

**Title of Project:** STATEN ISLAND RAILROAD: CHEMICAL COAST LINE CONNECTOR

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**Date Submitted:** June 14, 2007

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## **Project Description**

This project involves the planning and construction of approximately 3,900 linear feet of a new freight rail connection, to be used together with a recently rehabilitated railroad lift bridge, to link the Staten Island Railroad (SIRR) in Staten Island, New York to Conrail's Chemical Coast Line in Elizabeth, New Jersey. The purpose of the project is to facilitate the reactivation of rail service between Staten Island, New York and the nation's rail network to enable the shipment of international cargo containers, New York City's municipal solid waste and other industrial freight currently transported to and from Staten Island by truck.

## **Introduction**

The original Staten Island Railroad right-of-way extends westward from the vicinity of Howland Hook, which is located on Staten Island's north shore near the confluence of the Kill Van Kull and the Arthur Kill, crossing the Arthur Kill Channel on a lift bridge and continuing over the Conrail Chemical Coast Line and New Jersey Turnpike westward approximately five miles to a junction with Conrail's Lehigh Line in Cranford, Union County, New Jersey. Much of the line west of the Turnpike is at ground level, and there are eight grade crossings on local streets that are protected by warning devices including gates and/or flashing lights.

The proposal project would establish a new track connection descending approximately 30 feet from the elevation of the Staten Island Railroad / Arthur Kill Lift Bridge (Appendix, Photo 1) to the level of the Chemical Coast Line, at a point about three-quarter mile west of the Arthur Kill Lift Bridge (Appendix, Photo 12). The Conrail Chemical Coast Line, a heavily used north-south freight line, would provide a

link between the Port Authority's ExpressRail Staten Island intermodal terminal and its ExpressRail intermodal facilities at Elizabeth and Newark, New Jersey. The new connection also connects directly to the Norfolk Southern and CSX rails systems linking the Howland Hook Marine Terminal with inland markets and replaces a previous track connection that ran through highly populated residential areas and had several problematic at-grade road crossings. (Note: The project cited in this application is located entirely in the State of New Jersey and was directed exclusively by the Port Authority of New York & New Jersey (PANYNJ). However, it should be noted that the project was also part of a larger joint-project, conducted by the PANYNJ and the New York City Economic Development Corporation (NYCEDC), which involved the coincident rehabilitation of the Arthur Kill Lift Bridge by NYCEDC and the construction / rehabilitation of other rail facilities on Staten Island by the PANYNJ and the NYCEDC.)

## **Goals and Objectives/Business Problem**

The absence of freight rail service between the Howland Hook Marine Terminal (Howland Hook) in Staten Island, New York and the nation's rail network limited the terminal's growth of business opportunities. Construction of a new track connection in New Jersey would enable the reactivation of the Staten Island Railroad (SIRR) to proceed in a manner acceptable to New Jersey communities and thereby provide for a more efficient, less costly and more environmentally friendly corridor for freight movement, while also helping to maximize the utilization of marine terminal capacity.

The new track connection would:

- Provide a more direct connection between Howland Hook and the main CSX/NS trunk routes.
- Link the SIRR and Howland Hook with the ExpressRail Intermodal System and the New Jersey Marine Terminals, providing operational synergies and flexibility for the Class I railroads serving the port.
- Avoid the use of tracks in a densely populated residential neighborhood west of the new track connection, thereby mitigating potential local community complaints.
- Increase safety by reducing the number of trains crossing highways at grade.
- Eliminate over 25,000 truck trips per year, and related significant amounts of diesel truck air emissions, between the Howland Hook Marine Terminal in Staten Island, New York and various rail yards in New Jersey.
- Avoid capital investments required to replace the bridges and upgrade the track.

- Reduce maintenance expenses of the SIRR line over the five-mile section between the new connection and Cranford due to less frequent, lighter trains.

Implementation of this project would allow the establishment of a cost effective rail service to further enhance the competitiveness of the Howland Hook Marine Terminal and provide low cost and environmental friendly alternatives for the transportation / movement of municipal solid waste and other industrial products to/from Staten Island, currently transported by truck.

## **Discussion**

### **Background**

After 100 years of operation, freight rail service to Staten Island was discontinued in 1991 due to a declining customer base. Since that time, the Port Authority, the City of New York (via the New York City Economic Development Corporation) and the New Jersey Department of Transportation have been working together to reactivate the former Staten Island Railroad in order to bring intermodal rail service to the Howland Hook Marine Terminal (Howland Hook) and restore rail service to other businesses on Staten Island. Howland Hook was the only deepwater marine terminal in New York State without a connection to the nation's rail network since its reopening in 1998. The increasing volume of container shipments through the region since the terminal reopened and its total reliance on trucks for cargo container movements, which adds to traffic problems in the already congested roadways, further necessitates the need to restore rail service.

