

1.6 FRAMEWORK FOR ANALYSIS

1.6.1 What is the Study Area?

A study area is defined as the area that may be directly and indirectly affected by the Proposed Project as shown in Figure 1.6-1. The study area was optimized to be the most appropriate boundary for the most resources; if the study area varies for a specific resource, it is defined in the affected environment section for that resource (Chapter 3). The study area for this EIS is based on and includes areas that may be directly impacted by construction and operation of the ICTF and components (off-site rail and roadway improvements).

1.6.2 What is the Project Site?

The Project site is a subset of the study area and is defined as the area of potential direct impacts on the resources. The Project site is shown on Figure 1.6-1 and includes the impact areas, also known as limits of construction, for the approximately 135-acre ICTF and the associated roadway and rail improvements.

1.7 DESCRIPTION OF PROPOSED PROJECT

The Proposed Project, as submitted by Palmetto Railways, consists of constructing and operating an ICTF on approximately 135 acres for the facility site, and undertaking off-site roadway and rail improvements for a total of 231.28 acres. The intermodal facility would include, but is not limited to, processing and classification railroad tracks, wide-span gantry cranes, container stacking areas, administrative buildings, and vehicle driving lanes. The off-site infrastructure improvements would include building: (1) a private drayage road and associated bridges approximately 1 mile long connecting the ICTF to the HLT, (2) rail improvements to the north and south of the ICTF resulting in 174,410 feet of new track, and (3) several roadway improvements and modifications, including the construction of a new overpass. As identified on Figure 1.7-1, the Proposed Project consists of the ICTF and proposed rail and roadway improvements.

Wide-span gantry crane: A crane that may be rail mounted or on tires, with a span of adequate width to straddle several rows of cargo containers. The crane is used to manage and stack cargo.

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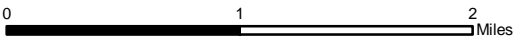


Proposed Project

Study Area

Existing Rail

Source: State of SC, Atkins



NAVY BASE ICTF EIS

Study Area
Figure 1.6-1



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



- Proposed Rail
- Proposed Bridge
- Port Access Road (Future, Approved Project)
- Proposed Rail (Related Activities)
- Existing Rail
- Proposed Roadway Improvements
- Proposed Project
- HLT

Source: State of SC, Palmetto Railways, Atkins

0 2,900 5,800 Feet

N
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Proposed ICTF Components Figure 1.7-1	<p style="font-size: 8px; margin: 0;">US Army Corps Of Engineers Charleston District</p>

1.7.1 The Intermodal Container Transfer Facility

1.7.1.1 Facility Infrastructure

The proposed 135-acre ICTF is bordered to the east by Bainbridge Avenue/North Hobson Avenue, to the north by McMillan Avenue and Cosgrove Avenue, to the south by Stromboli Avenue, and to the west by Spruill Avenue and the Chicora and Cherokee neighborhoods (Figure 1.7-2). Detailed designs for various components of the ICTF can be found in Appendix B. Design assumptions are based on approximately 60 percent plans.

