the selected alternative.

The Norfolk Southern Railroad along the Southside/NS route also has the potential to be eligible for inclusion in the NRHP, as previously documented by the Route 460 Location Study. A final determination of eligibility for the rail line itself and potential effects would be necessary. This would include a determination of contributing and noncontributing resources, a period of significance and the development of a boundary for the resource. These elements would be developed during the Tier II studies if the Southside/NS route is part of the Preferred Alternative.

A portion of the abandoned Virginian Railway would be utilized by the Southside/NS route between Kilby and the proposed Bowers Hill station. More detailed study pertaining to the Virginian Railway is necessary in order to determine if it is potentially eligible for listing on the NRHP. The railway would need to be surveyed and evaluated according to National Register criteria during Tier II investigations if the Southside/NS route is part of the Preferred Alternative.

Further evaluations and coordination with VDHR would be undertaken during the Tier II environmental analysis to determine actual impacts to resources identified and the eligibility of undetermined resources along the Peninsula/CSXT route and/or Southside/NS route. Early coordination with VDHR indicates that both of the proposed routes will likely have an effect on historic properties should major infrastructure improvements occur. VDHR recommends that the FRA initiate the Section 106 review process early in the Tier II evaluation of the selected alternative.

Two Indian tribes were identified within the vicinity of the study area. Efforts were made by DRPT and FRA to contact the tribes (Appendix C); however, no response from these tribes was received as of the date of this document. During subsequent analysis, additional outreach to these tribes would occur.

3.14.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

It is unlikely that the historic resources identified along the Peninsula/CSXT route would be adversely affected by Alternative 2a since the Amtrak service proposed (six daily round-trip trains) would not require major infrastructure improvements resulting in new rail right-of-way. The resources that have the greatest potential for physical impact would be those within the immediate vicinity of improvements that would take place outside of existing rail right-of-way, such as the proposed parking improvements at the Williamsburg Amtrak Station and the proposed downtown Newport News Station. Potential impacts may include increased noise and vibration due to increased train speeds and frequencies and alteration of the surrounding visual or aesthetic character near station facilities.

It is unlikely that the cultural resources identified for the Southside/NS route would be adversely affected by Alternative 2a since the Amtrak service proposed (three daily round-trip trains) would not require major infrastructure improvements resulting in new rail right-of-way. The resources that have the greatest potential for any type of physical impact would be those within the immediate vicinity of improvements that would take place outside of existing rail right-of-way, which include the Kilby rail connection (transition from the Southside/NS rail line to the Virginian rail line in Suffolk) and the two proposed stations at Bowers Hill and Downtown Norfolk. Potential impacts may include increased noise and vibration due to increased train speeds and frequencies and alteration of the surrounding visual or aesthetic character near station facilities.

Archaeological resources identified within the study area have less potential to be affected. As the project progresses and the locations and footprints of improvements are better defined, archaeological resources known to exist within those limits and potential resources should be investigated to determine if impacts will occur.

Both the CSXT Railroad along the Peninsula/CSXT route and the NS rail line along the Southside/NS route may be eligible for listing on the NRHP. A detailed field survey and historical assessment would be conducted prior to any formal determination of eligibility being prepared for the railroad resource.

Two Indian tribes were identified within the vicinity of the study area. Efforts were made by DRPT and FRA to contact the tribes (Appendix C); however, no response from these tribes was received as of the date of this document. During subsequent analysis, additional outreach to these tribes would occur.

3.14.4.5 Alternative 2b Peninsula Higher Speed Only

It is unlikely that the historic resources identified along the Peninsula/CSXT route would be adversely affected by Alternative 2b since the Amtrak service proposed (nine daily round-trip trains) would not require major infrastructure improvements resulting in new rail right-of-way. The resources that have the greatest potential for physical impact would be those within the immediate vicinity of improvements that would take place outside of existing rail right-of-way, such as the proposed parking improvements at the Williamsburg Amtrak Station and the proposed Downtown Newport News Station. Potential impacts may include increased noise and vibration due to increased train speeds and frequencies and alteration of the surrounding visual or aesthetic character near station facilities. Potential impacts due to grade crossing consolidations and separations cannot be evaluated at this time since the locations of these improvements would be determined through subsequent environmental assessment.

Archaeological resources identified within the study area have less potential to be affected. As the project progresses and the locations and footprints of improvements are better defined, archaeological resources known to exist within those limits and potential resources should be investigated to determine if impacts will occur.

The Peninsula/CSXT rail line itself may be potentially eligible for listing on the NRHP. However, more detailed analysis is required to make an eligibility determination of this resource.

Two Indian tribes were identified within the vicinity of the study area. Efforts were made by DRPT and FRA to contact the tribes (Appendix C); however, no response from these tribes was received as of the date of this document. During subsequent analysis, additional outreach to these tribes would occur.

3.14.5 Potential Mitigation

Since detailed impacts to specific cultural resources have not been determined, no mitigation measures are proposed at this time. As the project progresses and impacts are determined, appropriate mitigation measures will be coordinated with VDHR. For any uses of historic properties, Section 4(f) of the U.S. Department of Transportation Act will require a more detailed evaluation and determination of specific impacts and proposed mitigation strategies. Mitigation measures would be detailed in a Memorandum of Agreement (MOA) between the involved parties, which may include FRA, DRPT, ACHP, VDHP and others. The MOA might require context-sensitive design or rehabilitation of historic structures or sites to mitigate potential impacts.

3.14.6 Subsequent Analysis

The level of resource identification and analysis undertaken for this Tier I Draft EIS is appropriate to compare the relative potential for impacts among the alternatives. During the Tier II analysis, compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, will be completed. The subsequent analysis required for project environmental documentation would focus on project-specific impacts that reflect more precise definitions of the right-of-way, the proposed station locations and operations. Areas of further study would include the following:

- Further evaluations and coordination with VDHR to determine actual impacts to resources identified and the eligibility of undetermined resources along the Preferred Alternative.
- Formally determine the NRHP eligibility for the Preferred Alternative and potential effects. The railway(s) would need to be surveyed and evaluated according to National Register criteria. This

would include a determination of contributing and noncontributing resources, a period of significance and the development of a boundary for the resource.

- Two Indian tribes were identified within the vicinity of the study area. DRPT and FRA contacted the tribes by written letter; however, no response from these tribes was received as of the date of this document. During subsequent analysis, additional outreach to these tribes would occur.
- Develop appropriate mitigation measures for any unavoidable impacts to historic properties.

3.15 Geologic Resources

This section describes the existing geologic conditions, including topography, soils and mineral resources within the study area. It also provides a discussion of the potential impacts to these resources by the alternatives under consideration for the Richmond/Hampton Roads Passenger Rail Project.

3.15.1 Methodology

Research was the principal method used to gather information about the geologic resources within the study area. Geology and topography was obtained from the U.S. Geological Survey (USGS) maps and atlases. Soil and prime farmland data were compiled from the U.S. Environmental Protection Agency (EPA) and the Natural Resources Conservation Service (NRCS), under the U.S. Department of Agriculture (USDA). Data and information related to mineral resources was obtained from the Virginia Department of Mines, Minerals, and Energy, as well as the USGS. Additional information was obtained from websites, local and regional plans, and personal communications with representatives from various federal, state and local agencies.

3.15.2 Regulatory Requirements

Laws regarding sole source aquifers and prime farmlands are pertinent to defining geological resources. The Sole Source Aquifer Protection Program is authorized by the Safe Drinking Water Act of 1974. The Act was originally passed to protect public health by regulating the nation's public drinking water supply. It was amended in 1986 and 1996, and requires many actions to protect drinking water and its sources—rivers, lakes, reservoirs, springs and groundwater. Aquifers are designated as "Sole Source" to protect drinking water supplies in areas with few or no alternative sources of potable water.

The Virginia Department of Mines, Minerals, and Energy administers the laws for the rights of owners of land adjacent to Mineral Mines (Code of Virginia, Title 45). The laws mostly pertain to mine safety.

3.15.3 Affected Environment

3.15.3.1 Peninsula/CSXT Route

Geology - The western portion of Richmond lies within the Piedmont Province. The rest of the Peninsula/CSXT route lies within the Coastal Plain Physiographic Province, which extends from New Jersey to Florida and includes all of Virginia east of the Fall Line. The Fall Line is the easternmost extent of Rocky River rapids, the point at which east-flowing rivers cross from the hard igneous and metamorphic rocks of the Piedmont to the Coastal Plain. The Coastal Plain is underlain with Pliocene and Miocene sedimentary rocks that dip gently eastward. These rocks are made up of relatively soft, unconsolidated layers of Cretaceous and younger clay, sand and gravel. At the northern end of Williamsburg County, the study area crosses a band of Middle Eocene through Paleocene sedimentary rocks. The closest sole source aquifer to the study area is the Columbia and Yorktown-Eastover Multi-aquifer System, which underlies the Virginia portion of the Delmarva Peninsula.

Topography - As discussed in the Geology Section above, only a small portion of the Peninsula/CSXT route is located within the Piedmont Province. A large portion of the study area lies within the Coastal Plain Province. The topography within the Coastal Plain is mainly flat with gently rolling hills. As the Coastal Plain advances towards the east, the elevation gradually decreases.

As the Piedmont Province transitions into the Coastal Plain, the elevation in the study area decreases. The elevation in the Peninsula/CSXT route within Richmond is approximately 60 feet above sea level, which

increases to approximately 150 feet above sea level in western Henrico County and then drops to approximately 80 feet above sea level in the eastern portion of Henrico County. The elevation varies between 10 feet and 30 feet above sea level as it parallels the Chickahominy River within New Kent County and then rises to 30 to 40 feet above sea level in northern James City County. Within Newport News County, the elevation gradually decreases to approximately 20 feet above sea level at the eastern terminus of the study area.

Soils - A majority of the soil types in the Peninsula/CSXT route have low shrink-swell potential[42] and are well suited for rail transportation. Two soils in the Piedmont are the Cecil and Iredell soil series, which have a moderate and very high shrink-swell potential, respectively. Common soils in Virginia's Coastal Plain that have high shrink-swell potential are the Ackwater, Bohicket, Chickahominy, Craven and Peawick soil types. Generally, the soils on steep slopes are subject to erosion. The Caroline soil is an example of a soil type that has a relatively high erosion factor that indicates soil susceptibility to sheet and rill erosion by water. The most common soil types in the study area are discussed below.

Much of the soil in the portion of the study area located in Richmond is made up of urban land soil due to development within the city. Within Henrico County, urban land and gravel pit soils are common; however, Kinston, Mantachie and Atlee soil types make up the greatest percentages of soil in the study area. Within Charles City and New Kent Counties, Altavista, Roanoke, Nawney and Tomotley soils occur most frequently in the study area. The most common soils from Richmond through New Kent County are not highly erodible.

According to the soil survey of James City and York Counties and the City of Williamsburg, Virginia, the majority of the study area within James City County lies within the Kempsville-Emporia-Suffolk and Slagle-Emporia-Uchee general soils. These soils are deep, well-drained, dominantly loamy or clayey, and gently sloping to very steep. Urban Land and the Udorthents-Dumps complex make up a large percentage of the soils in the portion of the study area located within the City of Newport News. These areas have been disturbed by excavation and grading.

Mineral Resources - The Commonwealth of Virginia produces more than 30 different mineral resources at a combined annual value of nearly $2 billion. Virginia is within the top ten coal and crushed stone producing states. Gold, copper, arsenic, manganese, iron and many other minerals have been mined in the state. Sand, clay, limestone, granite, slate, mineral sands, vermiculite and kyanite are examples of minerals currently mined.

Active and inactive mine location information was obtained from the Virginia Department of Mines, Minerals, and Energy, Division of Mineral Mining in a Year 2005 data layer. The center points of mine locations were identified in relation to the Peninsula/CSXT route. Mines within a buffer area of 300 feet from the centerline of the study area have a potential for impacts from project implementation. No active mines were identified within the study area. However as summarized in Table 3-51, five inactive mines were identified. The table contains the county locations of the mines and the distance of the mines' center points from the centerline of the route.

[42] Shrink-swell potential, as defined by the United States Department of Agriculture, Soil Conservation Service, refers to the shrinking of soils when dry, and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations and other structures.

Table 3-51: Inactive Mines Adjacent to the Peninsula/CSXT Route

Location	Mineral(s)/ Type of Mine	Distance to the Proposed Alignment (feet)
Newport News (City), near intersection of Fort Eustis Boulevard/Jefferson Avenue	sand/pit	271
New Kent, near Route 60 and Old Telegraph Road	sand & gravel/pit	163
Henrico, 37th Street, off of Route 5	sand & gravel/pit	102
Henrico, 37th Street, off of Route 5	sand & gravel/pit	134
Henrico, near intersection of Darbytown Road/Fergus Boulevard	sand & gravel/pit	225

Source: Virginia Department of Mines, Minerals, and Energy, Division of Mineral Mining

3.15.3.2 Southside/NS Route

Geology - The majority of the Southside/NS route lies within the Atlantic Coastal Plain Physiographic Province, with the western most portion of Richmond lying within the Piedmont Province. The Coastal Plain is underlain with Pliocene and Miocene sedimentary rocks, which are relatively soft, unconsolidated layers of Cretaceous and younger clay, sand and gravel.

Topography - As discussed in the Geology Section above, only a small portion of the Peninsula/CSXT portion of the study area is located within the Piedmont Province. A majority of the study area lies within the Coastal Plain Province. The topography within the Coastal Plain is mainly flat with gently rolling hills. As the Coastal Plain advances towards the east, the elevation gradually decreases.

Within Richmond, north of the James River, the elevation is approximately 60 feet above sea level. The elevation rises to between 100 and 140 feet above sea level within Chesterfield County. Near the City of Petersburg, the elevation varies from 60 feet above sea level north of the city to 140 feet above sea level east of the city. Through Prince George and Sussex Counties the elevation varies between 70 and 130 feet above sea level. The elevation decreases toward the east to approximately 70 feet above seal level in northern Southampton County and dips to 10 feet above see level within the floodplain of the Blackwater River. The elevation varies between 50 and 75 feet above sea level in Isle of Wight County and the City of Suffolk. Near the City of Chesapeake, the Great Dismal Swamp is relatively flat with a few ridges at approximately 20 feet above sea level. At the terminus of the Southside/NS route near the mouth of the James River, the elevation is approximately ten feet above sea level.

Soils - Overall, a majority of the soils along the Southside/NS route have low shrink-swell potential and are well suited for rail transportation. Within the Piedmont Province, Cecil and Iredell soil types have a moderate and very high shrink-swell potential, respectively. Common soils in Virginia's Coastal Plain that have high shrink-swell potential are the Ackwater, Bohicket, Chickahominy, Craven, Levy and Peawick soil types. Generally, soils on steep slopes are subject to erosion. The Montrose soil is an example of a soil type that has a relatively high erosion factor that indicates soil susceptibility to sheet and rill erosion by water. The most common soil types in the study area are discussed below.

Most of the study area within Prince George and Southampton Counties lies adjacent to Slagle and Emporia soil types. These soils are deep and moderately well drained, formed in fluvial and marine sediments on uplands. If these soils are on a slope higher than two percent, they have a potential to be highly erodible land.

Within Isle of Wight County, Myatt and Slagle soil types are the most common in the study area. These soils are made up of fine sandy loam and are not highly erodible unless the Slagle soil slope has a percentage greater than two percent.

Loamy Udorthents, which is potentially highly erodible land, is the most common type of soil in the Southside/NS route within the City of Suffolk. Sandy and loamy soils such as Eunola, Torhunta and Rains are also common in the study area within the City of Suffolk. Within the City of Chesapeake, the Udorthents-urban land complex and Tomotley soil types are the most common in the study area. These soils are not highly erodible.

Mineral Resources - The Commonwealth of Virginia has over 400 different minerals within its borders. More than 30 different mineral resources are produced in Virginia, at a combined annual value of nearly $2 billion. Virginia is within the top ten coal and crushed stone producing states. Gold, copper, arsenic, manganese, iron, and many other minerals have all been mined in Virginia. Sand, clay, limestone, granite, slate, mineral sands, vermiculite and kyanite are examples of minerals currently mined.

Active and inactive mine locations were obtained from the Virginia Department of Mines, Minerals, and Energy, Division of Mineral Mining in a Year 2005 data layer. The center points of mine locations were identified in relation to the Southside/NS route. Mines within a buffer study area of 300 feet from the centerline of the route have a higher potential for impacts from project implementation. No active mines were identified within the study boundaries. As summarized in Table 3-52, three inactive mines were identified within approximately 300 feet of each side of the centerline of the Southside/NS route. The table contains the locations of the mines and the distance of the mines' center points from the centerline of the Southside/NS route. Due to the potential margin of error, the center point of the inactive mine that is approximately 315 feet from the centerline of the study area was included in the table.

Table 3-52: Inactive Mines Adjacent to the Southside/NS Route

Location	Mineral(s)/Type of Mine	Distance to Proposed Alignment (feet)
Richmond (City), off of Trenton Avenue	clay/pit	228
Suffolk (City), near intersection of Indian Trail Road/Lake Cohoon Road	sand & gravel/pit	315
Suffolk (City), near intersection of Indian Trail Road/NS rail line	sand & gravel/pit	200

Sources: Virginia Department of Mines, Minerals, and Energy, Division of Mineral Mining; Google Maps

3.15.4 Environmental Consequences

3.15.4.1 Status Quo Alternative

Under the Status Quo Alternative, all passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made, other than routine maintenance. There would be no impacts on geologic features, topography, soils or mineral resources associated with the Status Quo Alternative.

3.15.4.2 No Action Alternative

The No Action Alternative includes planned improvements to the existing transportation network and 2004 committed highway, rail, and airport improvement projects. These improvements include the addition of one daily round-trip passenger rail train along the Peninsula/CSXT route. Under the No Action Alternative, there would be a total of three daily round-trip trains operating at maximum speeds of 79 mph between Newport News and Richmond. There would be no passenger rail service provided on the Southside/NS route. Given that no physical improvements would be made to accommodate the additional passenger rail service outside of existing rail right-of-way, no impacts on the existing geologic features, topography, soils and mineral resources would occur with the No Action Alternative.

3.15.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

As part of Alternative 1, no upgrades to the Peninsula/CSXT route would be required that would extend beyond existing rail right-of-way. Parking at the existing Main Street Station in Richmond may be augmented and it is unknown at this point if that would require additional right-of-way. No physical impacts on the existing geologic features, topography, soils and mineral resources would occur along the Peninsula/CSXT route.

Upgrades to the existing Southside/NS route track would be required in order to accommodate higher speed passenger rail service. Currently only freight rail operates along this line. New stations with parking facilities would be provided at Bowers Hill and Downtown Norfolk. Upgrades would also include a new rail connection

in the vicinity of Kilby. Impacts would be minimal to geologic features, topography and soils. Construction related impacts may occur associated with grading, earth removal, grade crossing separations and construction of new embankments or altering existing embankments at bridge approaches. No expansive excavation is anticipated. Geotechnical investigations and subsurface studies would be conducted prior to any construction activities to assess site-specific soil characteristics.

