2.0 DEVELOPMENT AND DESCRIPTION OF ALTERNATIVES

2.1 ALTERNATIVES ANALYSIS

This EIS will identify and evaluate a range of reasonable and practicable alternatives for the proposed action. The analysis of alternatives serves two purposes: (1) it must meet the requirements of NEPA (reasonable alternatives), and (2) it must provide the basis for the Corps to make specific findings under Section 404(b)(1) of the CWA (practicable alternatives).

NEPA

To comply with NEPA, guidelines developed by the CEQ and the Corps require a detailed analysis of reasonable alternatives and the potential environmental consequences of each so that their comparative merits may be considered by agency decision makers (40 C.F.R. 1502.14[b]). The alternatives evaluation must include the applicant's Proposed Project, a no-action or no-build alternative, and a range of other reasonable alternatives for the Proposed Project. The range of reasonable alternatives can include alternative sites, alternative project configurations, alternative technologies, and alternative project sizes.

Section 404(b)(1) Guidelines

In addition to meeting the requirements of NEPA, the Section 404(b)(1) Guidelines stipulate that the Corps may not issue a Department of the Army (DA) permit without identifying whether the proposed action is the least environmentally damaging practicable alternative (LEDPA). This regulatory review must be supported by an alternatives analysis.

After alternatives have been identified and evaluated, only those alternatives that are found to be reasonable (40 C.F.R. 1502.14[a]) and practicable (40 C.F.R. 230.10 [a][1-3]) are moved forward for detailed review in the Draft EIS (DEIS). "Reasonable" is understood to mean those technically and economically feasible project alternatives that would satisfy the primary objectives of the project defined in the statement of project purpose. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.[38] An alternative is considered to be "practicable" if it is, "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not

[38] 46 Fed. Reg. 18026, at 18027 (March 23, 1981), Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations (https://ceq.doe.gov/nepa/regs/40/40P1.HTM)

presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered."[39]

An EIS informing a DA permit decision by the Corps must be thorough enough to determine compliance with NEPA and the Section 404(b)(1) Guidelines, as well as all federal, state, and local requirements with respect to the Proposed Project activities and permit approvals. Based on information submitted by Palmetto Railways (Appendix B) and the Corps' independent review, the Corps has completed an initial identification, screening, and evaluation of all alternatives for the Navy Base ICTF, and has identified the alternatives to be evaluated in detail in the EIS. The alternatives analysis conducted by the Corps and described in this EIS complies with NEPA, and provides the basis for the Corps to make the required findings under the Section 404(b)(1) Guidelines.

2.2 SCOPING AND DEVELOPMENT OF ALTERNATIVES

Participation by the public, governmental agencies, tribes, and non-governmental organizations is critical to the NEPA process, which requires an early and open process for determining the scope of the issues to be addressed as part of the preparation of an EIS. The Corps has provided and will continue to offer opportunities for participation through review of the Final EIS. Input for the scope of the EIS was obtained through a scoping process that included the following elements:

- **Initiation of the scoping process via the Notice of Intent (NOI)**. The Corps, Charleston District, initiated the public scoping process with the publication of the NOI in the *Federal Register* on October 23, 2013.
- **Public scoping meeting and comments**. The Corps conducted a public scoping meeting on November 14, 2013, to solicit public, agency, and Tribe comments.
- **Scoping comment period**. Written and oral comments were received via email, letters, and the project website (www.NavyBaseICTF.com) during the public scoping meeting and during the scoping period, which ended on December 14, 2013.
- **Additional Comments**: The Corps received additional comments after the formal scoping period, and these comments have been considered in the development of the EIS.
- **Second public scoping meeting and comments.** The Corps conducted a second public scoping meeting on October 27, 2015, to inform the public, agencies, and Tribes of the revised project and to solicit comments.
- **Second scoping comment period.** Written and oral comments were received via email, letters, and the project website during the additional public scoping meeting and during the scoping period, which ended on November 27, 2015.
- **Additional Comments**: The Corps received additional comments after the second formal scoping period, and these comments have been considered in the development of the EIS.

[39] 40 C.F.R. 230.10 [a][1–3]

The Corps received a number of comments on a broad range of topics. A summary of the scoping process and all the comments are available on the Corps' Navy Base ICTF EIS website at www.NavyBaseICTF.com. Several comments were submitted that pertain to identification and evaluation of alternatives for the proposed action, and they are summarized in Appendix C. These comments were taken into consideration during the alternatives development process.

2.3 CORPS' SCREENING OF ALTERNATIVES

This section describes the process used by the Corps to identify and screen potential alternatives to Alternative 1 (Proposed Project) that would be considered further in the EIS, in compliance with the applicable CEQ and Corps regulations. The analysis of alternatives is considered to be the "heart of the environmental impact statement" (40 C.F.R. 1502.14). The Corps is required to "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated" (40 C.F.R. 1502.14). Determining a range of reasonable alternatives to be evaluated is the first step in this process. For some proposals, a large number of possible reasonable alternatives may exist. Therefore, the Corps typically develops appropriate screening criteria that are used to pare down a large list to a reasonable number of alternatives to evaluate in an EIS.

Reasonable alternatives do not include remote or speculative alternatives, or alternatives that would not achieve the project purpose. The CEQ provides guidance on the range of alternatives that should be considered in an EIS and on how to define whether an alternative is sufficiently reasonable to be considered in detail in an EIS. As noted earlier, reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant[40]; however, first and foremost, a reasonable alternative must meet the purpose and need of the project.

The following sections introduce the alternatives screening criteria (Section 2.3.1) and then provide the results of the analysis using the screening criteria (Section 2.3.2).

2.3.1 Alternatives Screening Criteria

In consideration of the purpose of and need for Alternative 1 (Proposed Project), the Corps developed screening criteria to identify possible alternative ICTF sites that would be evaluated in the EIS. Three different levels of screening were used: Initial, Tier I, and Tier II. Initial screening criteria narrowed the analysis to private/public intermodal container terminals in Charleston Harbor. Tier I screening criteria narrowed the realm of possible alternative ICTF locations to specific sites, and then Tier II screening criteria further narrowed these sites to those to be carried forward in the EIS.

[40] NEPA's Forty Most Asked Questions (http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm).

2.3.1.1 Initial Screening Criteria: Presence of Private/Public Intermodal Container Terminals in the Charleston Harbor

The Corps recognizes that the construction and operation of an economically viable ICTF is dependent on the facility being located near a container terminal that currently handles or is planning to handle intermodal containers. Locating a facility too far from the container terminal would not be feasible as the distance to transport the containers from the terminal to the facility would be cost prohibitive. For example, drayage services may account for up to 40 percent of total shipping cost, and this cost increases sharply if rail facilities are not located near points of origin or destination.[41] Furthermore, considering the service territory for Palmetto Railways, the Corps recognizes that the ICTF must be located near a private or public intermodal container terminal in the Charleston Harbor. Therefore, the initial screening criterion used in the formulation of viable alternatives is the presence of private/public intermodal container terminals in the Charleston Harbor.

2.3.1.2 Tier I Screening Criteria

The Tier I screening criteria were used in a step-wise fashion to identify specific alternative sites for the Proposed Project. The criteria were:

- Proximity (within 4 miles) to private/public intermodal container terminals in the Charleston Harbor, with a projected 400,000 TEU annual throughput by rail
- Area required for an ICTF (65+ acres)

2.3.1.2.1 Screening Criterion #IA: Proximity (within 4 miles) to Private/Public Intermodal Container Terminals in the Charleston Harbor

The maximum distance between the placement of the ICTF and a private or public intermodal container terminal is dictated by the purpose and need statement, which requires that the ICTF be a near-dock facility. While there is not a definitive distance associated with the term "near-dock," approximately 4 miles has generally been considered by the rail industry as the furthest viable distance because of the need for the drayage road (and the use of UTR trucks) to link the nearest intermodal container terminal with the associated ICTF. Intermodal containers from other nearby container terminals would be transported by OTR trucks as they would not have a drayage road connection (other than the public road/highway network). Accordingly, this conservative distance of 4 miles was used as the limit for determining potential locations for siting an ICTF.

Containers would be brought to the ICTF by both private drayage road via UTR trucks and public streets via OTR trucks from the off-site terminals. The advantage of the near-dock facility is that containers can continue to be moved between the terminal and the ICTF on the private drayage road

[41] "Time to market and overall logistics costs are prime factors driving freight facility location decisions," National Cooperative Freight Research Program, Report 13 – Freight Facility Location Selection: A Guide for Public Officials, at 39, 54 (NCFRP Report 13).

even after the external gates of the terminal are closed (e.g., for truck shipments). Therefore, in addition to being "near-dock," the ICTF also must be connected to a container terminal that has existing or projected TEU volumes to support the ICTF's 24-hour-per-day, 7-day-a-week operations. The connection to a high-volume container terminal is needed for the ICTF to reach a minimum operational capacity of 800,000 TEUs per year (per the Applicant's purpose and need statement).

2.3.1.2.2 Screening Criterion #IB: Area of Available Land Required for an ICTF (65+ acres)

The ability for an ICTF to handle existing and projected future intermodal container traffic from the Port and/or other businesses in the region also would require a minimum facility footprint. For an ICTF to handle a minimum of 20 percent of intermodal traffic that would be shipped by rail from the Port, or approximately 800,000 TEUs, a TEU capacity throughput per acre must be established. Whereas a conventional ICTF typically has a throughput capacity of 3,500 TEUs/acre, the Proposed Project would be a state-of-the-art facility that could process as much as 12,000 TEUs/acre (primarily due to the use of a private drayage road connected with a high TEU-capacity container terminal). As a result, a contiguous 65-acre minimum footprint would be necessary to handle the 800,000 TEUs/year. Sites were considered available if they were: (1) undeveloped and could be acquired by Palmetto Railways[42]; (2) identified in the South Carolina State Rail Plan (Wilbur Smith Associates 2009); or (3) owned by Palmetto Railways.

2.3.1.3 Tier II Screening Criteria

For those potential sites that were carried forward from the Tier I analysis, more detailed Tier II screening criteria were used in a step-wise process to narrow the realm of specific alternative sites for the Proposed Project. The criteria included:

- Available infrastructure required for an ICTF
  - Proximity to existing rail lines for both Class I carriers
  - Proximity to highway network
  - Major infrastructure needed to access existing rail and/or highway network
- Availability of a private drayage road
- Configuration of available acreage

2.3.1.3.1 Screening Criterion #IIA: Available Infrastructure Required for an ICTF

The availability of key infrastructure is critical in determining whether a potential ICTF location would be viable. In light of the project's purpose and need, infrastructure needed for an ICTF would include rail lines for both Class I carriers, and major road networks for trucks that are transporting

[42] Palmetto Railways cannot acquire federally owned property and property owned by the Class I carriers; therefore, these lands are not considered to be available.

containers from other Port terminals and/or local businesses and industries. Potential sites without rail/road networks in close proximity, or that would need the construction of major new infrastructure (e.g., interstate or highway bridges), could be cost-prohibitive to develop as an ICTF.

2.3.1.3.1.1 Screening Criterion #IIA-1: Proximity to Existing Rail Lines for both Class I Carriers

The provision of equal access to CSX and NS is a requirement identified in the purpose and need for the project. For the purposes of this analysis, the potential cost and impacts to the human and natural environment associated with the construction of new rail connections that access existing Class I rail carrier lines would be considered as part of the screening criterion. This criterion also considers the anticipated wetland impacts from extending the rail alignment for both Class I carriers. Adding long-distance rail connections would be cost-prohibitive.

2.3.1.3.1.2 Screening Criterion #IIA-2: Proximity (less than 2 miles) to Highway Network

Access from the ICTF to major road networks and highways is also imperative for delivery of intermodal containers by trucks from other nearby intermodal container terminals and/or businesses in the region. Nearby access to a highway system, less than 2 miles (Bochner, Higgins, and Frawley 2010), minimizes the need for truck traffic to navigate through local and secondary road networks, while simultaneously minimizing adverse impacts to the roads, residents, and businesses located along these secondary road networks. This criterion also considers the anticipated wetland impacts from extending roadway alignments to major roadways. Adding long-distance connections to or extensions of major roadways would be cost-prohibitive.

2.3.1.3.1.3 Screening Criterion #IIA-3: Major Infrastructure Needed to Access Existing Rail and Highway Networks

The Corps recognized that locating an ICTF in an area that would require major infrastructure projects and/or improvements, such as new interstate or highway bridges or exit ramps, would be cost prohibitive. Accordingly, each potential site was evaluated to determine whether such major infrastructure would be needed to accommodate an ICTF.

2.3.1.3.2 Screening Criterion #IIB: Availability of a Private Drayage Road

One of the key elements for a competitive and cost effective near-dock facility is the ability to transport intermodal containers from the Port terminal to the ICTF on a private road, or private road network. As discussed in the project's purpose and need statement from Palmetto Railways, the ability to achieve a throughput capacity of 12,000 TEUs/acre is dependent on operational efficiencies from the presence of a private drayage road.

The primary reason for this project element is that the private drayage road provides a critical operational efficiency by allowing for 24 hour/day, 7 days/week delivery of intermodal containers

from the associated Port container terminal. This steady flow of containers enables the ICTF to operate 24 hours per day, maximize the throughput of intermodal containers to approximately 12,000 TEUs/acre, and, as a result, meet the purpose and need for transporting a minimum of 20 percent, or 800,000 TEUs, of the Port's total intermodal container traffic using rail. To be considered as a near-dock facility, the drayage road would need to be a length of less than 4 miles in distance from a container terminal.

In addition, many international containers have a weight that exceeds the limits allowed on public roadways and highways, typically 80,000 pounds. In the absence of a private drayage road, these overweight containers would have to undergo additional handling and processing so the goods could be divided and transferred to an additional container to comply with all applicable public roadway weight restrictions. The use of a private drayage road eliminates this double handling of heavier international containers, and is a more cost-effective approach to handling intermodal container traffic.

2.3.1.3.3 Screening Criterion #IIC: Configuration of Available Acreage

While it is important to have a parcel of land large enough to accommodate an ICTF, the configuration of the parcel is equally important. Any potential parcel of land that is at least 65 acres in size must also be able to accommodate the numerous processing and classification railroad tracks, wide-span gantry cranes, container storage areas, administrative and maintenance buildings, and other associated infrastructure for an ICTF to achieve a throughput capacity of at least 800,000 TEUs per year. While there is not a specific definable configuration that is required, examples of ICTFs across the country indicate the most cost-effective configuration for an ICTF would be an extended rectangular-shaped parcel. Regardless of specific shape, the site configuration should be conducive to process the intended throughput capacity.

2.3.2 Results of Screening Analyses

2.3.2.1 Results from Initial Screening Criterion: Presence of Private/Public Intermodal Container Terminals in the Charleston Harbor

There are four public and no private container terminals in the Charleston Harbor that handle, or are planning to handle, intermodal container traffic. The four intermodal public terminals are part of the Port: North Charleston Container Terminal, HLT (under construction), Wando Welch Container Terminal, and Columbus Street Terminal. The other two terminals associated with the Port (Union Pier and Veterans Terminal) do not handle intermodal containers. Union Pier Terminal is almost exclusively a cruise terminal but also handles "break-bulk" (e.g., paper, wire rods) and roll-on/roll-off items such as heavy equipment and cars. Veterans Terminal has very few ship calls, and primarily handles "bulk" (e.g., aggregate) and "break-bulk" cargo.

Accordingly, the four public container terminals carried forward into Tier I Screening are Wando Welch Container Terminal, HLT, Columbus Street Terminal, and North Charleston Container Terminal.

2.3.2.1.1 Wando Welch Container Terminal

The Wando Welch Container Terminal is located in Mt. Pleasant on the east bank of the Wando River. It currently handles a majority of the container traffic through the Port of Charleston, and has a total throughput capacity of approximately 1.6 million TEUs per year. The Port projects that the terminal will handle approximately 1.5 million TEUs per year in 2018, and approximately 1.6 million TEUs per year in 2038[43]. Currently, intermodal containers that will be transported by rail are first carried by truck to CSX's Ashley Junction rail yard or NS's 7-Mile rail yard.

2.3.2.1.2 Hugh K. Leatherman, Sr. Terminal (HLT)

The HLT is located in North Charleston along the west bank of the Cooper River, and is within the boundary of the former CNC. After the terminal is completed (projected completion is 2019), it would be able to handle a total throughput capacity of 1.4 million TEUs of container traffic per year. While the terminal would not be completed by the time that the proposed ICTF would be in operation (2018), the Port projects that the terminal would handle approximately 1.4 million TEUs per year by 2038.