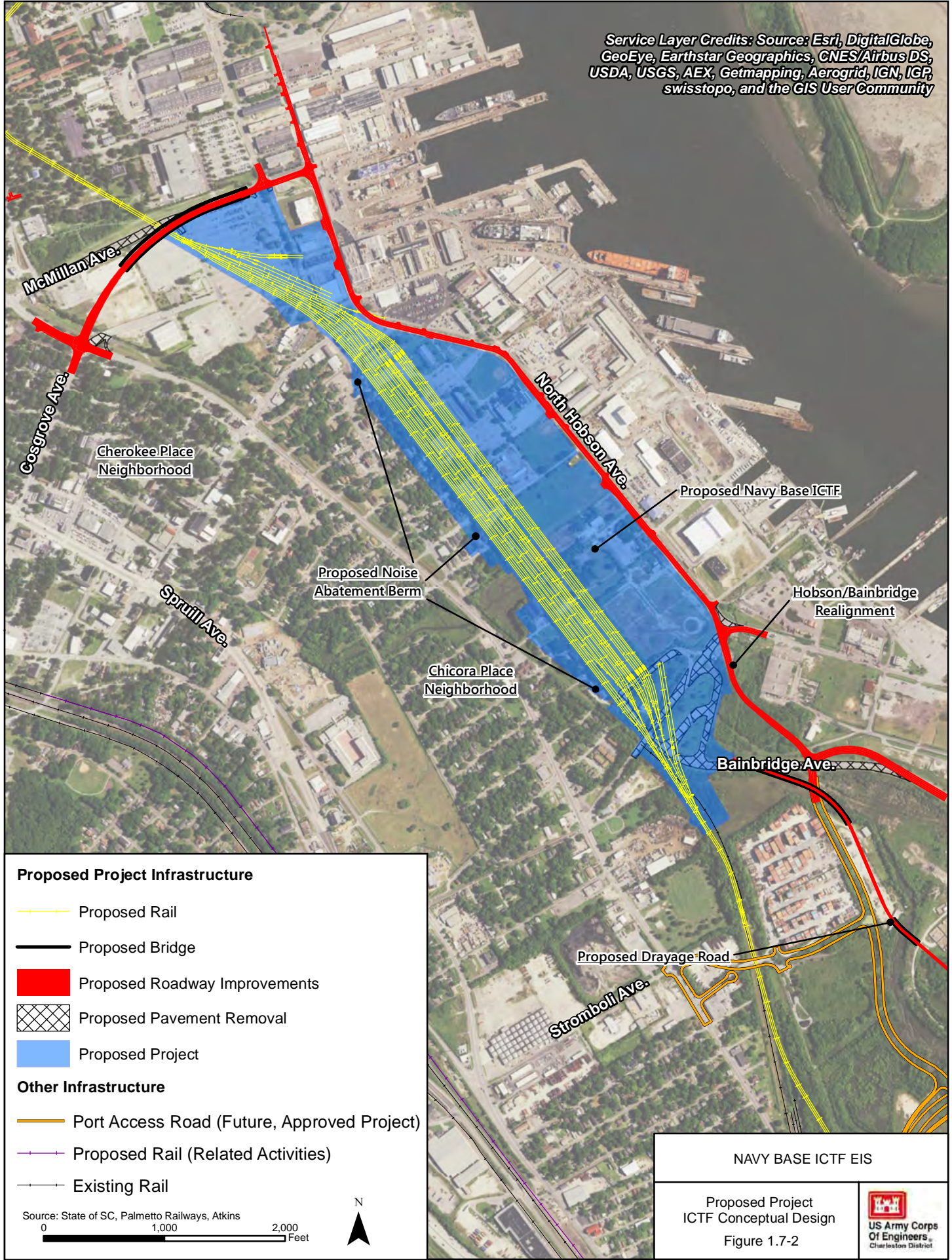
The ICTF would include the following permanent structures:

- Two two-story buildings (a locomotive repair shop and an administration and maintenance building, including heating, ventilation, air conditioning [HVAC] systems; plumbing; mechanical systems; security systems; and electrical systems); the area of the buildings would be approximately 24,377 square feet (SF);
- A parking area for operational and commercial vehicles (143 parking spaces and 6 handicap parking spaces);
- A landscaped earthen berm and two walls with security fence to provide for sound attenuation along the length of the processing and classification railroad tracks adjacent to the Chicora and Cherokee neighborhoods; in areas adjacent to waters of the U.S., including wetlands, a sound attenuation wall would replace the earthen berm. The sound walls would be approximately 10 feet in height. The top of the berm would be approximately 10 feet above the rail elevation.
- Two sound walls (approximately 10 feet in height) along St. Johns Avenue. One is in the vicinity of Reddin Road extending north for approximately 280 feet and one begins in the vicinity of Hunter Street extending to the northeast for approximately 700 feet.
- A cut-section (trench) at the northern rail connection that would be approximately 3,200 feet in length and 15-foot deep (trench varies approximately 10 to 20 feet in depth, depending on existing topography).
- Approximately 41,600 linear feet (LF) of processing railroad track;
- Approximately 28,950 LF of classification railroad track;
- Four electric, wide-span gantry cranes, with heights up to 103 feet, and the potential for up to eleven “nested” cranes at full build-out that would be placed east of the wide-span gantry cranes, resulting in a maximum total combined height of 125 feet (Appendix B);






Processing and classification tracks: One of several sets of railroad tracks devoted to sorting and classifying rail cars for their next destination.

Inbound cars arrive on receiving tracks, are inspected, assigned priority for departure, and sent to classification tracks in “blocks” with common destinations.