### **Objectives and Methodology**

The new Connection traverses existing railroad properties and streets in Elizabeth, New Jersey and the track is carried at-grade and above grade, with new bridges provided where the track traverses existing city streets. Key elements of the project include:

- Simulation of train-handling dynamics for different freight train configurations to assure safe and efficient operations, given the combination of a maximum 2% gradient on a curve of 7 degrees and 30 seconds.
- New bridge structures provided as the new track crosses over local streets (South Front Street and Amboy Avenue).

- Re-alignment of Bayway Avenue to accommodate the new track on-grade and again intersects Bayway Avenue beyond the bridge's east approach roadway.
- Extensive modification of an existing New Jersey Turnpike highway bridge carrying Bayway Avenue to provide vertical and lateral clearances for the new track to carry double-stack container trains crossing underneath the bridge.
- New pressure relieving platform structure carrying the Connection track as it crosses over the existing influent sewer of the Joint Meeting of Essex & Union Counties wastewater treatment facility.

New bridges and track supporting structures are designed to support the E-80 train loadings in accordance with the American Railway Engineering and Maintenance Association (AREMA) standards. A railway signal system based on electronic track circuits with Electrocode equipment is built to govern train movements through the track connection and the Arthur Kill Lift Bridge to ensure safety and smooth passage of trains over the bridge and the Chemical Coast Line.

#### **Hardware/software Used**

Track and structural plans were developed using Autocad. The signal plans were developed using Microstation. Construction schedules were prepared using Primavera. Structural analyses were performed using CONSYS, LARSA engineering software packages and spreadsheets.

#### **Project Cost**

\$57 Million for construction, utility relocation and property acquisition.



## **Performance Measures**

The project was built in an environmentally sensitive location with complex underground utility networks where the cooperation of state, local government and private industries was critical. The project was completed on schedule in December 2006 and under budget while maintaining highest construction quality, structural integrity and safety standards. Since completion of the project, rail service of the Staten Island Railroad was reactivated on April 2, 2007 with the movement of municipal solid waste from Staten Island, New York. Service to transport international cargo containers from Howland Hook Marine Terminal is expected to commence in July 2007.

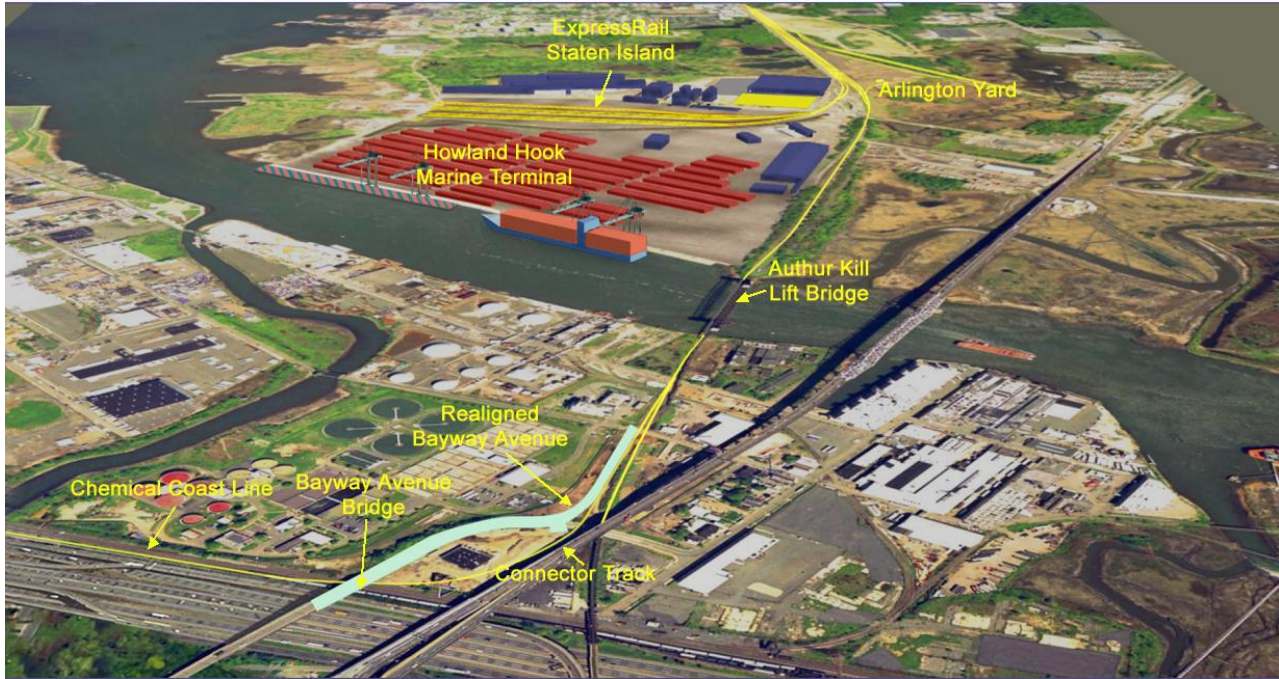
## **How the project fulfills the Award Criteria**

The new track connection establishes a new cost effective and environmentally friendly interstate transportation corridor for shipment of international cargo, domestic industrial products and municipal solid waste. It helps to maximize port and terminal utilization, reduce highway congestion and improve the quality of life in affected cities.