2.3.2.1.3 Columbus Street Terminal

The Columbus Street Terminal is located in the City of Charleston on the west bank of the Cooper River, and south of the former CNC. The Columbus Street Terminal is a combination "break-bulk" and container terminal that primarily serves the automobile manufacturer BMW. The Port projects that the terminal will handle approximately 66,000 TEUs per year in 2018, and approximately 300,000 TEUs per year in 2038.[44]

2.3.2.1.4 North Charleston Container Terminal

The North Charleston Container Terminal is located in the City of North Charleston along the west bank of the Cooper River, and is adjacent to the Charleston Naval Weapons Station. The Port projects that the terminal will handle approximately 650,000 TEUs per year in 2018, and approximately 700,000 TEUs per year in 2038.[45]

[43] Personal communication, Barbara Melvin, August 12, 2014.

[44] Personal communication, Barbara Melvin, August 12, 2014.

[45] Personal communication, Barbara Melvin, August 12, 2014.

2.3.2.2 Results from Tier I Screening Criteria

The Wando Welch Container Terminal, HLT, Columbus Street Terminal, and North Charleston Terminal were evaluated using the Tier I screening criteria. The screening criteria were adapted into a GIS-based approach to identify potential alternative sites.

2.3.2.2.1 Screening Criterion #IA: Proximity (within 4 miles) to Private/Public Intermodal Container Terminals in the Charleston Harbor

As described below, out of the four container terminals in the Charleston Harbor that were identified during the initial screening process, two were eliminated based on Screening Criterion IA (Columbus Street Terminal and North Charleston Container Terminal), and two were carried forward for evaluation based on Screening Criterion IB (Wando Welch Container Terminal and HLT).

The Port currently projects that Columbus Street Terminal would handle approximately 14,000–20,000 TEUs that would be shipped by rail in 2018 (the projected opening of the proposed ICTF), and further projects that, in Year 2038, the terminal would handle no more than 90,000 TEUs per year that would be transported by rail.[46] In light of these low TEU volumes, it would be impractical, and would not meet the purpose and need for the Proposed Project, to site an ICTF on or near the Columbus Street Terminal solely for the purposes of accommodating existing and/or projected future intermodal traffic through the Port.

The inability to meet a minimum throughput TEU capacity of 800,000 TEUs/year (as defined in the purpose and need) also would prevent placement of an ICTF near or on the North Charleston Container Terminal. The Port currently projects that the North Charleston Container Terminal would handle approximately 120,000–160,000 TEUs that would be shipped by rail in 2018, and further projects that, in Year 2038, the terminal would handle no more than 210,000 TEUs that would be transported by rail.[47] Neither container terminal processes a sufficient volume to warrant the use of a private drayage road for 24/7 operations to the ICTF; therefore, they were eliminated from further consideration.

In comparison, the Port projects that Wando Welch Container Terminal and the HLT (under construction) would handle as much as 475,000 TEUs and 420,000 TEUs, respectively, which would be transported by rail in 2038. Both of these projected volumes would be sufficient to warrant a connection of an ICTF with a private drayage road, and to operate efficiently to reach a minimum 800,000 TEU throughput; therefore, these two container terminals are carried forward for additional screening.

[46] Personal communication, Barbara Melvin, August 12, 2014.

[47] Personal communication, Barbara Melvin, August 12, 2014.

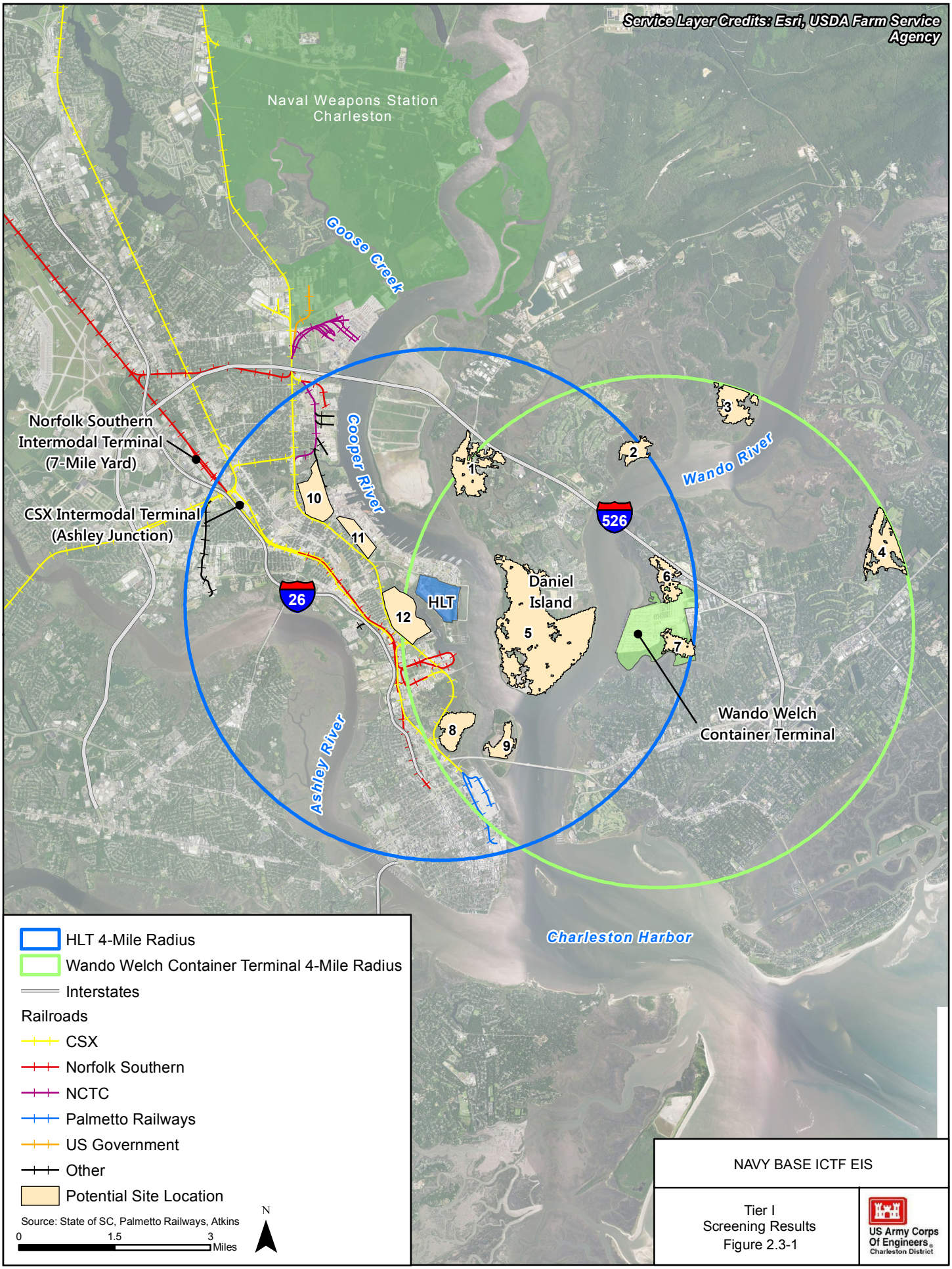
2.3.2.2.2 Screening Criterion #IB: Area of Available Land Required for an ICTF (65+ acres)

To efficiently identify potential ICTF sites associated with the Wando Welch Container Terminal and the HLT, data from the National Oceanic and Atmospheric Administration's (NOAA) Coastal Change Analysis Program (C-CAP) was utilized. C-CAP produces a nationally standardized database of land cover and land change information for the coastal regions of the U.S. To identify suitable sites, all developed land uses within a 4-mile radius of the two terminals were eliminated. Wetlands were identified to determine suitable sites with minimal wetland impacts. After all non-suitable land uses were eliminated, a query was performed to determine contiguous land uses that were 65 acres or greater (minimum size necessary for the site). After all the remaining sites were identified, each site then was reviewed a final time to ensure development potential. If sites had additional constraints (i.e., federal lands, state parks, etc.) that would prevent their use, they were removed from further consideration.

This analysis resulted in twelve potential sites (Figure 2.3-1) that were carried forward to evaluation by Tier II screening criteria. Descriptions of the 12 sites are contained in Table 2.3-1.

2.3.2.3 Results from Tier II Screening Criteria

Twelve sites near Wando Welch Container Terminal and the HLT were evaluated using Tier II screening criteria. Three of the 12 sites were previously identified in the South Carolina State Rail Plan (Wilbur Smith Associates 2009) as potential locations for an ICTF. These three sites are identified in this analysis as the Macalloy Site, the Project site (Former Clemson Site), and the River Center project site (Former Noisette Site). All 12 sites were evaluated in a step-wise fashion, where potential sites that were screened out by a particular Tier II criterion were not carried forward for further evaluation in subsequent criteria.


Service Layer Credits: Esri, USDA Farm Service Agency
Naval Weapons Station Charleston
Goose Creek
Cooper River
Wando River
Ashley River
Charleston Harbor
Norfolk Southern Intermodal Terminal (7-Mile Yard)
CSX Intermodal Terminal (Ashley Junction)
Daniel Island
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Wando Welch Container Terminal
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Interstates
Railroads
CSX
Norfolk Southern
NCTC
Palmetto Railways
US Government
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NAVY BASE ICTF EIS
Tier I
Screening Results
Figure 2.3-1
US Army Corps Of Engineers
Charleston District

Table 2.3-1
Potential Sites Associated with the HLT
and the Wando Welch Port Facilities

Site	Description	Driving Distance to Container Terminals*
1	This 238-acre parcel primarily consists of evergreen forest with sparse areas of scrub/shrub habitat and grassland. This site is adjacent to the interchange at I-526 and Clements Ferry Road. The nearest existing rail line for Class I carriers is approximately 8.96 miles away.	Driving distance along existing roadway(s) from Site 1 to Wando Welch is approximately 5.6 miles. Driving distance to HLT is 11.2 miles.
2	This 80-acre parcel consists of evergreen forest land. The site is adjacent to the Wando River, 1.67 miles northeast of I-526, and south of the Daniel Island Country Club. This site is approximately 7.45 miles away from an existing rail line for a Class I carrier.	Driving distance along existing roadway(s) from Site 2 to Wando Welch is approximately 6.6 miles. The distance from Site 2 to the HLT is 17 miles.
3	This 153-acre parcel consists of an even mixture of evergreen forest and scrub/shrub habitat. The evergreen forest appears to be planted rows of pine trees. The site is adjacent to the Wando River on Point Hope Island and lies south of Clements Ferry Road. The site is approximately 2.59 miles to a major highway network and 7.05 miles away from an existing rail line for a Class I carrier.	Driving distance along existing roadway(s) from Site 3 to Wando Welch is approximately 11.1 miles. Distance to the HLT is approximately 18.7 miles
4	This 214-acre parcel consists of a mixture of pastureland, evergreen forest, and cultivated crops with some scrub/shrub habitat. The site is adjacent to U.S. Highway 17 (US 17) and Long Point Road. This site is 10.09 miles from an existing rail line for a Class I carrier.	Driving distance along existing roadway(s) from Site 4 to Wando Welch is approximately 5.7 miles. Distance to the HLT is approximately 13.8 miles.
5	This 1,117-acre parcel is classified as an active and inactive confined disposal facility (CDF) and a mixture of cultivated crops, cleared land, and scrub/shrub habitat. The site is located on the southern tip of Daniel Island, and is bounded by the Wando River to the east and the Cooper River to the west. This site is approximately 2.59 miles from a major highway network and approximately 11.58 miles from an existing rail line for a Class I carrier.	Driving distance along existing roadway(s) from Site 5 to Wando Welch is approximately 6.4 miles and from Site 5 to the HLT is 17.2 miles.
6	This 102-acre parcel primarily consists of evergreen forest with patches of scrub/shrub habitat and mixed forest. The site is adjacent to the Wando Welch Terminal on the north side and lies adjacent to I-526. The nearest existing rail line for Class I carriers is approximately 9.55 miles away.	Site 6 is adjacent to the Wando Welch Terminal and is approximately 20.2 miles to the HLT.

Table 2.3-1, cont'd

Site	Description	Driving Distance to Container Terminals*
7	This 80-acre parcel consists of a mixture of undeveloped grassland and evergreen forest. The site is located just south of the Wando Welch Terminal. This site is approximately 0.43 mile south of I-526 and is adjacent to an existing rail line for a Class I carrier.	The Wando Welch Terminal is adjacent to Site 7, while driving distance to the HLT is approximately 13.4 miles.
8	This 139-acre parcel primarily consists of grassland/cleared land with scattered areas of scrub/shrub habitat. The site is located off of Romney Street and is bordered by the Cooper River on the east side. US 17 is close by to the north of the parcel (0.20 mile). An existing rail line for a Class I carrier is located adjacent to the site to the west.	Driving distance along existing roadway(s) from Site 8 to the HLT is approximately 4.5 miles. Distance to Wando Welch Terminal is approximately 8.7 miles.
9	This 80-acre parcel is located on Drum Island, and consists primarily of cleared land. The Arthur Ravenel Jr. Bridge along US 17 spans the site on the south side. The site is approximately 0.62 mile from an existing rail line for a Class I carrier and is adjacent to a major highway network, but there are no connections to either from the island.	Driving distance along existing roadway(s) from Site 9 to the HLT is approximately 6.0 miles. Distance to Wando Welch Terminal is approximately 7.5 miles.
10	This 185-acre parcel consists of a mixture of high-intensity and medium-intensity development. Formerly known as the Noisette Site (Wilbur Smith Associates 2009), this site is located at the northern end of the former CNC and is referred to as the "River Center project site" for this analysis. The majority of the site is owned by Palmetto Railways; however, several tracts of property that are owned by the City of North Charleston will be transferred into ownership by Palmetto Railways in 2017. The site is nearby to an existing rail line for a Class I carrier and to a major highway network.	Driving distance along existing roadway(s) from Site 10 to the HLT is approximately 2.2 miles. Distance to Wando Welch Terminal is approximately 13.9 miles.
11	This 100-acre parcel consists of a mixture of low- to medium-intensity development with some developed open space (i.e., ball fields). Formerly known as the Clemson Site (Wilbur Smith Associates 2009), this site is located in the middle of the former CNC and is referred to as the Project site for this analysis. There is an existing rail line for a Class I carrier nearby to the west. The site is also adjacent to a major highway network.	Driving distance along existing roadway(s) from Site 11 to the HLT is approximately 1.2 miles. Distance to Wando Welch Terminal is approximately 12.3 miles.

Table 2.3-1, cont'd

Site	Description	Driving Distance to Container Terminals*
12	This 228-acre parcel consists of a mixture of medium-intensity development, developed open space, and cleared land. Undeveloped land accounts for approximately 151 acres, while 76 acres are developed on the western portion of the property, which currently provides isotainer (i.e., a bulk liquid tank in a container) cleaning and storage. Known as the Macalloy Site (Wilbur Smith Associates 2009), the site lies west of the HLT and Shipyard Creek, and is a Superfund site. There is an existing rail line for a Class I carrier adjacent to the west. The site is also adjacent to a major highway network.	Driving distance along existing roadway(s) from Site 12 to the HLT is approximately 0.5 mile. Distance to Wando Welch Terminal is approximately 11.8 miles.

Source: Atkins 2018.

* Driving distance was determined along the roadways that were assumed to have more through-traffic and not along roads going through neighborhoods.

The alternatives analysis resulted in two sites—the River Center project site and the Proposed Project site—that "passed" all the Tier I and Tier II screening criteria and that would meet the purpose and need of the Proposed Project (Figure 2.3-2). Because the Corps deemed these two sites acceptable locations for potential placement of an ICTF, they were be carried forward for further consideration in the EIS. Tables 2.3-2, Table 2.3-3 and Table 2.3-4 provide the summary results of the Tier II screening analysis, including the conclusion from the Tier I screening (eliminated/reason or carried forward to Tier II screening).

2.3.2.3.1 Screening Criterion #IIA: Available Infrastructure Required for an ICTF

When the final 12 potential sites were determined (Figure 2.3-1), each site was then evaluated to determine: (1) its proximity and distance to existing rail lines and highway networks; (2) the need to construct new, major road/rail improvements (e.g., highway and/or interstate bridges) to connect with existing rail and highway networks; (3) the impact (wetlands and rough cost) for connecting the existing road/rail connection to the potential site; and (4) proximity of the potential sites to the associated container terminal.

