

NORTH CAROLINA  
**MARITIME** Strategy

**NC Maritime Strategy**  
**Proposed Railroad Infrastructure**

**Prepared for the North Carolina Department of Transportation**

**by**

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**in association with URS**

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## 1 RAIL NETWORK AND SERVICE IMPROVEMENTS

North Carolina's freight rail network today serves primarily north-south traffic, with major regional intermodal facilities in Charlotte and Greensboro. Improved rail service is an important component of inland distribution for market opportunities that include large or heavy loads, containerized goods, or transport of goods beyond a cost-efficient truck distance. For the most part, North Carolina's rail network offers sufficient capacity to accommodate additional rail trips. The completion of several projects under development to improve rail system operation, such as the Pembroke Turn and the Fayetteville Connector, will improve the operational efficiency of the rail network.

The critical driver of success in realizing effective and cost-competitive rail service is the ability to attract sufficient freight volumes to make train service a viable alternative to trucking. Market scenarios were evaluated for potential to attract rail service based on the following factors:

- Potential rail freight tonnages to support minimum daily train service for containerized goods, or weekly train service for bulk and breakbulk commodities
- Proximity of rail yards to shippers that would use rail service
- Anticipated train haul distance of 200 miles or more
- Potential for rail-delivered freight to avoid highway bottlenecks and congestion, particularly in and around North Carolina's urban centers.

Proposed rail improvements were also aimed to be complementary to associated highway investments to achieve the greatest overall travel time savings for North Carolina's shippers.

## 2 PROJECTED TRAIN FREQUENCY

Projected volume and share of goods transported by truck and by rail was evaluated to establish estimated daily or weekly train frequency under each market scenario. Mode split (share of goods transported by rail versus other modes, such as truck or barge) was based on location of inland nodes (higher rail share for nodes greater than 200 miles from the port), historic mode split at regional ports, and the ability to generate sufficient volumes to support regular train service. Rail was considered to be a viable alternative if forecasted commodity volumes would generate demand for at least weekly or biweekly train service. Weekly train service assumes 52 working weeks per year. The estimate of daily train frequency assumes five working days per week.

Except for containers, none of the market scenarios is projected to generate more than one additional train per week to North Carolina's ports. In 2040, container demand at North Carolina ports is projected to generate three to seven daily double-stack intermodal trains. Fewer trains are required if longer trains, up to about 8000 ft. in length, are used.

**Table 1: Projected Daily and Weekly Train Service by Market Scenario**

	<b>Grain</b> (tons)	<b>Wood Pellets</b> (tons)	<b>Other Wood</b> (tons)	<b>Ro/Ro &amp; Oversize</b> (tons)	<b>Containers</b> (including refrigerated, TEU)
Forecasted 2040 volume	729,597	445,399	1,315,417	192,921	1,335,977
Railcar capacity	90	90	90	90	4
No. of railcars per train	45 to 75	45 to 75	30 to 45	30 to 45	80 to 120
Train capacity	4,050 to 6,750	4,050 to 6,750	2,700 to 4,050	2,700 to 4,050	320 to 480
Estimated share of goods transported by rail	10%	50%	20%	50%	30%
No. of trains per week	up to one	1	1 or 2	1	16 to 24
No. of trains per day	NA	NA	NA	NA	3 to 5

### **3 ACCESS TO PORT OF WILMINGTON**

The existing CSX mainline provides direct access to the Port of Wilmington, although the current rail route swings wide around downtown Wilmington. Proposed highway improvements in and around downtown Wilmington, including the Wilmington Bypass and Cape Fear Skyway, will alleviate some of the at-grade traffic conflicts that exist on the CSX rail alignment to the Port of Wilmington. Based upon projected rail traffic, no modifications to the existing CSX rail alignment through Wilmington are proposed as part of the *Maritime Strategy* capital investments. Should rail volumes grow significantly beyond the mode share estimated here, focused improvements along this route may be desirable in the future.

New rail connections are proposed to provide on-port rail access to the Ro/Ro & Oversize, Wood Pellet, Grain, and Container terminals.