No active mines were identified along the Peninsula/CSXT or Southside/NS routes. However, several inactive mines were identified. While it is unlikely that impacts to these mines would occur, agency coordination with the Virginia Department of Mines, Mineral, and Energy, Division of Mineral Mining, the EPA, and other federal, state, and local agencies would be conducted during subsequent analysis to ensure that no impacts to these mines would occur and to identify any potential safety hazards associated with these mines.

3.15.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would provide higher speed passenger rail service on the Peninsula/CSXT route and would also add conventional speed passenger rail service to the Southside of the James River along the existing NS freight line. Impacts would only be expected in those areas where additional right-of-way would be required. In addition to the right-of-way needs described for Alternative 1, Alternative 2a proposes a relocated passenger rail station in Newport News. The types of potential impacts to geologic features, topography, soils and mineral resources would be similar to those described in Alternative 1. Geotechnical investigations and subsurface studies would be conducted prior to any construction activities to assess site specific soil characteristics.

As stated for Alternative 1, inactive mines have been identified along the Peninsula/CSXT route and coordination with appropriate agencies is warranted during subsequent investigations to identify any potential impacts or safety hazards associated with these mines.

3.15.4.5 Alternative 2b Peninsula Higher Speed Only

Alternative 2b proposes only to provide higher speed passenger rail service along the Peninsula. As stated for Alternative 2a, potential impacts to geologic features, topography and soils would only occur in areas where additional right-of-way may be required. Potential right-of-way may be required for Alternative 2b to provide additional parking at the Main Street and Williamsburg Amtrak stations and for the relocated Newport News station.

3.14.5 Potential Mitigation Strategies

Potential impacts resulting from construction would be mitigated through the use of best management practices. In accordance with local requirements, erosion and sediment control plans would be prepared and implemented.

3.14.6 Subsequent Analysis

Subsequent analysis for the selected alternative would likely include:

- Subsurface testing to determine underlying geologic and soil conditions; and
- Additional coordination with the Virginia Department of Mines, Minerals, and Energy, Division of Mineral Mining to ascertain potential safety hazards of identified mines.

3.16 Hydrologic and Water Resources

This section describes water resources to include surface waters, water quality, wetlands, floodplains, floodways and coastal zones within the study area. It also provides a preliminary assessment of potential effects to these resources.

3.16.1 Methodology

Surface waters, wetlands and floodplains were identified using Geographic Information System (GIS) mapping of the study area. Jurisdictional wetlands contained within the study area were estimated based on

review of National Wetlands Inventory (NWI) maps, which were quantified using GIS. NWI mapping was established to generate information about the characteristics, extent and status of the nation's wetlands and deepwater habitats. Once a Preferred Alternative is selected, a wetland delineation will be conducted using the three-parameter approach as prescribed in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). This wetland delineation will be included in a request for Jurisdictional Determination (JD) from the U.S. Army Corps of Engineers. The JD confirms the Corps concurrence with the wetland delineation. The wetland delineation methodology would include analysis of three parameters: hydrophytic vegetation, hydric soils and hydrology indicators. No field surveys to confirm the NWI wetland data were conducted for this Tier I Draft EIS wetland investigation. Field investigations and jurisdictional wetland delineations will be conducted as required during the subsequent environmental analysis for the Preferred Alternative.

Floodplains were identified using Q3 Flood Data obtained from the Federal Emergency Management Agency (FEMA). Q3 Flood Data is a digital representation of certain features of FEMA's Flood Insurance Rate Map mapping product, intended for use with desktop mapping and GIS technology. Study areas vary depending upon the proposed improvements (e.g., rail stations) being evaluated. The study area for surface waters, wetlands, floodplains and floodways is 300 feet from each side of the existing route centerline. For areas surrounding existing and proposed rail stations and parking facilities, the study area is evaluated within a 500-foot radius.

The Virginia Coastal Program was reviewed to determine those jurisdictions within the study area that are included in Virginia's Coastal Zone. For portions of the study area that are included in the coastal zone, a Federal Consistency Determination will be required.

Precise locations and exact sizes of proposed stations and parking areas are not yet known and will be further evaluated at a later date. Impacts to natural resources are qualitatively discussed but have not been quantified for this Tier I Draft EIS. In addition, regulatory permits and approvals that may be necessary for the proposed routes were identified and are described herein.

3.16.2 Legal and Regulatory Context

The FRA's Procedures for Considering Environmental Impacts require consideration of environmental impacts of an action in an EIS, including potential effects on water quality, wetlands, waterways and floodplains in the context of federal, state and local regulations (FRA Docket No. EP-1, Notice 5).

When evaluating water quality, Section 303(d) of the Clean Water Act requires that the Commonwealth of Virginia provide a Total Maximum Daily Load (TMDL) Priority List to the EPA. This list, contained in the 303(d) Report on Impaired Waters in Virginia, is a compilation of waters in the state that do not meet water quality standards. Most impaired waters require the development of TMDLs. A TMDL is the total amount of a pollutant that a water body may receive from all sources without exceeding water quality standards. Impaired bodies of water within the Southside/NS route and the Peninsula/CSXT route study area were evaluated.

Section 404 of the Clean Water Act, as well as the Virginia Water Protection Permit Program, requires authorization for activities which include placement of dredge and fill material and/or mechanized land clearing, ditching, draining, channelization or other excavation activities into the waters of the United States, including wetlands adjacent to those waters. In Virginia, both the Virginia Department of Environmental Quality (VDEQ) and the U.S. Army Corps of Engineers (USACE) have jurisdiction over wetland impacts.

Impacts to floodplains were evaluated pursuant to Executive Order 11988, *Floodplains Management*, which prohibits floodplain encroachments that are uneconomic, hazardous or result in incompatible uses of the floodplain; as well as any action which would cause a critical interruption of an emergency transportation facility, a substantial flood risk or adverse impact to the floodplain's natural resource values.

Coastal zones are protected and managed under the Coastal Zone Management Act of 1972, as reauthorized in 1990 (CZMA). The CZMA provides legislation to "preserve, protect, develop, and where possible, restore and enhance the resources of the nation's coastal zone for this and succeeding generations." The act also encourages and assists states to protect the natural resources, such as wetlands, floodplains, estuaries,

beaches, dunes barriers, fish and wildlife and their habitats, within the coastal zone. In 1986, the Virginia Coastal Resources Management Area was established to protect and manage Virginia's Coastal Zone.

A federally approved Coastal Program authorizes a state to require federal action within a coastal zone to be consistent with the state's Coastal Program laws and enforceable policies. Since Virginia has a federally approved Coastal Program, federal activities within the Coastal Zone require a Federal Consistency Determination. VDEQ is responsible for the Federal Consistency Determination review and approval.

3.16.3 Affected Environment

3.16.3.1 Peninsula/CSXT Route

Surface Waters - Surface water resources in the study area include tidal and non-tidal wetlands, rivers, streams, lakes and ponds. These surface waters are divided between the James River Basin and the York River Basin. The Peninsula/CSXT route closely follows the boundary of the James and York River Basins with most of the study area within the James River Basin. Figure 3-14 is a map of surface waters and floodplains along the Peninsula/CSXT route.

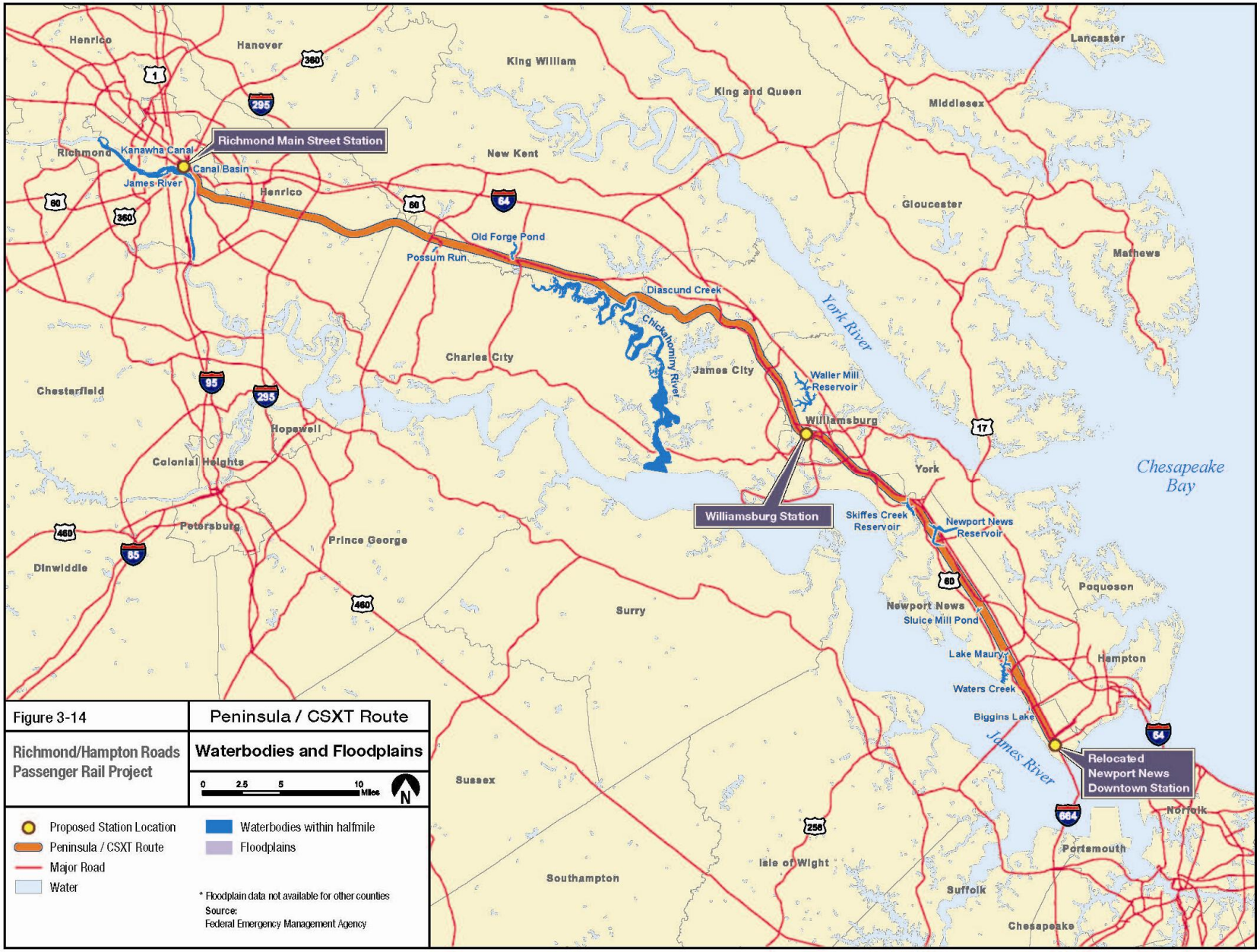
James River Basin - The James River Basin is located in the central portion of Virginia and is approximately 10,206 square miles, making it the largest river basin in Virginia. The James River Basin drains approximately one-fourth of the state's water resources. Over 65 percent of the basin is forested, approximately 19 percent is cropland and pasture, and approximately 12 percent is urban. Major tributaries to the James River are Craig Creek and Willis Creek, as well as the following rivers: Jackson, Cowpasture, Maury, Tye, Rockfish, Slate, Rivanna, Appomattox, Chickahominy, Pagan, Nansemond and Elizabeth. Surface waters within the James River Basin ultimately discharge to the Chesapeake Bay in Virginia.

York River Basin - The York River Basin lies in the central and eastern portions of Virginia and is approximately 2,662 square miles. Approximately 65 percent of the land area is forested, approximately 20 percent is farmland and pasture and approximately 10 percent is urban. Major tributaries include the Pamunkey and Mattaponi Rivers. Surface Waters within this river basin ultimately discharge to the Chesapeake Bay in Virginia.

It should be noted that there are no rivers within Virginia classified as Wild and Scenic Rivers by the National Park Service. However, several sections of the Chickahominy River along the Peninsula/CSXT route within Charles City County and New Kent County are considered worthy of inclusion by the Commonwealth of Virginia.

Water Quality - Primary factors that influence pollutant loading on water quality include the type, size and biological diversity of the receiving bodies of water, potential for dispersion, size of the catchment area, and relative effectiveness of proposed mitigation measures such as total suspended solids (TSS) removal and suspended detention time for removal of other pollutants. At this level of analysis, impairment of smaller study area bodies of water was not determined. Evaluation of these bodies of water can be conducted at a later date, as necessary, to determine if impairments exist in these smaller bodies of water.

As set forth in Final 2006 305(b)/303(d) Water Quality Assessment Integrated Report, named surface waters which are classified as impaired within the Peninsula/CSXT route area include the James River, Chickahominy River and Diascund Creek. Some common causes of impairments in these waters include fecal coliform, PCBs found in fish tissue, pH and low dissolved oxygen.


Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
Richmond
Kanawha Canal
James River
Richmond Main Street Station
Canal Basin
New Kent
Gloucester
Old Forge Pond
Possum Run
Diascund Creek
Chickahominy River
Mathews
York River
Charles City
James City
Waller Mill Reservoir
Chesterfield
Williamsburg
Hopewell
Colonial Heights
York
Chesapeake Bay
Williamsburg Station
Skiffes Creek Reservoir
Newport News Reservoir
Petersburg
Prince George
Dinwiddie
Poquoson
Newport News Sluice Mill Pond
Surry
Lake Maury
Hampton
Waters Creek
Biggins Lake
James River
Relocated Newport News Downtown Station
Sussex
Norfolk
Portsmouth
Isle of Wight
Southampton
Suffolk
Chesapeake
Figure 3-14
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Waterbodies and Floodplains
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Waterbodies within halfmile
Floodplains
* Floodplain data not available for other counties
Source:
Federal Emergency Management Agency

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Wetlands - Wetland systems within the study area include Lacustrine Limnetic (L1), Lacustrine Littoral (L2), Palustrine Aquatic Bed (PAB), Palustrine Emergent (PEM), Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Unconsolidated Bottom (PUB) and Riverine Lower Perennial (R2). Palustrine Unconsolidated Shore (PUS), Riverine Tidal (R1), and Riverine Lower Perennial (R2). Palustrine wetlands are freshwater systems which may contain forest, emergent or scrub-shrub vegetation. Lacustrine wetlands are open water and deepwater systems. Riverine wetlands consist of persistently or periodically moving water contained within a channel or ditch, and Estuarine wetlands are brackish. PFO are the most abundant wetlands within the study area. A total of 99 wetland systems are crossed by, or are immediately adjacent to the existing Peninsula/CSXT route (Appendix D lists these wetlands by locality and wetland type). Within the rail route, wetlands range in size from less than one-half acre to greater than 150 acres. As shown in Table 3-53, the Peninsula/CSXT route area contains approximately 600 acres of wetlands. Most of these are within Henrico County (252 acres), while no wetlands are contained within York County. There are no wetlands within a 500-foot radius of the existing or the proposed relocated rail station at Newport News. Figure 3-15 is a map of the wetland areas along the Peninsula/CSXT route. Appendix D provides a breakdown of wetland type and acreage by locality.

Table 3-53: Peninsula/CSXT Route– Total Wetland Acreage by Locality

Location	Approximate Total Acreage of Wetlands Within Study Area*
Richmond	29
Henrico	252
Charles City	89
New Kent	136
James City	55
York	0
Williamsburg	0
Newport News	40
Total Acres	601

*The approximate total acreage is based on wetland areas identified within the 300-foot boundary on either side of the centerline and within a 500-foot area around proposed station locations.

Floodplains and Floodways - In cooperation with state and local governments, FEMA has developed flood boundary and flood insurance mapping. Since not all local governments within the study area participate in FEMA's National Flood Insurance Program (NFIP), floodplain information was not available for all localities within the study areas.

The NFIP defines a floodplain as any land area susceptible to being inundated by water. The floodplain includes both the floodway and the floodway fringe. The floodway is defined as the channel of the stream and adjacent floodplain area that should be kept free of any encroachment so that a 100-year flood event may occur without increasing the level and extent of base flood elevations. The base, or 100-year flood, is defined as an event that is equaled or exceeded, on average, once every hundred years. The floodway fringe, or the 100-year floodplain, is the area between the floodway boundary and the outer limits of the 100-year floodplain boundary.

Along the Peninsula/CSXT route, FEMA floodplain mapping was not available for the following counties and cities: Richmond, Henrico, Charles City, New Kent, James City and York. The 100-year floodplain is generally found adjacent to or near major surface waters and smaller tributaries. These include Skiffes Creek Reservoir, Newport News Reservoir, Stony Run, Lukas Creek, Sluice Mill Pond and Lake Maury. Based on GIS mapping, the existing Peninsula/CSXT route is located within the 100-year floodplain boundaries of all of the aforementioned bodies of water.