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Proposed Project Infrastructure

-  Proposed Rail
-  Proposed Bridge
-  Proposed Roadway Improvements
-  Proposed Pavement Removal
-  Proposed Project

Other Infrastructure

-  Port Access Road (Future, Approved Project)
-  Proposed Rail (Related Activities)
-  Existing Rail


Source: State of SC, Palmetto Railways, Atkins

0 1,000 2,000 Feet

N

NAVY BASE ICTF EIS

Proposed Project
ICTF Conceptual Design
Figure 1.7-2



- Container stacking areas, up to four containers in height: Container area for Production/Stacking (Production Cranes) at approximately 254,110 SF;
- One automated gate system for on-road trucks entering/exiting the ICTF from the Wando Welch and North Charleston port facilities and an optical character recognition (OCR) portal on the drayage road between the ICTF and the HLT;
- Vehicle driving lanes: Gate Area at 4,600 LF, Yard Circulations at 6,500 LF; and
- Stormwater management improvements including approximately 74,075 LF of pipe of varying sizes, approximately 52,700 LF of underdrains, and construction of five dry detention ponds (A, B, C, D1, and D2) and two sediment forebays associated with pond A, totaling approximately 989,281 cubic feet (cf) of storage (not including 1 foot of freeboard, which would provide additional storage) for on-site water, and vegetated swales.

Actions supporting the facility construction include land clearing, paving, fencing, general site improvements, and extension of utilities to serve the Proposed Project. Approximately 3 acres of land disturbance would be expected per day during daylight hours, Monday through Saturday. All drainage infrastructure—including dry detention ponds, outlet control structures, and storm sewers—would be constructed as part of Phase I construction. A staging area (or more, as needed) would be located within the 135-acre facility site for equipment storage and stockpiling of materials to be used for construction. One hundred forty-eight structures, or approximately 451,500 SF (includes buildings only and does not include other structures such as overpasses), would be demolished. The Chapel of the Eternal Father of the Sea has been relocated to another part of the CNC that is outside of the ICTF (independent of this Proposed Project). Details regarding anticipated construction activities and materials for the Proposed Project are provided in Table 1.7-1. Use of proper Best Management Practices (BMPs) for erosion and sedimentation control would be implemented during all construction phases, such as installation of silt fences and turbidity barriers and re-vegetating areas of exposed soil immediately following construction. Sediment basins with temporary diversion ditches for runoff would be used to control sediment loading to surface waters during land-disturbing activities.

Table 1.7-1
Details of anticipated construction activities and
associated materials for the Proposed Project

Material or Activity	Quantity
Export material (site ~15 miles away)	66,400 CY
Import material	355,000 CY
Demolition of facility site buildings	451,500 SF
Demolition of asphalt and sidewalks for facility site	2,218,810 SF
Demolition of roadway paving	867,376 SF
Total asphalt/concrete to be reused/recycled	All paving/concrete demolished on-site
Vegetation removal/paving	130 acres
Soil imported for grading facility site	160,000 CY
Soil imported for grading roadways (site ~28 miles away)	105,000 CY
Soil exported for roadway	3,000 CY
Architectural coating	2,000 SF

Source: Palmetto Railways 2016.