### **4 ACCESS TO MOREHEAD CITY**

The Morehead City Rail Relocation project proposes to address the railroad operational constraints and local traffic impacts of the NCR single main track between Havelock and the Morehead City port. This 17-mile stretch of railroad includes 25 at-grade crossings, of which only six have automatic warning devices. The current railroad speed is limited to 15 mph.

While not warranted by projected train volumes, implementation of the Havelock to Morehead City Train Relocation Project is proposed to support Roll On/Roll Off (Ro/Ro) & Oversize Cargo because this scenario also supports military cargo, which would benefit from improved rail service to the Port of Morehead City.

Improved terminal access is proposed for scenarios calling for development of the Radio Island site.

**Figure 1: Havelock to Morehead City Rail Relocation**



## 5 PORT TERMINAL RAIL INFRASTRUCTURE

### 5.1 Bulk Grain and Wood Pellets

The most efficient means to deliver bulk commodities, like grain and wood pellets, to the port terminal is by rail. An on-dock rail loop providing the ability to have the train delivered as a progressive move facilitating efficient and effective train movements along with a rail yard capable of supporting up to 75-car trains is proposed for the grain and for the wood pellet terminals. This rail loop would surround the interior storage buildings or silos. Based on the volumes projected, overall terminal area for either of these market scenarios would be controlled by these rail requirements. The area within the loop could be used to support other cargos, or wood and grain uses could share the same on-terminal railroad infrastructure.

**Figure 2: On-Terminal Railroad Tracks for Unloading of Bulk Grain or Wood Pellets at Wilmington**



**Figure 3: On-Terminal Railroad Tracks for Unloading of Bulk Grain or Wood Pellets at Radio Island**



## 5.2 Container Terminals

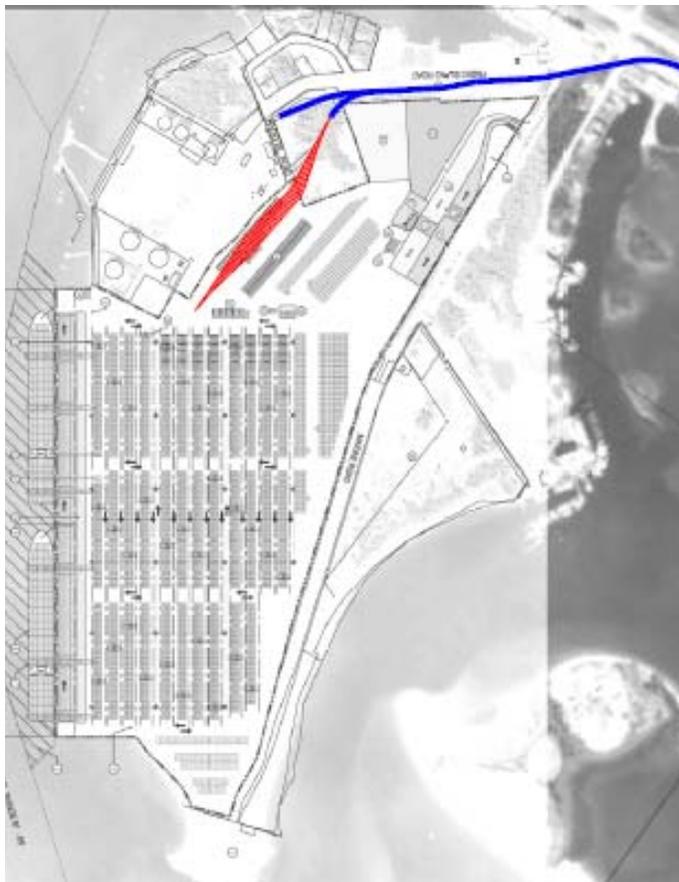
Rail connections and on-dock intermodal rail facilities are needed to support efficient container transfer. Each container yard site would require rail access to the nearest railroad mainline to support intermodal rail service.

Port terminal improvements for each of the four container port sites considered – Radio Island, Wilmington, River Road, and Southport – include on-dock rail facilities as presented below. The greenfield container port sites at River Road and at Southport would require the construction of a new “last mile” rail connection to support intermodal rail service.