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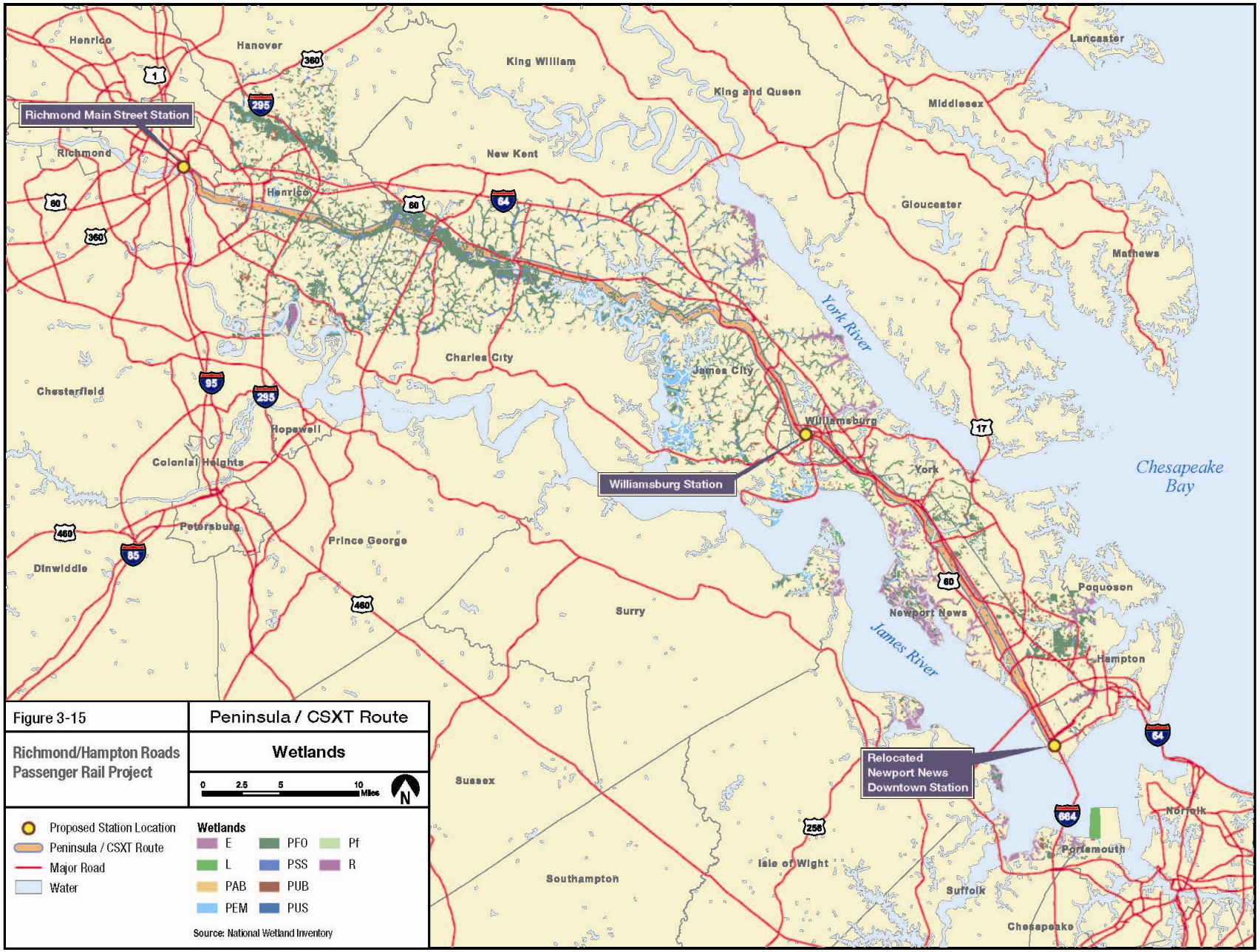
Richmond Main Street Station
Williamsburg Station
Relocated
Newport News
Downtown Station
Henrico
Hanover
King William
King and Queen
Middlesex
Lancaster
Richmond
New Kent
Gloucester
Mathews
Charles City
James City
York River
Chesterfield
Hopewell
Colonial Heights
Williamsburg
York
Chesapeake Bay
Petersburg
Prince George
Dinwiddie
Surry
Newport News
James River
Poquoson
Hampton
Sussex
Isle of Wight
Southampton
Suffolk
Chesapeake
Portsmouth
Norfolk
Figure 3-15
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Wetlands
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Wetlands
E
PFO
Pf
L
PSS
R
PAB
PUB
PEM
PUS
Source: National Wetland Inventory

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Coastal Zone Management - According to the VDEQ Virginia Coastal Program, the following cities, counties and incorporated towns are located within the coastal resource management area on the Peninsula/CSXT route:

- Cities
  - Richmond
  - Williamsburg
  - Newport News

  Counties
- Henrico
  - New Kent
  - Charles City
  - James City
- Incorporated Towns
  - None

3.16.3.2 Southside/NS Route

Surface Waters - Surface water resources in the study area include tidal and non-tidal wetlands, rivers, streams, lakes and ponds. Surface waters in the study area are either part of the James River Basin or the Chowan River Basin. Along the study area, areas located within the Chowan River Basin are situated approximately between Petersburg and Suffolk/Chesapeake, while the remaining route is in the James River Basin. Each of these basins is discussed below. Figure 3-16 is a map of surface waters and floodplains along the Southside/NS route.

James River Basin - The James River Basin is located in the central portion of Virginia and is approximately 10,206 square miles, making it the largest river basin in Virginia. The James River Basin drains approximately one-fourth of the state's water resources. Over 65 percent of the basin is forested, approximately 19 percent is cropland and pasture, and approximately 12 percent is urban. Major tributaries to the James River are Craig Creek and Willis Creek, as well as the following rivers: Jackson, Cowpasture, Maury, Tye, Rockfish, Slate, Rivanna, Appomattox, Chickahominy, Pagan, Nansemond and Elizabeth. Surface waters within the James River Basin ultimately discharge to the Chesapeake Bay in Virginia.

Chowan River Basin - The Chowan River Basin is located in the southeastern portion of Virginia and is approximately 4,061 square miles. This basin is mostly rural with approximately 64 percent of its land covered by forest. Cropland and pasture comprise approximately 28 percent of the basin, while approximately 6 percent is classified as urban. Major tributaries include the Nottaway, Meherrin and Blackwater Rivers. Surface waters within the Chowan River Basin ultimately discharge to the Albemarle Sound in North Carolina.

There are no rivers within Virginia classified as Wild and Scenic Rivers by the National Park Service.

Water Quality - Primary factors that influence pollutant loading on water quality include the type, size, and biological diversity of the receiving bodies of water, potential for dispersion, size of the catchment area, and relative effectiveness of proposed mitigation measures such as total suspended solids (TSS) removal and suspended detention time for removal of other pollutants. At this level of analysis, impairment of smaller study area bodies of water was not determined. Evaluation of these bodies of water can be conducted at a later date, as necessary, to determine if impairments exist in these smaller bodies of water.

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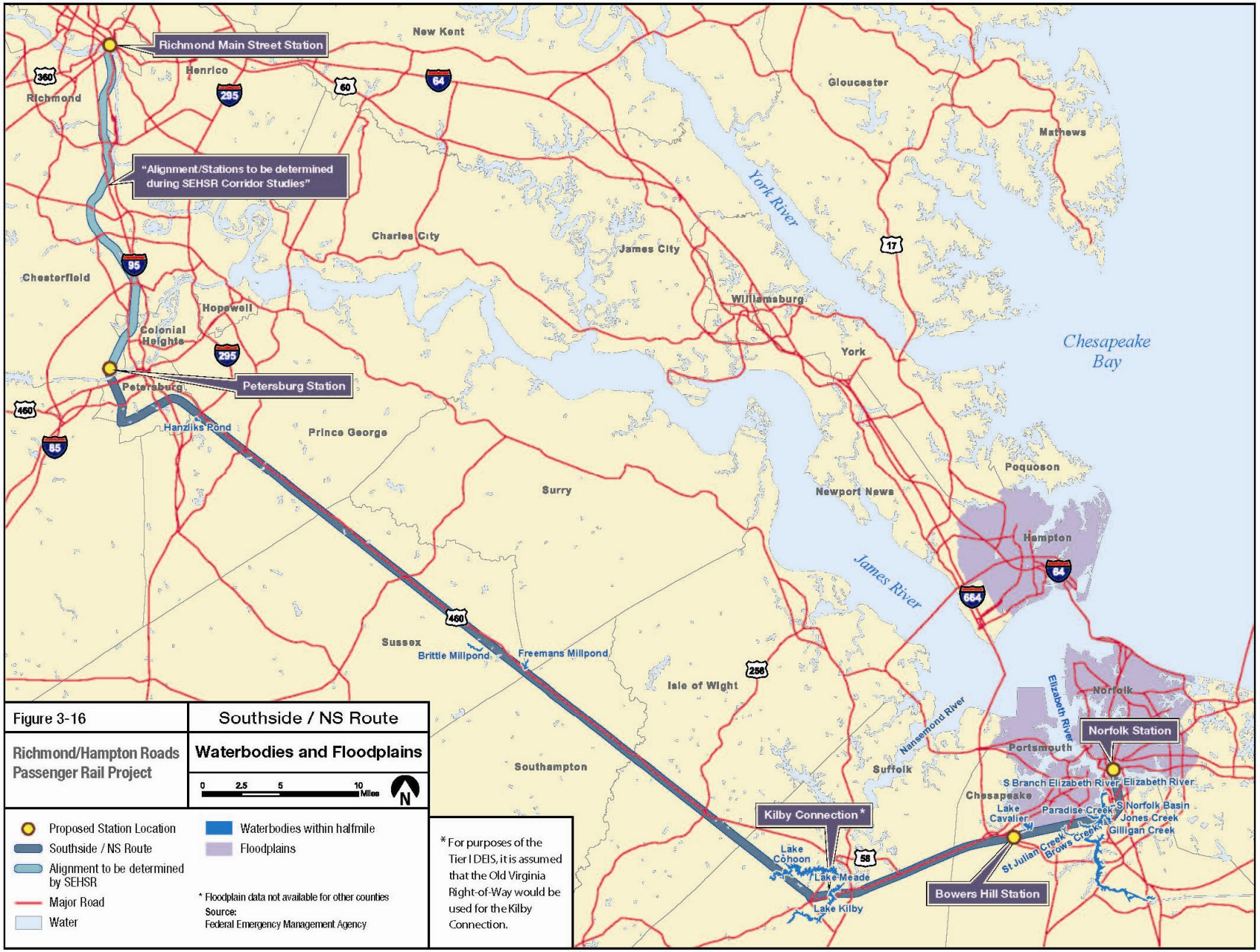
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
Kilby Connection *
Bowers Hill Station
Norfolk Station
New Kent
Henrico
Richmond
Gloucester
Mathews
York River
Charles City
James City
Williamsburg
Chesterfield
Hopewell
Colonial Heights
Petersburg
York
Chesapeake Bay
Hanzliks Pond
Prince George
Surry
Poquoson
Newport News
Hampton
James River
Sussex
Brittle Millpond
Freemans Millpond
Isle of Wight
Southampton
Suffolk
Norfolk
Portsmouth
Chesapeake
Nansemond River
Elizabeth River
S Branch Elizabeth River
Lake Cavalier
Paradise Creek
S Norfolk Basin
Jones Creek
Gilligan Creek
St Julian Creek
Brows Creek
Lake Cohoon
Lake Meade
Lake Kilby
Figure 3-16
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Waterbodies and Floodplains
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Waterbodies within halfmile
Floodplains
* Floodplain data not available for other counties
Source:
Federal Emergency Management Agency
* For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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As set forth in the 2006 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report (Integrated Report) (VDEQ, 2004), named surface waters which are classified as impaired were evaluated within the study area. Out of the ten named bodies of water in the study area, four are designated as impaired, including the Blackwater River, the Eastern and Southern Branches of the Elizabeth River and St. Julian Creek. Some common causes of impairment in these waters include fecal coliform, exceeded general benthic standards, tributyltin and low dissolved oxygen.

Wetlands - Wetland systems within the study area, as classified by the National Wetlands Inventory, include Estuarine Subtidal (E1), Estuarine Intertidal (E2), Lacustrine Limnetic (L1), Palustrine Emergent (PEM), Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Unconsolidated Bottom (PUB), Palustrine Farmed (Pf), and Riverine Lower Perennial (R2). Palustrine wetlands are freshwater systems which may contain forest, emergent or scrub-shrub vegetation. Lacustrine wetlands are open water and deepwater systems. Riverine wetlands consist of persistently or periodically moving water contained within a channel or ditch, and Estuarine wetlands are brackish. PFO are the most abundant wetlands within the study area. A total of 142 wetland systems are crossed by or immediately adjacent to the existing Southside/NS route (Appendix D lists these wetland systems by locality and wetland type). Within the rail route, wetlands range in size from less than one-half acre to greater than 20 acres. As shown in Table 3-54, the Southside/NS route area contains a total of 435 acres of wetlands, most of which are within Sussex County (89 acres) with the least amount of wetlands occurring in Surry County (1 acre). Wetlands within the existing and proposed rail station study area range in size from approximately one-half acre to greater than six acres and consist of Palustrine and Estuarine systems. Three wetlands are within the study area of the proposed Bowers Hill Rail Station and two wetlands are within the proposed Norfolk Rail Station study area. The study area for the proposed Bowers Hill Rail Station contains 4.42 acres of PFO and the proposed Norfolk Rail Station study area contains 8.35 acres of E1. Figure 3-17 is a map of the wetland areas along the Southside/NS route. Appendix D provides a breakdown of wetland type and acreage by locality.

Floodplains and Floodways - In cooperation with state and local governments, FEMA has developed flood boundary and flood insurance mapping. Since not all local governments within the study area participate in FEMA's National Flood Insurance Program (NFIP), floodplain information was not available for all localities within the study area.

The NFIP defines a floodplain as any land area susceptible to being inundated by water. The floodplain includes both the floodway and the floodway fringe. The floodway is defined as the channel of the stream and adjacent floodplain area that should be kept free of any encroachment so that a 100-year flood event may occur without increasing the level and extent of base flood elevations. The base, or 100-year flood, is defined as an event that is equaled or exceeded, on average, once every hundred years. The floodway fringe, or the 100-year floodplain, is the area between the floodway boundary and the outer limits of the 100-year floodplain boundary.

The 100-year floodplain and areas which are between the limits of the 100-year and 500-year flood are generally found adjacent to or near major surface waters and smaller tributaries. Along the rail route, FEMA floodplain mapping was not available for the following counties and cities: Petersburg, Prince George, Sussex, Surry, Southampton, Isle of Wight, Suffolk and Chesapeake; hence, potential floodplain impacts could not be identified in these areas. Within the City of Norfolk, the Norfolk Rail Station and portions of the existing Southside/NS route are located within floodplains associated with the Southern and Eastern Branches of the Elizabeth River. As such, these floodplains may be impacted by the proposed project. Within the City of Portsmouth, floodplains which may be impacted are associated with St. Julian Creek, Brows Creek, Paradise Creek and the Southern Branch of the Elizabeth River. Figure 3-16 is a map of the bodies of water and floodplains along the Southside/NS route.

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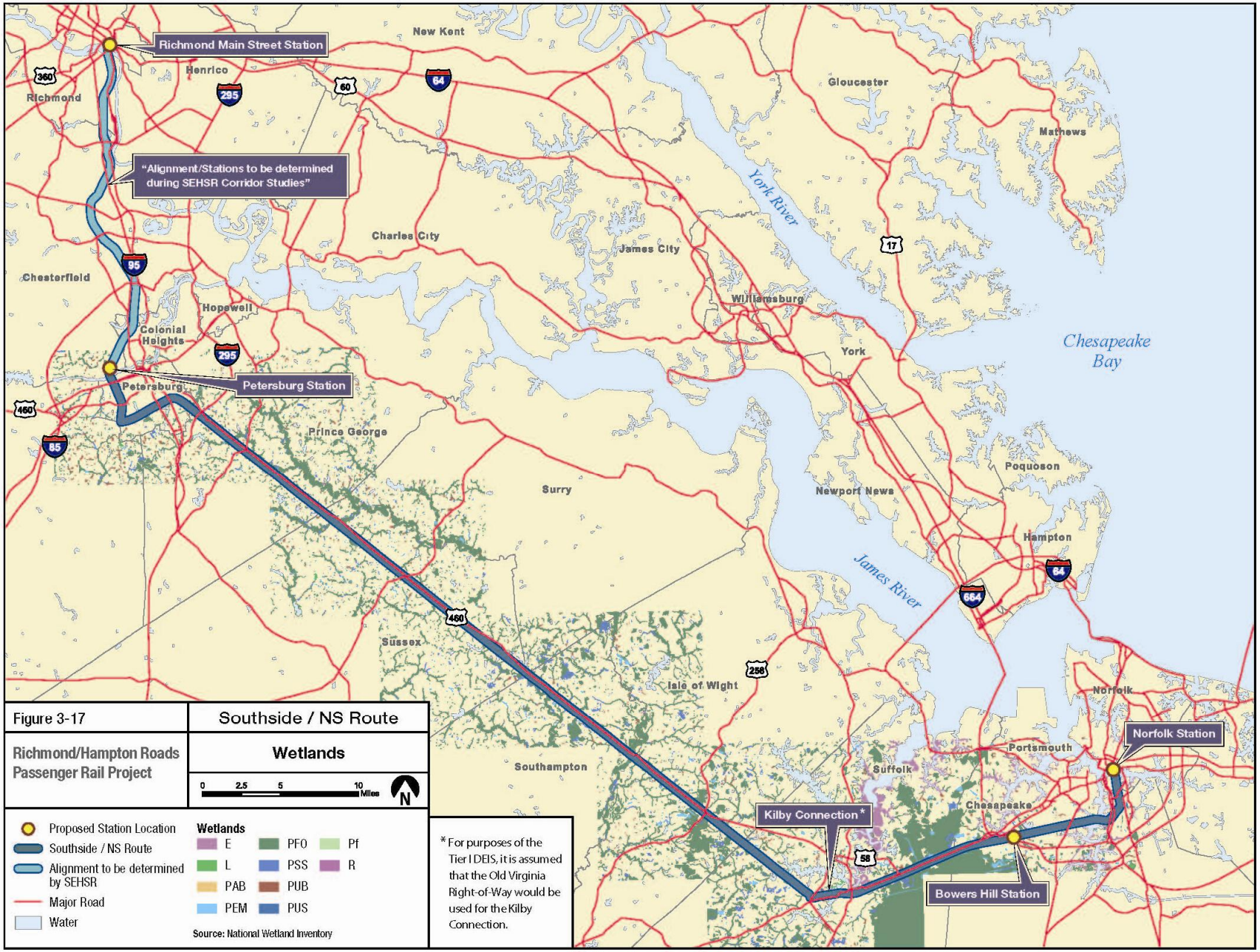
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
Kilby Connection*
Bowers Hill Station
Norfolk Station
New Kent
Henrico
Richmond
Gloucester
Mathews
Charles City
James City
York River
Chesterfield
Hopewell
Colonial Heights
Petersburg
Williamsburg
York
Chesapeake Bay
Prince George
Surry
Newport News
Poquoson
Hampton
James River
Sussex
Isle of Wight
Southampton
Suffolk
Portsmouth
Norfolk
Chesapeake
Figure 3-17
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Wetlands
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Wetlands
E
L
PAB
PEM
PFO
PSS
PUB
PUS
Pf
R
Source: National Wetland Inventory
*For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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Coastal Zone Management - Virginia's coastal zone encompasses 29 counties, 17 cities and 42 incorporated towns. According to the VDEQ Virginia Coastal Program, the following cities, counties and incorporated towns are located within the coastal resource management area of the Southside/NS route:

- Cities
  - Suffolk
  - Chesapeake
  - Portsmouth
- Counties
  - Prince George
  - South Hampton
  - Isle of Wight
- Incorporated Towns
  - None

Table 3-54: Southside/NS Route – Total Wetland Acreage by Locality

Location	Approximate Total Acreage of Wetlands Within Study Area*
Petersburg	14
Prince George	53
Sussex	89
Surry	1
Southampton	73
Isle of Wight	39
Suffolk	85
Chesapeake	70
Portsmouth	3
Norfolk	8
Total Acres	435

*The approximate total acreage is based on wetland areas identified within the 300-foot boundary on either side of the centerline and within a 500-foot area around proposed station locations.

3.16.4 Environmental Consequences

3.16.4.1 Status Quo Alternative

Under the Status Quo Alternative, all passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. No physical or operational rail improvements would be made, other than routine maintenance.

As previously stated, the current passenger rail service uses the existing CSXT rail line. This rail right-of-way crosses several bodies of water including the James River Canal Basin, Diascund Creek, Skiffes Creek Reservoir, Newport News Reservoir, Stonu Run, an unnamed body of water, Sluice Mill Pond and Lake Maury. There are several unnamed bodies of water within 300 feet of either side of the study area's centerline. Approximately 601 acres of wetlands are within the study area and include wetlands classified as L1, Lacustrine Littoral (L2), Palustrine Aquatic Bed (PAB), PEM, PFO, PSS, PUB, R2, PUB, Palustrine Unconsolidated Shore (PUS), Riverine Tidal (R1), and R2. The study area does cross or encroach on areas designated as 100-year floodplains. Within the City of Newport News, the existing passenger service route is located within the 100-year floodplain of the Skiffes Creek Reservoir, Newport News Reservoir, Stony Run, Lukas Creek, Sluice Mill Pond and Lake Maury. The existing rail line is also within Virginia's coastal resource management areas.