Table 2.3-2
Summary of Results for Tier II Screening Analysis (Screening Criterion #IIA)

Site	Tier II Screening Criterion #IIA: Available Infrastructure Required for an ICTF				Carried Forward to #IIB Screening?
	Proximity to Existing Rail Lines for Class I Carriers (Miles)	Proximity to Major Highway Network (Miles)	Estimated Wetland Impacts (Acres) for Rail, Public Road Access	New Major Infrastructure Needed to Access Rail/Road Network?	YES/NO
1	8.96	Adjacent	16.6 rail, 0.00 road	Y	NO
2	7.45	1.67	14.2 rail, 6.75 road	Y	NO
3	7.05	2.59	3.56 rail, 2.33 road	Y	NO
4	10.09	Adjacent	13.8 rail, 0.00 road	Y	NO
5	11.58	2.59	20.40 rail, 15.8 road	Y	NO
6	9.55	Adjacent	16.3 rail, 0.00 road	Y	NO
7	10.67	0.43	16.7 rail, 0.79 road	Y	NO
8	Adjacent	0.20	0.00 rail, 0.00 road	N	YES
9	0.62	Adjacent	2.19 rail, 0.00 road	Y	NO
10	Less than 0.50	Adjacent	0.99 rail, 0.00 road	N	YES
11	Less than 0.50	Adjacent	0.00 rail, 0.00 road	N	YES
12	Adjacent	Adjacent	0.00 rail, 0.00 road	N	YES

Source: Atkins 2018.

As a result of this screening criterion, the Corps eliminated eight sites from further Tier II screening, while the remaining four sites associated with the HLT (8, 10, 11, and 12) were carried forward to screening Criterion IIB (shown in Table 2.3-2).

When calculating wetland impacts for rail lines, a buffer of 25 feet[48] on each side of the rail center line was used. For roadway alignments, a buffer of 62 feet on each side of the roadway centerline was used. Industry standards for costs to construct or modify infrastructure for rail and road access are:

- $225/LF, or $1 million/mile for new main rail line track
- $1 million/mile to resurface a two-lane rural road
- $2 million/mile to construct a two-lane rural road
- $5 million/mile to construct a 4-lane urban arterial road

Therefore, adding long-distance connections to existing road or rail networks would be considered cost-prohibitive and therefore unreasonable. Likewise, the need to construct major roadway improvements such as highway exits or interstate bridges would be considered cost-prohibitive and therefore unreasonable.

2.3.2.3.2 Screening Criterion #IIB: Availability of a Private Drayage Road

Four sites (8, 10, 11, and 12) were evaluated for the feasibility of constructing a private drayage road linking the potential site with the HLT. Table 2.3-3 provides the results of Screening Criterion #IIB.

- Establishing a private drayage road from Site 8 would not be practical due to the location of the HLT entry gate. The private drayage road would exceed the four-mile maximum length that is identified in the screening criterion (4.5 miles long) and would cross multiple rail crossings, and private property that would have to be condemned. Without the private drayage road, the ICTF would not be a near-dock facility and, therefore, would not meet the project's purpose and need. In addition, Site 8 is located on a former landfill (dredged material disposal site on top of unconsolidated trash), and would not be suitable for placement of an ICTF. For these reasons, this site was not carried forward for screening.
- Site 10 (the River Center project site) would be able to support a private drayage road from the HLT entry gate to the southernmost portion on the River Center project site. The private drayage road would be approximately 2 miles in length and would have approximately 1 acre of wetland impacts.
- Site 11 (the project site) also would be able to support a private drayage road from the HLT's entry gate to the southern boundary of the project site. The private drayage road would be 1 mile in length, and would have approximately 1 acre of wetland impacts.
- Site 12 (the Macalloy Site) would support a private drayage road from the HLT. The private drayage road would be approximately 0.5 mile in length and would have approximately 1 acre of wetland impacts.

[48] Twenty-five feet was used for this planning level analysis to cover the ROW width and allow some additional width for temporary construction. In sections to follow, a limits-of-construction file with an average of twenty-nine feet from rail center to buffer edge was used to calculate wetland impacts.

Table 2.3-3
Summary of Results for Tier II Screening Analysis (Screening Criterion #IIB)

Site	Tier II Screening Criterion #IIB: Availability of a Private Drayage Road	Estimated Wetland Impact (acres) from Drayage Road	Carried Forward to #IIC Screening?
	YES/NO		YES/NO
8	NO	N/A	NO
10	YES	1	YES
11	YES	1	YES
12	YES	1	YES

Source: Atkins 2016.

2.3.2.3.3 Screening Criterion #IIC: Configuration of Available Acreage

The three sites carried forward (10, 11, and 12) were evaluated to determine whether the site's configuration would support an ICTF that would meet the purpose and need of the project. At more than 185 acres, Site 10 (the River Center project site) has sufficient acreage to support a state-of-the-art ICTF, and has sufficient configuration to place an ICTF on an extended rectangular-shaped parcel. Similarly, Site 11 (the Project site) has sufficient acreage (118 acres) in an acceptable configuration to support a state-of-the-art ICTF.

Site 12 (the Macalloy Site) has sufficient acreage with 228 acres (approximately 170 acres on the south side of the Port Access Road); however, existing and proposed future infrastructure on the site (e.g., Port Access Road) constrains the site's ability to achieve a throughput capacity of at least 800,000 TEUs per year, which is necessary to meet the purpose and need of the Proposed Project. In light of the encumbrances that result from existing and future infrastructure, the site configuration cannot achieve the required throughput capacity for several reasons, including: the number of wide-span gantry cranes that can be placed on the site is limited (available space and required buffers between cranes); the inability to physically place a sufficient number of arrival/departure tracks and associated processing and classification tracks required for the operation of the wide-span gantry cranes (a minimum of 500 feet of track is needed for each crane, 3) the inability to place tail tracks on the site, which contributes to the inability to assemble multiple 3,000-foot train segments (for building 9,000- to 10,000-foot trains); and physical constraints to train switching requirements within the site as a result of configuring the various elements of an ICTF in the existing available acreage. Land adjacent to the Macalloy property that could provide additional space for placement of processing and classification

***Tail track*: A section of rail track that is stub-ended and allows for the staging of approximately 3,000-foot train segments while building an approximately 9,000- to 10,000-foot train.**

tracks is not available because the property is owned by CSX, and it cannot be condemned.

2.3.2.3.4 Summary

As a result of this screening criterion, and as shown in Table 2.3-4, one site (Site 12) was eliminated from further analysis. The remaining two sites, Sites 10 and 11, are carried forward for detailed evaluation in the EIS (shown on Figure 2.3-2).

Table 2.3-4
Summary of Results for Tier II Screening Analysis (Screening Criterion #IIC)

Site	Tier II Screening Criterion #IIC: Configuration of Available Acreage	Carried Forward for Analysis in the EIS?
	YES/NO	YES/NO
10	YES	YES
11	YES	YES
12	NO	NO

Source: Atkins 2016

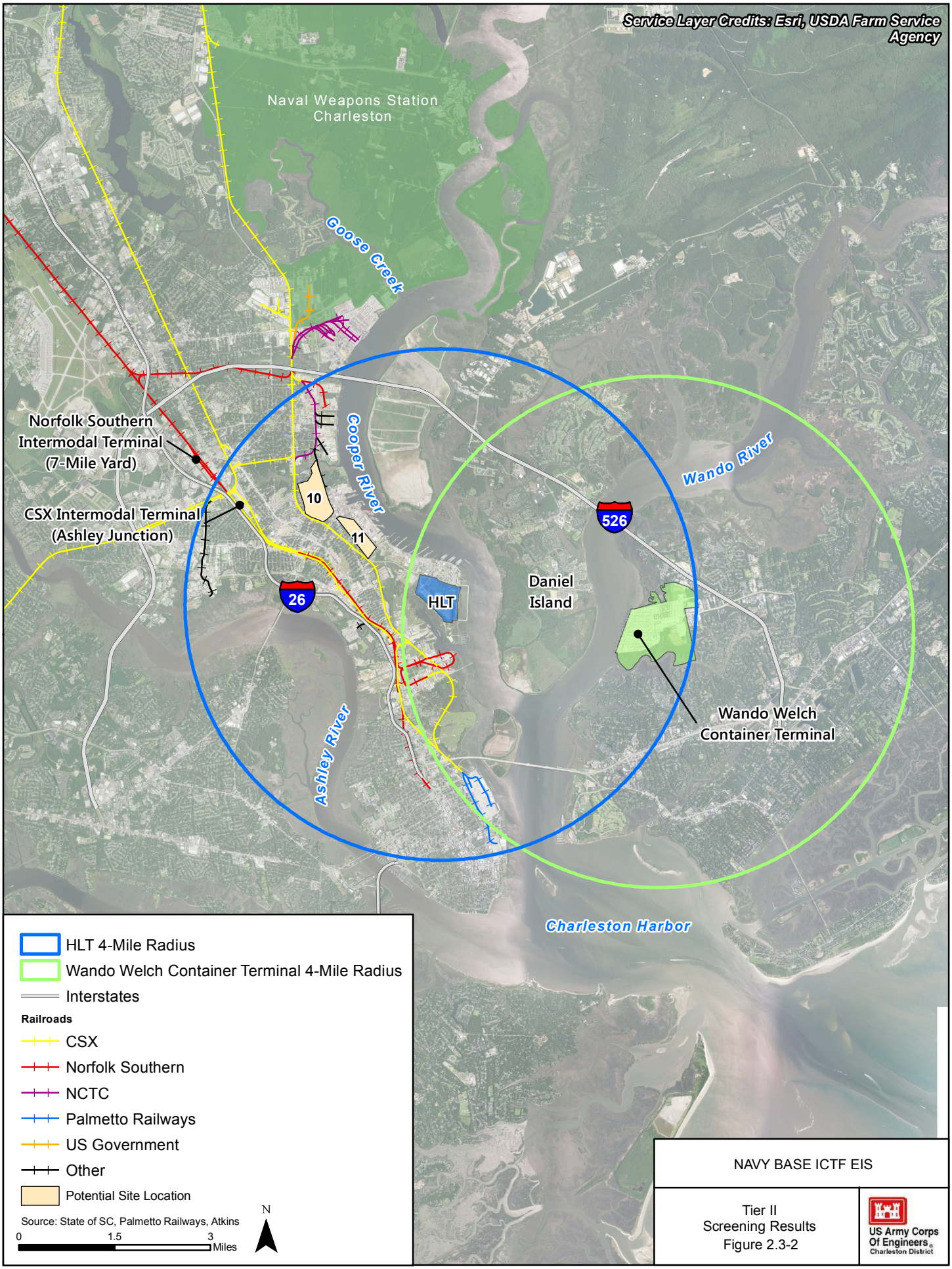
2.3.3 Alignments Considered but Not Further Evaluated

2.3.3.1 Arrival/Departure Track Alignments

In addition to the two arrival/departure track options presented under the Proposed Project, there were other alternative rail routes leaving the Project site that were considered but eliminated from further evaluation. This included placement along Noisette Boulevard, and placement along Spruill Avenue adjacent to the CSX ROW.

The Noisette Boulevard Route was eliminated because geometry of the proposed grade separation of Cosgrove Ave would not be able to give adequate clearances to tie into the existing roadways, it would block pedestrian access to parking areas across Noisette Blvd, and create safety hazards due to having to add more at grade railroad crossings. This alignment would also require demolition of additional structures along Noisette Blvd and limit operations and access to existing businesses and other land uses for extended periods of time. Redevelopment efforts of adjacent buildings would also be impacted.

Placing the route along Spruill Avenue adjacent to, but not within, the CSX ROW was eliminated from further evaluation due to property acquisition associated with construction. In order to have the correct track geometry, this option would require impacts to existing businesses and residences along Aragon Avenue and Spruill Ave. As many as 50 properties or more would need to be acquired.


Service Layer Credits: Esri, USDA Farm Service Agency
Naval Weapons Station Charleston
Goose Creek
Norfolk Southern Intermodal Terminal (7-Mile Yard)
CSX Intermodal Terminal (Ashley Junction)
Cooper River
10
11
26
526
HLT
Daniel Island
Wando River
Wando Welch Container Terminal
Ashley River
Charleston Harbor
HLT 4-Mile Radius
Wando Welch Container Terminal 4-Mile Radius
Interstates
Railroads
CSX
Norfolk Southern
NCTC
Palmetto Railways
US Government
Other
Potential Site Location
Source: State of SC, Palmetto Railways, Atkins
0
1.5
3
Miles
N
NAVY BASE ICTF EIS
Tier II
Screening Results
Figure 2.3-2
US Army Corps Of Engineers
Charleston District

2.3.3.2 Drayage Road Alignments

Several alignments for the drayage road were considered during the development of the Proposed Project and alternatives analysis but not further evaluated. These included an alignment along Bainbridge Avenue, and various alignments in the western portion of the FLETC-owned property to the north of the HLT.

The placement of the drayage road along Bainbridge Avenue was eliminated from further evaluation because all FLETC operations west of Bainbridge Avenue would be cut off, and the placement would require a secondary entrance to the HLT. Placement along the furthest western boundary of the FLETC-owned property was also considered at the request of FLETC so as to minimize impacts to its operations at the site; however, even with using the centerline of the tidelands road for the alignment, this placement would result in acres of additional tidal salt marsh impacts. As a result, the Corps eliminated this alignment from further evaluation. Similarly, placement of the drayage road on uplands within the western boundary of the FLETC-owned property was considered so that impacts to wetlands would be minimized; however, such placement would require relocation of two training areas that FLETC uses just south of Shipyard Creek, and would impact an area that the U.S. Coast Guard leases from FLETC for two radio towers used for emergency VHF communications along the east coast. As a result, the Corps eliminated this alignment from further evaluation. The proposed alignment of the drayage road minimizes impacts to waters of the U.S., including wetlands and avoids impacts to FLETC training facilities and the U.S. Coast Guard facilities.

2.4 ALTERNATIVES RECOMMENDED FOR DETAILED EVALUATION IN THE EIS

Based on information submitted by the Applicant in their proposal, and the Corps' own independent review, the Corps completed the initial identification and evaluation of alternatives for the Navy Base ICTF and determined that eight alternatives should be evaluated in detail in the EIS (see Table 2.4-1). In addition to the No-Action Alternative, four alternatives are associated with the Project site, and three alternatives are associated with the River Center project site. Variations of alternatives within a Project site are primarily based on differing arrival/departure track alignments.

Terminology used for River Center alternatives:

- ***River Center ICTF*: The 113-acre facility site.**
- ***River Center Project Site*: The 113-acre facility site (ICTF), and associated impact areas for the ICTF and off-site roadway and rail improvements.**

Table 2.4-1
Alternatives Recommended for Detailed Evaluation in the EIS

Alternative	Description
No-Action Alternative	Application for DA permit would be denied; the Proposed Project would not occur; CSX and NS would undertake operational and structural modifications to Ashley Junction and 7-Mile rail yards. Future use of the Proposed Project and River Center project sites would likely be mixed-use and industrial (e.g., rail-served warehousing distribution center).
Alternative 1: Applicant's Proposed Project (South via Milford / North via Hospital District)	Palmetto Railways Project would be constructed and operated as proposed (Section 1.7).
Alternative 2: Proposed Project Site (South via Milford / North via S-line)	A variation of the Proposed Project where the northern rail connection would be relocated along Spruill Avenue within existing CSX ROW to the S-line, and turn east along Aragon Avenue to the existing NCTC rail line; road and rail improvements would be adjusted accordingly to facilitate rail and road traffic as a result of the northern rail connection alignment.
Alternative 3: Proposed Project Site (South via Kingsworth / North via Hospital District)	A variation of the Proposed Project where the southern rail connection would connect to an existing rail line near Kingsworth Avenue (and adjacent to existing rail and ROW); road and rail improvements would be adjusted accordingly to facilitate rail and road traffic as a result of the southern rail connection alignment.
Alternative 4: Proposed Project Site (South via Milford)	A variation of the Proposed Project where trains would enter and exit the Navy Base ICTF from a southern rail connection only. An additional parallel track would enter and exit the Navy Base ICTF as described in the Proposed Project, and connect to an existing rail line near Milford Street (and adjacent to existing rail and ROW). Proposed rail for train switching (building) through the Hospital District would stop short of Noisette Creek.
Alternative 5: River Center Project Site (South via Milford / North via Hospital District)	A variation of the Proposed Project with the Project site being moved to the River Center project site; road and rail improvements would be adjusted accordingly to facilitate rail and road traffic at the new site.
Alternative 6: Alternative 6: River Center Project Site (South via Kingsworth / North via Hospital District)	A variation of the Proposed Project with the Project site being moved to the River Center project site and the southern rail connection would connect to an existing rail line near Kingsworth Avenue (and adjacent to existing rail and ROW). Road and rail improvements would be adjusted accordingly to facilitate rail and road traffic at the new site.