### 5.2.1 Radio Island

The 136-acre site at the Port of Morehead City, on Radio Island, has been identified as a potential site for a proposed container terminal. The ability to have support trackage for switching of rail cars is essential to an efficient operation. In addition, the ability to not trap motive power while serving the terminal is equally important.

**Figure 4: New Rail Connection and On-dock Rail Yard for Radio Island Container Terminal**



### 5.2.2 Wilmington

The proposed Wilmington container terminal lies immediately adjacent to the existing CSX mainline. A new yard lead from this existing track along with on-dock intermodal tracks along the east side of the container yard are proposed, as shown at the top of the figure below.

**Figure 5: Rail Access and On-Dock Rail Yard at Wilmington**

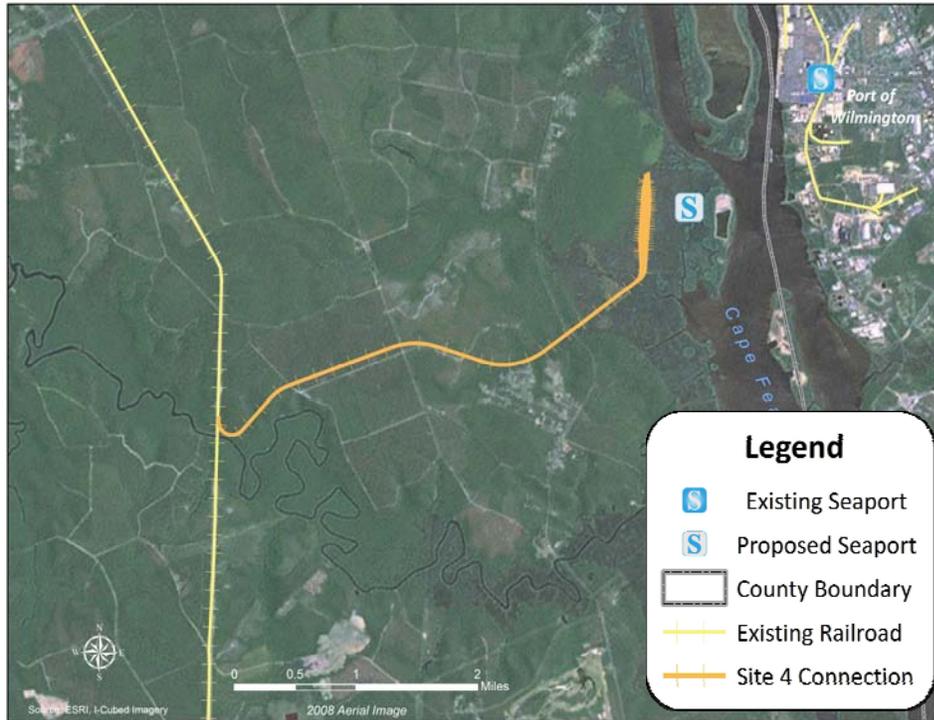


### 5.2.3 River Road

The 375-acre site located north of Southport is another potential site for a container terminal. This site is proposed to be accessed by a 22,000' lead track off of the existing north/south US Military track that runs from Sunny Point Junction to Sunny Point. Track curvatures are reasonable and the long lead to the terminal allows unit trains to be built outside the facility permitting the staging of arrival and departing trains to facilitate efficient train operations without impacting the public due to blockage of at grade crossings.

Rehabilitation of the existing US Army track from Sunny Point Junction in Leland to the container yard lead is assumed to be required to support efficient operation of intermodal trains.

