Chapter 1: Project Purpose and Need

1.1 Introduction

The New York State Department of Transportation (NYSDOT) is proposing to replace the existing rail bridge across the Hudson River between the Cities of Albany and Rensselaer. This bridge, known as the Livingston Avenue Bridge, is a critical link on the Empire Corridor passenger and freight rail route in New York State and in the state's wider freight rail network, and is nearing the end of its serviceable life. For this proposed bridge replacement project (the Project), NYSDOT has assigned identifying Project Identification Number (PIN) 1935.49.

NYSDOT was selected to receive Fiscal Year 2010 grant funding for the Project under the High Speed Intercity Passenger Rail Program administered by the U.S. Department of Transportation's (USDOT) Federal Railroad Administration (FRA). Prior to issuing permits or approvals for a project, including approval of funding, Federal agencies must consider the environmental impacts of their actions in accordance with the National Environmental Policy Act (NEPA). FRA and NYSDOT have prepared this Environmental Assessment (EA) to comply with the requirements of NEPA as well as the New York State Environmental Quality Review Act (SEQRA). FRA is the lead Federal agency for review under NEPA and NYSDOT is the lead state agency for review under SEQRA.

FRA and NYSDOT prepared this EA in accordance with the Council on Environmental Quality's (CEQ) regulations implementing NEPA (40 CFR Parts 1500-1508), FRA's Procedures for Considering Environmental Impacts (64 FR 28545, [May 26, 1999] and 78 FR 2713 [January 14, 2013]), and NYSDOT's SEQRA regulations at 17 NYCRR Part 15. The EA also documents compliance with other applicable Federal, New York State, and local environmental laws and regulations, including Section 106 of the National Historic Preservation Act; the Conformity requirements of the Clean Air Act; the Clean Water Act; the Rivers and Harbors Act of 1899; Section 4(f) of the Department of Transportation Act of 1966 (Section 4(f)); the Endangered Species Act; Executive Order 11988 and USDOT Order 5650.2 on Floodplain Management; Executive Order 11990 on Protection of Wetlands; the Magnuson-Stevens Act related to Essential Fish Habitat; the Coastal Zone Management Act; and Executive Order 12898 on Environmental Justice.

This chapter of the EA describes the Project's NEPA and SEQRA classifications, Project setting, the Project purpose and need, and NYSDOT's goals for the Project.

1.2 Environmental Classification

1.2.1 NEPA Classification

NYSDOT is receiving financial assistance for the Project from FRA and will require Federal regulatory approvals for construction activities within and over a navigable waterway of the United States from the U.S. Army Corps of Engineers (USACE) and U.S. Coast Guard (USCG). The Federal funding and Federal approvals will require compliance with NEPA and applicable Federal rules and regulations. Therefore, this EA has been prepared in compliance with NEPA. FRA is the lead Federal agency for this EA.

1.2.2 SEQRA Classification

NYSDOT, acting as lead state agency pursuant to SEQRA, commenced the SEQRA environmental review of the Livingston Avenue Bridge Project in 2010. NYSDOT has determined that the Project is a SEQRA Non-Type II Action in accordance with 17 NYCRR Part 15 – Procedures for Implementation of State Environmental Quality Review Act. SEQRA Non-Type II projects include actions for which the environmental impacts are not clearly established, indicating that the impacts should be evaluated under SEQRA. The Project is being evaluated in an EA because the extent of significance of its impacts is unknown.

1.3 Project Location and Setting

The Livingston Avenue Bridge is a rail bridge that spans the Hudson River between the City of Albany (Albany County) and City of Rensselaer (Rensselaer County) in New York State (see **Figure 1-1** for the Project location). The Livingston Avenue Bridge was built for the New York Central Railroad in 1901-1903 by the American Bridge Company. The bridge uses the abutments and piers of a previous bridge at the location built in the 1860s.

The two-track Livingston Avenue Bridge is approximately 1,300 feet long from abutment to abutment, with nine piers. The tracks are approximately 12 feet apart, measured from the centerline of one track to the centerline of the other. The profile of the existing bridge is level, with a very slight grade of less than 1 percent. Two steel frame towers approximately 151.5 feet high above Mean High Water flank the swing span and support power cables. **Figure 1-2** provides an elevation and profile of the bridge, and **Figure 1-3** shows views of the bridge.