While surface waters, wetlands, floodplains and coastal zone management areas exist within the study area, it is not expected that any of these resources would be impacted by the Status Quo Alternative.

3.16.4.2 No Action Alternative

Under the No Action Alternative, the existing freight and passenger rail service would remain along the Peninsula with the addition of one round-trip train per day, operating at conventional speeds. The proposed operational change would not require additional right-of-way. It is expected that any physical improvements needed to accommodate the additional service would take place within the existing rail right-of-way. The bodies of water, wetland areas and types, 100-year floodplain, and coastal zone management areas are the same as those described for the Status Quo Alternative. While surface waters, wetlands, floodplains and coastal zone management areas exist within the study area, it is not expected that any of these resources would be impacted by the No Action Alternative.

3.16.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Hydrologic and water resources have the potential to be impacted under Alternative 1. This alternative combines the No Action Alternative with higher speed passenger rail service along the Southside/NS route. As described for the No Action Alternative, impacts would not be expected to occur to these types of resources along the Peninsula/CSXT route. Physical improvements would be needed for the existing NS freight rail line in order to operate higher speed passenger rail service, which could result in impacts. Improvements to the Southside/NS rail line include a new rail connection at Kilby, which would require additional right-of-way, and new passenger rail stations with parking at Bowers Hill and Downtown Norfolk.

The Southside/NS rail line crosses several bodies of water including the Blackwater River, Lake Meade, Brows Creek, the Southern Branch of the Elizabeth River, Gilligan Creek and the Eastern Branch of the Elizabeth River. Several bodies of water are within 300 feet of either side of the route's centerline or within the 500-foot radius of the proposed Bowers Hill and Norfolk rail stations. Potential impacts that might affect these bodies of water include permanent clearing of vegetation, fill placement in waters for railway right-of-way widening, railway stations and parking areas. Long-term surface water impacts could occur as a result of permanent fill placement in or disturbance of bodies of water, such as bridge span widening and the addition or extension of culverts. These impacts may potentially alter the natural characteristics of these resources, resulting in changes in water temperature, increased nutrients and sedimentation, and alterations in stream channel circulation. These impacts would likely occur on a localized basis where the existing rail line and proposed improvements cross existing bodies of water.

Water quality could be affected by additional run-off generated by new impervious ground surfaces associated with track bed widening, and the proposed Bowers Hill and Norfolk Stations (e.g., for parking lots, new structures). Pollutants associated with train operations and motor vehicles, including buses and automobiles using parking areas and pick-up/drop-off facilities, include leaked gasoline and other petroleum products, antifreeze and lubricants. These pollutants deposited on impervious ground surfaces may be carried to downstream bodies of water, thereby adversely affecting water quality unless appropriate and effective stormwater management facilities are constructed to manage additional run-off and filter pollutants and sediment.

Bridge construction or widening may impact the water quality of surface waters crossed by the study area due to permanent stream bank vegetation removal and additional shading of bodies of water. Vegetation removal and additional shading impacts may result in bank destabilization and associated sedimentation, increased turbidity, altered flow rates, and possible temperature fluctuations within the stream channel. These impacts would be localized in nature (i.e., at bridge crossing locations) and would be minimized to the greatest extent practicable.

As previously mentioned, there are approximately 435 acres of wetlands within the study area for the Southside/NS route. Wetlands identified are classified as Estuarine Subtidal (E1), Estuarine Intertidal (E2), Lacustrine Limnetic (L1), Palustrine Emergent (PEM), Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), Palustrine Unconsolidated Bottom (PUB), Palustrine Farmed (Pf) and Riverine Lower Perennial (R2). However, it is unlikely that all wetlands identified by mapping would be impacted. Floodplains have also been identified along the Southside/NS route. Permanent wetland and floodplain impacts may occur in specific

locations where new track bed, rail stations and parking areas are introduced in or adjacent to these areas. Where possible, widening of the track bed would occur away from jurisdictional wetlands. Rail stations and parking areas would be located in areas where no wetlands exist or wetland impacts would be minimal. Jurisdictional wetland delineations would be included in subsequent analysis and wetland impacts would be quantified as part of that evaluation. It is important to note that in many floodplain locations the existing rail bed is already elevated, such that floodplain impacts would likely be minimal.

Effects on any of the Commonwealth's coastal uses or resources may include, but would not be limited to, impacts to wetlands, public recreation areas, significant wildlife habitat areas, coastal high hazard areas (such as floodplains) and waterfront development areas. The Southside/NS route encompasses portions of Virginia's coastal zone and has the potential to affect coastal resources. Therefore, a federal consistency determination will be required. A federal consistency determination will be prepared for the Preferred Alternative during subsequent analysis. The review is conducted by the Environmental Impact Review Office of VDEQ. The review period for federal agency activities and development projects is 60 days. A copy of the required federal consistency determination outline is provided in Appendix D.

Potential Construction Impacts - Impacts related to construction activities would be temporary and minimized through the use of best management practices. During construction, vegetation would be cleared and soil exposed due to grubbing, earth moving and grading, and other construction-related activities. These activities may cause soil erosion and subsequent sedimentation in downstream receiving waters. Temporary access for construction activities and equipment may also impact hydrologic and water resources. Other potential construction-related activities that could affect hydrologic and water resources include increased risk of potential contamination associated with the presence of heavy equipment (e.g., fuels, lubricants, etc.) and construction-related chemicals (e.g., paints, concrete additives, etc.).

3.16.4.5 Alternative 2a Peninsula Higher Speed/Southside Conventional

Unlike Alternative 1, Alternative 2a has the potential to impact hydrologic and water resources along both routes. Alternative 2a introduces higher speed passenger rail service on the Peninsula/CSXT route and adds new conventional speed passenger rail service to the Southside/NS route. Even though passenger rail service exists along the Peninsula/CSXT route, the existing track configuration is designed for speeds up to 79 mph. Infrastructure improvements would be required to accommodate higher speed passenger rail on the Peninsula/CSXT route. In addition, Alternative 2a calls for a relocated Newport News station and expanded parking facilities at Richmond Main Street Station and Williamsburg Amtrak Station.

Given that no passenger rail service exists on the Southside/NS route, infrastructure improvements would be needed to accommodate the proposed passenger service, which includes a new rail connection at Kilby and passenger rail stations with parking at Bowers Hill and Downtown Norfolk.

Potential impacts to hydrologic and water resources would be similar to those described in Alternative 1. Impacts would likely be site-specific where track bed expansion, rail stations, and parking are proposed. The bodies of water, wetland area and types, 100-year floodplain, and coastal zone management areas that have the potential to be affected by improvements to the Peninsula/CSXT route are the same as those described for previous alternatives. The hydrologic and water resources that could be affected by the Southside/NS route are the same as described in Alternative 1.

Because Alternative 2a would require greater infrastructure improvements to both rail lines, it is likely that this alternative would have the greatest potential to impact hydrologic and water resources.

Potential Construction Impacts - Potential construction impacts would be the same as those identified for Alternative 1.

3.16.4.6 Alternative 2b Peninsula Higher Speed Only

Alternative 2b has the potential to affect water resources. It provides higher speed passenger rail service to the Peninsula only. No passenger service would be added to the Southside. Impacts to hydrologic and water resources would be similar to those described under Alternative 2a for the Peninsula/CSXT route. Impacts would most likely occur at site-specific locations as related to track bed expansion, the relocation of the

Newport News passenger rail station and the proposed parking expansions at the Richmond and Williamsburg stations. No impacts would occur along the Southside/NS route because no improvements would be made.

Potential Construction Impacts - Potential construction impacts would be the same as those identified for Alternative 1.

3.16.5 Potential Mitigation and Required Permits

3.16.5.1 Potential Mitigation

Direct impacts to water resources would be minimized to the extent practicable through avoidance and minimization strategies in the project design, such as the use of bridge spans and retaining walls; Best Management Practices (BMPs) during construction, such as minimizing vegetation disturbance and soil exposure where possible; expeditious re-establishment of permanent vegetative cover following construction; use of silt fencing and hay bales; temporary dewatering where necessary; and stabilized construction access to and from the project site (e.g., use of sediment pads for removal of mud from construction vehicles and cleaning of vehicles prior to leaving the construction site). Following construction, permanent BMPs may be used, such as detention or retention basins and grassed swales.

Minimizing or restricting the use of nutrient-bearing fertilizers or using stormwater management facilities could effectively prohibit or minimize nutrient loading in receiving bodies of water. Where there is an increase in impervious ground surfaces, permanent stormwater management measures would be implemented to avoid and/or minimize an increase in peak run-off rates and promote groundwater infiltration within a given drainage area. A long-term stormwater management plan would be prepared to maintain water quality and groundwater recharge within the study area.

The Virginia Water Protection permit regulations state that “mitigation means sequentially avoiding and minimizing impacts to the extent practicable, and then compensating for remaining unavoidable impacts of a proposed action.” When Virginia Water Protection permits are issued, such “permits should contain requirements for compensating impacts on wetlands” and “…such compensation requirements shall be sufficient to achieve no net loss of existing wetlands acreage and functions…”

In Virginia, both VDEQ and the U. S. Army Corps of Engineers (USACE) have jurisdiction over and decision-making participation regarding wetland mitigation. Federal wetlands mitigation policy is guided by a Memorandum of Agreement (MOA) between the USACE and the EPA. As with VDEQ, the MOA outlines a three-step approach for wetland mitigation sequencing under the Clean Water Act Section 404(b)(1) Guidelines, as follows: 1) avoidance, 2) minimization and 3) compensation for unavoidable wetland impacts. USACE also embraces the concept of “no net loss of wetlands”. The purpose of this concept is to restore and maintain the chemical, biological and physical integrity of “waters of the United States,” specifically wetlands.

Proposed improvements associated with both of the proposed routes would likely result in unavoidable impacts to wetlands. However, these impacts would be avoided to the greatest extent practicable, especially in consideration of facilities such as potential rail stations and parking area locations, as there is some flexibility in the placement of these facilities.

Wetland impact avoidance and minimization strategies would be evaluated and implemented throughout the design process. Coordination with VDEQ and USACE would occur as necessary throughout the design and permitting phase to identify avoidance and minimization strategies and critical mitigation locations. Methods to avoid wetland impacts would be evaluated and these methods would be employed wherever possible in the design. Minimization typically focuses on decreasing the footprint of the proposed project or strategic placement of project elements outside of wetlands. Examples of avoidance and mitigation strategies that may be implemented as part of the design include maintenance of the existing right-of-way width, use of bridge spans, retaining walls and widening away from wetlands or bodies of water in locations where these resources narrow.

Alternative 2a requires new infrastructure to be constructed on both sides of the James River, resulting in potential impacts to water quality. However, avoidance and minimization approaches would be effectively employed for improvements to both the Southside/NS route and the Peninsula/CSXT route. Examples of avoidance and minimization strategies include:

- Strict enforcement of BMPs to control sedimentation and enhance water quality during and after project construction;
- Minimizing clearing and grubbing activities;
- Decreasing or eliminating discharges to streams;
- Reduction of fill slopes at stream/wetland crossings;
- Sensitive placement of drainage structures;
- Use of spanning structures or bottomless culverts over streams to maintain exiting hydrology and stream flow characteristics;
- Reestablishment of vegetation on exposed areas immediately following disturbance;
- Avoidance or minimization of in-stream activity; and,
- Use of responsible litter control practices.

Compensatory mitigation is defined in the Virginia Water Protection Program regulations as "actions taken that provide some form of substitute aquatic resource for the impacted aquatic resource" (9 VAC 25-210-10). Compensatory mitigation is generally not considered until anticipated impacts to waters of the United States have been avoided and minimized to the greatest extent practicable. It is recognized that the "no net loss of wetlands" functions and values may not be achieved in every regulated action. In these instances, appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been achieved. Compensatory actions often include restoration, creation, and enhancement of waters of the United States, and wetlands. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site if practicable. The USACE Norfolk District and VDEQ have developed recommendations for wetland compensatory mitigation. These recommendations would be employed in the development of a compensatory mitigation approach for the proposed routes.

Compensatory mitigation, as recommended by VDEQ may include:

- Wetland creation or restoration;
- Stream restoration;
- Purchase or use of wetland mitigation bank credits at a VDEQ-approved mitigation bank;
- Contributing to a VDEQ approved in-lieu fee fund;
- Preservation of existing wetlands and streams when utilized in conjunction with creation, restoration or mitigation bank credits; or,
- Preservation or restoration of upland buffers adjacent to surface waters when utilized in conjunction with creation, restoration or mitigation bank credits.

Mitigation ratios for impacts to forested wetlands are typically two acres constructed to every one acre impacted (2:1); 1.5:1 for scrub-shrub wetlands; and 1:1 for emergent wetlands. However, mitigation ratios required by VDEQ and/or USACE may be determined on a case-by-case basis.

Where widening of the existing route would occur within a floodplain, impacts would be avoided or minimized to the greatest extent practicable to minimize loss of flood storage capacity and to reduce an increase in the base year flood elevation. Mitigation measures include limiting fill placement within the floodplain through maintenance of the existing right-of-way width, the use of bridge spans, retaining walls, and widening where floodplains are narrow. A stormwater management plan would be implemented as necessary to retain

stormwater during flooding events, control downstream flooding and attenuate peak storm discharges for conditions both during and after construction.

3.15.5.2 Required Permits

Construction and implementation of higher speed passenger rail on either route would likely require the following permits:

Federal Permits - U.S. Army Corps of Engineers – Norfolk District Joint Section 404 Permit

This permit is required for dredge or fill activities in "waters of the United States," including wetlands, pursuant to Section 404 of the Clean Water Act, as well as the Virginia Water Protection Permit Program. Pursuant to the Joint Permit Application (JPA) process, USACE will review the JPA concurrently with other regulatory reviewing agencies, but will issue its own wetlands permit.

State Permits

Virginia Marine Resources Commission (VMRC) Wetlands Permit - VMRC has jurisdiction over projects involving tidal water and wetland resources, pursuant to the JPA process and the Virginia Water Protection Permit Program. VMRC will review the JPA concurrently with other regulatory reviewing agencies, but will issue its own wetlands permit.

VDEQ Wetlands Permit - VMRC has jurisdiction over projects involving non-tidal waters and freshwater wetland resources, pursuant to the JPA process and the Virginia Water Protection Permit Program. VDEQ will review the JPA concurrently with other regulatory reviewing agencies, but will issue its own wetlands permit.

VDEQ Section 401 Water Quality Certification - Water Quality Certification is required pursuant to Section 401 of the Clean Water Act and the Virginia Water Protection Permit Program. USACE will not issue a Section 404 permit until Water Quality Certification is obtained.

VDEQ Coastal Zone Consistency Determination - The Virginia Coastal Resources Management Program (CRMP) is a networked program with several agencies administering the enforceable coastal zone management policies. VDEQ is the lead agency for the CRMP, and is responsible for coordinating Virginia's review of federal consistency determinations and certifications with cooperating agencies. USACE will not issue a Section 404 permit until a Coastal Zone Consistency Determination has been obtained.

VMRC Coastal Resources Permit - The VMRC has jurisdiction over tidal waters in Virginia, including submerged lands. Therefore, approval from the VMRC would be required for use of such lands through the JPA Process, pursuant to the Virginia Water Protection Permit Program.

Virginia Pollutant Discharge Elimination System (VPDES) Program, Virginia Department of Conservation and Recreation (VDCR) Stormwater Management Plan - Section 402 of the Clean Water Act established the National Pollutant Discharge Elimination System to limit pollutant discharges into streams, rivers and bays. In Virginia, VDEQ administers the federal program as the VPDES. VDEQ regulates stormwater discharge associated with "industrial activities," while VDCR regulates stormwater discharges from construction sites.

VDCR's construction site stormwater permits require construction operators disturbing equal to or more than one acre of land to develop and implement a stormwater management plan (also called a stormwater pollution prevention plan) that uses BMPs for erosion and sediment control at the construction site. Permits for construction sites do not typically require monitoring but require that the operator regularly inspect stormwater discharges from the site to ensure that BMPs are controlling the discharge of pollutants to the maximum extent practicable and are meeting water quality standards. Upon approval, VDCR certifies that a project is designed to minimize erosion and sedimentation into adjacent bodies of water. A stormwater management plan approved by VDCR would be required for the proposed project.

Regional Permits

Chesapeake Bay Preservation Act - The Chesapeake Bay Preservation Act is enforced by individual localities in Virginia. Each locality determines the compliance of a project with the Act and may require information such as the type of vegetation present and the amount of vegetation proposed to be cleared as a result of project construction. Therefore, approval for either the Peninsula/CSXT route or the Southside/NS route would be required from the following localities:

- Peninsula/CSXT Route
  - Newport News
  - Williamsburg
  - Richmond
- Southside/NS Route
  - Ettrick
  - Chester
  - Suffolk
  - Portsmouth
  - Chesapeake

Local Permits

Local Wetland Board (LWB) Approval - LWBs have jurisdiction over projects involving water and wetland resources, pursuant to the JPA process and the Virginia Water Protection Permit Program. LWBs differ from the localities that review the project consistency with the Chesapeake Bay Preservation Act. Approval for either the Peninsula/CSXT route or the Southside/NS route would be required from the following LWBs:

- Peninsula/CSXT Route
  - Richmond
  - Charles City County
  - New Kent
  - James City County
  - Williamsburg
  - York County
  - Hampton
  - Newport News
- Southside/NS Route
  - Isle of Wight
  - Suffolk
  - Portsmouth
  - Chesapeake

3.16.5.3 Review Process

Several permits and approvals would be required from a variety of regulatory and jurisdictional agencies. In order to streamline the application process, VDEQ in conjunction with USACE, developed the JPA Process, whereby one form is used by several jurisdictional agencies for review of proposed projects. This form must

be completed and submitted to the VMRC, which then distributes the application to all reviewing agencies. Each agency reviews the application concurrently but each agency is responsible for issuing its own permit for the resources under its jurisdiction. The form is used by the USACE, VDEQ, VMRC, and LWBs. The form is not used for the local review process for land disturbance for the Chesapeake Bay Act review.

3.16.6 Subsequent Analysis

Subsequent analysis to further identify potential impacts on hydrologic and water resources would be required for the preferred alternative during subsequent analysis. The subsequent analysis may include the following.

- Field surveys of potential surface water impacts to further analyze potential impacts on water quality and to seek required permits from the appropriate agencies.
- Analysis of how the different alignment options would contribute to total additional impervious ground surfaces and the subsequent potential additional impacts on surface run-off. This analysis would also identify potential mitigation measures.
- Application for necessary permits.
- Field investigations and jurisdictional wetland delineations, which would include the quantification of wetland impacts.
- Both the Peninsula/CSXT and Southside/NS routes encompass portions of Virginia's coastal zone and have the potential to effect coastal resources. Therefore, a federal consistency determination will be required for any Build alternative selected. The review would be conducted by the Environmental Impact Review Office of VDEQ.