Alternative	Description
Alternative 7: River Center Project Site (South via Milford)	A variation of the Proposed Project with the Project site being moved to the River Center project site and trains would enter and exit the Navy Base ICTF from a southern rail connection; road and rail improvements would be adjusted accordingly to facilitate rail and road traffic at the new site.

2.4.1 No-Action Alternative

The No-Action Alternative represents the future without the Proposed Project, and is used as a baseline from which to compare alternatives. Under the No-Action Alternative, the Corps would not issue a DA permit. As the Project is currently proposed, impacts to waters of the U.S., including wetlands at Shipyard Creek and Noisette Creek would be unavoidable, and a DA permit would be required for the Project to proceed. As a result, the second scenario would not be feasible. Therefore, under the No-Action Alternative, the Corps would not issue a DA permit, and construction and operation of the Navy Base ICTF would not occur. The No-Action Alternative assumes that the SCDOT would construct the Port Access Road, which would elevate Stromboli Avenue.[49]

Related to the purpose and need as stated by the Applicant, the No-Action Alternative assumes that the two existing rail yards (Ashley Junction/Bennett Yard and 7-Mile) would continue to handle and process current and projected future intermodal container traffic that would be transported by rail. CSX and NS would implement operational and structural modifications to their respective rail yards to increase their capabilities; however, the capacities and size limitations of the two rail yards would constrain the region's ability to accommodate the projected 25–30 percent of intermodal containers that could be transported by rail in 2038. Intermodal containers would continue to be delivered by truck to the two rail yards. The majority of intermodal containers coming through the Port's container terminals would continue to be transported by truck to their destinations, using public roadways.

For the purposes of this EIS, the No-Action Alternative assumes that the Project site and the River Center project site would continue to include mixed use (residential and commercial) and industrial land uses. In light of Palmetto Railways' ownership of the properties, there would be the potential for redevelopment of these areas to include rail-served warehousing and distribution. A rail-served warehousing and distribution center typically consists of a yard in the center of the property, with either multiple "smaller" warehouses or the construction of a large warehouse (1,000,000+ SF). Rail tracks could be placed alongside the warehouse(s). Other features associated with a rail-served warehousing distribution center could include impervious parking, green space, administrative

[49] The SCDOT began construction on the Port Access Road (Project ID 0037345) Design-build Project in November 2016. Information on the project can be found at: http://www.scportaccessroad.com .

buildings, stormwater retention, and other infrastructure. Truck traffic to a rail-served warehousing and distribution center would most likely occur using the Cosgrove Avenue exit on I-26.

2.4.2 Alternative 1: The Applicant's Proposed Project (South via Milford / North via Hospital District)

Alternative 1 is the Applicant's Proposed Project as defined in Section 1.7 and shown on Figure 1.7-1.

2.4.3 Alternative 2: Proposed Project Site (South via Milford / North via S-line)

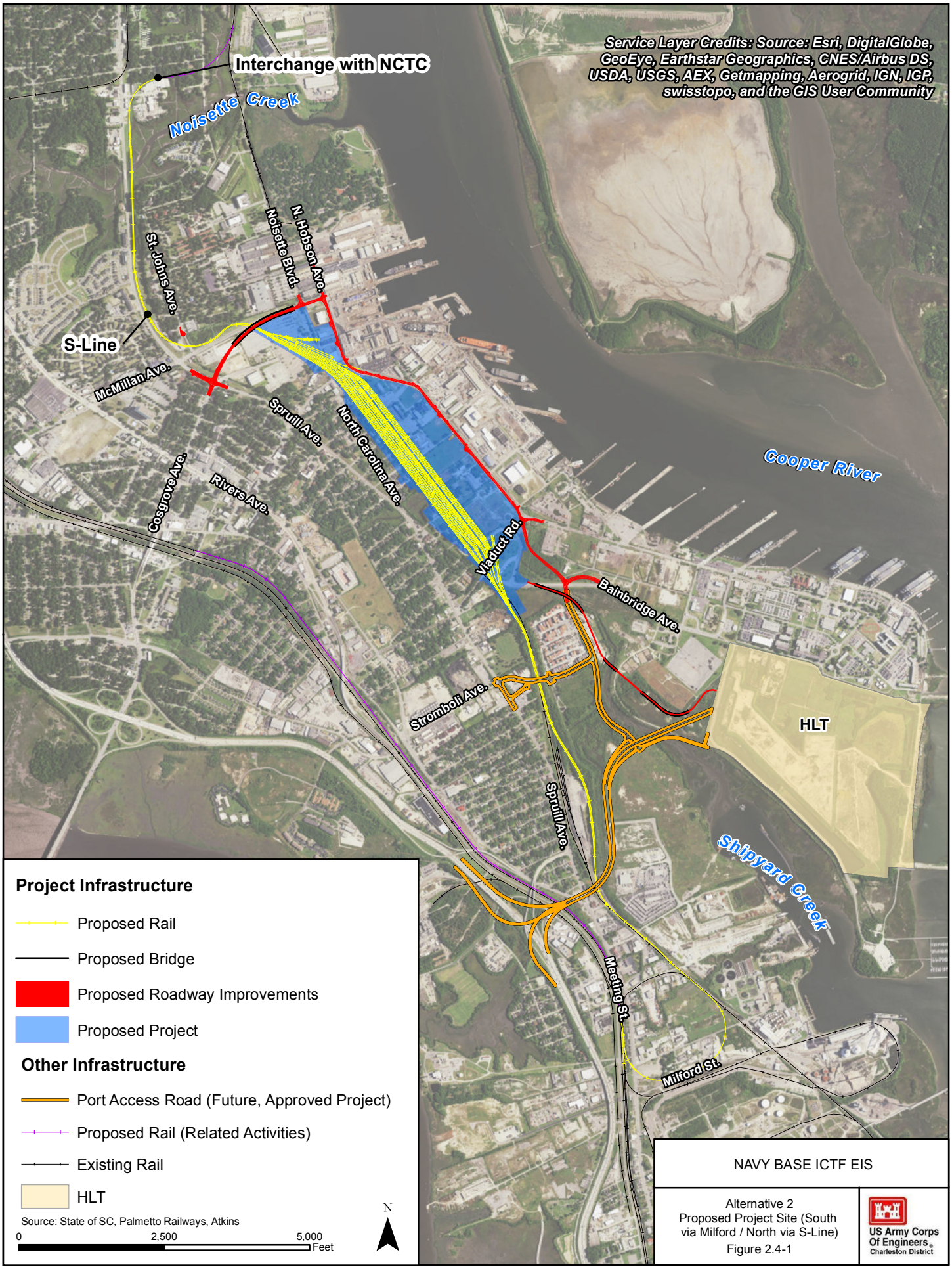
Under Alternative 2, the intermodal facility would include all the facility components of Alternative 1 (Proposed Project). Road and rail improvements associated with the southern rail connection would be the same as Alternative 1 (Proposed Project). The following road and rail improvements would be required to place the northern rail connection along the out-of-service CSX S-line (Figure 2.4-1):

- At the northern end of the ICTF, close the segment of McMillan Avenue between Spruill Avenue and Kephart Street. The segment of Cosgrove Avenue that is located east of Spruill Avenue would be realigned and replaced with a flyover over the new rail lines. The flyover would provide future roadway access between Spruill Avenue and Noisette Boulevard and Spruill Avenue and North Hobson Avenue after McMillan Avenue is closed. In this same vicinity, a cul-de-sac would be constructed at the southern end of St. Johns Avenue, and the CNC gate at Turnbull Avenue would be open to provide future access from St. Johns Avenue to Noisette Boulevard (Figure 2.4-1).

- In the vicinity of McMillan Avenue and St. Johns Avenue, install an arrival/departure track tie-in to the existing out-of-service CSX S-line within the existing CSX right of way (ROW) that runs parallel to Spruill Avenue (to provide northern rail access into the ICTF). An agreement with CSX would be required for this proposed rail improvement; however, such an agreement between Palmetto Railways and CSX has not yet taken place.

- Reactivate the existing out-of-service CSX S-line track within the existing CSX ROW that runs parallel to Spruill Avenue. A new multiple track rail bridge would be constructed to replace the existing single-track bridge within the existing ROW across Noisette Creek.

- Make NCTC and CSX ROW improvements and construct a new track to the east of the Spruill Avenue and Aragon Avenue intersection (to connect the northern arrival/departure track from the ICTF to the existing NCTC track along Virginia Avenue).


Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Interchange with NCTC
Noisette Creek
St. Johns Ave.
Noisette Blvd.
N. Hobson Ave.
S-Line
McMillan Ave.
Spruill Ave.
North Carolina Ave.
Cosgrove Ave.
Rivers Ave.
Cooper River
Viaduct Rd.
Bainbridge Ave.
Stromboli Ave.
HLT
Spruill Ave.
Shipyard Creek
Meeting St.
Milford St.
Project Infrastructure
Proposed Rail
Proposed Bridge
Proposed Roadway Improvements
Proposed Project
Other Infrastructure
Port Access Road (Future, Approved Project)
Proposed Rail (Related Activities)
Existing Rail
HLT
Source: State of SC, Palmetto Railways, Atkins
0
2,500
5,000
Feet
N
NAVY BASE ICTF EIS
Alternative 2
Proposed Project Site (South via Milford / North via S-Line)
Figure 2.4-1
US Army Corps Of Engineers
Charleston District

2.4.4 Alternative 3: Proposed Project Site (South via Kingsworth / North via Hospital District)

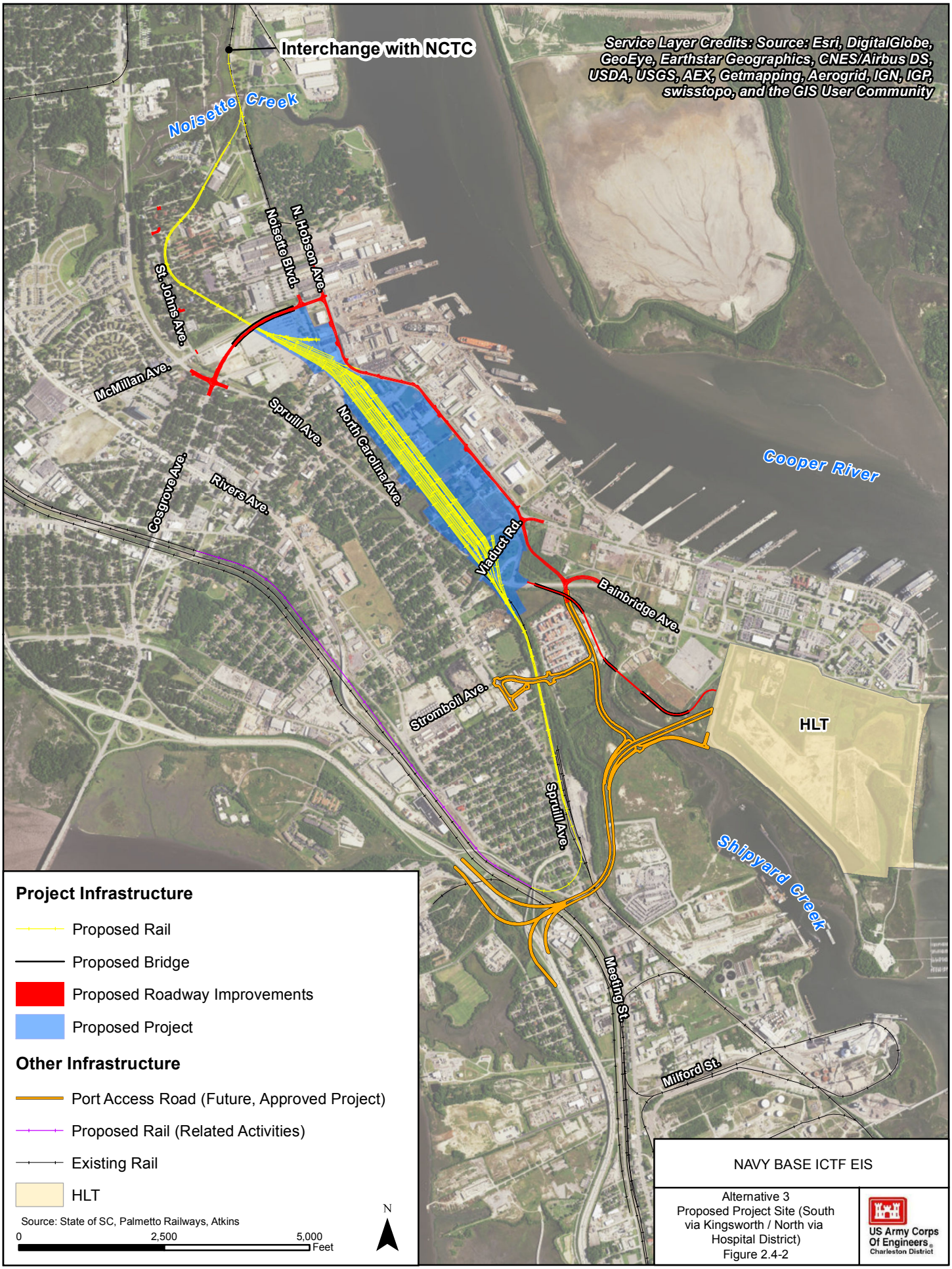
Under Alternative 3, the intermodal facility would include all the facility components of Alternative 1 (Proposed Project), and road improvements would be the same as those identified in Alternative 1 (Proposed Project). The arrival/departure track design would be the same as described in Alternative 1 (Proposed Project); however, the southern rail connection would connect to an existing rail line near Kingsworth Avenue (and adjacent to existing rail and ROW), which would require acquisition of new ROW. Construction of the rail and ROW improvements under Alternative 3 would result in an at-grade crossing at Spruill Avenue and Meeting Street, west of Cooper Yard (Figure 2.4-2).

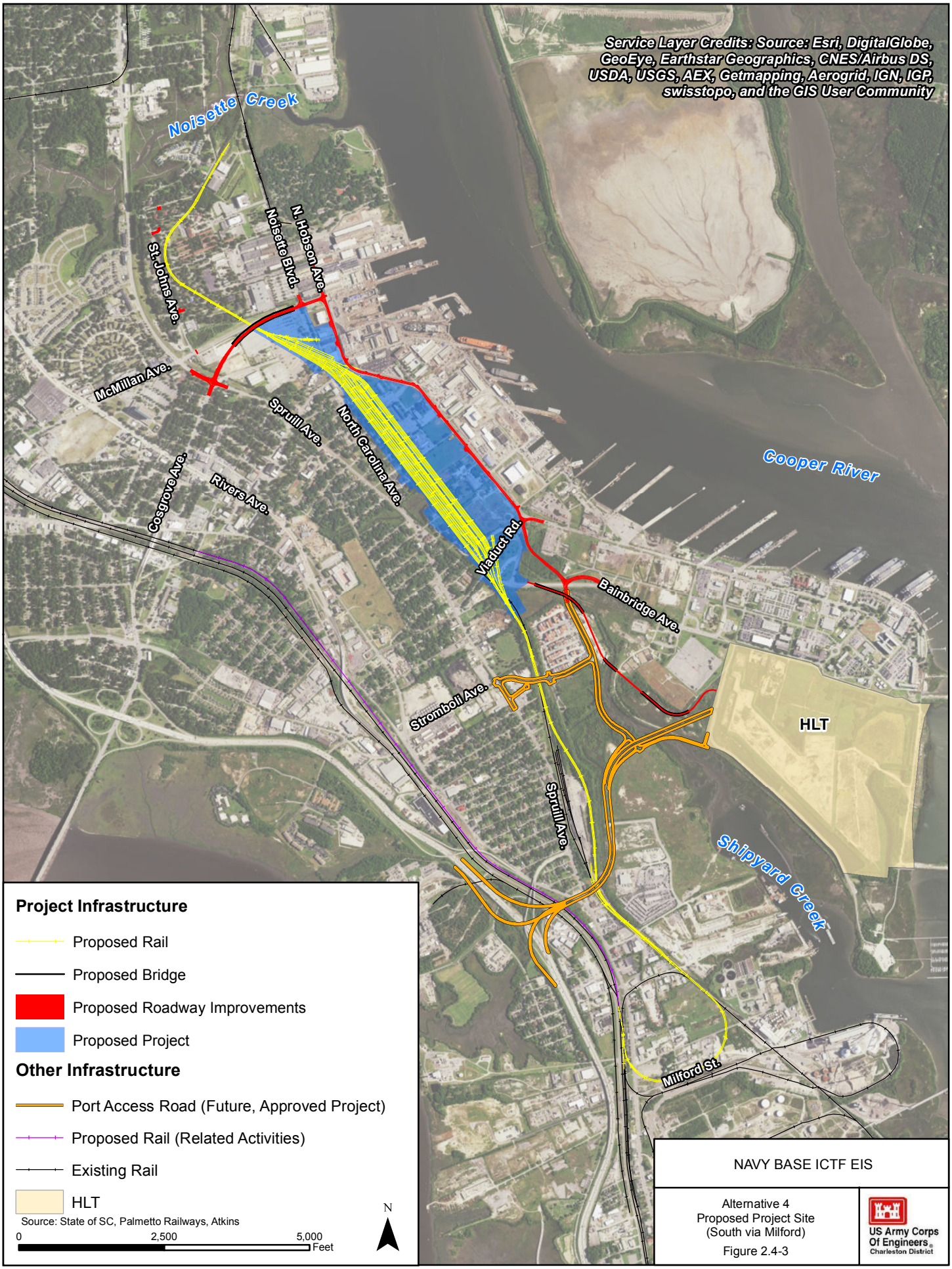
2.4.5 Alternative 4: Proposed Project Site (South via Milford)