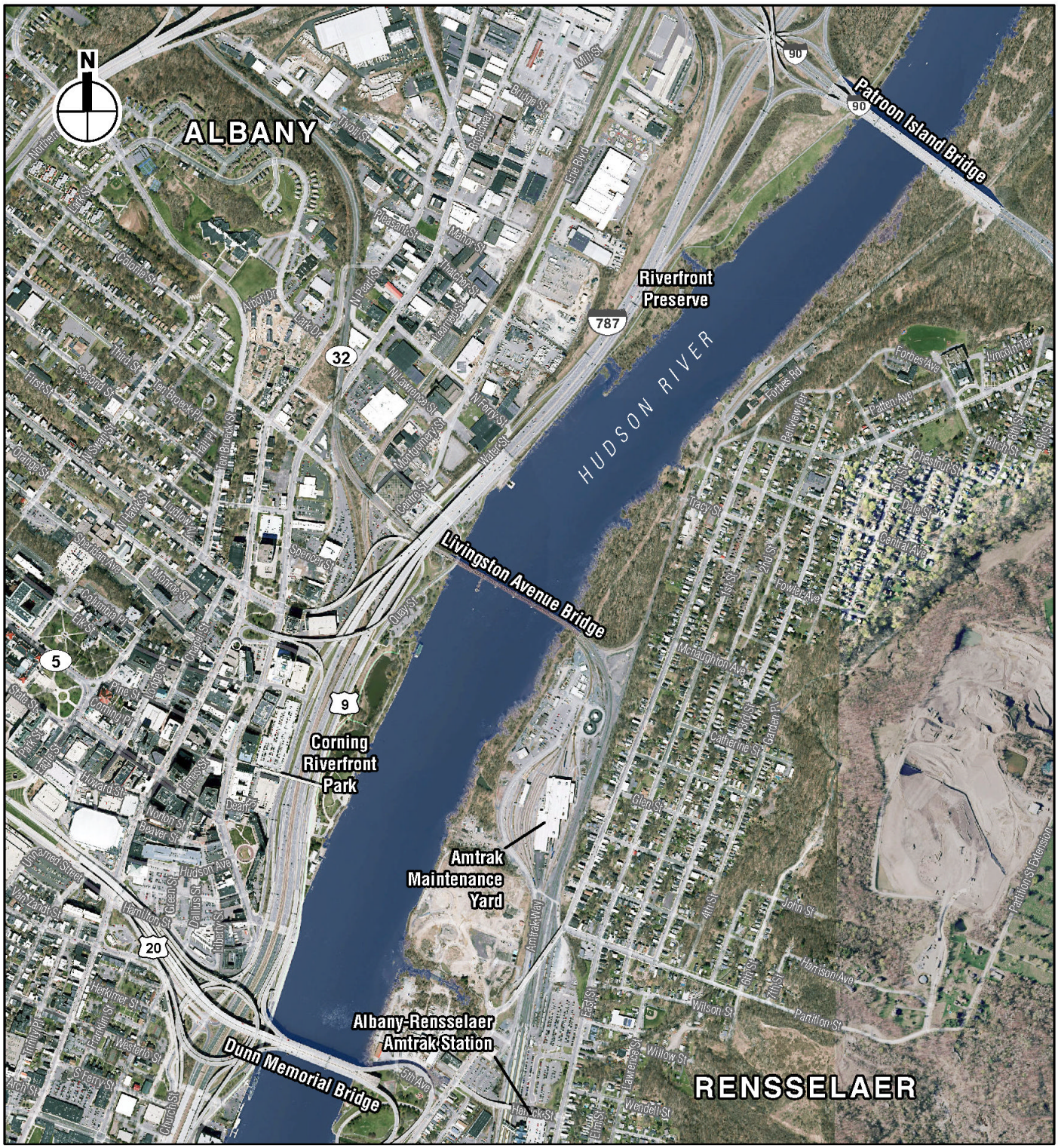
The Livingston Avenue Bridge spans a navigable portion of the Hudson River and has a vertical clearance above the water that varies from 25 to 30 feet, depending on the tide. The structure is a swing span movable bridge. The swing span provides a vertical clearance from Mean High Water to overhead catenary cables of approximately 135 feet. Although there are two channels when the bridge is in the open position, only the east channel has a fender system and is used for navigation. When the bridge is in the open position, the east channel provides 100 feet horizontal clearance due to the fender system while the west channel provides 110 feet. The regulated navigation channel maintained by USACE in this portion of the Hudson River is approximately 600 feet wide, most of the width of the river. The bridge's movable span is at the western edge of the navigation channel. In recent years, the bridge has opened as many as 474 times a year (in the peak year of 2005), with an average of 300 openings a year, generally during the boating season between April and November.