3.17 Biological Resources

This section provides a general description of terrestrial and aquatic biological resources and habitats, as well as rare, threatened and endangered species known to occur within the vicinity of the study area.

3.17.1 Methodology

Terrestrial and aquatic biological resources and habitats within the study area were assessed by reviewing topographic, aerial photographs and other USGS mapping, as well as agency websites and other relevant information. The study area is 300 feet from each side of the existing route centerline. For areas surrounding existing and proposed rail stations and parking facilities, the study area is evaluated within a 500-foot radius. Precise locations and exact sizes of stations, parking areas and grade separations are not yet known and will be further evaluated during the Tier II evaluations for the Preferred Alternative.

In order to determine federal and state species listed within the study area, the U.S. Fish and Wildlife Service (USFWS) Threatened and Endangered Species Database System was searched for cities and counties within the study area. In addition, the Virginia Fish and Wildlife Information Service website was reviewed for wildlife resources within the study area.

Coordination with the USFWS, the Virginia Department of Game and Inland Fisheries (VDGIF), the Virginia Department of Conservation and Recreation (VDCR) and the Virginia Department of Agriculture and Consumer Services (VDACS) was undertaken during the scoping process and at the initiation of the Tier I Draft EIS. Coordination letters can be found in Appendix B.

3.17.2 Legal and Regulatory Context

Terrestrial habitats outside of private or public preserves, management areas, parks or other legally protected areas have no special regulations limiting their use. However, plant and wildlife species within these areas are afforded legal protections. VDGIF regulates non-endangered wildlife at the state level. Federal protection also occurs for non-endangered wildlife under the Migratory Bird Treaty Act of 1918, last amended in 1986. This Act provides protection for all native migratory game and non-game birds with exceptions for the control of species that cause damage to agricultural or other interests.

Aquatic habitats are protected under a variety of regulations that limit their use or destruction. A detailed discussion of the aquatic habitats protected under Section 404 of the Clean Water Act can be found in Section 3.16.

Plant and animal species whose populations have declined to a point where extinction is imminent are afforded legal protection under federal and state laws. Section 7 of the Endangered Species Act of 1973 is the main legislation that regulates federally listed threatened and endangered species and designated critical habitats. The USFWS and National Marine Fisheries Service have authority in identifying those species in danger of extinction and provide for their management and protection.

The Commonwealth of Virginia has enacted legislation through the Endangered Plant and Insect Species Act of 1979 and Endangered Species Act of 1973, as amended in 1977. Three Commonwealth agencies have authority over state-protected species and maintain species listings: VDGIF, VDCR and VDACS.

Commonwealth agencies involved in species and habitat management and protection include VDGIF, VDCR, VDACS, and the Virginia Marine Resources Commission (VMRC). VDGIF has developed *Virginia's Comprehensive Wildlife Conservation Strategy* (VDGIF, 2005) to identify and manage wildlife species of greatest conservation need within the Commonwealth. VDGIF has the legislative mandate to manage Virginia's white-tailed deer resources including maintaining their habitat, managing their damage to other resources and property, and providing opportunities for recreation and education.

3.17.3 Affected Environment

3.17.3.1 Peninsula/CSXT Route

The terrestrial habitats and their corresponding wildlife within the study area occur within a mixture of developed and undeveloped landscapes. For habitats to be suitable for wildlife species they must provide food, shelter, nesting sites and water. The types of terrestrial habitats found within the study area include landscaped, agricultural, transitional and forest.

One area of particular importance along the Peninsula/CSXT route is the Elko West Conservation Site. According to VDCR, the existing rail line intersects this site. VDCR designates conservation sites throughout the Commonwealth based on the natural heritage resources and habitats these areas support. The Elko West Conservation Site is considered to be a site of "high significance" by VDCR.

Surface water resources provide aquatic habitats throughout the study area. As discussed in Section 3.16, surface water resources within the study area include tidal and non-tidal wetlands, rivers, streams, lakes and ponds. VDGIF indicates that the James River is designated as an Anadromous Fish Use Area. Anadromous fishes are those that spend all or part of their adult life in salt water and return to freshwater streams and rivers to spawn. This designation limits in-water activities during certain times of the year when anadromous fish spawn. None of the streams within 300 feet of the Peninsula/CSXT route is subject to the special provisions of trout fishing under the Virginia Administrative Code (4 VAC 15-330-50 and 140). Table 3-55 provides a general description of the types of habitat along the route and the types of species supported by each habitat.

Table 3-55: General Habitats and Species along the Peninsula/CSXT Route

Type of Habitat	General Description	Types of Species Supported by Habitat
Landscaped	Includes residential, commercial and institutional areas with manicured lawns and plantings; provides little habitat for wildlife.	Common yard birds (such as Northern Mockingbird, American Robin, Northern Cardinal) Small mammals (such as amphibians, reptiles, eastern chipmunk, gray squirrel)
Agricultural	Includes grain and hay fields and pastures; does not provide suitable nesting/shelter but provides feeding sites.	Various birds, raccoons and white-tailed deer, small mammals and several species of snakes
Transitional	Occurs where agricultural land has been abandoned or forests have been disturbed and land is in various stages of plant succession.	Wildlife species that prefer a mix of open grassland and scrub-shrub areas
Forested	Includes deciduous, evergreen and mixed forest land; generally associated with parks, stream valleys and wetlands areas in the study areas.	Great diversification of wildlife species to include mammals, reptiles and amphibians
Aquatic	Includes surface waters, floodplains and wetlands.	Waterfowl, reptiles, amphibians, various fish species (such as catfish, rockfish, largemouth bass, white shad and sunfish)

Source: DMJM Harris, October 2005

Rare, Threatened and Endangered Species - There are 39 federal and state-protected species listed for the Peninsula/CSXT route. A complete list of these species, their status and habitat requirements is provided in Appendix B.

Based on coordination with USFWS and VDGIF, two species of concern have been known to occur in the vicinity of the Williamsburg Amtrak Station. According to VDGIF, a bald eagle's (*Haliaeetus leucocephalus*) nest is located approximately 1.5 miles from the Williamsburg Amtrak Station and the federal/state listed small-whorled pogonia (*Isotria medeoloides*) is also within proximity to this station. Additionally, the James River is also designated as a Confirmed Anadromous Fish Use Area. A complete list of protected species for the Peninsula/CSXT route is located in Appendix B.

3.17.3.2 Southside/NS Route

The types of habitats and species found along the Southside/NS route are the same as described in Section 3.17.3.1 for the Peninsula/CSXT route.

Rare, Threatened and Endangered Species - There are 43 federal and state-protected species listed for the Southside/NS route study area. A complete list of these species, their status and habitat requirements is provided in Appendix B.

Based on coordination with the USFWS and VDGIF, three species of concern have been known to occur in the vicinity of the proposed Bowers Hill Rail Station in Chesapeake. These species include the bald eagle (*Haliaeetus leucocephalus*), canebrake rattlesnake (*Crotalus horridus*) and the Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*). A complete list of protected species for the Southside/NS route is located in Appendix B.

3.17.4 Environmental Consequences

3.17.4.1 Status Quo

Under the Status Quo Alternative, all passenger rail service conditions would remain the same. There would continue to be two daily round-trip trains along the Peninsula/CSXT route operating at maximum speeds of 79 mph. Only freight rail operations would operate along the Southside/NS route. No physical or operational rail improvements would be made to the Peninsula/CSXT route other than routine maintenance. There would be no impacts to biological resources or rare, threatened or endangered species.

3.17.4.2 No Action Alternative

The No Action Alternative calls for those planned improvements in the existing transportation network and 2004 committed highway, rail and airport improvement projects in the study corridor. These improvements include the addition of one daily round-trip train along the Peninsula/CSXT route. Under the No Action Alternative, there would be a total of three daily round-trip trains operating at maximum speeds of 79 mph between Newport News and Richmond. It is expected that if any minor infrastructure improvements are needed to accommodate this additional round-trip train that those could be done within the existing rail right–of-way.

VDCR indicates that there is concern over a particular area, the Elko West Conservation Site along the Peninsula/CSXT route, in which several protected species are located. In addition, VDGIF indicated the James River has been designated as a Confirmed Anadromous Fish Use Area.

It is not expected that any wildlife or habitat would be disturbed by implementing the No Action Alternative. It is unlikely that any infrastructure improvements needed to accommodate the additional service would require additional rail right-of-way that would impact the Elko West Conservation Site. There are no planned improvements that would likely require in-water activity in the James River. Furthermore, the protected species that have been known to occur in the vicinity of the Williamsburg Amtrak Station would not be impacted because no expansions of the station or parking facilities are proposed under the No Action Alternative.

3.17.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Alternative 1 combines the No Action Alternative with the provision of higher speed passenger rail on the Southside/NS route. As stated for the No Action Alternative, no impacts to species or habitats are expected to occur on the Peninsula/CSXT route. However, given that major infrastructure improvements would be required along the Southside/NS route, impacts may occur from permanently clearing vegetation and filling or disturbing bodies of water including wetlands. A related effect would be the potential increase in the impervious ground cover that would result in decreasing soil infiltration of rain water, which generally contributes to tributary base flow. Additionally, the increase in impervious ground cover could increase run-off during rain events that could carry additional sediment and other pollutants to nearby bodies of water. These impacts may alter the natural characteristics of aquatic habitats, resulting in changes in water temperature, increased nutrient and sediment loads, and alterations in stream channel circulation. These impacts would most likely occur in a localized area where the routes directly cross the bodies of water.

The greatest potential for impacts to habitats and species would occur in areas where infrastructure improvements would be required outside of the existing rail right-of-way to include track bed expansion, the proposed rail connection at Kilby, and the proposed stations and parking at Bowers Hill and Downtown Norfolk. As part of this alternative, parking at the Main Street Station in Richmond would be augmented to some degree.

VDGIF records indicate that there are several protected species in the vicinity of the proposed Bowers Hill Rail Station. A bald eagle's (*Haliaeetus leucocephalus*) nest is located less than two miles from the proposed location. The proposed station is located outside of the primary and secondary management zones of this nest; therefore, VDGIF does not anticipate any significant adverse impact to the nest. Their records also indicate the occurrence of the state endangered canebrake rattlesnake (*Crotalus horridus*) and state threatened Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) in proximity to this station. In order

to address potential impacts to these species, a formal habitat assessment is recommended at the proposed site of the Bowers Hill Rail Station if it is part of the Preferred Alternative as part of the Tier II analysis.

In a letter dated August 15, 2005, the USFWS indicated that this project is not likely to affect federally listed or proposed species or adversely modify critical habitats. As the project progresses and more detailed information becomes available, coordination will continue with federal and state agencies to determine potential effects.

In a letter dated August 19, 2005, VDCR also indicated that there is concern over a particular area, the Elko West Conservation Site along the Peninsula/CSXT route, in which several protected species are located. VDCR recommends further coordination with the USFWS and VDACS to ensure compliance with legislation regarding these species.

Potential Construction Impacts - Minimal short-term effects to terrestrial biological resources and habitats are anticipated as a result of constructing the Build Alternatives and could include the temporary clearing of vegetation for construction equipment and the stockpiling of soil, ballast, or other construction materials. Spills from construction vehicles could occur, allowing pollutants such as fuels, lubricants, paints and concrete additives to enter adjacent bodies of water. Additionally, short-term noise, vibration and air pollution from construction equipment and activities could temporarily affect terrestrial habitats and their corresponding wildlife.

3.17.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Alternative 2a would require infrastructure improvements to both the Peninsula/CSXT and Southside/NS routes that would require additional rail right–of-way. Along the Peninsula/CSXT route, the existing Newport News Amtrak Station would be relocated and parking would be augmented at the existing Richmond Main Street Station and Williamsburg Amtrak Station. Additional right-of-way may also be required in some areas for track bed expansion. As described in Alternative 1, the Southside/NS route would need infrastructure improvements to accommodate passenger rail service. While Alternative 2a proposes conventional service along the Southside/NS route and not higher speed passenger rail, it would still require many of the same infrastructure improvements to include a new rail connection at Kilby and new passenger stations at Bowers Hill and Downtown Norfolk.

The types of potential impacts to biological resources and rare, threatened and endangered species would be similar to those described for Alternative 1. For the Peninsula/CSXT route, areas of potential concern were identified by the USFWS, VDGIF and VDCR. According to VDGIF, the James River has been designated as a Confirmed Anadromous Fish Use Area. While it is unlikely that any improvements would involve the James River, any in-stream activities to take place in the James River would follow the time-of-year restriction from February 15-June 30 of any year. In addition, a bald eagle's (*Haliaeetus leucocephalus*) nest is located approximately 1.5 miles from the proposed Williamsburg Amtrak Station. However, the station is located outside of the primary and secondary management zones of this nest; therefore, VDGIF does not anticipate any significant adverse impact to the nest. The VDGIF also indicated the occurrence of the federal/state listed small-whorled pogonia (*Isotria medeoloides*) within proximity to this station. Coordination will continue with federal and state agencies regarding this species if improvements to the Williamsburg Amtrak Station are included as part of the Preferred Alternative.

In a letter dated August 19, 2005, VDCR also indicated that there is concern over a particular area, the Elko West Conservation Site along the Peninsula/CSXT route, in which several protected species are located. VDCR recommends further coordination with the USFWS and VDACS to ensure compliance with legislation regarding these species.

Implementation of conventional service on the Southside/NS route would require similar infrastructure improvements as proposed for higher speed rail service along the route in Alternative 1. The impacts for the Southside/NS route on biological resources and rare, threatened and endangered species would be the same as described for Alternative 1.

Potential Construction Impacts - Potential construction impacts would be the same as described for Alternative 1.

3.17.4.5 Alternative 2b Peninsula Higher Speed Only

The potential impacts to biological resources and rare, threatened, and endangered species would be similar as described for Alternative 2a along the Peninsula/CSXT route. Alternative 2b does not propose any improvements to the Southside/NS route, which would continue to operate freight rail service only. Therefore, this alternative would have no impacts to Southside/NS route.

Several areas of potential concern have been identified along this route by the USFWS, VGDIF, VDCR and VDACS. The USFWS has indicated that this project is not likely to affect federally listed or proposed species or adversely modify critical habitats (See Appendix B, letter dated August 15, 2005). However, in a letter dated August 19, 2005, VDCR indicated that there is concern over a particular area, the Elko West Conservation Site, in which several protected species are located. VDCR recommends further coordination with the USFWS and VDACS to ensure compliance with legislation regarding these species.

3.17.5 Potential Mitigation Measures

Once a Preferred Alternative is selected, field investigations or surveys would be conducted to determine the likelihood of impact to listed species and their habitats found within the study area during subsequent analysis. Critical habitats and species assessments would be conducted in accordance with all applicable federal and state regulations. Appropriate mitigation would be coordinated with federal and state agencies.

In order to minimize construction effects and minimize disturbance of terrestrial and aquatic habitats and wildlife, best management practices would be used. Local ordinances would be followed for erosion, sediment and stormwater controls during construction to minimize any potential effects on aquatic resources. For terrestrial habitats that might be temporarily disturbed by construction, pre-construction conditions or better would be restored once construction is complete.

3.17.6 Subsequent Analysis

Subsequent analysis may include field surveys to determine the extent and type of general and sensitive biological resources, including formal biological assessments for protected species and consultation with the USFWS, VDGIF, VDCR, and VDACS as needed. The boundaries of the Elko West Conservation Site would be confirmed to avoid and/or minimize affects to this site.

3.18 Sections 4(f) and 6(f)

This section discusses the properties that are protected under Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Act. This is not intended to be a complete Section 4(f) Evaluation but rather an inventory of properties that will likely require Section 4(f) documentation. As more detailed studies are completed for the Preferred Alternative during Tier II analysis, other properties that may be afforded protection under the provisions of Section 4(f) and Section 6(f) may be identified.

3.18.1 Methodology

Public parks, recreation areas, wildlife refuges and historic resources were identified for the study area through the use of readily available information and limited field reviews. At this point in the study, impacts to these resources have not been fully identified. For recreational resources, a defined study area of 300 feet from either side of the centerline of the right-of-way (for a 600-foot total study area) was used. For historic resources, a defined study area of 500 feet from either side of the centerline (for a 1,000-foot total study area) was used. Resources listed are those that have the greatest potential to be affected. For a complete discussion on park and recreation resources, see Section 3.9. For a complete listing of cultural resources identified, refer to Section 3.14 and Appendix C – Historic Resources. Only potential effects to these potential Section 4(f)/Section 6(f) resources have been identified for consideration.

3.18.2 Legal and Regulatory Context

3.18.2.1 Section 4(f)

Section 4(f) of the U.S. Department of Transportation of 1966 (49 U.S.C. 303), as amended, protects public parks and recreational lands, wildlife refuges, and historic sites of national, state, or local significance from acquisition and conversion to transportation use. Use of these publicly owned lands is prohibited for a transportation use unless there are no other prudent and feasible alternatives to the use and only if the project includes all possible planning to minimize harm to such sites.

Section 4(f) applies when a use of a protected property occurs. Use is defined as either permanent, temporary adverse or proximity effects. These uses are defined below.

- A ***permanent use*** occurs when a transportation project incorporates the resource into the transportation facility, including a fee simple or permanent easement.
- A ***temporary adverse use*** occurs when a transportation project temporarily occupies any portion of the resource and results in an adverse condition. Certain conditions must be met in order for a temporary use not to be considered adverse.
  - The duration of the occupancy must be less than the time needed for the construction of the project and there must not be a change in ownership.
  - There are no anticipated permanent adverse physical changes or interference with activities or purposes of the resource on a temporary or permanent basis.
  - There must be a documented agreement between the appropriate federal, state or local officials having jurisdiction over the resources regarding the aforementioned conditions.
  - The nature and magnitude of the changes to Section 4(f) resources are minimal and the land is restored to the same or better condition.
- A ***proximity effect*** (also referred to as constructive use) occurs when the resource is not physically occupied but the proximity effects of the transportation project (including mitigation) are so severe that the activities, features or attributes that qualify the property for Section 4(f) protection are substantially impaired.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended Section 4(f) to allow the FHWA, FTA and FRA to determine that certain uses would have a de minimus, or no adverse effect, on a protected resource provided that the responsible party with jurisdiction over the affected property agrees in writing. In this context, a de minimus impact is a minor impact that does not adversely affect the activities, features or attributes of the Section 4(f) property.

3.18.2.2 Section 6(f) of the Land and Water Conservation Fund Act

Section 6(f) of the Land and Water Conservation Fund Act (L&WCF) of 1965 preserves, develops, and assures the quality and quantity of outdoor recreation resources through purchase and improvement of recreation lands, wildlife and waterfowl refuges, and similar resources. The Act provides funding for the federal acquisition of park and recreation lands and matching grants for state and local governments. Once a property is purchased using these funds, these lands are protected from conversion to land uses other than public outdoor recreation uses.

A conversion of a 6(f) protected property occurs when the property is converted to anything other than outdoor recreation. A conversion of use must be in accordance with an existing statewide outdoor recreation plan and must be approved by the U.S. Secretary of the Interior. If a conversion does occur, then the land must be replaced with a property of equivalent value and usefulness. Temporary uses for construction are not considered a conversion if the property is restored to its original condition after construction.