**Figure 6: Rail Access to River Road**

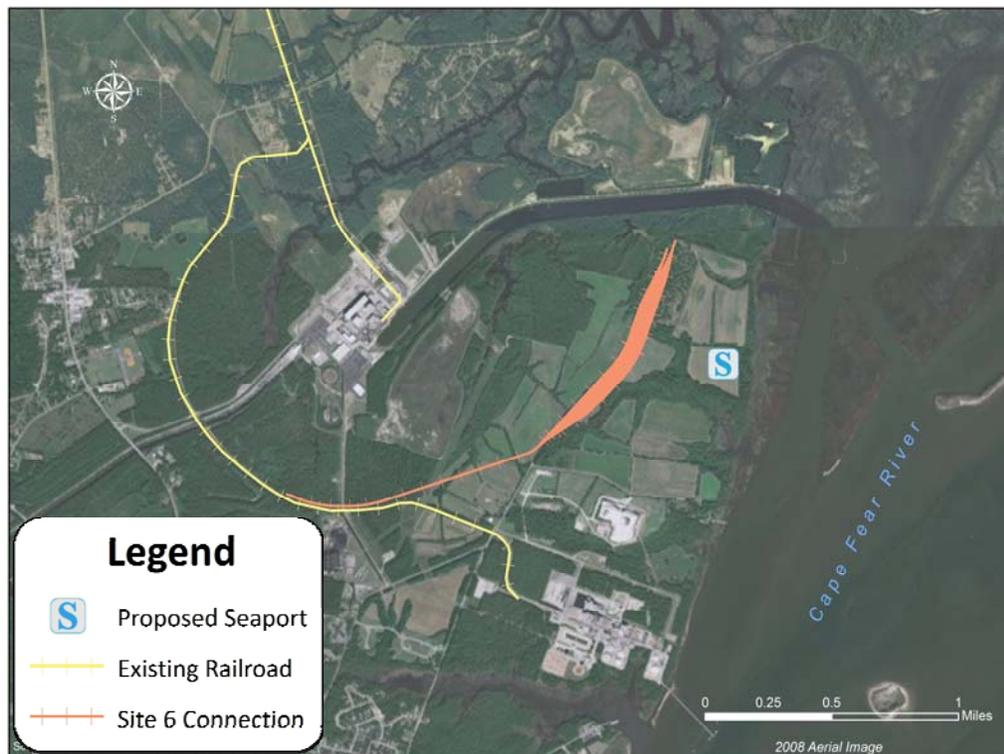


### 5.2.4 Southport

The Southport 586-acre site has also been identified for a potential container terminal. To provide rail access to the site, a 5,400 ft lead track is proposed off the existing track that is currently serving nearby industries. The US Military track from Sunny Point to Sunny Point Junction would be utilized to gain access to/from the CSXT mainline. While the potential lead track to the facility is identified, review of the entire rail operation will be required to locate siding and receiving and departure tracks.

Rehabilitation of the US Army main track from its connection with CSX at Sunny Point Junction to the container terminal lead is assumed to be required.

**Figure 7: Rail Access to Site 6 - Southport**



## 6 INLAND FACILITIES

The market opportunities evaluated each have unique transport requirements and origin or destination of goods. The needs for inland loading, transfer, or distribution for each scenario is therefore different and there is no set of inland developments that would support all market opportunities. Rather, the availability and effectiveness of inland facilities was evaluated individually for each set of investment alternatives.

### 6.1 Industry Rail Connections

The availability of rail lift facilities at inland manufacturing locations would facilitate the transfer of heavy and over size goods to the port. These would ideally be located at inland port or mega sites, where the benefit of this infrastructure to support Ro/Ro and heavy cargo would be shared by multiple users. Such a mega site location could attract manufacturers with common needs for transport of oversize goods to port. The rail connection now under construction to the Global TransPark is a good example; this project will allow for the transport of large aircraft components by rail from the SpiritAir facility to the Port of Morehead City.

The development of two additional Ro/Ro-Lift On/Lift Off (Lo/Lo) ramps are proposed to support the Ro/Ro & Oversize Cargo market scenario. Locations for ramp development should be identified in collaboration with in-state manufacturing and economic development interests.