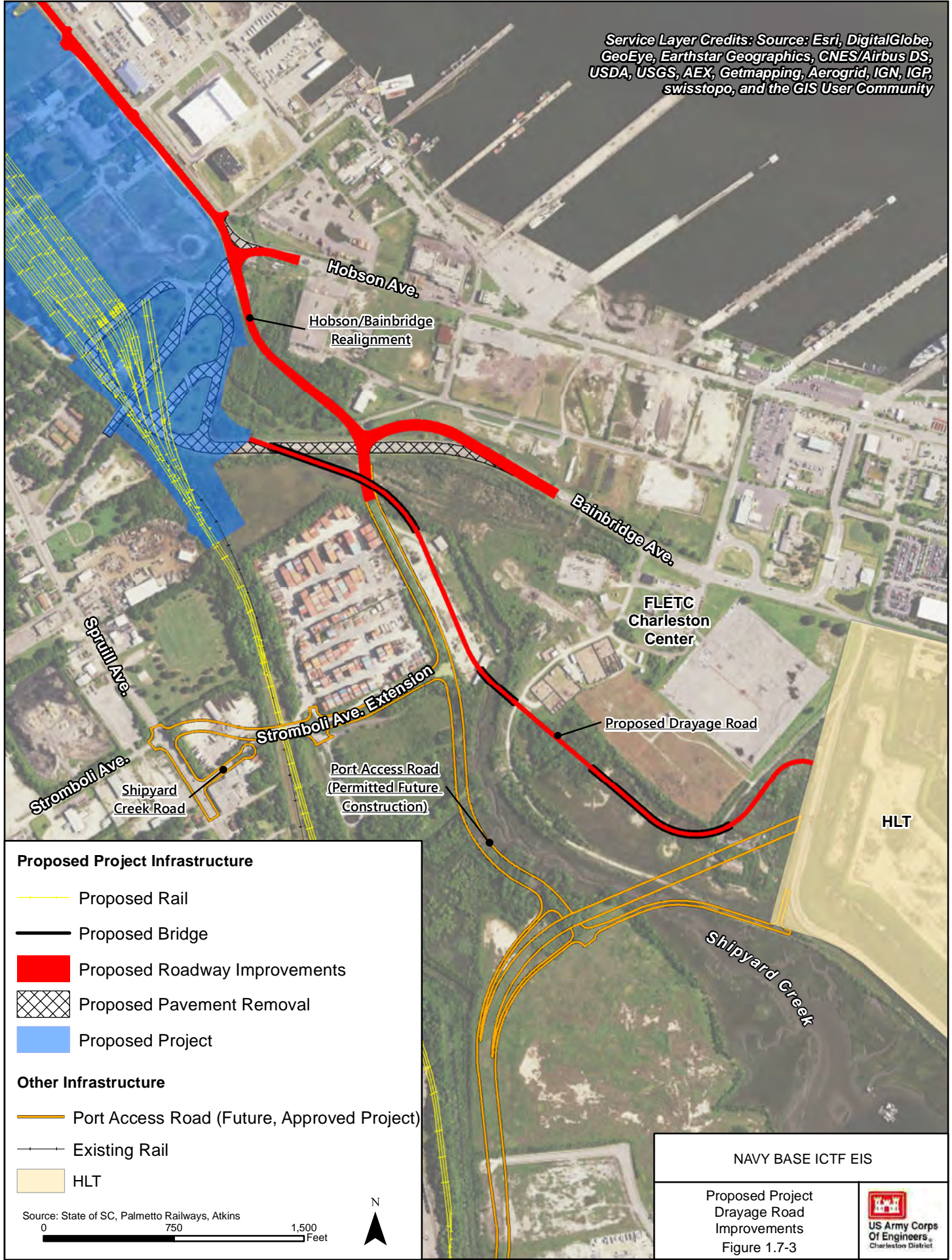
1.7.1.2 Road and Rail Improvements

1.7.1.2.1 Drayage Road

Establishing a direct connection between the ICTF and the HLT would involve the construction of a drayage road of approximately 1 mile in length, and 50 feet in width (one-lane divided roadway). The drayage trucks would exit the HLT, continue north through Federal Law Enforcement Training Center (FLETC)-owned property and across Shipyard Creek, and then would pass through the OCR portal before entering the southern portion of the ICTF (see Figure 1.7-3). The route for the drayage road would require construction of three bridges over Shipyard Creek and associated marsh. The drayage road would be a private roadway, would include security fencing as required, and would accommodate two-way traffic from Utility Tractor Rig (UTR) trucks transporting intermodal containers from the HLT to the ICTF. The drayage road would be grade separated over the Port Access Road.

Private drayage road: For intermodal freight transport, a dedicated, private roadway used for the transfer of goods or cargo over a short distance between ocean ports or rail ramps and shipping docks or intermodal transfer container facilities.

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- Proposed Project Infrastructure**
- Proposed Rail
 - Proposed Bridge
 - Proposed Roadway Improvements
 - Proposed Pavement Removal
 - Proposed Project
- Other Infrastructure**
- Port Access Road (Future, Approved Project)
 - + Existing Rail
 - HLT

Source: State of SC, Palmetto Railways, Atkins
 0 750 1,500 Feet



NAVY BASE ICTF EIS	
Proposed Project Drayage Road Improvements Figure 1.7-3	<p style="font-size: 8px; margin: 0;">US Army Corps Of Engineers Charleston District</p>

1.7.1.2.2 Road Improvements

Several roadway improvements and modifications would be constructed to facilitate operation of the Proposed Project.

At the northern end of the ICTF, the segment of McMillan Avenue between St. Johns Avenue and Kephart Street would be closed. The remainder of McMillan Avenue would become an extension of St. Johns Avenue. The segment of Cosgrove Avenue that is located east of Spruill Avenue would be realigned and replaced with a flyover above the new rail lines. The flyover would provide future roadway access between Spruill Avenue and North Hobson Avenue after McMillan Avenue is closed. A multi-use path would be integrated into the flyover structure providing pedestrian access from Spruill Avenue to Noisette Boulevard, and then continuing to Hobson Ave and north to property owned by the City of North Charleston. The City could connect this access point to the Riverfront Park in the future. The CNC gate at Turnbull Avenue and St. Johns Avenue would remain closed (Figure 1.7-4). Turnbull Avenue would be closed where the northern lead crosses. Access for properties along St. Johns Avenue would be maintained through improved connections from St. Johns Avenue to Truxtun Avenue and from St. Johns Avenue to Avenue H.