3.18.3 Potential Section 4(f) and 6(f) Resources

3.18.3.1 Parks

Peninsula/CSXT Route - In all, fifteen park resources were identified within the study area for the Peninsula/CSXT route. All of the resources identified for this route have the potential to be affected. The resources are listed in Table 3-56 and mapped in Figure 3-18.

Table 3-56: Potential Recreational Resources along the Peninsula/CSXT Route

Resource	Type	Ownership	Public Access*	Location	Acreage within Study Area
Great Shiplock Park	City Park	City of Richmond	Yes	City of Richmond	4.44
Libbie Hill Park	City Park	City of Richmond	Yes	City of Richmond	0.22
VOF Open Space Easement	Conservation Easement	Virginia Outdoors Foundation (VOF)	No	New Kent County	37.89
Crawford State Forest	State Forest	Virginia Department of Forestry	Yes	New Kent County, Charles City County	37.85
Waller Mill Park**	Local Park	City of Williamsburg	Yes	City of Williamsburg	1.30
Colonial Williamsburg National Historical Park	Historical Park	National Park Service	Yes	James City County, City of Williamsburg, York County	4.75
Quarterpath Park	Local Park	City of Williamsburg	Yes	City of Williamsburg	0.047
Lee Hall Plantation City Park	City Park	City of Newport News	No-presumed closed	City of Newport News	4.73
Newport News City Park	City Park	City of Newport News	Yes	City of Newport News	112.69
Skiffes Creek Park	Local Park	City of Newport News	Yes	City of Newport News	1.58
Stony Run Park	Local Park	City of Newport News	Yes	City of Newport News	23.50
Deer Park	City Park	City of Newport News	Yes	City of Newport News	1.05
Lake Maury Natural Park	Local Park	City of Newport News	Yes	City of Newport News	36.75
Municipal Lane Park	Local Park	City of Newport News	Yes	City of Newport News	2.58
Mariners Museum Park	Private Museum/Estate	Mariners Museum	No	City of Newport News	0.03

Source: National Park Service, Virginia Department of Conservation and Recreation, Virginia Department of Forestry and local jurisdictions.

*Public Access is based on readily available information. No confirmation of access has been conducted.

**Section 6(f) property

Southside/NS Route - In all, three park resources were identified for the Southside/NS route. Each of those resources was identified as having the potential to be affected. The resources are listed in Table 3-57 and mapped on Figure 3-19.

Table 3-57: Potential Recreational Resources along the Southside/NS Route

Resource	Type	Ownership	Public Access*	Location	Acreage within Study Area
Lake Kilby Park	Local Park	City of Suffolk	Yes	City of Suffolk	0.98
Great Dismal Swamp	National Wildlife Refuge	National Park Service (NPS)	Yes	City of Suffolk	47.75
Town Point Park/ Harbor Park Civic Facility	City Park	City of Norfolk	Yes	City of Norfolk	9.01

Source: National Park Service, Virginia Department of Conservation and Recreation, Virginia Department of Forestry and local jurisdictions.

*Public Access is based on readily available information. No confirmation of access has been conducted.

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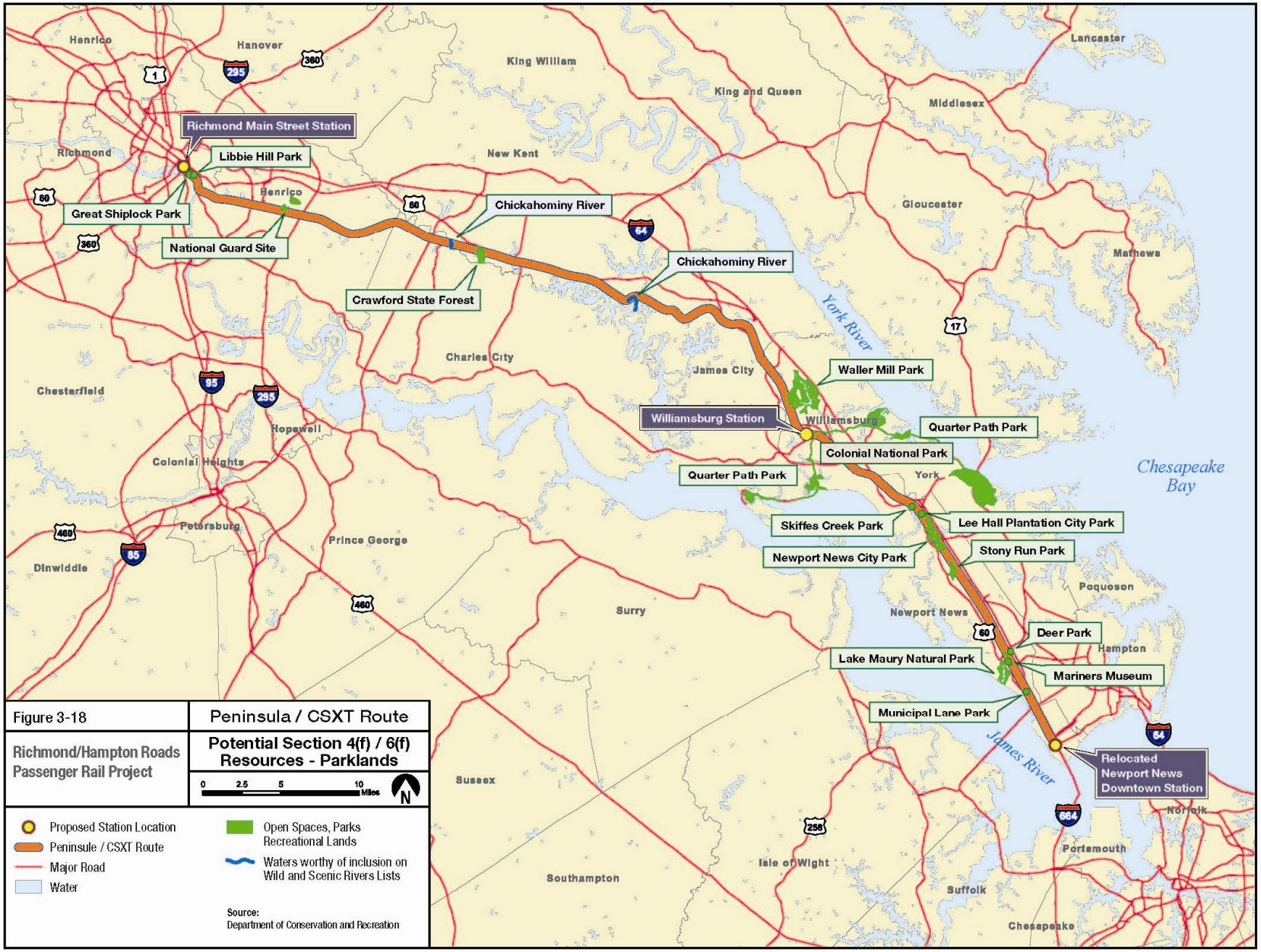
Richmond Main Street Station
Libbie Hill Park
Great Shiplock Park
National Guard Site
Chickahominy River
Crawford State Forest
Chickahominy River
Waller Mill Park
Williamsburg Station
Quarter Path Park
Colonial National Park
Quarter Path Park
Skiffes Creek Park
Lee Hall Plantation City Park
Newport News City Park
Stony Run Park
Deer Park
Lake Maury Natural Park
Mariners Museum
Municipal Lane Park
Relocated Newport News Downtown Station
Henrico
Hanover
King William
King and Queen
Lancaster
Middlesex
Richmond
New Kent
Gloucester
Mathews
Charles City
James City
York River
Chesterfield
Hopewell
Colonial Heights
Petersburg
Prince George
Dinwiddie
Surry
Sussex
Southampton
Isle of Wight
Suffolk
Chesapeake
Portsmouth
Norfolk
Newport News
Hampton
Poquoson
York
Chesapeake Bay
James River
Figure 3-18
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Potential Section 4(f) / 6(f) Resources - Parklands
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Open Spaces, Parks Recreational Lands
Waters worthy of inclusion on Wild and Scenic Rivers Lists
Source:
Department of Conservation and Recreation

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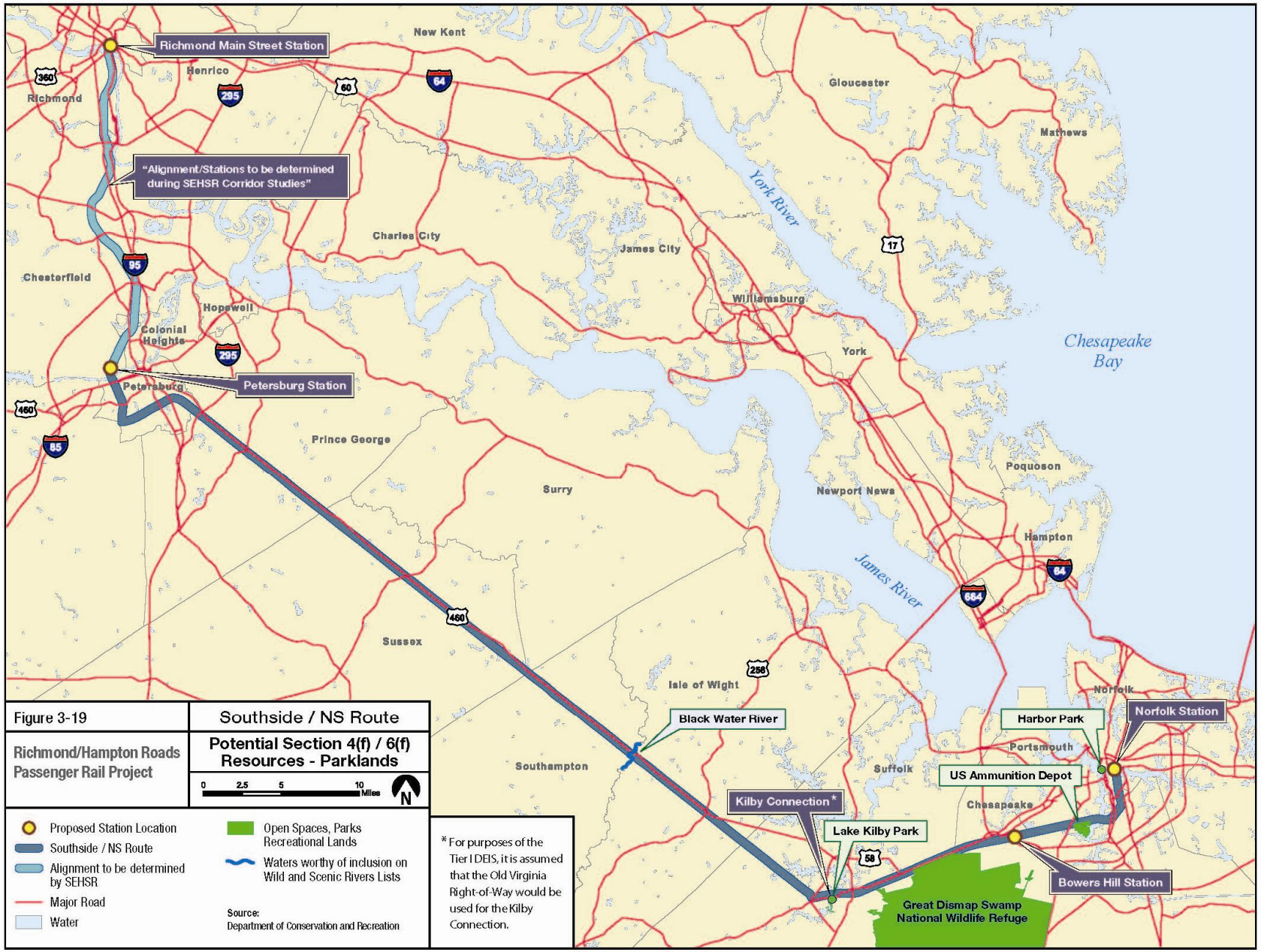
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
New Kent
Henrico
Richmond
Chesterfield
Hopewell
Colonial Heights
Petersburg
Charles City
James City
Gloucester
Mathews
York River
Williamsburg
York
Chesapeake Bay
Prince George
Surry
Sussex
Poquoson
Newport News
Hampton
James River
Isle of Wight
Southampton
Suffolk
Norfolk
Portsmouth
Chesapeake
Black Water River
Kilby Connection*
Lake Kilby Park
Harbor Park
Norfolk Station
US Ammunition Depot
Bowers Hill Station
Great Dismap Swamp National Wildlife Refuge
Figure 3-19
Richmond/Hampton Roads Passenger Rail Project
Southside / NS Route
Potential Section 4(f) / 6(f) Resources - Parklands
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Open Spaces, Parks Recreational Lands
Waters worthy of inclusion on Wild and Scenic Rivers Lists
Source: Department of Conservation and Recreation
* For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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3.18.3.2 Cultural Resources

Peninsula/CSXT Route - The VDHR Historic Resources Data Sharing System (DSS) is a database of resources that have been evaluated by others and reported to VDHR. According to the VDHR DSS, a total of 48 architectural resources along the Peninsula/CSXT route were evaluated for potential eligibility for the National Register of Historic Places (NRHP). Of those, 12 have been recommended eligible for listing or are listed on the NRHP. The remaining 36 are either not recommended eligible for listing on the NRHP, or the historic significance has been undetermined. Forty-one archaeological sites were identified along the route. Table 3-58 summarizes the architectural resources that have been previously identified as being recommended eligible or listed on the NRHP and Table 3-59 summarizes the archaeological resources. A complete list of all resources identified from the DSS for the Peninsula/CSXT route is provided in Appendix C, Cultural Resources Identified. Figure 3-20 shows the locations of cultural resources located along the Peninsula/CSXT route.

Southside/NS Route - According to the DSS, a total of 59 architectural resources have previously been identified for the Southside/NS route. Of those, 10 are recommended eligible for listing or are listed on the NRHP, while the remaining 49 are either not recommended eligible for listing on the NRHP or the historic significance is undetermined. Seven archaeological sites were identified along the route. Table 3-60 summarizes the architectural resources previously identified as being recommended eligible or listed on the NRHP and Table 3-61 summarizes the archaeological resources. A complete list of all resources identified by the DSS for the Southside/NS route is provided in Appendix C, Cultural Resources Identified. Figure 3-21 shows the locations of cultural resources located along the Southside/NS route.

Table 3-58: Architectural Resources Eligible or Listed in the National Register of Historic Places along the Peninsula/CSXT Route

DHR ID #	Property Name	Date	Location	County/City	Property Description	Date Listed on NRHP *(if known)*	Date Listed on VA Landmarks Registry *(if known)*
121-0171-0002	Warehouse (Site), James River and Kanawha Canal	N/A	Gamble's Hill	Richmond	N/A		
127-0192	Saint John's Church Historic District	1800s	22nd Street on west, Marshall Street on east	Richmond	District contains some of the oldest frame structures as well as some of the oldest brick houses in Richmond. Architecture is almost exclusively the side hall townhouse plan.		
127-0171	James River and Kanawha Canal Historic District	1800ca	Peach Street to intersection of Sleepy Hollow Road	Richmond/ Henrico	District extends from Ship Lock at the foot of Peach Street westward to an extension of Sleepy Hollow Road and the C&O Railroad tracks in Henrico. Linear feature that consists of earthen excavations, stone locks, bridges, culverts, basins and other related objects.	8/26/71	9/9/69
043-0439	Aviation General Supply Depot	1917	508 Bickerstaff Road	Henrico	Depot complex consists of large U-shaped warehouse, a model shop/records administration office and another warehouse.		
043-0306	The Cedar Works Warehouse	Circa 1885	Old Osborne Turnpike, Route 5	Henrico	Primary warehouse is a rectangular shaped, brick industrial building with a flat roof. It has surviving painted signage Richmond Cedar Works manufactured cedar ice-cream freezers, barrels and other wooden products.		
063-0218	Little Roxbury	1920	Route 615	New Kent	Single dwelling, Colonial Revival architectural style.	9/15/70 Expansion Accepted: 1/17/91	6/2/70 Expanded: 4/17/90
047-0034	Norge Historic District	Post 1840	Richmond Road, Peninsula Street, Peach Street	James City	14 acres located in the northwest portion of James City County between the towns of Lightfoot and Toano.		

DHR ID #	Property Name	Date	Location	County/City	Property Description	Date Listed on NRHP *(if known)*	Date Listed on VA Landmarks Registry *(if known)*
121-0043	North End Historic District	1900	Near Shipyard	Newport News	Residential neighborhood. Proximity to the Newport News Shipbuilding and Dry Dock Company had profound influence on its development and architectural character. Dwellings range from modest vernacular to large Queen Anne-style houses.	8/28/86	6/17/86
121-0009	Hilton Village Historic District	1918	Adjacent to east bank of James River, approximately two miles north of Newport News Shipbuilding and Dry Dock	Newport News	Hilton was designed to resemble the villages of Tudor England; it has mostly Jacobethan style structures with numerous examples of Dutch and Georgian Colonial.	6/23/69	11/5/68
121-0050	Lee's Mill Earthworks	1862	280 Rivers Ridge Circle	Newport News	Site contains remnants of the Confederate Warwick-Yorktown defensive line from the 1862 Peninsula Campaign. Area is bound by Ft. Eustis, Warwick River and Mill's Ridge Housing Development.	6/23/03	3/19/03
121-0016	Lee Hall	1859	163 Yorktown Road	Newport News	Property is associated with the village of Lee Hall Historic District. Italianate mansion constructed c. 1859 was home to Richard Decauter Lee. The only large, mid-nineteenth century plantation house remaining on VA's lower peninsula, served as HQ for Confederate Generals John Bankhead Magruder and Joseph E. Johnston House. Is the only large mid-nineteenth century plantation house remaining on Virginia's lower peninsula. House served as headquarters for Confederate Generals in Spring of 1862.	12/5/72	8/15/72
121-5068	Village of Lee Hall Historic District	1881	Near Intersections of Warwick Blvd. (Rt. 60) and Ripley St.	Newport News	No generalized architectural summary exists. The areas of significance include architecture, commerce and transportation.		