CSX Transportation Inc. (CSX) owns the Livingston Avenue Bridge as part of its Hudson Subdivision, and the National Railroad Passenger Corporation (Amtrak) controls it as part of the Empire Corridor route through a long-term lease with CSX.[1] The bridge is at Milepost QC 143.1 on the CSX Hudson Subdivision. Using its bridge identification system, NYSDOT has assigned the structure Bridge Identification Number (BIN) 7092890. The bridge and the CSX Hudson Subdivision became part of Amtrak's and Conrail's national passenger and freight networks, respectively, in the 1970s. CSX acquired the Livingston Avenue Bridge, much of the CSX Hudson Subdivision, and other connecting rail routes in 1999 when it acquired 43 percent of Conrail's assets. Amtrak maintains and operates the bridge substructure, superstructure, swing mechanism, signal system, track, and ties by agreement with CSX.

The bridge serves both passenger and freight rail: Amtrak uses the bridge for intercity passenger trains traveling on the Empire Corridor route, and CSX and Canadian Pacific (CP) use the bridge for freight rail service.

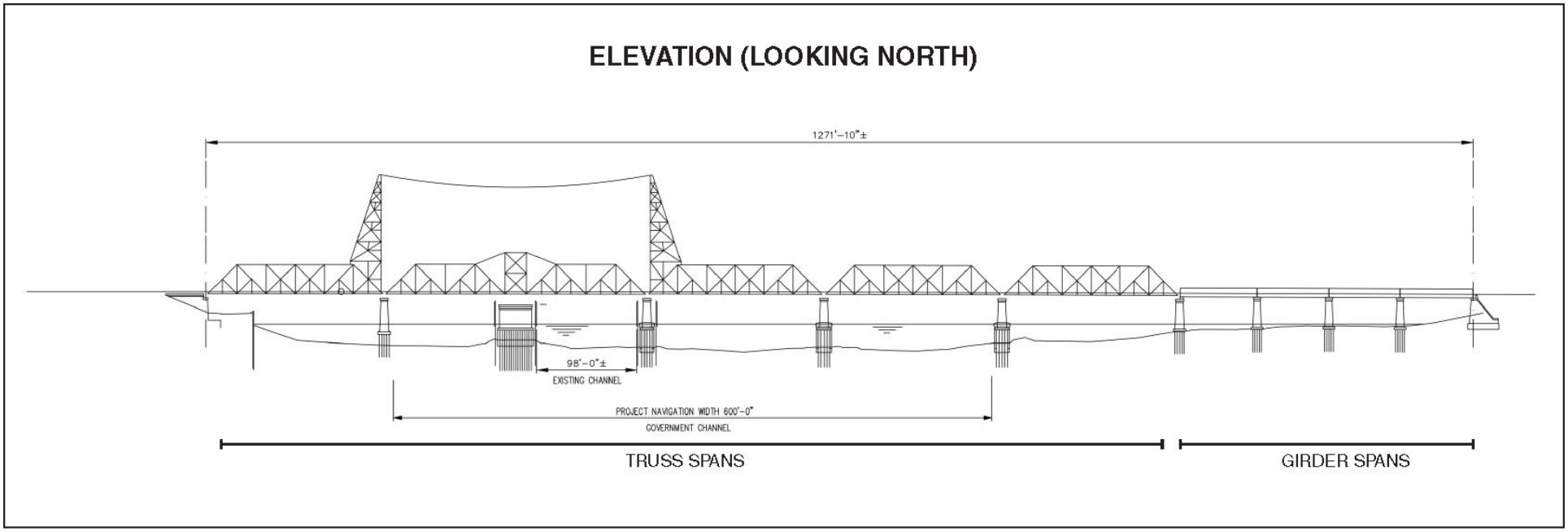
[1] Amtrak's lease extends until 2035 with option to extend to 2060.