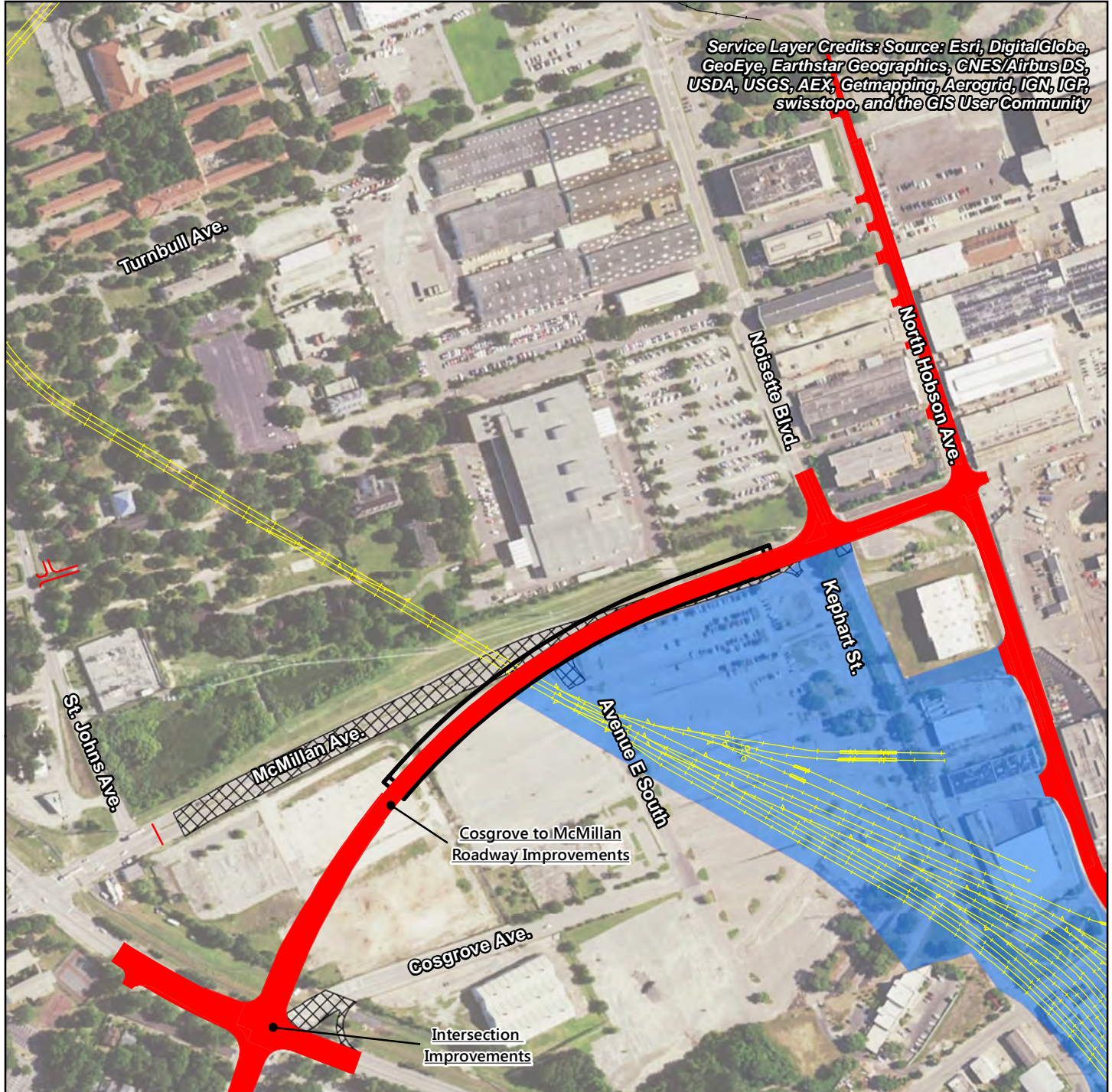
At the southern end of the ICTF, the Viaduct Road Overpass would be closed and removed. Bainbridge Avenue and North Hobson Avenue would be realigned, including improvements to their intersection (Figure 1.7-5). With the removal of Viaduct Road, vehicular access to the southern end of the CNC would use Stromboli Avenue, which would be grade separated, or the Port Access Road, which would provide a direct connection to I-26. The construction of the local access segment of the Port Access Road including the elevation of Stromboli Avenue is part of the Port Access Road Design Build project to be undertaken by the SCDOT. Palmetto Railways will not begin closure and removal of Viaduct Road until SCDOT's project is completed (Chapter 6).