Source: DHR DSS September 2005

Table 3-59: Archaeological Resources Identified Along the Peninsula/CSXT Route

DHR Site #	City/County	Site Class	Cultural Designation	Temporal Designation	Description
44HE0082	Henrico	Terrestrial, open air	Indeterminate	19th century	Single dwelling
44HE0057	Henrico	Terrestrial, open air	Native American	Middle Archaic	Camp, temporary
44HE0058	Henrico	Terrestrial, open air	Native American/Indeterminate	Woodland, 20th/19th Century	Camp, temporary
44HE0981	Henrico	Terrestrial, open air	African American, Euro-American	19th Century	Part of the Confederate Richmond Intermediate Defensive Line
44HE0764	Henrico	Terrestrial, open air	Native American	Prehistoric/Unknown	200 sq. ft. containing fragments of earthenware, colored and colorless glass, bullets, and one machine-made brick fragment.
44HE0328	Henrico	Terrestrial, open air	N/A	N/A	Single dwelling
44HE0890	Henrico	Terrestrial, open air	Indeterminate	19th century: 1st half	Cemetery ¼-mi. off Charles City Road on Monahan Road
44HE0929	Henrico	Terrestrial, open air	Native American	Prehistoric/Unknown	Temporary camp used for industry, processing, extraction
44HE0930	Henrico	Terrestrial, open air	Native American	Prehistoric/Unknown	Temporary camp used for industry, processing, extraction
44HE0702	Henrico	Terrestrial, open air	N/A	N/A	Temporary domestic camp
44HE0681	Henrico	Terrestrial, open air	Indeterminate	19th century: 3rd quarter	Trenches and batteries used for military/defense purposes
44HE0873	Henrico	Terrestrial, open air	Indeterminate	19th Century: 4th quarter	Single dwelling
44CC0021	Charles City	Terrestrial, open air	Native American	Woodland	N/A
44NK0031	New Kent	Terrestrial, open air	Indeterminate	17th Century: 1st Half	Military/Defense in general area of Fort James, one of three forts in operation during War against Indians (1645), and near site of Moysonec Indian Village.
44NK0021	New Kent	Terrestrial, open air	Indeterminate	18th Century	Single dwelling
44JC0018	James City	Terrestrial, open air	Native American	Prehistoric	Indeterminate
44JC0006	James City	Terrestrial, open air	Native American	Prehistoric	Indeterminate
44JC0003	James City	Terrestrial, open air	Native American	Woodland	Indeterminate
44JC0272	James City	Terrestrial, open air	Indeterminate	Roughly 19th Century	Historic, domestic farmstead
44JC1124	James City	Terrestrial, open air	Euro-American	19th Century	Farmstead containing stoneware, plate shards and fragments of an

DHR Site #	City/County	Site Class	Cultural Designation	Temporal Designation	Description
					American clay tobacco pipe bowl and English pipe stem.
44YO0313	York	Terrestrial, open air	Indeterminate	18th Century	N/A
44YO0753	York	Terrestrial, open air	N/A	N/A	Unknown domestic land, containing fragments of brick, wine bottles, cut nails, wrought nails, and possible dressed sandstone fragments.
44YO0751	York	Terrestrial, open air	Indeterminate	19th Century: 4th quarter	Single dwelling
44YO0754	York	Terrestrial, open air	Indeterminate	20th Century	Single dwelling
44YO0378	York	Terrestrial, open air	Indeterminate	18th Century	Single dwelling
44YO0377	York	Terrestrial, open air	Indeterminate	18th Century	Domestic
44YO0379	York	Terrestrial, open air	N/A	N/A	Domestic temporary camp
44WB0014	Williamsburg	Terrestrial, open air	Euro-American	17th Century: 4th quarter	Indeterminate
44WB0015	Williamsburg	Terrestrial, open air	Euro-American	17th Century: 4th quarter	Indeterminate
44JC0300	James City	Terrestrial, open air	N/A	N/A	Indeterminate
44JC0059	James City	Terrestrial, open air	Indeterminate	19th Century: 3rd quarter	Military/defense site containing significant earthen works
44JC1041	James City	Terrestrial, open air	N/A	N/A	
44JC1044	James City	Terrestrial, open air	Euro-American	19th Century: 2nd half	Domestic camp
44JC0063	James City	Terrestrial, open air	Indeterminate	20th Century	Domestic, with a scatter of domestic artifacts
44NN0327	Newport News	Terrestrial, open air	Euro-American	19th Century: 3rd quarter	Single dwelling
44NN0326	Newport News	Terrestrial, open air	Euro-American	19th Century	Possible shed or outbuilding for agricultural operation
44NN0062	Newport News	Terrestrial, open air	Native American	Prehistoric/Unknown	Indeterminate. Field survey discovered a broad spear point made of coarse yellow quartzite and one quartzite ovoid blade.
44NN0037	Newport News	Terrestrial, open air	Euro-American	N/A	Indeterminate. Soil survey produced Chinese porcelain, glaze ware and misc. earthen ware.
44NN0081	Newport News	Terrestrial, open air	Indeterminate	18th Century	Indeterminate. Site projected from historic map.

DHR Site #	City/County	Site Class	Cultural Designation	Temporal Designation	Description
44NN0309	Newport News	Terrestrial, open air	Native American	Late Woodland 17th Century: 4th quarter	Domestic camp. Quartzite debitage and incised Native American pipe stem fragment found on site.
44NN0308	Newport News	Terrestrial, open air	Native American	Middle Woodland 17th Century: 4th quarter	Domestic camp. Late 17th and early 18th century domestic and structural artifacts recovered from a subsurface pit.

Source: DHR DSS, September 2005

Table 3-60: Architectural Resources Eligible or Listed in the National Register of Historic Places along the Southside/NS Route

DHR ID #	Property Name	Date	Location	County/City	Property Description	Date Listed on the NRHP *(if known)*	Date Listed on the VA Landmarks Registry *(if known)*
091-5098	Norfolk & Petersburg Railroad	Circa 1858	Parallel to Route 460 as it extends southeast to northwest across Isle of Wight, Southampton, Sussex, and Prince George Counties.	Isle of Wight Southampton Sussex Prince George	The rail line served as the principal transportation link between southeastern Virginia south-central and the City of Petersburg in south-central Virginia. The rail line passes through a number of small towns and villages that developed around railroad stations during the 19th century.		
046-5101	Hobbs Property/6635 Windsor Boulevard	1933	6635 Windsor Boulevard	Isle of Wight Zuni	2-story Craftsman style building featuring a wooden frame structural system that rests on a solid concrete foundation. In addition to the store/dwelling, there are several agricultural buildings on the property including three tourist cabins, a chicken house, equipment shed, barn, shed, log structure, and garage.		
328-0001	Windsor Railroad Station/Windsor Depot/Norfolk and Western Railroad	1866	15 West Railroad Street	Isle of Wight Windsor	Station is fairly typical of stations put up not only by the Norfolk and Western Railway, but by other railroads as well. Is one floor and appears to have been built in three stages. Roof of station is rolled and crimped metal. Exterior is board-on batten pine.		
133-5138	Joel E. Harrell and Sons/ Smithfield Packing Company Plant No. 5	ca 1941	110 Virginia Ham Drive	Suffolk Magnolia	The processing facility was constructed in the early 1940s. The original complex consisted of three main structures. The main building (housing the slaughterhouse, curing room, and coolers), the office, and the stock pens were positioned in separate structures to provide the desired separation between function and uses.		
133-0072	Suffolk Historic District and Expansions	Post 1742	Bank Street Market Street Clay Street	Suffolk	This Property is associated with the Suffolk Historic District. The Suffolk Historic District, listed in 1987, is comprised of the area south of Old Town and		

DHR ID #	Property Name	Date	Location	County/City	Property Description	Date Listed on the NRHP *(if known)*	Date Listed on the VA Landmarks Registry *(if known)*
			Poplar Street N&W Railroad Tracks County Street Central Avenue Grayson Court Liberty Street Hill Street Pinner Street Chestnut Street North Street Pine Street W. Washington Street		contains buildings from the nineteenth and early-twentieth centuries. In 1999 a boundary amendment to the Suffolk Historic District continued the district north along Main Street to encompass Old Town's Federal-era properties. A second amendment was added in 2002 with the addition of the East Washington Street corridor to the district's southern boundary. This third boundary expansion to the Suffolk Historic District is comprised of two areas. The first area is residential and centered around Pinner Street and Central Avenue. It is contiguous with the northeast corner of the district. The second extends westward from the East Washington Street Expansion area to encompass both commercial and residential buildings on West Washington, Pine, Chestnut, and North Streets. These expansion areas will be referred to as the Pinner/Central and the West Washington Street areas.		
133-5040	West End Historic District and Boundary Expansion	1865	The West End neighborhood is roughly bounded by the Seaboard Coast Line Railroad to the north, the Norfolk and Western Railroad (N & W) to the south, Linden Avenue, Wellons Street and Pender Street to the east, and Brewer Street and Causey Avenue on the west.	Suffolk	The West End Historic Boundary Expansion is adjacent to the eastern boundary of the West End Historic District. The original district and proposed boundary expansion are located approximately four blocks from Washington Square, the heart of historic Suffolk's commercial district. The boundary expansion contains ten primary resources located along the east side of Wellons Street between West Washington and Smith Streets. Properties within the expanded boundary are similar in design, architecture, and appearance to those on the west side of Wellons Street included in the West End Historic District. With the addition of the Boundary Expansion, the visual continuity of the district is extended to encompass all of the buildings within the Wellons Street streetscape.	1/16/04 Expansion Accepted: 11/27/04	

DHR ID #	Property Name	Date	Location	County/City	Property Description	Date Listed on the NRHP *(if known)*	Date Listed on the VA Landmarks Registry *(if known)*
131-0055	South Norfolk Historic District	Post 1890	Northern end of the City of Chesapeake in the area generally known as South Norfolk	Chesapeake	This Property covers about one-half of a sq. mile. Begun as a street car suburb and retaining its suburban residential character, the district contains 795 buildings, 127 of which are non-contributing. The streets within the district are laid out in a grid pattern. Fully detached houses, most of them single family, line the majority of the blocks. The district also includes several churches, a school, a park, and a small local business district. The Norfolk and Western Railroad forms one boundary of the district. Development within the district took place in the few decades between 1890 and 1930s, and the buildings exhibit the styles and construction methods that were popular at the time. Houses n modified Classical Revival and Queen Anne styles, as well as houses with Stick and Eastlake elements, are interspersed with early twentieth century houses in Bungalow, Cottage, Four Square, and Colonial Revival styles.	1/27/89	12/2/87
131-5325	Sunray Agricultural (Rural) Historic District	1908	Biernot Rd/Interstate 64/Carlise Rd./Compaz Rd./Danberry St./East Rd/Hertz Rd./Homestead Rd./Old State Rd/ Peach Ave./Seldon Rd./Sondej Ave./Sunray Ave./Truitt Rd.	Sunray Chesapeake	This Property is defined by agrarian fields divided by brackish-water ditches and early 20th century farmhouses with associated outbuildings in a rural setting. A single asphalt roadway flanked by brackish-water ditches accesses district area. Tree stands, roadways and ditched divide the rectangular agrarian fields. Early 20th century vernacular farmhouses are located throughout the district and are simple in form and treatment. Numerous agricultural builds are clustered around the farmhouses and are found in the agricultural fields. Near the main entrance road to the farming community and the intersecting railroad tracks at the now defunct VA Railway there are clustered institutional buildings, such as the Catholic Church with parish house and school, and the 1920-era public school, which eventually became the Bowers Hill Post Office. The district retains its integrity and reflects an early 20th century immigrant farming community.	Listing Pending	3/19/03
131-0389	House/604 Homestead	1923	604 Homestead Rd	Sunray Chesapeake	This property is associated with the Sunray Agricultural Historic District. Includes 2 front gables with lunettes; porte-cochere on one end; 1-room wing		

DHR ID #	Property Name	Date	Location	County/City	Property Description	Date Listed on the NRHP *(if known)*	Date Listed on the VA Landmarks Registry *(if known)*
					on other end. 2-½ story, 3-bay wide symmetrical frame house w ith stretcher-bond brick veneer on first floor, wood shingle siding on second. Two gablettes set into eave with semicircular window with spoke-like muntins.		
122-0590	Colonna's Shipyard	1920	400 Indian River Road	Norfolk	The inside machine shop at Colonna's Shipyard is a large, two-story concrete building. The building is industrial in nature and generally utilitarian in appearance with some commercial craftsman/classical detailing.		

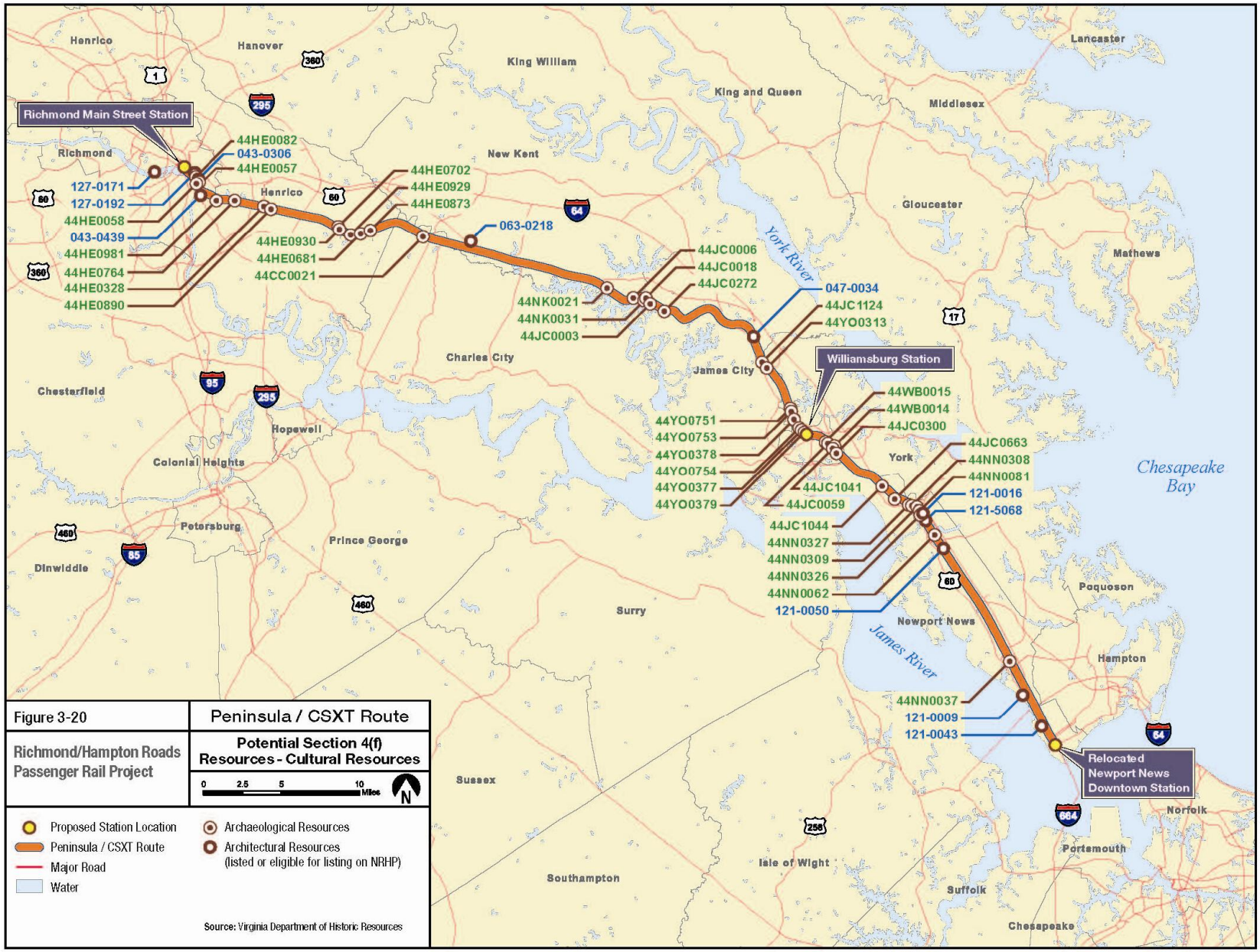
Source: DHR Data Sharing System, September 2005

Table 3-61: Archaeological Resources Previously Identified along the Southside/NS Route

DHR ID #	City/County	Site Class	Cultural Designation	Temporal Designation	Description
44PG0218	Prince George	Terrestrial, open air	Native American	Late Woodland	The artifact was found at an elevation of approximately 140 feet, on the surface of an open area serving as the shoulder of a dirt and gravel access road. The artifact was found in a badly eroded area that exposed stream worn rocks. Erosion gullies in the area revealed clay subsoil underlying thin topsoil.
44PG0142	Prince George	Terrestrial, open air	Indeterminate Indeterminate	19th Century 20th Century	Brown sandy loam soil. Controlled transect probably from 19th century house to the east, and Civil War material probably from battlefield east of fort. Maybe Fort Bross.
44PG0309	Prince George	Terrestrial, open air	Indeterminate	19th Century: 3rd Quarter	Approx. 1100-foot long breastwork beginning at Norfolk & Western RR and terminating in fort approximately 150 feet x 150 feet. The breastwork and fort are in excellent condition, although there is some evidence that Civil War relic hunters visit the site periodically. The woods north west and up to the site were shovel tested at 20-foot intervals.
44PG0143	Prince George	Terrestrial, open air	Native American Indeterminate Indeterminate	Late Archaic 20th Century 19th Century	Brown sandy loam soil. Controlled transect survey, visibility good, milk glass. Whiteware is probably 19th century surface scatter, farmhouse to west.
44SX0223	Sussex	Terrestrial, open air	Native American	Prehistoric/Unknown	Site was located by shovel testing at 50-foot intervals. The site is unplowed with the prehistoric cultural material shallowly buried.
44SX0320	Sussex	Terrestrial, open air			Shovel testing at 30-foot intervals, ¼-inch screen, no above ground remains, subsurface remains less than

DHR ID #	City/County	Site Class	Cultural Designation	Temporal Designation	Description
					12 inches deep.
44PM0050	Portsmouth	Terrestrial, open air	Native American	Woodland	Located during a Phase I survey, the area was systematically shovel tested at close intervals and yielded a light subsurface scatter of historic material. The site has been cross-cut by roads, ditches, and fences making exact site boundaries and integrity difficult to ascertain at Phase I.