## **Conclusion**

The project significantly improves the mobility of international cargo containers to/from the Howland Hook Marine Terminal, as well as enables the movement of New York City's municipal solid waste and other industrial freight, currently transported to and from Staten Island by truck. In addition, it enhances the competitiveness of the Port of New York & New Jersey by providing an efficient and cost effective alternative to trucks while also reducing roadway congestion and diesel truck air emissions.

## Appendix



**Staten Island Railroad: Chemical Coast Connector Project**



Photo 1: Deactivated Staten Island Railroad / AK Lift Bridge



Photo 2: Removal of SIRR / AK Bridge Approach Spans for Rehabilitation.

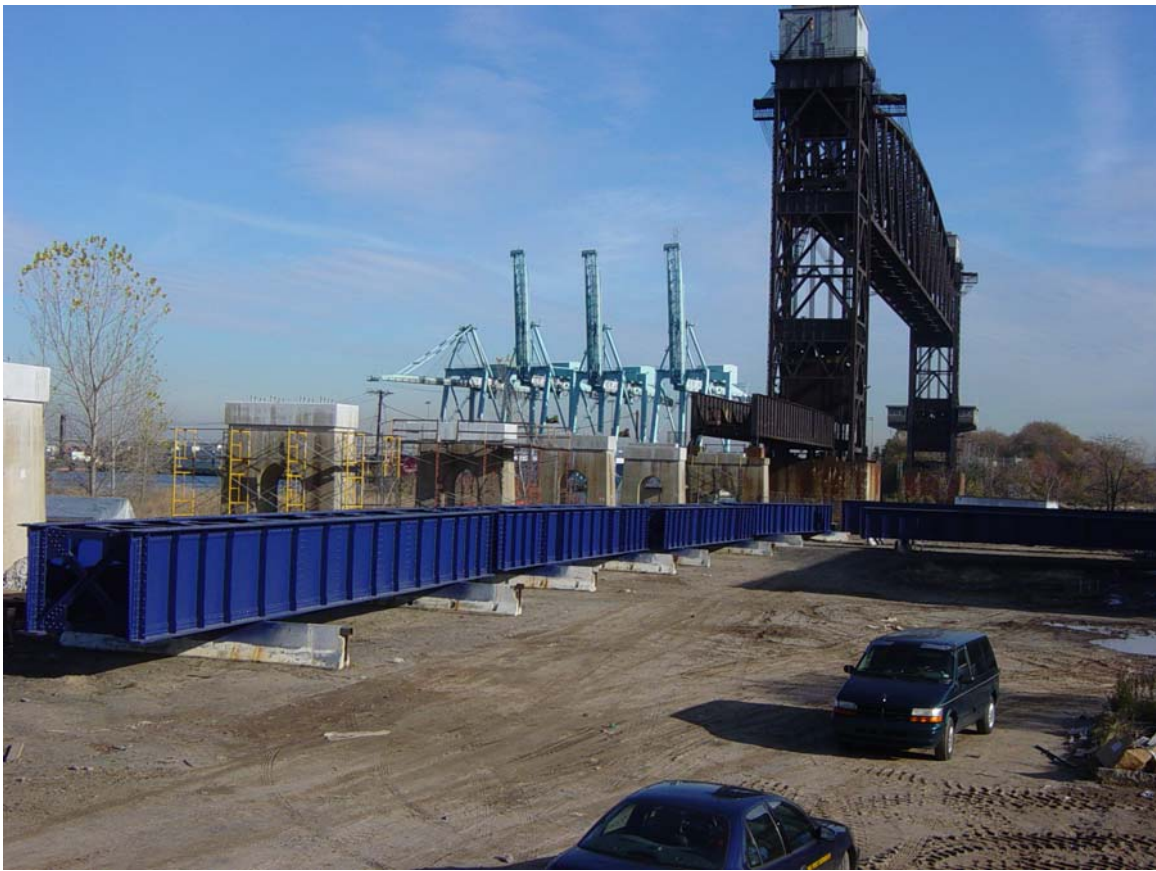


Photo 3: Rehabilitation of the AK Bridge Approach Spans.



Photo 4: Reinstallation of the Rehabilitated Approach Spans.



Photo 5: Installation of New Bridge at Amboy Avenue.



Photo 6: Completed Three Spans of Twin Bridge at Amboy Avenue.



Photo 7: Construction of the New Connector Retaining Structure.



Photo 8: Completed Elevated Connector and Realigned Bayway Avenue.



Photo 9: Bayway Avenue Bridge Reconfigured to Accommodate New Track.



Photo 10: Bayway Avenue Bridge over the New Connector Track.





Photo 11: Chemical Coast Connector to the AK Bridge.



Photo 12: Connection to the Conrail Chemical Coast Line.



Photo 13: Connector Under the Bayway Avenue Bridge.



Photo 14: Chemical Coast Connector to the AK Bridge.



Photo 15: Reactivated SIRR / Chemical Coast Connection to the Howland Hook Marine Terminal.