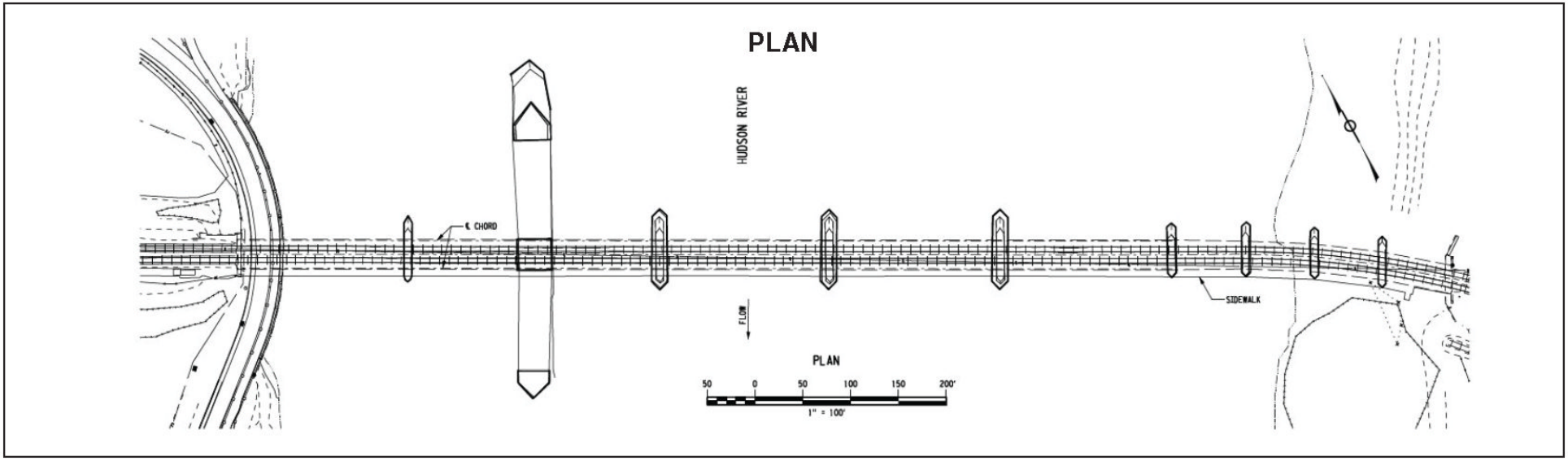
11.18.21



Project Location

Figure 1-1

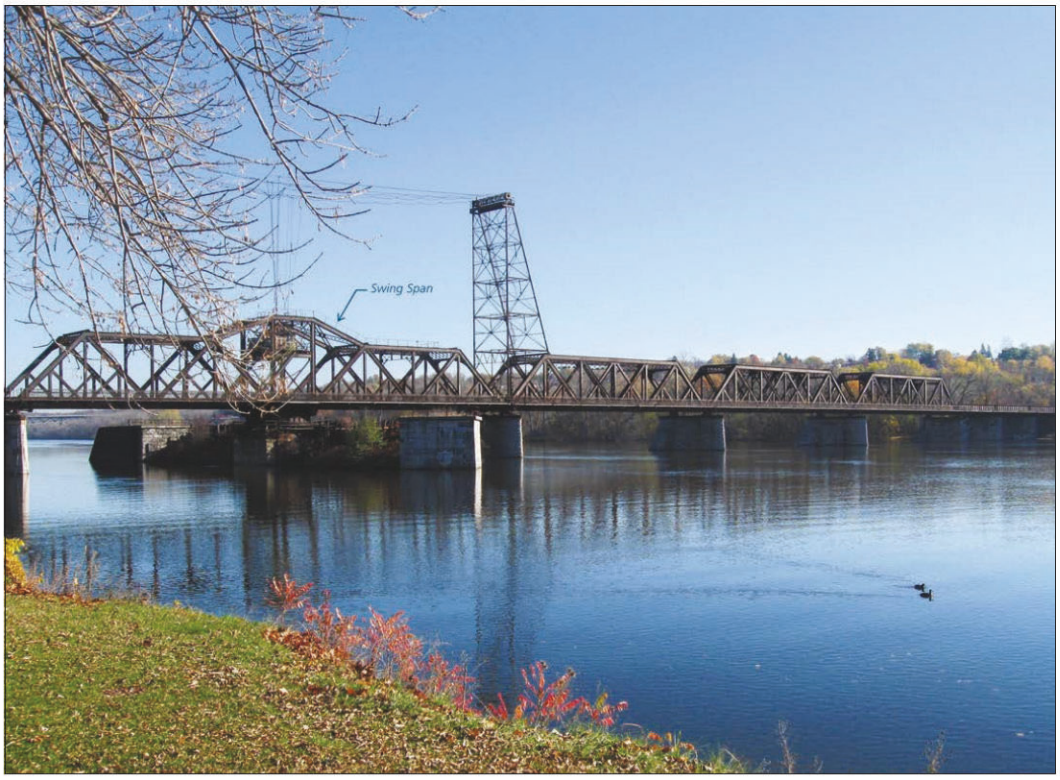




Existing Livingston Avenue Bridge Elevation and Plan

Figure 1-2

View southwest toward Albany 1



View northeast from Albany 2

Views of Existing Livingston Avenue Bridge

Figure 1-3

The bridge is just north and west of the Albany-Rensselaer Amtrak Station on the Empire Corridor rail route. The Empire Corridor is the principal passenger and freight rail route through New York State, extending approximately 460 miles between New York City and the Canadian border at Niagara Falls (see **Figure 1-4**). USDOT designated the Empire Corridor as a High-Speed Intercity Passenger Rail (HSIPR) program corridor in 1998, based on its utility and its potential for future development. Amtrak routes that cross the bridge include the Empire Service (between New York City and Niagara Falls), Maple Leaf (between New York City and Toronto), Lake Shore Limited (between New York City and Chicago), Adirondack (between New York City and Montreal), and Ethan Allen Express (between New York City and Rutland, Vermont) routes. Amtrak has a rail yard for storage and maintenance of rail cars north of the Albany-Rensselaer Station along the Hudson River waterfront near the bridge, referred to in this EA as the Amtrak Maintenance Facility.

The Livingston Avenue Bridge is also part of CSX's Hudson Subdivision freight route, a 94-mile segment of the Empire Corridor between Poughkeepsie, NY, which is on the east side of the Hudson River about 70 miles south of Albany, and Scotia, NY, which is on the west side of the Hudson River near Schenectady (see **Figure 1-5**).