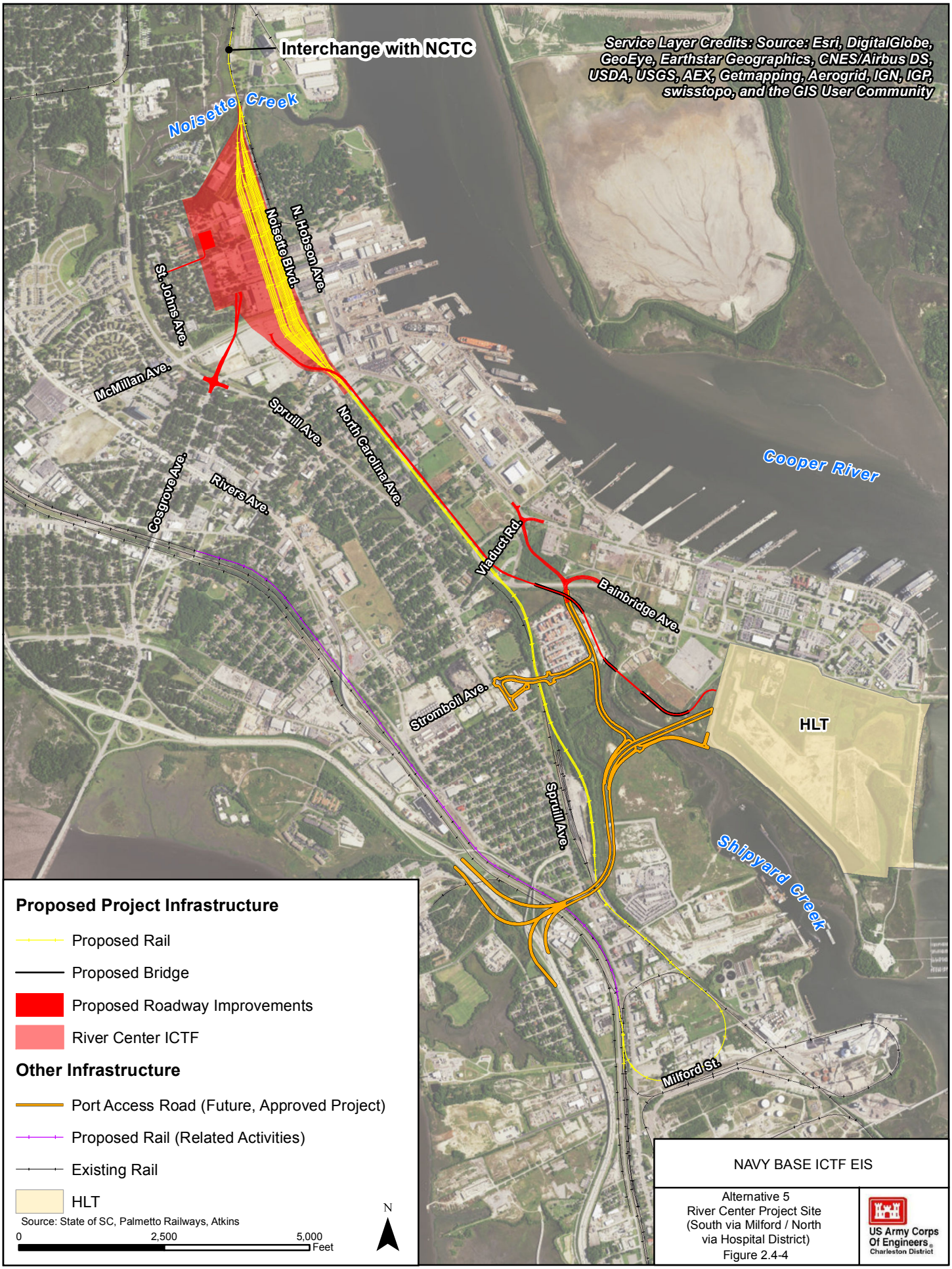
Under Alternative 4, the intermodal facility would include all the facility components of Alternative 1 (Proposed Project), and road improvements would be the same as those identified in Alternative 1 (Proposed Project). Rail improvements would be similar to those described for the southern rail connection in Alternative 1 (Proposed Project), with the exception that a second track would need to be constructed for equal access for both Class I rail carriers. The second track would connect to an existing rail line near Milford Street. To the north of the intermodal facility, a rail spur or tail track would extend from the facility through the Hospital District as is identified in Alternative 1 (Proposed Project), but would stop short of Noisette Creek (Figure 2.4-3).

2.4.6 Alternative 5: River Center Project Site (South via Milford / North via Hospital District)

Based on the screening process described in Section 2.3, the Corps identified the River Center project site as a reasonable and practicable alternative to Palmetto Railways' Proposed Project (Alternative 1). The River Center alternative would consist of approximately 113 acres for the ICTF and associated off-site road and rail improvements (Figure 2.4-4). The intermodal facility would include all the facility components of Alternative 1 (Proposed Project), with the exception that a sound attenuation and security wall would be constructed adjacent to Noisette Boulevard along the length of the eastern boundary of the facility site.


Interchange with NCTC
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Noisette Creek
N. Hobson Ave.
Noisette Blvd.
St. Johns Ave.
McMillan Ave.
Spruill Ave.
North Carolina Ave.
Cosgrove Ave.
Rivers Ave.
Cooper River
Viaduct Rd.
Bainbridge Ave.
Stromboli Ave.
HLT
Spruill Ave.
Shipyard Creek
Meeting St.
Milford St.
Project Infrastructure
Proposed Rail
Proposed Bridge
Proposed Roadway Improvements
Proposed Project
Other Infrastructure
Port Access Road (Future, Approved Project)
Proposed Rail (Related Activities)
Existing Rail
HLT
Source: State of SC, Palmetto Railways, Atkins
0
2,500
5,000
Feet
N
NAVY BASE ICTF EIS
Alternative 3
Proposed Project Site (South via Kingsworth / North via Hospital District)
Figure 2.4-2
US Army Corps Of Engineers
Charleston District


Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Noisette Creek
St. Johns Ave.
Noisette Blvd.
N. Hobson Ave.
McMillan Ave.
Spruill Ave.
North Carolina Ave.
Cosgrove Ave.
Rivers Ave.
Cooper River
Viaduct Rd.
Bainbridge Ave.
Stromboli Ave.
HLT
Spruill Ave.
Shipyard Creek
Milford St.
Project Infrastructure
Proposed Rail
Proposed Bridge
Proposed Roadway Improvements
Proposed Project
Other Infrastructure
Port Access Road (Future, Approved Project)
Proposed Rail (Related Activities)
Existing Rail
HLT
Source: State of SC, Palmetto Railways, Atkins
0
2,500
5,000
Feet
N
NAVY BASE ICTF EIS
Alternative 4
Proposed Project Site
(South via Milford)
Figure 2.4-3
US Army Corps Of Engineers
Charleston District


Interchange with NCTC
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Noisette Creek
N. Hobson Ave.
Noisette Blvd.
St. Johns Ave.
McMillan Ave.
Spruill Ave.
North Carolina Ave.
Cosgrove Ave.
Rivers Ave.
Cooper River
Viaduct Rd.
Bainbridge Ave.
Stromboli Ave.
HLT
Spruill Ave.
Shipyard Creek
Milford St.
Proposed Project Infrastructure
Proposed Rail
Proposed Bridge
Proposed Roadway Improvements
River Center ICTF
Other Infrastructure
Port Access Road (Future, Approved Project)
Proposed Rail (Related Activities)
Existing Rail
HLT
Source: State of SC, Palmetto Railways, Atkins
0
2,500
5,000
Feet
N
NAVY BASE ICTF EIS
Alternative 5
River Center Project Site
(South via Milford / North
via Hospital District)
Figure 2.4-4
US Army Corps Of Engineers
Charleston District

Roadway improvements and modifications for the River Center project site alternative would include:

- A private drayage road that would follow the same initial route as currently proposed in Alternative 1 (Proposed Project), with the exception that it would continue north through the Proposed Project's ICTF site to the southern end of the River Center project site, a distance of 2 miles. The drayage road would cross over the southern rail connection and enter the ICTF gate using a newly constructed flyover bridge. As with Alternative 1 (Proposed Project), the Viaduct Road Overpass would be closed and removed and the Bainbridge Avenue and North Hobson realignment and intersection improvements would also be completed.
- The segment of McMillan Avenue between St. Johns Avenue and Noisette Boulevard would be closed. Hipp Street, Goldberg Avenue, Hobby Street, and portions of Turnbull Avenue, Truxtun Avenue, Avenue F, and Avenue H would be closed. The segment of Cosgrove Avenue that is located east of Spruill Avenue would be closed to through-traffic, and would instead be used as the primary on-road truck access to the ICTF. Employee and visitor access for the ICTF would use St. Johns Avenue and Turnbull Avenue (after removal of the existing street closure at the intersection). Placement of the main gate to the ICTF would be on Cosgrove Avenue.
- To accommodate access in a northern rail connection, a new rail bridge would be constructed similar to the one described under Alternative 1 (Proposed Project). The northern rail connection would cross Noisette Creek and tie into the existing NCTC tracks along Virginia Avenue.
- To accommodate rail access for a southern rail connection, rail improvements identified under Alternative 1 (Proposed Project) would be undertaken, with the exception that approximately 1 mile of additional arrival/departure track would be constructed alongside the drayage road through the Proposed Project's ICTF site.

Operation activities associated with the ICTF at the River Center project site would be identical to Alternative 1 (Proposed Project), with the exception that intermodal containers would initially be transported from the HLT on the private drayage road using as many as 24 diesel-engine UTR trucks during the start-up of the facility. The number of UTR trucks would increase to as many as 60 diesel-engine UTR trucks by full build-out. The increased distance of the drayage road (2 miles versus the 1-mile road associated with the Project site) requires more vehicles to transport the same volume of rail intermodal containers, and meet the purpose and need of Alternative 1 (Proposed Project). Also, all railcar switching activities would occur south of the site.

2.4.7 Alternative 6: River Center Project Site (South via Kingsworth / North via Hospital District

Under Alternative 6, the intermodal facility would include all the facility components, road improvements, and northern rail connection as described in Alternative 5. Rail improvements would be similar to those described for the southern rail connection in Alternative 5, with the exception that the southern rail connection would connect to an existing CSX rail line near Kingsworth Avenue (and adjacent to existing rail and ROW), which would require acquisition of new ROW. Construction of the rail and ROW improvements under Alternative 6 would result in a new at-grade crossing at Spruill Avenue and Meeting Street (Figure 2.4-5).

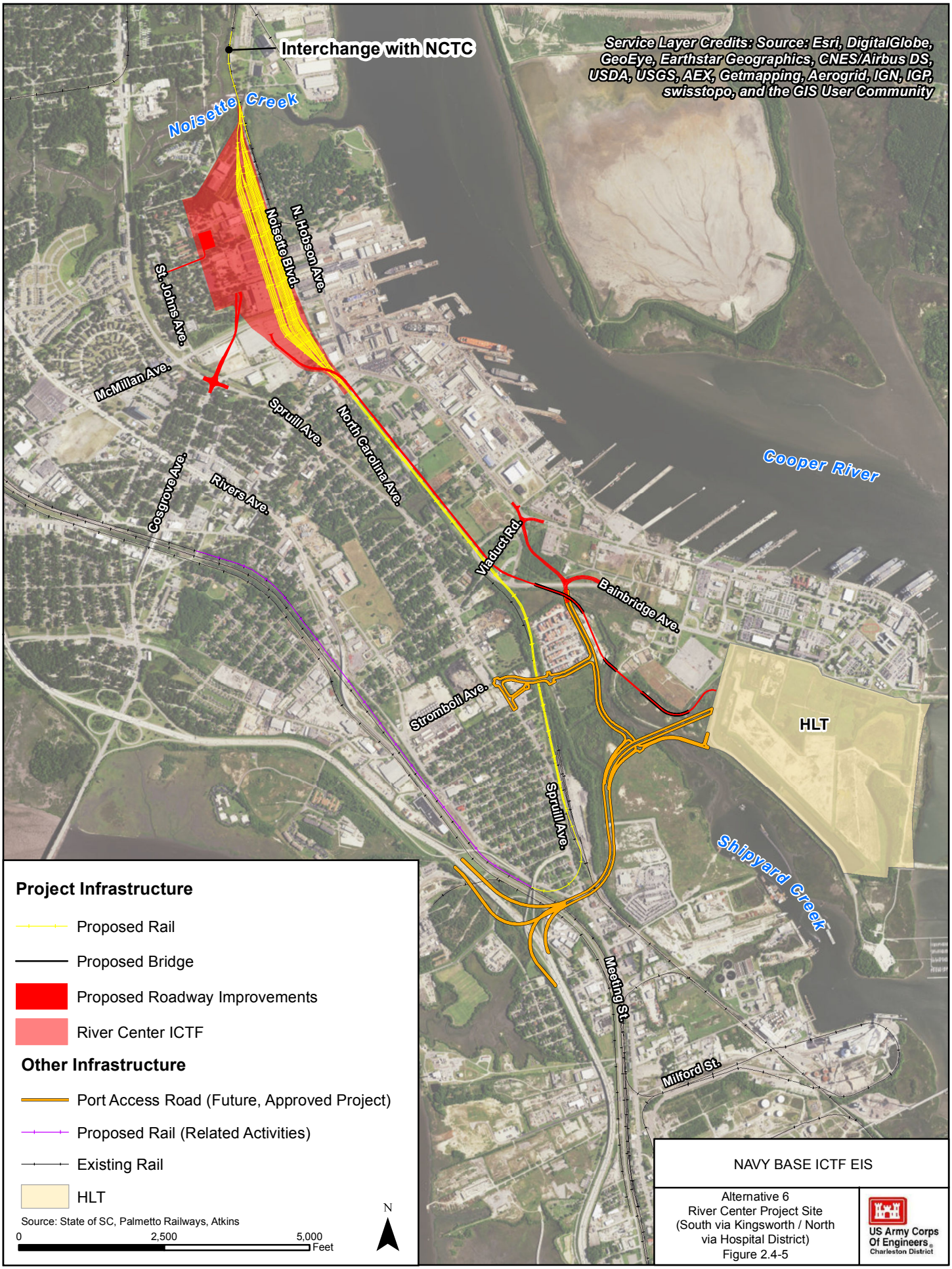
2.4.8 Alternative 7: River Center Project Site (South via Milford)

Under Alternative 7, the intermodal facility would include all the facility components and road improvements as described in Alternative 5. Rail improvements would be similar to those described for the southern rail connection in Alternative 5, with the exception that a second track would need to be constructed for equal access for Class I rail carriers. The second track would connect to an existing rail line near Milford Street (and adjacent to existing rail and ROW). To the north of the intermodal facility, a short rail spur or tail track is proposed to extend from the facility, but would stop short of Noisette Creek. Operational activities for Alternative 7 would be the same as those described under Alternative 5 with the exception that both Class I rail carriers would enter and exit the Navy Base ICTF from a southern rail connection (Figure 2.4-6).

2.4.9 Related Activities

Additional construction of new track is required in order to connect the ICTF to existing Class I carrier rail networks. This construction is not a part of the Proposed Project. It would be constructed by the Class I carriers and may require separate environmental permitting. This additional construction is collectively referred to as Related Activity.