1.7.1.2.3 Rail Improvements






Several rail improvements would be undertaken to facilitate operation of the Proposed Project and accommodate equal access for CSX and NS. These include:

- Construct a northern rail connection through the Charleston Naval Hospital Historic District (Hospital District), which would connect to an existing interchange point with the North Charleston Terminal Company (NCTC) located across Noisette Creek (Figure 1.7-6).
- As part of the northern rail connection, rehabilitate the existing railroad bridge across Noisette Creek by elevating the superstructure a foot to improve hydrology and by sheathing existing piles (Figure 1.7-6).
- Construct a southern rail connection that begins in the vicinity of Viaduct Road, extends to the south on the east side of Cooper Yard, crosses Meeting Street, then connects to existing railroad ROW (Figure 1.7-7). One major at-grade rail crossing on Meeting Street would be required.


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Proposed Project Infrastructure


-  Proposed Rail
-  Proposed Bridge
-  Proposed Roadway Improvements
-  Proposed Pavement Removal
-  Proposed Project

Other Infrastructure

-  Existing Rail

Source: State of SC, Palmetto Railways, Atkins
 0 250 500 Feet



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Cosgrove Avenue to McMillan Avenue Intersection Improvements Figure 1.7-4	
 US Army Corps Of Engineers Charleston District	

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- Proposed Project Infrastructure**
- Proposed Rail
 - Proposed Bridge
 - Proposed Roadway Improvements
 - Proposed Pavement Removal
 - Proposed Project

- Other Infrastructure**
- Existing Rail

Source: State of SC, Palmetto Railways, Atkins

0 500 1,000 Feet



NAVY BASE ICTF EIS	
Proposed Project North Hobson Avenue/Viaduct Road/ Bainbridge Avenue Intersection Improvements Figure 1.7-5	 US Army Corps Of Engineers <small>Charleston District</small>

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Interchange with NCTC

Bexley St.

O'Hear Ave.

Noisette Blvd.

Rehabilitation of Existing Rail Bridge

Noisette Creek

Charleston Naval Hospital
Historic District (Hospital District)

Noisette Blvd.