Bridge approach tracks on the east side of the Hudson River are part of a "wye," or a triangle of tracks (i.e., tracks that create a shape like the letter "Y"). The wye is formed by the intersection of the two Empire Corridor tracks curving toward the bridge from Albany-Rensselaer Station; a single freight track that runs north from Albany-Rensselaer Station past the bridge toward Troy, known as the Troy Industrial Track; and a single track curving south toward the bridge from the Troy Industrial Track (see **Figure 1-6**). The north and south legs of the wye ramp up from the Troy Industrial Track to meet the bridge, which is at a higher elevation.

On the west side of the river, the bridge abutment is on the west side of Quay Street, which runs along the waterfront. West of the abutment, the two-track west approach is on a berm that passes beneath a viaduct carrying eight lanes of Interstate 787 (I-787) and then passes across a series of five additional bridges over Water Street, Centre Street-Erie Boulevard, a CP freight line (and unbuilt location of Montgomery Street), Colonie Street and Broadway, and North Pearl Street. This stretch of track, including the bridges and the earthen berm between them, was historically referred to as the Albany Railroad Viaduct. **Figure 1-6** illustrates the locations of the five bridges of the west approach.

1.4 Project Purpose

The purpose of the Project is to improve reliability and reduce passenger and freight train delays along this segment of the Empire Corridor; achieve (at a minimum) a long-term state-of-good-repair for the bridge; eliminate existing bridge and track deficiencies; and maintain or improve navigation near the bridge. This will ensure that the Livingston Avenue Bridge meets modern passenger and freight rail capacity and load (weight) standards, maintains acceptable levels of safety, and supports the long-term utility and vitality of the Empire Corridor.