If the Proposed Project was constructed, new track would be constructed on a section of out-of-service CSX ROW to accept intermodal trains at the proposed new at-grade crossing at Meeting Street. Construction would extend from the vicinity of Discher Street to Misroon Street. Existing track would be reactivated from Misroon Street into Ashley Junction as needed. This Related Activity would apply to Alternatives 1, 2, 4, 5, and 7. Under Alternatives 3 and 6, the Related Activity construction would be the same as for Alternatives 1, 2, 4, 5, and 7; however, construction of new track would begin at the proposed new at-grade crossing at Meeting Street in the vicinity of Kingsworth Avenue. Under Alternative 2, an additional Related Activity, reactivating an out-of-service ROW and reconstructing a new railroad bridge to replace the existing inadequate structure, would be required to connect the northern arrival/departure track from the ICTF across a portion of marsh that drains to Noisette Creek to the existing NCTC track along Virginia Avenue.


Interchange with NCTC
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Noisette Creek
N. Hobson Ave.
Noisette Blvd.
St. Johns Ave.
McMillan Ave.
Spruill Ave.
North Carolina Ave.
Cosgrove Ave.
Rivers Ave.
Cooper River
Viaduct Rd.
Bainbridge Ave.
Stromboli Ave.
HLT
Spruill Ave.
Shipyard Creek
Meeting St.
Milford St.
Project Infrastructure
Proposed Rail
Proposed Bridge
Proposed Roadway Improvements
River Center ICTF
Other Infrastructure
Port Access Road (Future, Approved Project)
Proposed Rail (Related Activities)
Existing Rail
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Source: State of SC, Palmetto Railways, Atkins
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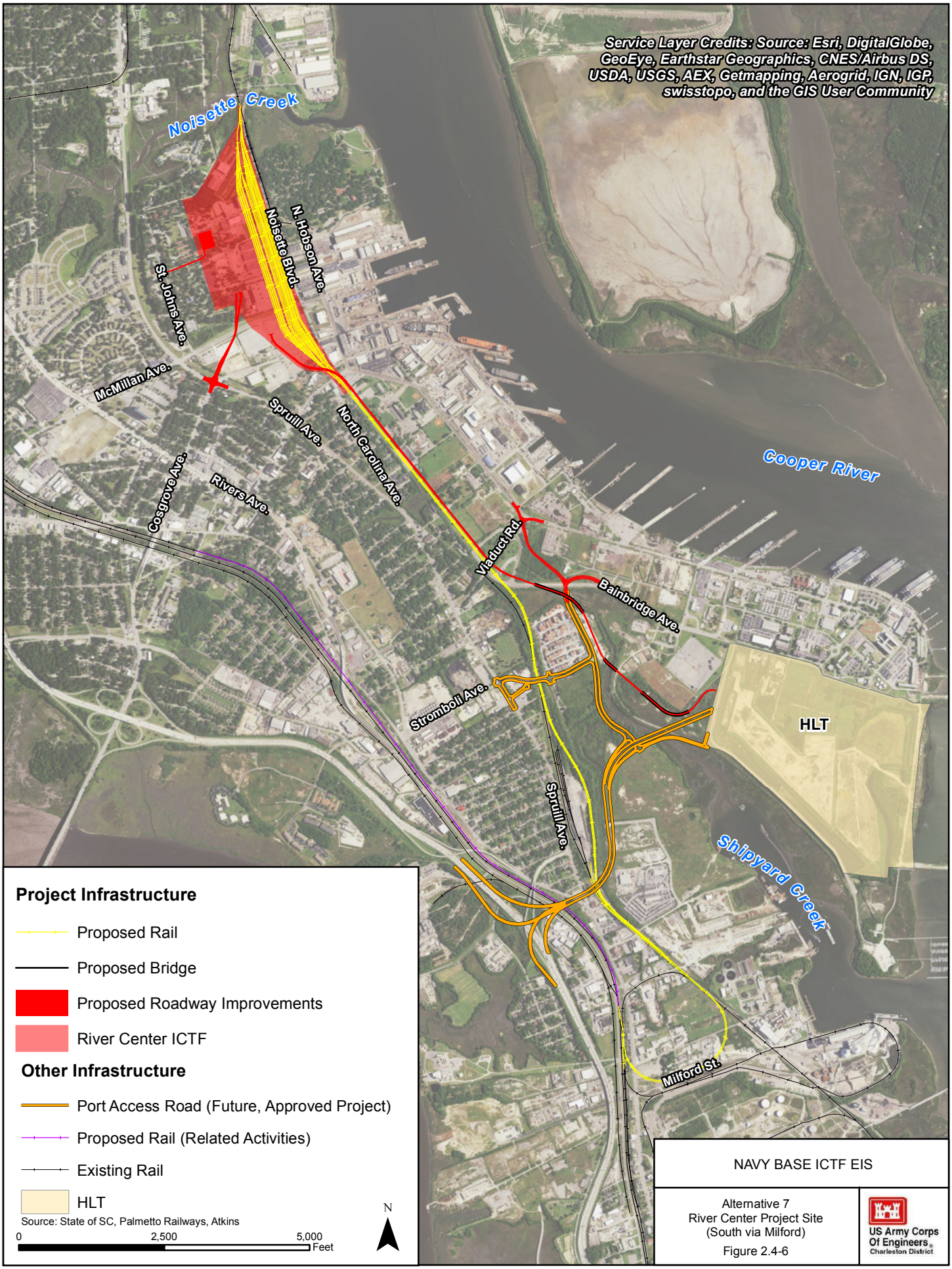
NAVY BASE ICTF EIS
Alternative 6
River Center Project Site
(South via Kingsworth / North via Hospital District)
Figure 2.4-5
US Army Corps Of Engineers
Charleston District


Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Noisette Creek
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Proposed Rail (Related Activities)
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HLT
Source: State of SC, Palmetto Railways, Atkins
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NAVY BASE ICTF EIS
Alternative 7
River Center Project Site
(South via Milford)
Figure 2.4-6
US Army Corps Of Engineers
Charleston District

2.5 COMPARISON OF ALTERNATIVES

The current condition of environmental resources potentially affected by the Applicant's Proposed Project (Alternative 1) and the associated environmental consequences of the Navy Base ICTF activities on these resources are described in Chapters 3 and 4, respectively. The results of the impact analyses for the No-Action Alternative and the seven alternatives, including Alternative 1 (Proposed Project) are summarized in Table 2.5-1.

To comply with NEPA, agencies require a detailed analysis of reasonable alternatives and the potential environmental consequences of each so that their comparative merits may be considered by agency decision makers (40 C.F.R. 1502.14[b]). As a result, Alternative 2 was evaluated in this document for comparative analysis purposes as it was reasonable (per 40 C.F.R. 1502.14[a]) and practicable (per 40 C.F.R. 230.10 [a][1-3]) to assume that an existing, inactive rail corridor could potentially be used for the Proposed Project. Since inception of the Proposed Project, the Applicant has examined the use of the S-Line as a potential alternative. However, FRA has determined that Alternative 2 is not prudent (per 23 C.F.R. 774.17). See Section 4.18 for analysis and full details.

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Table 2.5-1
Summary of Potential Impacts by Alternative and Environmental Resource

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Geology and Soils	Negligible effects to unique geologic features. Potential minor adverse impact resulting from a short-term increase in soil erosion, a loss of topsoil, soil compaction, and runoff.	Negligible effects to unique geologic features. Potential minor adverse impact resulting from a short-term increase in soil erosion, a loss of topsoil, soil compaction, and runoff.	Similar to Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project)	Negligible effects to unique geologic features. Potential minor adverse impact resulting from a short-term increase in soil erosion, a loss of topsoil, soil compaction, and runoff.	Similar to Alternative 5	Similar to Alternative 5
Hydrology	• Negligible impact to surface water flows and circulation resulting from construction activities within and/or adjacent to waterways (e.g., bridges); negligible impact to groundwater. • Permanent, minor adverse impact from increase in impervious surface; minor beneficial impact from improved stormwater management. • Negligible impact to base floodplains resulting from the placement of fill; negligible impact to flood hazard for other adjacent areas.	• Negligible impact to surface water flows and circulation resulting from roadway and rail improvements (e.g., arrival/departure tracks, bridges) across Noisette Creek and Shipyard Creek; negligible impact to groundwater. • Permanent, minor adverse impact from increase in impervious surface; minor beneficial impact from improved stormwater management. Negligible effect on groundwater recharge. • Negligible impact to base floodplains resulting from the placement of fill; negligible impact to flood hazard for other adjacent areas.	Similar to Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project)	• Negligible impact to surface water flows and circulation resulting from roadway and rail improvements (e.g., arrival/departure tracks, bridges) across Noisette Creek and Shipyard Creek; negligible impact to groundwater. • Minor beneficial impact from improved stormwater management. • Negligible effect on groundwater recharge. • Negligible impact to base floodplain resulting from the placement of fill; negligible impact to flood hazard for other adjacent areas.	Similar to Alternative 5	Similar to Alternative 5
Water Quality	• Negligible surface water quality impacts in vicinity of the project, downstream, and throughout tidal segments of on-site creeks from potential changes in runoff, watershed alterations, and increased vehicular and rail traffic. Possible	• Similar to the No-Action Alternative, with a few exceptions. Negligible to minor short-term effect on TSS, turbidity and concentrations of heavy metals and other toxic contaminants due to disturbance of sediments in Shipyard	• Similar to Alternative 1 (Proposed Project). Impacts to surface waters may be slightly increased as a new bridge would be constructed over Noisette Creek. • Stormwater runoff, sediment quality and groundwater resources impacts similar to	• Impacts to surface water quality, stormwater runoff, sediment quality, and groundwater resources similar to Alternative 1 (Proposed Project).	• Impacts to surface water quality similar to Alternative 1 (Proposed Project). Impacts to surface waters of Noisette Creek would be negligible to minor and limited to those associated with a short-term increase in stormwater runoff	• Surface water quality impacts similar to the No-Action Alternative, with a few exceptions. Negligible to minor short-term effect on TSS, turbidity and concentrations of heavy metals and other toxic contaminants due to disturbance of	• Surface water quality impacts, stormwater runoff, and sediment quality impacts similar to Alternative 5. • Groundwater resource impacts similar to Alternative 5, but with 12 fewer potentially contaminated sites impacted.	• Impacts to surface water quality similar to Alternative 5. Impacts to surface waters of Noisette Creek would be negligible to minor and limited to those associated with a short-term increase in stormwater runoff from disturbed lands

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	beneficial effect on DO, TSS, and concentrations of nutrients, heavy metals and other toxic contaminants in downstream waters. Minor and/or major direct impacts from accidental spills. • Negligible effect on water quality from stormwater runoff with implementation of current stormwater management practices. Possible beneficial effect on DO, TSS, and concentrations of nutrients, heavy metals and other toxic contaminants in downstream waters • Minor short-term effect during construction activities from disturbance of sediments and associated release of pollutants into the water column. • Negligible effect on groundwater recharge. Minor direct impact on groundwater quality from accidental spills. Minor effect on groundwater quality due to excavation and use of stormwater infrastructure and ponds in vicinity of contaminated groundwater.	Creek (during new bridge construction) and Noisette Creek (during bridge rehabilitation). • Stormwater runoff impacts similar to the No-Action. Beneficial effect on DO, TSS, and concentrations of nutrients, heavy metals and other toxic contaminants in downstream waters compared to the existing condition. • Sediment quality impacts similar to the No-Action Alternative. • Groundwater resource impacts similar to the No-Action Alternative, but with multiple areas with groundwater monitoring that would be impacted and more potentially contaminated sites.	Alternative 1 (Proposed Project).		from disturbed lands during upland construction activities. • Stormwater runoff, sediment quality and groundwater resources impacts similar to the Alternative 1 (Proposed Project).	sediments in Shipyard Creek (during new bridge construction) and Noisette Creek (during bridge rehabilitation). • Stormwater runoff impacts similar to the No-Action with beneficial effect on DO, TSS, and concentrations of nutrients, heavy metals and other toxic contaminants in downstream waters. • Sediment quality and groundwater resource impacts similar to the No-Action Alternative.		during upland construction activities. • Stormwater runoff, sediment quality, and groundwater resources similar to Alternative 5.
Vegetation and Wildlife	• Negligible effect on vegetative land cover classes from habitat alteration and fragmentation due to	• Minor adverse effect on habitat. Loss of habitat from removal of vegetation during construction but would	• Same as Alternative 1 (Proposed Project) but approximately 236.83 acres of vegetation would be removed, of	• Same as Alternative 1 (Proposed Project) but approximately 214.27 acres of vegetation would be removed, of	• Same as Alternative 1 (Proposed Project) but approximately 235.89 acres of vegetation would be removed, of	• Minor adverse effect on habitat. Loss of habitat from removal of vegetation during construction but would	• Effect on habitat is the same as Alternative 5, but approximately 175.15 acres of vegetation would be	• Effect on habitat is the same as Alternative 5, but approximately 197.98 acres of vegetation would be

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	the continuation of mixed use and industrial land uses. • Minor adverse impact on the introduction of invasive/noxious species. Routine maintenance (cutting and mowing) of vegetation could result in the proliferation of invasive/noxious plants present within the study area. • Negligible effect on species displacement. Existing and future land uses are not expected to directly or indirectly displace the wildlife species inhabiting the study area. • Negligible effect on species mortality. Existing and future land uses are not expected to result in the mortality of species inhabiting the study area.	not degrade the stability of animal populations; approximately 233.71 acres of vegetation would be removed, of which 95.5 percent would consist of previously disturbed communities and 4.5 percent of natural communities (10.35 acres of marsh and 0.17 acre of marine open water) increase in habitat fragmentation. • Minor adverse effect from routine maintenance (cutting and mowing) of vegetation could result in the proliferation of invasive/noxious plants present within the study area. • Minor adverse short-term effect on species displacement. Potential exists for direct and indirect species displacement during construction; common species are relatively abundant and adapted to living in close association with human activity and infrastructure. • Minor adverse effect on species mortality. Potential exists for mortality of species during construction; wildlife would likely move away in the presence of human activity.	which 94.4 percent would consist of previously disturbed communities and 5.6 percent of natural communities (12.93 acres of marsh and 0.36 acre of marine open water).	which 95.14 percent would consist of previously disturbed communities and 4.9 percent of natural communities (10.34 acres of marsh and 0.17 acre of marine open water).	which 95.7 percent would consist of previously disturbed communities and 4.3 percent of natural communities (10.07 acres of marsh); no marine open water would be impacted.	not degrade the stability of animal populations; approximately 194.32 acres of vegetation would be removed, of which 95.7percent would consist of previously disturbed communities and 4.35 percent of natural communities (8.28 acres of marsh and 0.17 acre of marine open water); increase in habitat fragmentation. • Minor adverse effect on introduction of invasive/noxious species as routine maintenance (cutting and mowing) of vegetation could result in the proliferation of invasive/noxious plants present within the study area. • Minor short-term adverse effect on species displacement. Potential exists for direct and indirect species displacement during construction; common species are relatively abundant and adapted to living in close association with human activity and infrastructure. • Minor adverse effect on species mortality. Potential exists for mortality of species during construction; wildlife would likely move away in the presence of human activity.	removed, of which 95.2 percent would consist of previously disturbed communities and 4.83 percent of natural communities (8.28 acres of marsh and 0.17 acre of marine open water). • Potential for introduction of invasive/noxious species, species displacement, and species mortality would be the same as Alternative 1 (Proposed Project).	removed, of which 96.0 percent would consist of previously disturbed communities and 4.0 percent of natural communities (8.00 acres of marsh); no marine open water would be impacted. • Potential for introduction of invasive/noxious species, species displacement, and species mortality would be the same as Alternative 1 (Proposed Project).