Proposed Project Infrastructure

— Proposed Rail

Other Infrastructure

— Existing Rail

Source: State of SC, Palmetto Railways, Atkins
0 210 420 Feet

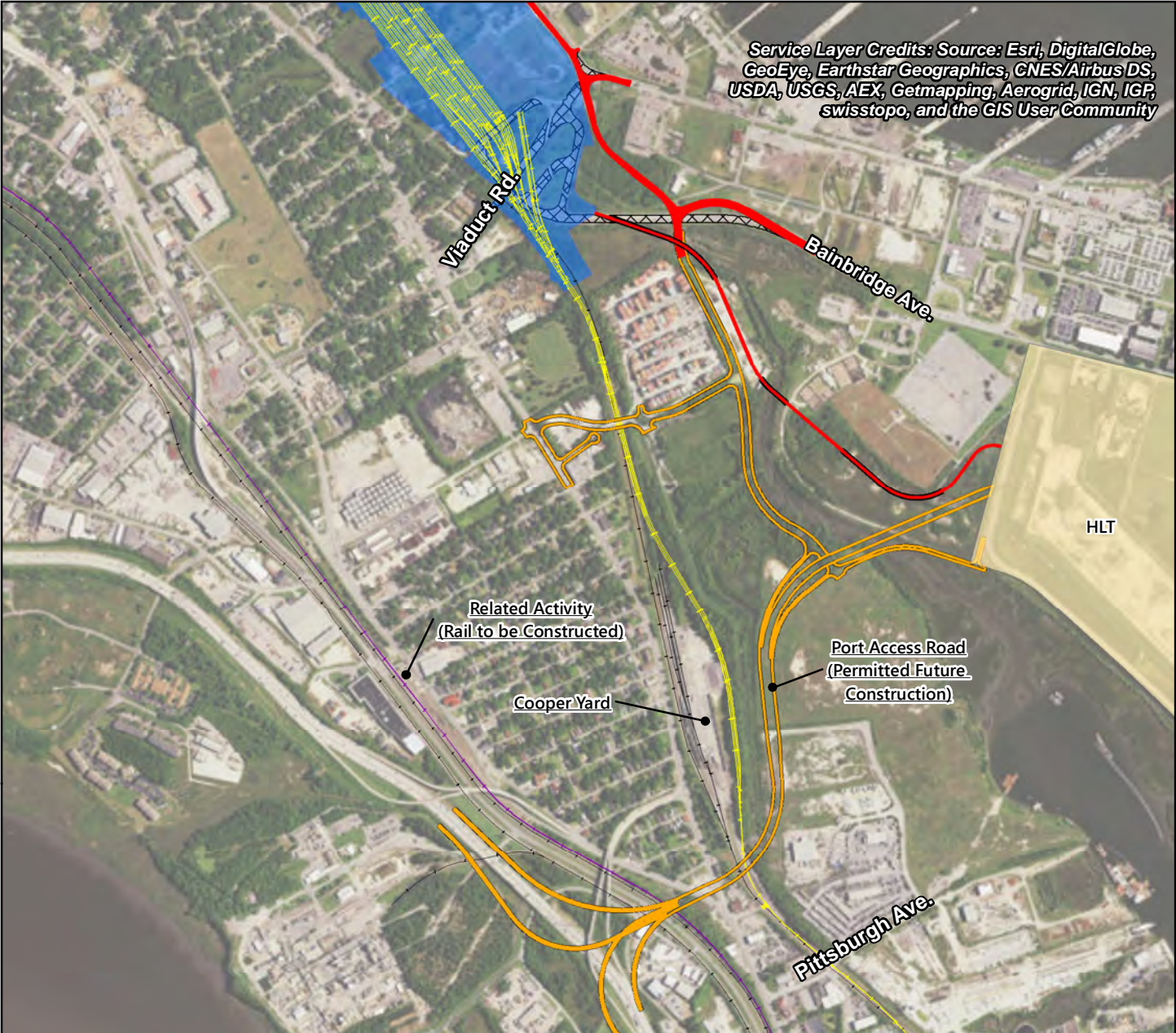


NAVY BASE ICTF EIS

Proposed Project
Northern Rail Connection
Figure 1.7-6



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



- Proposed Project Infrastructure**
- Proposed Rail
 - Proposed Roadway Improvements
 - Proposed Bridge
 - Proposed Project
- Other Infrastructure**
- Proposed Rail (Related Activities)
 - Port Access Road (Future, Approved Project)
 - Existing Rail
 - HLT
 - Proposed Pavement Removal

Source: State of SC, Palmetto Railways, Atkins
 0 1,250 2,500 Feet



NAVY BASE ICTF EIS	
Proposed Project Southern Rail Connection Figure 1.7-7	 US Army Corps Of Engineers <small>Charleston District</small>

1.7.2 Operations

Information on operational activities associated with the Navy Base ICTF were provided by the Applicant. These activities include transferring intermodal containers from UTR trucks and over the road (OTR) trucks; classifying, processing, and storing the intermodal containers; switching (building) train segments; inbound and outbound train activity; and maintenance and administrative activities associated with daily operations. Operations of the Navy Base ICTF would take place 24 hours a day, 7 days a week. Palmetto Railways would employ approximately 120 employees overall, which would include shift workers (approximately 30 employees per shift, three shifts in total) and non-shift workers.

There would be two different methods for the Navy Base ICTF to accept intermodal containers from the Port's various container terminals. Intermodal containers that arrive at the HLT would be transported to the Navy Base ICTF using the private, secure drayage road, and would enter through the OCR portal at the southern end of the facility site. These transfers would take place on a 24-hour-per-day schedule, seven days a week. The intermodal containers would initially be transported by as many as 16 diesel-engine yard trucks during the start-up of the facility; however, the number of diesel-engine yard trucks would increase to as many as 40 with full build-out.

Intermodal containers that arrive from the port facilities would first be placed on OTR trucks and driven on public roadways (primarily I-26 and Interstate 526 [I-526]) into the ICTF through its main gate, which is located in the middle of the facility site along North Hobson Avenue. Gate hours for trucks that transport these intermodal containers would be aligned with the Port's gate hours to allow for early staging of containers at the Port gate in the mornings, and for final cut-off for containers at the ICTF in the evening. The ICTF gate would be operational seven days a week.

Once intermodal containers enter the ICTF by UTR trucks and OTR trucks, a network of rail-mounted electric wide-span gantry cranes would be used to offload the containers. Off-loaded containers then would be classified and processed, including the storing and stacking of containers in designated areas (four-container high stacking limit). Containers come in varying lengths (e.g., 20, 40, 45, and 53 feet), and are typically 8 feet wide and 9.5 feet in height. Initially, four wide-span gantry processing cranes with heights up to 103 feet would be operated. In addition, at full build-out, eleven "nested" cranes, can be positioned east of the existing wide-span gantry cranes and may be employed in the future to meet projected demand for processing and transporting intermodal containers to/from the Navy Base ICTF. At full build-out, the resulting maximum total combined height would be 125 feet.