## 6.2 Inland Rail Terminals

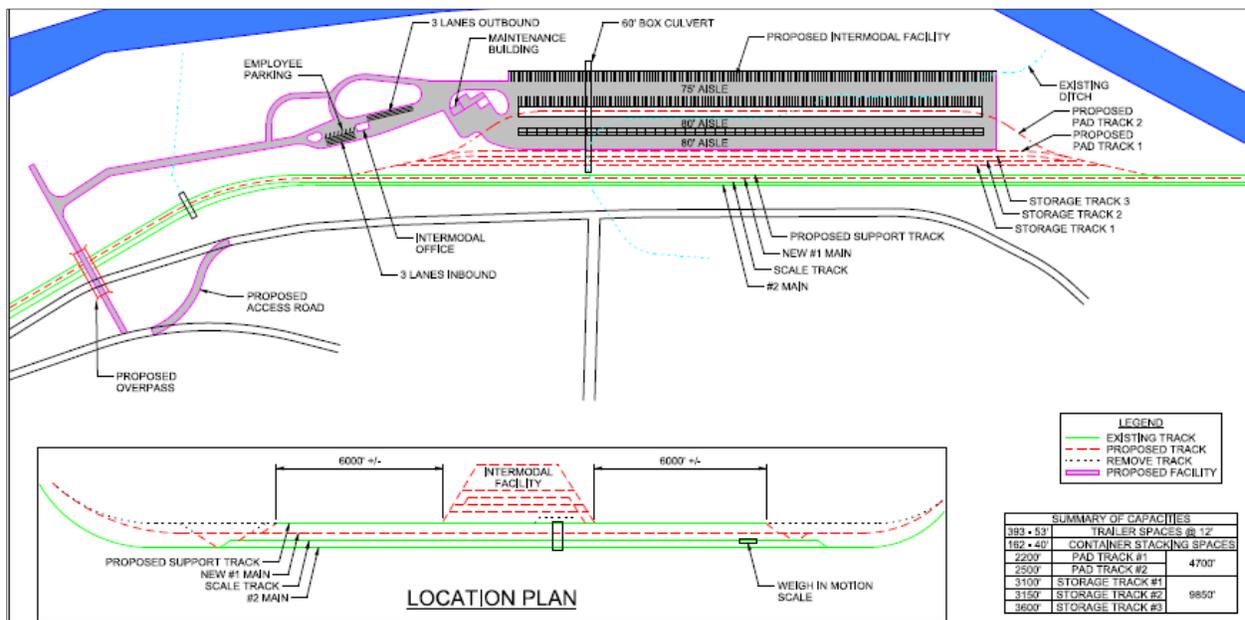
Existing intermodal rail yards in Charlotte (two separate terminals operated by CSX and by NS) and in Greensboro (NS) support the transport and distribution of containers. Many containers handled through North Carolina ports can be expected to be transported from inland intermodal facilities to and from the port via truck. Relocation and expansion of the NS Charlotte facility is underway at a new location at the Charlotte-Douglas International Airport. The current CSX Charlotte intermodal yard, however, does not have sufficient capacity to meet projected demand. Additionally, evaluation of future truck movements using the FHWA Freight Analysis Framework mode demonstrates that highway access to the CSX site in western Charlotte will be increasingly difficult.

In order to improve distribution and port access for North Carolina's containers, a new, expanded CSX intermodal yard at a location east of Charlotte is proposed. The new rail terminal would function as an inland port, including functions that have normally been performed dockside such as receiving processing, customs requirements, inspection, and handling for cross-dock shipment.

A rail-served intermodal terminal requires a minimum of 60 acres to operate efficiently. As additional activities are added such as track or chassis repair industries or logistics services, additional adjacent parcels are required. The railroad may add additional services on their own, depending on the rail operation and location on the rail network.

Site selection for an inland port is dependent on the availability of various transportation modes (rail and interstate), market proximity, traffic density as well as local impact factors such as zoning or tax rates. An inland port can be a part of a larger a commercial development that provides greater port access, increased capacity, and lower landside logistics costs for maritime goods.