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Waters of the United States	Future construction and/or other human activities could adversely impact Waters of the U.S. within the Waters of the U.S. Study Area; any permanent or temporary impacts would require a permit from the Corps.	• Major adverse impacts to Waters of the U.S. • Direct impacts from fill/shading activities during construction would result in the permanent impact of approximately 15.84 acres of Waters of the U.S., including 6.65 acres of tidal salt marsh, 8.01 acres of freshwater wetlands, 1.14 acres of tidal open waters, and 0.04 acres of non-tidal open waters.	• Major adverse impacts to Waters of the U.S. • Similar to Alternative 1 (Proposed Project) but would result in the permanent impact of approximately 17.92 acres of Waters of the U.S. including 8.86 acres of tidal salt marsh, 7.64 acres of freshwater wetlands, 1.35 aces of tidal open waters, and 0.07 acres of non-tidal open waters.	• Major adverse impacts to Waters of the U.S. • Similar to Alternative 1 (Proposed Project) but would result in the permanent impact of approximately 11.81 acres of Waters of the U.S. including 6.66 acres of tidal salt marsh, 3.86 acres of freshwater wetlands, 1.14 acres of tidal open waters, and 0.15 acres of non-tidal open waters.	• Major adverse impacts to Waters of the U.S. • Similar to Alternative 1 (Proposed Project) but would result in the permanent loss of approximately 15.98 acres of Waters of the U.S. including 6.66 acres of tidal salt marsh, 8.22 acres of freshwater wetlands, 1.03 acres of tidal open waters, and 0.07 acres of non-tidal open waters.	• Major adverse impacts to Waters of the U.S. • Would result in the permanent loss of approximately 14.75 acres of Waters of the U.S. including 5.29 acres of tidal salt marsh, 8.36 acres of freshwater wetlands, 1.01 acres of tidal open waters, and 0.09 acres of non-tidal open waters.	• Major adverse impacts to Waters of the U.S. • Similar to Alternative 5 but would result in the permanent loss of approximately 10.82 acres of Waters of the U.S. including 5.29 acres of tidal salt marsh, 4.35 acres of freshwater wetlands, 1.01 acres of tidal open waters, and 0.17 acres of non-tidal open waters.	• Major adverse impacts to Waters of the U.S. • Similar to Alternative 5 but would result in the permanent loss of approximately 15.01 acres of Waters of the U.S. including 5.32 acres of tidal salt marsh, 8.68 acres of freshwater wetlands, 0.92 acre of tidal open waters, and 0.09 acres of non-tidal open waters.
Protected Species	• Negligible effect on habitat alteration/ fragmentation with implementation of avoidance and minimization measures due to the continuation of mixed use and industrial land uses. • Potential exists for direct and indirect species displacement during future land use activities but minor effects with implementation of avoidance and minimization measures.	• Negligible effect on habitat alteration/ fragmentation of Protected Species with implementation of avoidance and minimization measures during construction activities. • Potential exists for direct and indirect short-term species displacement effects during construction; but negligible with implementation of Applicant's prescribed avoidance and minimization measures in combination with the additional Corps mitigation measures listed in Section 4.6.12.	Same as Alternative 1 (Proposed Project).	Same as Alternative 1 (Proposed Project).	• Habitat alteration/ fragmentation impacts would be same as Alternative 1 (Proposed Project). • Species displacements impacts would be similar to Alternative 1 (Proposed Project) but in-water construction activities would be limited to Shipyard Creek.	• Negligible effect on habitat alteration/fragmentation of Protected Species with implementation of avoidance and minimization measures during construction. • Potential exists for direct and indirect effects during construction, but minor effects with implementation of Applicant's prescribed avoidance and minimization measures in combination with the additional potential mitigation measures listed in Section 4.6.12.	Same as Alternative 5.	• Habitat alteration/ fragmentation impacts would be same as Alternative 5. • Species displacements impacts would be similar to Alternative 5, but in-water construction activities would be limited to Shipyard Creek.
Essential Fish Habitat	• Negligible effect on loss of Essential Fish Habitat (EFH) that currently exists within the study area. • Negligible effect on species displacement. Potential exists for a small impact (in number, quantity, or extent) to federally	• Minor impact on loss of EFH as approximately 7.79 acres of EFH, including 6.65 acres of Estuarine Emergent Marsh (EEM) and 1.14 acres of Intertidal Flats/Estuarine Water Column (IF/EWC) would be impacted.	Same as Alternative 1 (Proposed Project) except approximately 10.24 acres of EFH, including 8.86 acres of EEM, 0.03 acre of oyster reefs/shell banks (OR/SB), and 1.35 acres of IF/EWC, would be impacted.	Same as Alternative 1 (Proposed Project) except approximately 7.80 acres of EFH, including 6.66 acres of EEM and 1.14 acres of IF/EWC, would be impacted.	Same as Alternative 1 (Proposed Project) except approximately 7.69 acres of EFH, including 6.66 acres of EEM and 1.03 acres of IF/EWC, would be impacted.	• Minor impact on loss of EFH as approximately 6.30 acres of EFH, including 5.29 acres of EEM and 1.01 acres of IF/EWC, would be impacted. • Minor Potential exists for a small impact to federally managed	Same as Alternative 5 except approximately 6.30 acres of EFH, including 5.29 acres of EEM and 1.01 acres of IF/EWC, would be impacted.	Same as Alternative 5 except approximately 6.24 acres of EFH, including 5.32 acres of EEM and 0.92 acre of IF/EWC would be impacted.

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	managed species during construction, such as brown and white shrimp, which are relatively abundant and adapted to living in close association with human activity and infrastructure.	• Minor impact to species displacement as potential exists for a small impact to federally managed species during construction, such as brown and white shrimp, which are relatively abundant and adapted to living in close association with human activity and infrastructure. • Negligible impact to oysters with the implementation of water quality BMPs and the potential for future oyster settlement and propagation with the new pilings.				species during construction, such as brown and white shrimp, which are relatively abundant and adapted to living in close association with human activity and infrastructure.		
Traffic and Transportation	No impacts	• Negligible short-term impact during construction to I-26, I-526, US 17, and at-grade rail crossings; minor short-term adverse impact during construction to North Charleston intersections. • Negligible permanent impact on majority of I-26 corridor in the opening year 2018 and design year 2038; beneficial or adverse permanent impact on a few segments due to a LOS change. • Negligible permanent impact on majority of I-526 corridor in the opening year 2018 and design year 2038; beneficial or adverse permanent impact on a few segments due to a LOS change.	Same as Alternative 1 (Proposed Project) except: • Slightly different number of impacted North Charleston intersections; and • Major permanent adverse impact on the opening year 2018 and design year 2038 at-grade crossing operations as the Alternative would increase the frequency and number of train occurrences in North Charleston. Additionally, two new at-grade crossings would be created.	Same as Alternative 1 (Proposed Project) except for: • Impacts to at-grade rail crossings are similar to Alternative 1 but with different number of new at-grade rail crossing locations (2-Meeting Street and Spruill Avenue at Kingsworth Avenue) and operations. Additionally, two new at-grade crossings would be created.	Same as Alternative 1 (Proposed Project) except for: • Impacts to at-grade rail crossings are similar to Alternative 1 (Proposed Project) but with different at-grade rail crossing locations and operations as this Alternative would have double (8/day) the number of train occurrences on the southern rail connection as Alternative 1.	• Negligible short-term impact during construction to I-26, I-526, US 17, and at-grade rail crossings; minor short-term adverse impact during construction to North Charleston intersections. • Negligible permanent impact on majority of I-26 corridor in the opening year 2018 and design year 2038; beneficial or adverse permanent impact on a few segments due to a LOS change. • Negligible permanent impact on majority of I-526 corridor in the opening year 2018 and design year 2038; beneficial or adverse permanent impact on a few segments due to a LOS change.	Same as Alternative 5 except for: • Major permanent adverse impact on the opening year 2018 and design year 2038 at-grade crossing operations as the Alternative would increase the frequency and number of train occurrences in North Charleston. Additionally, two new at-grade crossings would be created.	Same as Alternative 5 except for: • Impacts to at-grade rail crossings are similar to Alternative 5 but with different at-grade rail crossing locations and operations as this Alternative would have double (8/day) the number of train occurrences on the southern rail connection as Alternative 5.

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
		• Negligible permanent impact on the opening year 2018 and design year 2038 US 17 operations as Alternative 1 (Proposed Project) would have minimal influence on the US 17 traffic volumes. • Minor permanent adverse impact on the opening year 2018 and design year 2038 North Charleston intersection operations. Traffic patterns would change but slightly more intersections would degrade than improve operations. • Moderate permanent adverse impact on the opening year 2018 and major permanent adverse impact design year 2038 at-grade crossing operations as the Proposed Project would increase the frequency and number of train occurrences in North Charleston. Additionally, one new at-grade crossing would be created.				• Negligible permanent impact on the opening year 2018 and design year 2038 US 17 operations as Alternative 5 would have minimal influence on the US 17 traffic volumes. • Minor permanent adverse impact on the opening year 2018 and design year 2038 North Charleston intersection operations. Traffic patterns would change but slightly more intersections would degrade than improve operations. • Moderate permanent adverse impact on the opening year 2018 and major permanent adverse impact design year 2038 at-grade crossing operations as Alternative 5 would increase the frequency and number of train occurrences in North Charleston. Additionally, one new at-grade crossing would be created.		
Land Use and Infrastructure	• Negligible impact on land use change. No change in land use designation required. • Negligible impact on displacement of structures. No non-Palmetto Railways owned or specially designated structures would have to be displaced or demolished.	• Major permanent impact on land use change. Rezoning of the residential area along the western boundary of the ICTF and rezoning of portions of the project site from Institutional future land use. Comprehensive Plan amendment also required.	Similar to Alternative 1 (Proposed Project) except additional off-site roadway and rail improvements would cause the displacement of approxi-mately 26 structures.	Similar to Alternative 1 (Proposed Project) except additional off-site roadway and rail improvements would cause the displacement of approximately 25 structures.	Similar to Alternative 1 (Proposed Project)	• Negligible impact on land use change. No change in land use designation required. • Major permanent impact on displacement of structures. Approximately 33 non-Palmetto Railways owned or specially designated structures would have to be displaced or	Similar to Alternative 5 except additional off-site roadway and rail improvements would cause the displacement of approximately 16 structures.	Similar to Alternative 5

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	• Negligible impact on infrastructure and utilities. No impacts as upgrades to service are not anticipated.	• Major permanent impact on displacement of structures. Approximately 88 non-Palmetto Railways owned or specially designated structures would have to be displaced or demolished. Additional off-site roadway and rail improvements would cause the displacement of approximately 23 structures. • Negligible short-term impact on infrastructure and utilities as any interruption of service to local area residents and businesses would be less than 12 hours.				demolished. Additional off-site roadway and rail improvements would cause the displacement of approximately 14 structures. • Negligible short-term impact on infrastructure and utilities as any interruption of service to local area residents and businesses would be less than 12 hours.		
Cultural Resources	No effect	• Adverse effect on Charleston Naval Hospital (CNH) Historic District from demolition of contributing elements of the Historic District, and altered setting of the District. • No effect on Charleston Naval Yard (CNY) Historic District, Charleston Navy Yard Officer's Quarters (CNYOQ) Historic District, or other historic properties outside the Charleston Naval Complex (CNC). • Adverse effect from altered setting for U.S. Marine Corps (USMC) Barracks.	No effect	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	• Adverse effect on CNH Historic District and CNY Historic District from demolition of contributing elements of the Historic Districts, and altered settings of the Districts. • Adverse effect on the CNYOQ Historic District from altered settings. • Adverse effect on USMC Barracks from demolition of NRHP-listed building and altered settings of the District. • No effect on other historic properties outside the Charleston Naval Complex (CNC).	Same as Alternative 5	Same as Alternative 5
Visual Resources and Aesthetics	• No impact to scenic views.	• Minor, permanent adverse impact to scenic views from	• Minor, permanent adverse impact to scenic views from	• Same as Alternative 1 (Proposed Project).	• No impact to scenic views.	• Major, permanent adverse impact on viewer sensitivity to	• Same impact to scenic views as Alternative 5.	• Same impact to scenic views as Alternative 5.

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	• Minor adverse impact to scenic resources through the removal of mature trees. • Potential minor beneficial impacts to visual quality and character from redevelopment efforts as vacant parking lots are other areas are replaced with newer built structures and associated landscaping. • No impact from light and glare.	renovation and slight elevation of existing rail over Noisette Creek along Noisette Boulevard. • Major, permanent adverse impact to scenic resources from the removal of contributing elements of the CNH Historic District and mature trees, as well as the altered setting of the USMC Barracks. • Major, permanent adverse impact to visual quality and character from demolition of contributing elements of the CNH historic district and altered setting of the USMC Barracks. • Moderate, permanent adverse impact from new vertical elements in the VRSA (wide-span gantry cranes and high mast lighting). • Minor, permanent adverse impact to visual quality and character from renovation and slight elevation of existing rail bridge) over Noisette Creek. • Negligible impact to visual quality and character from the arrival/departure tracks to the south of the ICTF. • Negligible impact to visual quality and character from the realignment of Hobson Ave/Bainbridge Ave and construction of	construction of a new rail bridge over Noisette Creek along Spruill Avenue. • Minor adverse impact to scenic resources from the removal of mature trees. • Similar impacts to visual quality and character as described under Alternative 1 (Proposed Project), but no impact to CNH historic district and USMC Barracks. Similar impacts from light and glare as those described under Alternative 1 (Proposed Project).		• Same impacts to scenic resources as Alternative 1 (Proposed Project). • Similar impacts to visual quality and character as described under Alternative 1 (Proposed Project), but without renovated rail bridge over Noisette Creek. • Similar impacts from light and glare as those described under Alternative 1 (Proposed Project), but negligible effect resulting from nighttime train head lamps due to lack of curvatures (and affected residences) on the southern arrival/departure tracks.	scenic views from renovation and slight elevation of existing rail bridge near Noisette Boulevard over Noisette Creek and placement of the ICTF adjacent to Noisette Creek. • Major, permanent adverse impact to scenic resources from the removal of contributing elements to the CNH and CNY historic districts, the USMC Barracks, and mature trees, as well as the altered setting associated with the CNH, CNY, and CNYOQ. • The overall impacts to visual quality and character would be similar to Alternative 1 (Proposed Project), including the major, permanent adverse impact to visual quality and character from the demolition of contributing elements of to the CNH and CNY historic districts, demolition of the USMC Barracks, and altered settings of the CNH, CNY, and CNYOQ. • Minor, permanent adverse impact from light and glare associated with high mast lighting, but negligible effect resulting from nighttime train head lamps due to lack of curvatures (and affected residences) on the southern arrival/departure tracks.	• Same impacts to scenic views and resources as Alternative 5. • The overall impacts to visual quality and character would be similar to Alternative 5. • Similar impact from light and glare as those described under Alternative 5.	• Same impacts to scenic views and resources as Alternative 5. • The overall impacts to visual quality and character would be similar to Alternative 5. • Similar impact from light and glare as those described under Alternative 5.

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
		the drayage road; minor, permanent adverse impact from the removal of the Viaduct Road Overpass. • Minor, permanent adverse impact to visual quality and character from the construction of the earthen berm adjacent to the Chicora-Cherokee neighborhood. • Minor, permanent adverse impact from light and glare associated with the new 85-foot tall mast lighting that will be illuminated from dusk to dawn, and from nighttime train head lamps.						
Noise and Vibration	No impacts	• Negligible traffic noise impacts with negligible beneficial effect for several streets. • Minor to moderate rail noise impact along several segments due to increased rail activity and new track builds. • Negligible rail vibration impact. • Minor to moderate construction noise impact in the vicinity of noise berm. • Minor to Moderate exterior daytime operational noise impact and major exterior nighttime operational noise impact. Refer to subsection 4.12.3.5 for information on exterior to interior	• Negligible traffic noise impacts similar to Alternative 1 (Proposed Project). • Minor to moderate rail noise impact along several segments due to increased rail activity and new track builds. Major rail noise impact for up to 4 land uses along one future track segment. • Negligible rail vibration impacts similar to Alternative 1 (Proposed Project), except potential impact for two or three receptors near curved track of S-line. • Construction impacts and Operational impacts are similar to the Alternative 1 (Proposed Project).	Similar to Alternative 1 (Proposed Project), except additional potential for rail vibration impact for one or two receptors near the curved track at Kingsworth Avenue.	Similar to Alternative (Proposed Project) except minor to moderate rail noise impact along several segments due to increased rail activity in the southern alignment.	• Negligible traffic noise impacts with a minor to moderate impact along one future road. • Minor to moderate rail noise impact along several segments due to increased rail activity and new track builds. Moderate rail noise impact along one future track segment • Negligible rail vibration impact. • Minor to moderate construction noise impact in the vicinity of construction. • Negligible exterior daytime impact and moderate to major exterior nighttime impact. Refer to subsection 4.12.7.5 for information on exterior to interior	Similar to Alternative 5 except • Minor to moderate rail noise impact along several segments due to increased rail activity and new track builds and moderate rail noise impact along one new build future segment. • Additional potential for rail vibration impact for one or two receptors near the curved track at Kingsworth Avenue.	Similar to Alternative 5 except • Minor to moderate rail noise impact along several segments due to increased rail activity in the southern alignment and moderate rail noise impact along one new build future segment. • Major additive noise impact at Port drayage road (Traffic + Rail). Negligible daytime impact and major nighttime impact for additive noise for Noisette Boulevard (Traffic + Operations).