Source: DHR Data Sharing System, September 2005


Richmond Main Street Station
Williamsburg Station
Relocated Newport News Downtown Station
44HE0082
043-0306
44HE0057
127-0171
127-0192
44HE0058
043-0439
44HE0981
44HE0764
44HE0328
44HE0890
44HE0702
44HE0929
44HE0873
063-0218
44HE0930
44HE0681
44CC0021
44NK0021
44NK0031
44JC0003
44JC0006
44JC0018
44JC0272
047-0034
44JC1124
44YO0313
44YO0751
44YO0753
44YO0378
44YO0754
44YO0377
44YO0379
44WB0015
44WB0014
44JC0300
44JC1041
44JC0059
44JC1044
44NN0327
44NN0309
44NN0326
44NN0062
121-0050
44JC0663
44NN0308
44NN0081
121-0016
121-5068
44NN0037
121-0009
121-0043
Henrico
Hanover
King William
King and Queen
Middlesex
Lancaster
Richmond
New Kent
Gloucester
Mathews
Charles City
James City
York
Chesterfield
Hopewell
Colonial Heights
Petersburg
Prince George
Dinwiddie
Surry
Sussex
Southampton
Isle of Wight
Suffolk
Chesapeake
Portsmouth
Norfolk
Hampton
Newport News
Poquoson
York River
James River
Chesapeake Bay
Figure 3-20
Peninsula / CSXT Route
Richmond/Hampton Roads Passenger Rail Project
Potential Section 4(f) Resources - Cultural Resources
0 2.5 5 10 Miles
N
Proposed Station Location
Peninsula / CSXT Route
Major Road
Water
Archaeological Resources
Architectural Resources (listed or eligible for listing on NRHP)
Source: Virginia Department of Historic Resources

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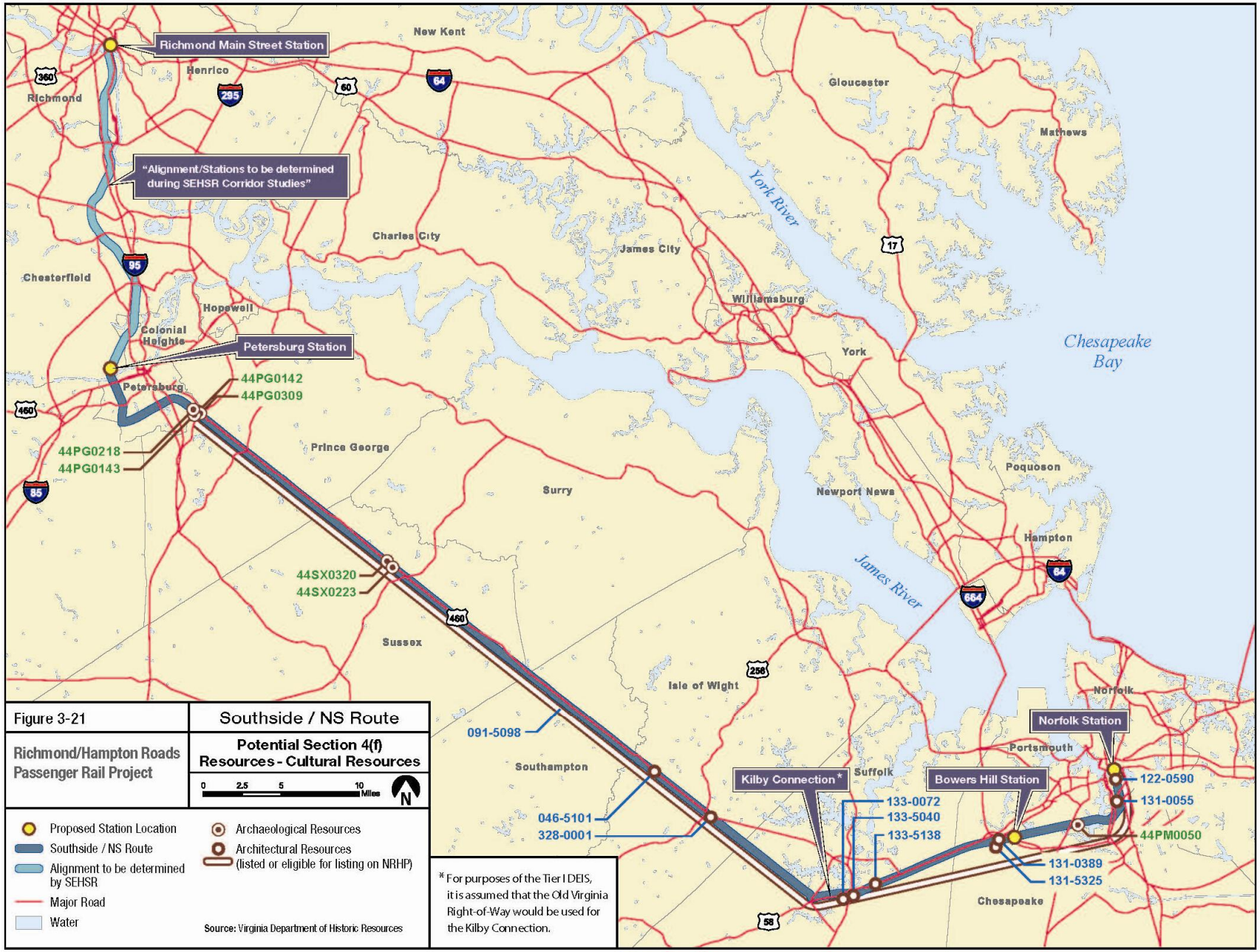
Richmond Main Street Station
"Alignment/Stations to be determined during SEHSR Corridor Studies"
Petersburg Station
Kilby Connection*
Bowers Hill Station
Norfolk Station
44PG0142
44PG0309
44PG0218
44PG0143
44SX0320
44SX0223
091-5098
046-5101
328-0001
133-0072
133-5040
133-5138
122-0590
131-0055
44PM0050
131-0389
131-5325
New Kent
Henrico
Richmond
Gloucester
Mathews
York River
Charles City
James City
Williamsburg
York
Chesapeake Bay
Chesterfield
Hopewell
Colonial Heights
Petersburg
Prince George
Surry
Newport News
Poquoson
Hampton
James River
Sussex
Isle of Wight
Southampton
Suffolk
Portsmouth
Norfolk
Chesapeake
Figure 3-21
Southside / NS Route
Richmond/Hampton Roads Passenger Rail Project
Potential Section 4(f) Resources - Cultural Resources
0 2.5 5 10 Miles
N
Proposed Station Location
Southside / NS Route
Alignment to be determined by SEHSR
Major Road
Water
Archaeological Resources
Architectural Resources (listed or eligible for listing on NRHP)
Source: Virginia Department of Historic Resources
* For purposes of the Tier I DEIS, it is assumed that the Old Virginia Right-of-Way would be used for the Kilby Connection.

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3.18.4 Potential Use of Section 4(f)/6(f) Resources

3.18.4.1 Status Quo Alternative

Under the Status Quo Alternative, there would be no additional passenger rail service on the Peninsula/CSXT route. The existing passenger service of two round-trip trains per day would remain. The Southside/NS route would be continued for use by freight operations only as planned by Norfolk Southern.

Because no physical or operational improvements would occur under the Status Quo Alternative to either route, no impacts to Section 4(f)/6(f) resources identified within the study area would occur.

3.18.4.2 No Action Alternative

Under the No Action Alternative, one additional passenger train would be added to the existing Peninsula service and would operate at a maximum speed of 79 mph. In total, there would be three daily round-trip trains operating between Richmond and Newport News.

It is expected that any necessary infrastructure improvements required to support this additional round-trip train would be accommodated within the existing right-of-way. No additional right-of-way would be required.

Section 4(f)/6(f) resources can be considered as potentially sensitive land use categories, depending on the designated use and purpose of the property, in determining potential noise and vibration impacts. For this Tier I Draft EIS, a screening level assessment for noise and vibration was conducted and specific noise and vibration impacts were not identified. It is unlikely that noise or vibration impacts would occur as a result of the additional round-trip train. Because the No Action Alternative does not include any new visual elements to be added along either the Peninsula/CSXT route or the Southside/NS route, there would be no potential for visual impacts to these resources. There would be no improvements for passenger service on the Southside/NS route. Section 4(f)/6(f) properties would not be adversely impacted by the No Action Alternative.

3.18.4.3 Alternative 1 Peninsula Conventional/Southside Higher Speed

Parks - Based on the preliminary analysis conducted for this Tier I Draft EIS, it is unlikely that any of the recreational resources identified for the Peninsula/CSXT route would experience a permanent use of property. The most probable effects could potentially result from increased train frequencies. More detailed analysis is needed to determine if proximity effects would occur and the severity of those effects on the resources identified.

Based on the preliminary analysis conducted for this Tier I Draft EIS, it is unlikely that any of the recreational resources identified for the Southside/NS route would experience a permanent use of 4(f)/6(f) resources. Proximity effects from increased train frequencies and speeds are possible. More detailed analysis is needed to determine if proximity effects would occur and what the severity of those effects on the resources identified would be.

Although the proposed route passes through both Lake Kilby Park and Town Point Park, the route proposes to use existing tracks. It is not expected that any additional right-of-way would be required. If additional right-of-way is needed, then a permanent use of these properties could result. Town Point Park may also have the potential to be affected temporarily due to construction of the proposed station and related facilities in Downtown Norfolk. A determination of park boundaries is needed to determine if a permanent or temporary use would occur and to identify alternatives or mitigation measures. Table 3-62 summarizes the potential effects to each resource identified.

Table 3-62: Potential Effects to Recreational Resources Identified for Alternative 1

Resource	Relation to Rail Route	Potential Effects
Lake Kilby Park	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Great Dismal Swamp	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Town Point Park/Harbor Park Civic Facility	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds, minor visual impacts from proposed station/parking, temporary construction impacts possible. Adverse effects unlikely.

Source: DMJM Harris, October 2005

Cultural Resources - Based on preliminary coordination with VDHR, there is a high probability that historic resources could be affected by implementation of more frequent, conventional passenger rail service along the Peninsula/CSXT route and new higher speed service on the Southside/NS route. It is unlikely that direct impacts to cultural resources would occur, however proximity effects could occur. Section 3.14 describes the known resources identified within the study area and potential proximity effects.

The CSXT Railroad has not been fully evaluated to determine if the rail line is potentially eligible for listing on either the Virginia Landmarks Registry or the NRHP. Based on literature research, it appears that the CSXT merits further investigation as a potentially eligible resource.

Based on preliminary coordination with VDHR, there is a high probability that historic resources could be affected by implementation of higher speed passenger rail along the Southside/NS route. It is unlikely that direct impacts to cultural resources beyond the rail line itself would occur, however proximity effects could occur. Section 3.14 describes the known resources identified within the study area and potential proximity effects. Previous studies within the general study area indicate that the Norfolk Southern Railroad has been determined to be potentially eligible for listing on the NRHP. Direct effects to the rail line itself could occur. Improvements to the rail line would be required to maintain acceptable freight and passenger rail service. More detailed study is required to determine effects on these resources and any other potential resources within the route. Once an alternative is selected, more detailed study will then be conducted and impacts can be assessed.

3.18.4.4 Alternative 2a Peninsula Higher Speed/Southside Conventional

Parks - Based on the preliminary analysis conducted for this Tier I Draft EIS, it is unlikely that any of the recreational resources identified for the Peninsula/CSXT route or Southside/NS route will experience a permanent use of property. The most probable effects could potentially result in proximity effects from increased train frequencies and speeds. More detailed analysis is needed to determine if proximity effects would occur and the severity of those effects on the resources identified.

Although the proposed Southside/NS route passes through both Lake Kilby Park and Town Point Park, the route would use existing tracks. It is not expected that any additional right-of-way would be required. If additional right-of-way is needed, then a permanent use of these properties could result. Town Point Park may also have the potential to be affected temporarily for construction of the proposed station and related facilities in downtown Norfolk. A determination of park boundaries is needed to determine if a permanent or temporary use would occur.

All recreational resources identified along the Peninsula/CSXT route, with the exception of possibly four resources, have the potential to experience effects. The four resources—Libbie Hill Park, Quarterpath Park, Skiffes Creek Park and the Mariners Museum—have been included as potential Section 4(f) resources; however, it is unlikely that these resources would be affected due to the fact that they are all separated from tracks by existing roadways. Table 3-63 summarizes the potential effects to each resource identified.

As shown in Table 3-63, preliminary analysis indicates that a permanent use of any of these properties is unlikely. Some proximity effects could be possible. It does not appear that any of these resources would likely experience temporary adverse effects. More detailed analysis during subsequent studies is warranted to determine potential Section 4(f) uses.

Waller Mill Park in the City of Williamsburg has been identified as having received grant funds from the L&WCF; therefore, the property is considered a Section 6(f) resource. Any impacts to this resource would require coordination with U.S. Department of the Interior and would need to meet all requirements stated in Section 6(f).

Table 3-63: Potential Effects to Recreational Resources Identified for Alternative 2a

Resource	Relation to Rail Route	Potential Effects
Peninsula/CSXT Route		
Great Shiplock Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Libbie Hill Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.
VOF Open Space Easement	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Crawford State Forest	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Waller Mill* Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely. If impacts occur property is subject to Section 6(f) requirements.
Colonial Williamsburg National Historical Park	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Quarterpath Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.
Lee Hall Plantation City Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Newport News City Park	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Skiffes Creek Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.
Stony Run Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Deer Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Lake Maury Natural Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Municipal Lane Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Mariners Museum Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.
Southside/NS Route		
Lake Kilby Park	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Great Dismal Swamp	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Town Point Park/Harbor Park Civic Facility	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds, minor visual impacts from proposed station/parking, temporary construction impacts possible. Adverse effects unlikely.

Source: DMJM Harris, October 2005
*Section 6(f) Resource

Cultural Resources - Based on preliminary coordination with VDHR, there is a high probability that historic resources could be affected by implementation of higher speed passenger rail along the Peninsula/CSXT route and new conventional passenger rail service on the Southside/NS route. It is unlikely that direct impacts to cultural resources would occur along the Peninsula/CSXT route, however proximity effects could occur. Section 3.14 describes the known resources identified within the study area and potential proximity effects.

The CSXT Railroad has not been fully evaluated to determine if the rail line is potentially eligible for listing on either the Virginia Landmarks Registry or the NRHP. Based on literature research, it appears that the CSXT merits further investigation as a potentially eligible resource.

Based on preliminary coordination with VDHR, there is a high probability that historic resources could be affected by implementation of higher speed passenger rail along the Southside/NS route. It is unlikely that direct impacts to cultural resources beyond the rail line itself would occur, however proximity effects could occur. Section 3.14 describes the known resources identified within the study area and potential proximity effects. Previous studies within the general study area indicate that the Norfolk Southern Railroad has been determined to be potentially eligible for listing on the NRHP. Direct effects to the rail line itself could occur. Improvements to the rail line would be required to maintain acceptable freight and passenger rail service. More detailed study is required to determine effects on these resources and any other potential resources within the route. Once an alternative is selected, more detailed study will be conducted and impacts can be assessed.

3.18.4.5 Alternative 2b Peninsula Higher Speed Only

Parks - Based on the preliminary analysis conducted, all recreational resources identified within the study area, with the exception of possibly four resources, have the potential to experience effects. The four resources—Libbie Hill Park, Quarterpath Park, Skiffes Creek Park and the Mariners Museum—have been included as potential Section 4(f) resources; however, it is unlikely that these resources would be affected due to the fact that they are all separated from tracks by existing roadways. The remaining eleven resources have a greater potential for effects. Table 3-64 lists these resources and potential impacts.

As shown in Table 3-64, preliminary analysis indicates that a permanent use of any of these properties is unlikely. Some proximity effects could be possible and further analysis will be conducted. It does not appear that any of these resources would likely experience any temporary adverse effects. More detailed analysis during subsequent studies is warranted to determine potential Section 4(f) effects.

Waller Mill Park in the City of Williamsburg has been identified as having received grant funds from the L&WCF and therefore the property is considered a Section 6(f) resource. Any impacts to this resource would require coordination with U.S. Department of the Interior and would need to meet all requirements stated in Section 6(f).

Table 3-64: Potential Effects to Recreational Resources Identified for Alternative 2b

Resource	Relation to Rail Route	Potential Effects
Great Shiplock Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Libbie Hill Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.
VOF Open Space Easement	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Crawford State Forest	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Waller Mill* Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely. If impacts occur property is subject to Section 6(f) requirements.
Colonial Williamsburg National Historical Park	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Quarterpath Park	Tracks are adjacent, but	Unlikely to be affected.

Resource	Relation to Rail Route	Potential Effects
	separated by roadway.	
Lee Hall Plantation City Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Newport News City Park	Tracks pass through resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Skiffes Creek Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.
Stony Run Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Deer Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Lake Maury Natural Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Municipal Lane Park	Tracks are adjacent to resource.	Proximity effects such as noise/vibration from increased train frequencies and speeds. Adverse effects unlikely.
Mariners Museum Park	Tracks are adjacent, but separated by roadway.	Unlikely to be affected.

Source: DMJM Harris,October 2005
*Section 6(f) Resource

Cultural Resources - Based on preliminary coordination with VDHR, there is a high probability that historic resources could be affected by implementation of higher speed passenger rail along the Peninsula/CSXT route. It is unlikely that direct impacts to cultural resources would occur, however proximity effects could occur. Section 3.14 describes the known resources identified within the study area and potential proximity effects. More detailed study is required to determine effects on these resources and any other potential resources within the route. Once an alternative is selected, more detailed study will be conducted and impacts can be assessed.

The CSXT railroad has not been fully evaluated to determine if the rail line is potentially eligible for listing on either the Virginia Landmarks Registry or the NRHP. Based on literature research, it appears that the CSXT merits further investigation as a potentially eligible resource.

3.18.4.6 Comparative Evaluation of Alternatives

The following table summarizes the findings of the Tier I Draft EIS assessment of the potential effects of each alternative on Section 4(f)/6(f) resources. The findings indicate that direct impacts on Section 4(f)/6(f) resources are unlikely under any of the alternatives; additional right-of-way requirements are unlikely to impact parks or historic properties. However, implementing more frequent and/or higher speed passenger rail service may have proximity effects on Section 4(f)/6(f) resources, such as changes in noise or visual characteristics.

Table 3-65: Summary of Tier I Draft EIS Section 4(f)/6(f) Assessment Findings

Condition/Alternative	Peninsula/CSXT Route	Southside/NS Route
Number of Existing Parks	15	3
Number of Known NRHP Listed or Eligible Resources	12	10
Number of Known Archaeological Sites	41	7
Status Quo Alternative	No use; no proximity effect.	N/A
No Action Alternative	Potential uses and proximity effects are unlikely.	N/A
Alternative 1	Potential uses are unlikely; proximity effects are likely.	Potential uses are unlikely; proximity effects are likely.
Alternative 2a	Potential uses are unlikely; proximity effects are likely.	Potential uses are unlikely; proximity effects are likely.
Alternative 2b	Potential uses are unlikely; proximity effects are likely.	N/A

3.18.5 Avoidance Options and Measures to Minimize Harm

At this stage in the study it would be premature to identify avoidance options and measures to minimize harm for unavoidable impacts. As planning for the project progresses during subsequent analysis and specific impacts are identified, then avoidance options, if needed, and measures to minimize harm would be explored.

3.18.6 Subsequent Analysis

In the Tier II analysis, the Section 4(f) and 6(f) evaluation process will be more focused on the Preferred Alternative. The primary goal for Tier II analysis will be to identify Section 4(f) and 6(f) resources and potential impacts in greater detail and to identify and analyze potential mitigation measures. The following items would be included in the Section 4(f) and 6(f) evaluations for the Tier II analysis:

- Detailed physical descriptions of the selected alternative (including plans and profiles).
- Updated list of all Section 4(f) and 6(f) recreation resources in proximity to the proposed route centerlines and proposed station areas, using the most recent mapping available.
- Formally determine the NRHP eligibility for the rail lines of the selected alternative. The railroad would need to be surveyed and evaluated according to National Register criteria. This would include a determination of contributing and noncontributing resources, a period of significance, and the development of a boundary for the resource.
- Further evaluations and coordination with VDHR to determine actual impacts to resources identified along the selected alternative route.
- Two Indian tribes were identified within vicinity of the study area. Additional outreach to these tribes will be conducted.
- Descriptions of uses and functions of each Section 4(f) and 6(f) resource located within the selected alternative study area. The descriptions should include location map; size; services and facilities; annual patronage; unique qualities; relationship to other lands in the project vicinity; owner/operator; other relevant information regarding the resource; and an explanation of the significance of the property as determined by federal, state, regional or local officials with jurisdiction over the resource.
- Develop appropriate mitigation measures for any unavoidable uses of Section 4(f) and 6(f) properties.