**Figure 8: Example Layout of Intermodal Rail Terminal**

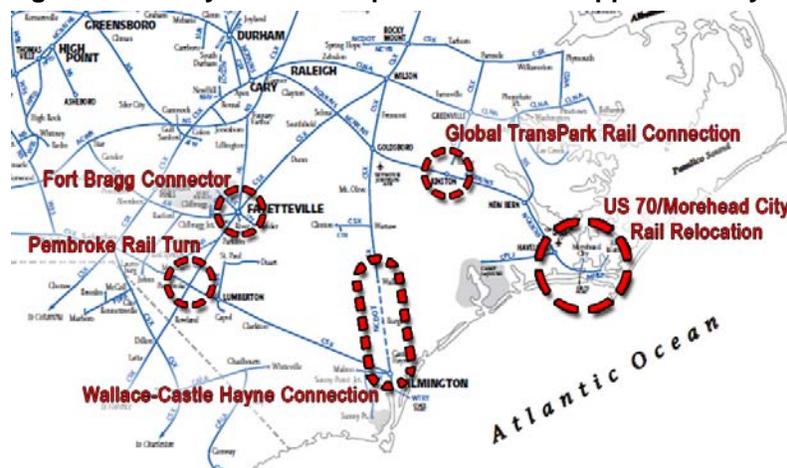


## 7 MILITARY-SUPPORTIVE RAIL INVESTMENTS

The availability of on-dock rail and inland rail facilities would minimize handling costs for military cargo. While not identified as a priority for the handling of commercial cargo, The Wallace to Castle Hayne Rail Connection has been identified by the Department of Defense and military stakeholders among several high-priority projects to support the movement of military equipment in North Carolina.

Construction of the Wallace to Castle Hayne Rail Connection would provide an important direct link from military facilities at Fort Bragg to Port of Wilmington. The Wallace to Castle Hayne project is also mentioned in the Strategic Seaport Report to Congress (2007) as an important investment in line haul rail infrastructure to provide more direct routing of Camp Lejeune cargo and redundant rail access to Port of Wilmington.<sup>1</sup>

**Figure 9: Priority Railroad Improvements to Support Military Cargo**



Source: North Carolina Logistics Village Initiative Transportation Needs and Priorities, Kimley-Horn & Associates (December 2011)

## 8 INSTITUTIONAL AND OPERATIONAL NEEDS

### 8.1 Role of NCR

Today, NCR manages railroad rights of way owned by the state and leased to NS. The future role of NCR to advocate, promote, or even operate rail service should be examined. The existing trackage rights agreement identifies general goals regarding industrial development to include NS cooperation with rail-related development efforts adjacent to the eastern rail line; however, the specific actions or objectives under this provision are not identified. An updated agreement could more clearly establish NCR and NS roles in promoting industrial and economic development along its rights of way or define P3 opportunities that would support the state's freight rail users.

<sup>1</sup> US Department of Defense Report to Congress on Projected Requirements for Military Throughput at Strategic Ports, Undersecretary of Defense (Acquisition, Technology, & Logistics) (April 2007)

The potential short line operation along the NCRR Raleigh-to-Morehead City segment was suggested by industry stakeholders. The feasibility and viability of a new short line service was beyond the scope of the *Maritime Strategy*, however, NCRR could lead the effort to evaluate such a proposal in advance of renegotiation of the NCRR-NS trackage rights agreement as the December 31, 2014 contract term approaches.

The State of North Carolina has been moving forward to implement many of the recommendations put forth by the Governor's Logistics Task Force such as establishment of a State-level logistics office. The ongoing integration of NCDOT and NC Ports and GTP will enhance the coordination of these entities to advance their shared goals. Closer alignment of NCRR objectives with these other State departments and divisions that are charged with moving the state's people and could be realized.

## **8.2 Shared Rail Service**

The implementation of shared rail service, whereby two railroads enter into agreement to transport the other's cars on their trains, could enhance competitive rail access to North Carolina's ports. CSX and NS hold shared service agreements in other locations, but do not have such an arrangement in North Carolina.

Shared rail service would allow shippers to contract with one railroad while obtaining access to the other railroad's operating lines (as set forth in the shared service agreement); an interchange of cars would be required between the two railroads. Implementation of shared service could also benefit NC Ports in attracting ocean carriers, who may enter into exclusive agreements with a single US rail carrier to provide point-to-point transportation service to shippers. Under the provisions of the existing trackage rights agreement that grants NS exclusive freight operating rights over designated NCRR rights of way, explicit agreement of NS and NCRR may be required to allow for CSX freight to be transported over these lines.