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
		noise reduction. Interior noise levels are not anticipated to disrupt sleep. • Negligible additive noise impacts (Virginia Avenue - Traffic + Rail Noise) and minor to moderate additive noise impacts (St. Johns Avenue - Traffic + Rail Noise)	• Negligible additive noise impacts (Virginia Avenue and Spruill Avenue - Traffic + Rail Noise)			noise reduction. Interior noise levels are not anticipated to disrupt sleep. • Negligible additive (daytime) impacts and moderate to major additive (nighttime) impacts (Noisette Boulevard –Traffic + Rail Noise), Negligible [Virginia Avenue (Traffic + Rail Noise)] and major additive impacts (Port drayage road – Traffic + Rail)		
Air Quality	• Impacts from construction emissions of criteria pollutant would be minor short-term adverse. • Operational criteria pollutant emissions would be less than 1 percent of Study Area's criteria pollutant emissions. Potential impacts would be minor permanent adverse. • Criteria pollutants emitted, along with the existing and projected criteria pollutants, would not put the Tri-County area into non-attainment for any criteria pollutants and the National Ambient Air Quality Standard (NAAQS) would remain in compliance. Potential impacts would be minor permanent adverse. • Non-diesel particulate matter (DPM) hazardous air pollutant (HAP) emissions from would each equal less	• Impacts from construction emissions of criteria pollutants would be minor short-term adverse because emissions would be short-term and spread out over 5 years. • Operational criteria pollutant emissions would be less than one percent of study area's criteria pollutant emissions. Potential impacts would be minor permanent adverse. • Criteria pollutants emitted, along with the existing and projected criteria pollutants, would not put the Tri-County area into non-attainment for any criteria pollutants and the NAAQS would remain in compliance. Potential impacts would be minor permanent adverse. • Non-DPM HAP emissions would each equal less than one-tenth of one percent of	Similar to Alternative 1	Similar to Alternative 1	Similar to Alternative 1	• Impacts from construction emissions of criteria pollutants would be minor short-term adverse because emissions would be short-term and spread out over five years. • Operational criteria pollutant emissions would be less than 1 percent of study area's criteria pollutant emissions. Potential impacts would be minor permanent adverse. • Criteria pollutants emitted from Alternative 5, along with the existing and projected criteria pollutants, may put the Tri-County area into non-attainment for the NO_2 1-hour NAAQS. Potential impacts would be minor adverse. • Non-DPM HAP emissions would each equal less than one-tenth of 1 percent of the total HAPs emitted in the Study Area.	Similar to Alternative 5	Similar to Alternative 5

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	than one-tenth of 1 percent of the total HAPs emitted in the study area. Potential impacts would be acceptable. • Potential excess cancer risk would be within the acceptable range. Impacts from cancer risk would be acceptable. • The maximum noncancer hazard would be below 1. Potential impacts from noncancer hazard would be negligible.	the total HAPs emitted in the Study Area. Potential impacts would be acceptable. • Potential excess cancer risk would fall within the acceptable range. Impacts from cancer risk would be acceptable. • The maximum noncancer hazard would be below 1. Potential impacts from noncancer hazard would be negligible.				Potential impacts would be acceptable. • Potential excess cancer risk would fall within the acceptable range. Impacts from cancer risk would be acceptable. • The maximum noncancer hazard would be below 1. Potential impacts from noncancer hazard would be negligible.		
Climate Change	• The No-Action Alternative results in short term construction period greenhouse gas (GHG) emissions and potential short-term impacts would be minor adverse. • Annual Operational GHG Emissions Inventory would be 36,060 MT CO_2e. The No Action Alternative would be the least efficient. Long-term effects would be major adverse. • The predicted sea level rise would not cause detectable changes to on-site structural integrity at the Proposed Project and River Center project sites, nor would it cause predictable impacts to human health and safety. Impacts due to sea level rise at the Impacts due to sea level rise at the	• Because the GHG emissions from the construction phase provide the needed infrastructure for the increased efficiency in the transport of goods, the short-term impacts would be minor adverse. • Annual Operational GHG Emissions Inventory would be 30,948 MT CO_2e. The Proposed Project would be the most efficient. Long-term effects would be minor adverse. • The predicted sea level rise would not cause detectable changes to on-site structural integrity at the Proposed Project site, nor would it cause predictable impacts to human health and safety. Impacts would be negligible. • The Proposed Project is predicted to get a level of storm surge	Similar to Alternative 1	Similar to Alternative 1	Similar to Alternative 1	• Because the GHG emissions from the construction phase provide the needed infrastructure for the increased efficiency in the transport of goods, the short-term impacts would be minor adverse. • Annual Operational GHG Emissions Inventory would be 32,208 MT CO2e. Alternative 5 would be more efficient than the No Action Alternative and nearly as efficient as the Proposed Project. Long-term effects would be minor adverse. • The predicted sea level rise would not cause detectable changes to on-site structural integrity at the River Center site, nor would it cause predictable impacts to human health and safety. Impacts would be negligible.	Similar to Alternative 5	Similar to Alternative 5

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	Proposed Project and River Center project sites would be negligible. • The Proposed Project and River Center sites are predicted to get a level of storm surge inundation that could damage on-site structures to the point of altering their structural integrity, move and damage heavy equipment, and pose a threat to human health and safety of people on-site. Impacts on the Proposed Project and River Center project sites would be major.	inundation that could damage on-site structures to the point of altering their structural integrity, move and damage heavy equipment, and pose a threat to human health and safety of people on-site. Impacts would be major.				• The River Center site is predicted to get a level of storm surge inundation that could damage on-site structures to the point of altering their structural integrity, move and damage heavy equipment, and pose a threat to human health and safety of people on-site. Impacts would be major.		
Hazardous, Toxic, and Radioactive Waste	• Eight active monitoring sites with contamination (two requiring investigation) for a total of 10. • Potential minor adverse impacts to soil (contamination) from excavation activities (after compliance with the Navy's permitting process, RCRA Permit #SC0 170 022 560 and all applicable laws for testing and disposal of contaminated soils). Ten known active contamination sites have been identified in the areas associated with the No-Action Alternative. • Potential minor adverse impacts to groundwater (contamination) from dewatering in excavation areas (after compliance with the	• Eight active monitoring sites with contamination (15 requiring investigation) for a total of 23. • Approximately 107 buildings requiring demolition/ renovation. • Potential minor adverse impacts to soil (contamination) from excavation activities (after compliance with the Navy's permitting process, RCRA Permit #SC0 170 022 560 and all applicable laws for testing and disposal of contaminated soils). 24 potentially contaminated sites would be impacted. • Potential minor adverse impacts to groundwater (contamination) from dewatering in excavation areas (after	Similar to Alternative 1 but with: • Eight active monitoring, 14 requiring investigation for a total of 22 contaminated sites. • Approximately 114 buildings requiring demolition/renovation • Impact approximately 114 buildings impacted through demolition of structures with asbestos and/or metals-based paints (after survey and applicable abatement measures).	Similar to Alternative 1 but with: • Eight active monitoring sites with contamination, three requiring investigation for a total of 11. • Approximately 113 buildings requiring demolition/renovation . • 13 fewer potentially contaminated sites would be impacted. • Impact approximately 113 buildings through demolition of structures with asbestos and/or metals-based paints (after survey and applicable abatement measures).	Similar to Alternative 1	• Eight active monitoring sites, with contamination (16 requiring investigation) for a total of 24. • Approximately 47 buildings requiring demolition/renovation • Impacts to groundwater similar to Alternative 1 (Proposed Project); but fewer areas with existing groundwater contamination and monitoring wells. • Impact from demolition of structures with asbestos and/or metals-based paints (after survey and applicable abatement measures) similar to Alternative 1 (Proposed Project); 82 fewer buildings impacted.	Similar to Alternative 5 but with: • Eight active monitoring sites with contamination (four requiring investigation) for a total of 12. • Approximately 49 buildings requiring demolition/ renovation. • Impact 49 buildings through demolition of structures with asbestos and/or metals-based paints (after survey and applicable abatement measures).	Similar to Alternative 5

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	Navy's permitting process, RCRA Permit SC0 170 022 560, and all applicable laws for treatment and disposal of dewatering effluent. • Potential minor adverse impact from demolition of structures with asbestos and/or metals-based paints (after survey and applicable abatement measures). • Potential for minor and/or major adverse impacts from accidental spills).	compliance with the Navy's permitting process, RCRA Permit SC0 170 022 560, and all applicable laws for treatment and disposal of dewatering effluent. Multiple areas with groundwater monitoring would be impacted and potentially contaminated sites would be impacted. • No anticipated involvement with the Macalloy Superfund Site. • Potential minor adverse impact from demolition of approximately 107 structures with asbestos and/or metals-based paints (after survey and applicable abatement measures). • Potential for minor and/or major adverse impacts from accidental spills resulting from use of above ground storage tanks (ASTs) (diesel fuel), storage of other minor amounts of solvents on the premises, and from containers containing hazardous materials.				• Potential for minor and/or major adverse impacts from accidental spills resulting from use of ASTs (diesel fuel), storage of other minor amounts of solvents on the premises, and from containers containing hazardous materials.		
Socioeconomics and Environmental Justice	• Negligible as there are no impacts to economic and business resources. • Minor adverse impact from private developer construction. • Negligible impact to community safety and emergency response	• Major short-term and indirect long-term benefit to local and regional economy; minor indirect adverse impact to local businesses adjacent to project (access, relocations, and aesthetics).	Similar to Alternative 1 (Proposed Project) except: • Additional minor adverse impact to mobility and access from the creation of cul-de-sac at St. Johns Avenue and McMillian Avenue,	Similar to Alternative 1 (Proposed Project) except: • Businesses north of Milford Street would be avoided. • Location of 2 new at-grade crossings are located at Meeting Street and Spruill	Similar to Alternative 1 (Proposed Project). except: Localized moderate impacts to emergency response.	• Major short-term and indirect long-term benefit to local and regional economy; direct adverse impacts to businesses on River Center project site; major direct adverse impacts to businesses relocations along	Similar to Alternative 5 except: • Businesses north of Milford Street would be avoided. • Approximately 8 additional residential displacements from Union Heights neighborhood.	Similar to Alternative 5

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	as any delay would be similar to existing conditions. • Major impact from displacement of Sterett Hall and surrounding arts facilities. • Negligible as there is no physical impact in terms of new barriers to the elderly and handicapped. • Environmental Justice considerations are not applicable (no Federal action).	• Minor short-term adverse impacts from construction; minor adverse access impacts for Chicora-Cherokee residents; minor adverse mobility impacts from new at-grade rail crossings and increased delay at intersections and at-grade crossings. • Potential minor adverse emergency response time impacts due to delay at at-grade crossings compared to No-Action however, alternate routes are available. Potential minor safety impacts due to additional conflict points at Meeting Street at-grade crossing. • Negligible impact from displacement of Sterett Hall and surrounding arts facilities as they would be displaced with or without Alternative 1 (Proposed Project). • Major adverse impacts to Chicora-Cherokee neighborhood from approximately 134 residential displacements; minor to moderate adverse impact from visual and noise impacts. • Minor indirect impact from exacerbation of housing and population loss. • Minor adverse impacts to Olde North Charleston and minor to moderate impacts	• Indirect minor adverse impacts (noise, light and glare) to residents and businesses along Spruill Avenue and Bexley Street corridor. • Additional 33 residential relocations within Olde North Charleston neighborhood.	Avenue at Kingsworth Avenue. • Localized moderate impacts to emergency response. • Approximately 8 additional residential displacements from Union Heights neighborhood.		Noisette Boulevard and the Lowcountry Innovation Center; minor adverse impact to properties adjacent to project (truck traffic, noise, aesthetics). • Minor, long-term adverse impact to east-west mobility for residents and businesses within the study area; Closure of McMillan Avenue would result in a minor adverse impact from the disruption of CARTA Route 104. • Potential for major adverse impact to emergency response, as a result of delay at at-grade crossings and limited east-west access to the study area. Potential for minor safety adverse impacts due to additional conflict point at Meeting Street at-grade crossing. • Negligible impact from displacement of Sterett Hall and surrounding arts facilities (they would be displaced with or without Alternative 5). • For the Chicora-Cherokee neighborhood, overall noise impacts would be minor to moderate adverse from rail and a localized major adverse noise impact from rail and drayage road. Chicora-Cherokee		

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
		to Howard Heights, Union Heights, and Windsor neighborhoods from noise. • Negligible impact in terms of new barriers to the elderly and handicapped. • Environmental Justice considerations are applicable: Major adverse impact from displacement of approximately 134 residential units would result in a disproportionately high and adverse impact to Chicora-Cherokee neighborhood.				neighborhood would have negligible visual impacts. • Major adverse impact to River Center neighborhood from displacement of approximately 62 residential units (includes approximately 60-unit West Yard Lofts). • Barriers to the elderly and handicapped are the same as Alternative 1 (Proposed Project). • Environmental Justice considerations are applicable: Major adverse impact from displacement of the approximately 60-unit West Yard Lofts low-income housing development would result in a disproportionately high and adverse impact.		
Human Health and Safety	• Negligible impact on worker safety, drinking water quality, hazardous materials. • No impact from noise and vibration. • Minor impact from air quality. • Negligible impact from hazardous materials due to implementation of BMPs during construction and operation. • Negligible impact for community safety and emergency response times as impact from delay would be similar to existing conditions.	• Negligible impact on worker safety, drinking water quality, hazardous materials, traffic noise and vibration. • Minor to moderate impact (several areas) from rail noise, construction noise (short-term), and operational noise (daytime). Major operational noise impact (nighttime). Additive noise impacts: negligible [Virginia Avenue (Traffic + Rail Noise)] minor to moderate [St. Johns Avenue (Traffic + Rail	Similar to Alternative 1 (Proposed Project).	Similar to Alternative 1 (Proposed Project) except with localized moderate impacts to emergency response.	Similar to Alternative 1 (Proposed Project) except with localized moderate impacts to emergency response and no additive noise impacts.	• Negligible impact on worker safety, drinking water quality, hazardous materials, ICTF operational noise (daytime) and vibration. • Minor to moderate impact (several areas) from traffic noise, rail noise, and construction noise (short-term). Moderate to Major exterior nighttime impact. Additive noise impacts: negligible (daytime) moderate to major (nighttime) [Noisette Boulevard (Traffic + Operations)], negligible [Virginia	Similar to Alternative 5 with additional localized moderate impacts to emergency response.	Similar to Alternative 5 with additional localized moderate impacts to emergency response.

Table 2.5-1, cont'd

Resource Area	No Action	Alternative 1 (Proposed Project)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
	• No impact from light and glare.	Noise). Overall impact to human health is minor with noise mitigation measures. • Minor permanent adverse impact to air quality (criteria pollutants and the NAAQS would remain in compliance). • Potential impacts from non-DPM HAP emissions would be acceptable. Potential excess cancer risk and cancer risk would be acceptable. Potential impacts from noncancer hazard would be negligible. • Potential for minor adverse impact on emergency response times and minor indirect adverse impact to community safety. • Negligible effect from high mast lighting, minor, permanent adverse impact from light and glare associated with nighttime train head lamps to residential structures along curvatures of the track.				Avenue (Traffic + Rail Noise)], and major [Port drayage road (Traffic + Rail)] • Minor impact to air quality (Tri-County area may be in non-attainment for NO_2). • Potential impacts from non-DPM HAP emissions would be acceptable. Potential excess cancer risk and cancer risk would be acceptable. Potential impacts from noncancer hazard would be negligible. • Potential for major impact to emergency response times and minor impact to community safety • Negligible effect from high mast lighting, negligible effect from nighttime train head lamps due to lack of curvatures (and affected residences) on the southern arrival/departure tracks.		
Section 4(f)/6(f)	No constructive or permanent use of any 4(f) resource. No conversion of 6(f) resources.	• Uses of Section 4(f) resources: permanent use of CNH Historic District from demolition of contributing elements of the historic district and permanent use of the parade ground of the USMC Barracks. No conversion of 6(f) resources.	Not prudent (per 23 C.F.R. 774.17). See Section 4.18 for analysis and full details.	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	• Uses of Section 4(f) resources: permanent use of CNH Historic District, CNY Historic District, and USMC Barracks from demolition of contributing elements of the historic district. Use of CNYOQ Historic District from altered setting of the historic district. No conversion of 6(f) resources.	Same as Alternative 5.	Same as Alternative 5