The design of the Proposed Project and the presence of two separate arrival/departure tracks that allow connectivity to both CSX and NS rail lines, provides the opportunity for equal access by the Class I rail carriers. The Proposed Project's design allows it to manage and switch two trains at the same time. Assumptions for the number of train occurrences and average crossing time was based on a rail simulation model provided by Palmetto Railways and its consultants at the request of the

Corps and included certain assumptions of Class I rail carrier service design that are outside the control of Palmetto Railways. In the initial years of operation, the analysis assumed that the facility would load/unload up to eight trains (i.e., two inbound and two outbound trains for NS and CSX for a total of eight train movements) every day. However, depending on capacity needs and service designs at facility opening and through initial years of operation, the distribution of arrival/departure trains connecting to NS or CSX rail lines may vary. Average train lengths may be less than 8,000 feet considering the TEU throughput that would occur at the ICTF. By the year 2038 (full build-out), the facility is expected to load/unload approximately eight trains (i.e., two inbound and two outbound trains for NS and CSX for a total of eight train movements) every day (based on assumed service design which may vary), although the average train lengths would be greater than 8,000 feet. Containers would be moved using a specially designed rail car with a depressed section (well) that carries the containers low, hence, allowing them to be double stacked. An 8,000-foot train (approximately 1.5 miles) would equate to approximately 145 individual intermodal wells.



Train with intermodal wells.

The Navy Base ICTF design would accommodate the assembly of outbound trains up to 10,000 feet in length; however, the typical limiting factor in Class I mainline capacity is 9,000 feet due to the length of much of the current sidings infrastructure east of the Mississippi River (infrastructure cannot accommodate very large trains). There is potential that rail infrastructure east of the Mississippi River could improve over time to accommodate longer trains. In the initial years of the operation of the ICTF, the average train length is expected to be smaller (5,000–8,000 feet). Palmetto Railways would assemble the longer train length by building separate 1,500–3,150-foot train segments by utilizing the southern and northern leads and tracks within the ICTF. During the switching of trains, existing and proposed future at-grade crossings would not be blocked by the

train. While incoming trains from CSX and NS would be on a regular schedule, deviations from the schedule and delays could occur. Similarly, outbound trains from the ICTF to these rail carriers also would be on a schedule, though delays could occur. Trains could enter or exit the ICTF during day or night. Train speeds entering and leaving the ICTF would be approximately 10 miles per hour (mph) or less. Anecdotally, with regards to the size of trains being processed, a trend seen in existing Charleston intermodal rail operations is that inbound trains are longer toward the end of the week, while outbound trains are longer at the beginning of the week. During nighttime hours, the ICTF would use high mast lights, approximately 85 feet in height, and they would operate from dusk to dawn, 7 days a week. Security patrols also would be employed within the ICTF and along the drayage road.

The ICTF design would also accommodate incoming trains. A network of rail-mounted electric wide-span gantry cranes would be used to offload the containers to then be classified and processed, including the storing and stacking of containers in designated areas. Containers would either be placed on OTR trucks bound for other port facilities or their final destination, or on UTR trucks bound for the HLT via the drayage road. OTR truck egress would proceed out of the exiting ICTF truck gate located in the middle of the facility site and turn right onto North Hobson Avenue, to the Port Access Road, then to I-26. A no left-hand turn restriction was placed on trucks leaving the facility for purposes of traffic safety and in an effort to funnel truck traffic to the Port Access Road and I-26, which will reduce truck traffic on local roadways.

Maintenance and administrative activities associated with daily operations would occur at the ICTF. Maintenance activities could be conducted at the Locomotive Shop and involve repair or maintenance work on locomotives. Light duty maintenance activities on railcars would occur at Repair-in-Place tracks located on the north and south of the facility. Light chassis repair would occur in the southeast corner of the facility where there is the open paved area. Administrative duties would be carried out at the ICTF Administrative and Maintenance Building located adjacent to North Hobson Avenue.

Estimated annual utility needs and consumption levels during operation of the Proposed Project are summarized in Table 1.7-2.

Table 1.7-2
Estimated annual utility consumption levels for the Proposed Project

Utility Consumption	Estimated Usage
Electricity for total Project	18 million kilowatt hours/year
Total water consumption	264,625 gallons/year
Water used per employee	28.9 gallons/day
Indoor water consumption	36,500 gallons/year
External water consumption	38,325 gallons/year
Solid waste generation	21 tons/year

Source: Palmetto Railways 2016.