1.5 Project Need

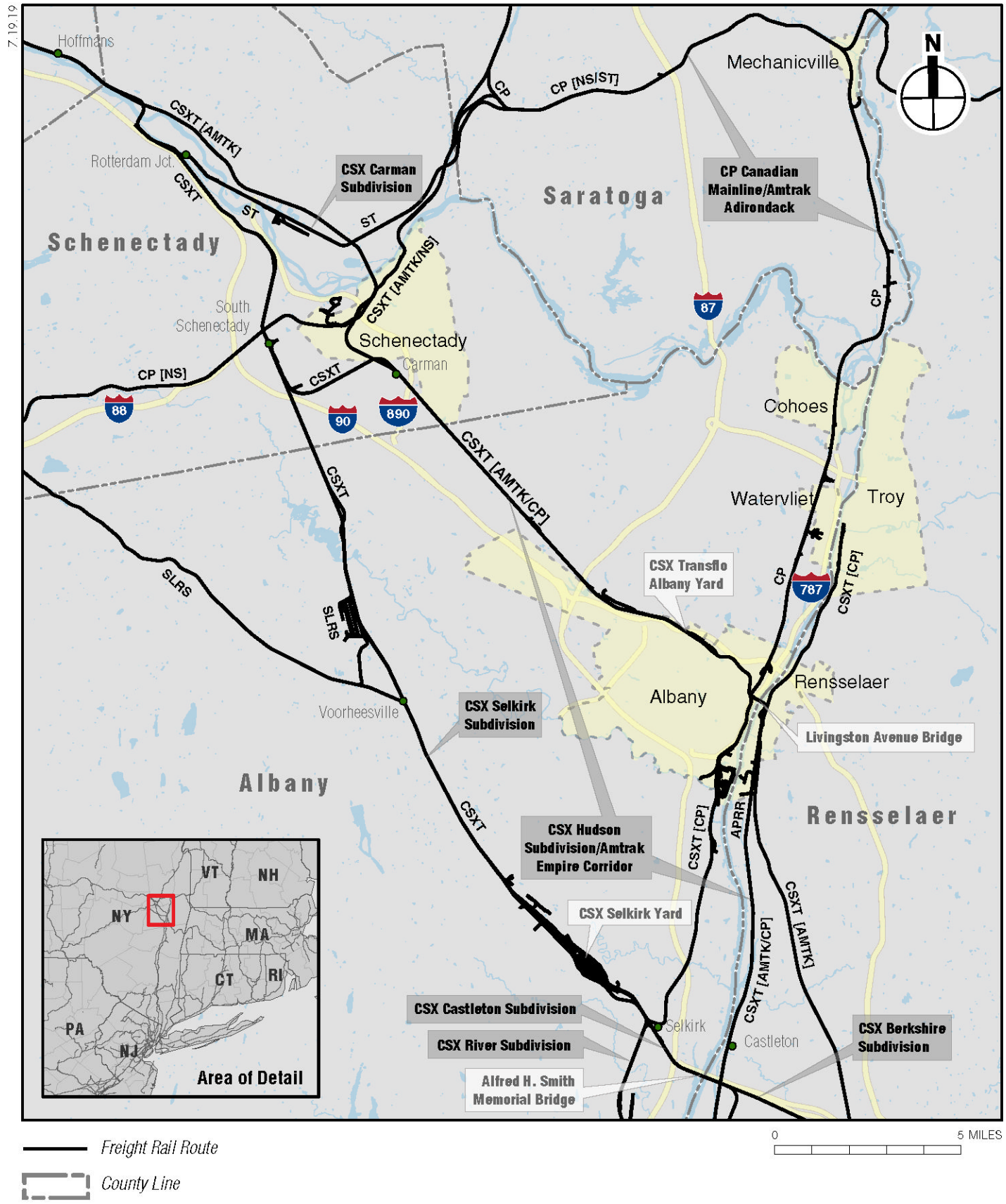
The superstructure of the existing bridge was erected in 1901-1903 on a substructure that dates to the 1860s and is near the end of its serviceable life. The swing span frequently malfunctions, resulting in delays to passenger trains, freight trains, and boat traffic. In addition, the bridge does not meet current design standards related to load, speed, and vertical clearance.

The existing Livingston Avenue Bridge has been identified as a contributing factor to delays in the movement of freight and passengers throughout New York State. The Project is essential to implementing future rail plans and improving state-wide transport.

7.18.19

Intercity Passenger Rail in New York State

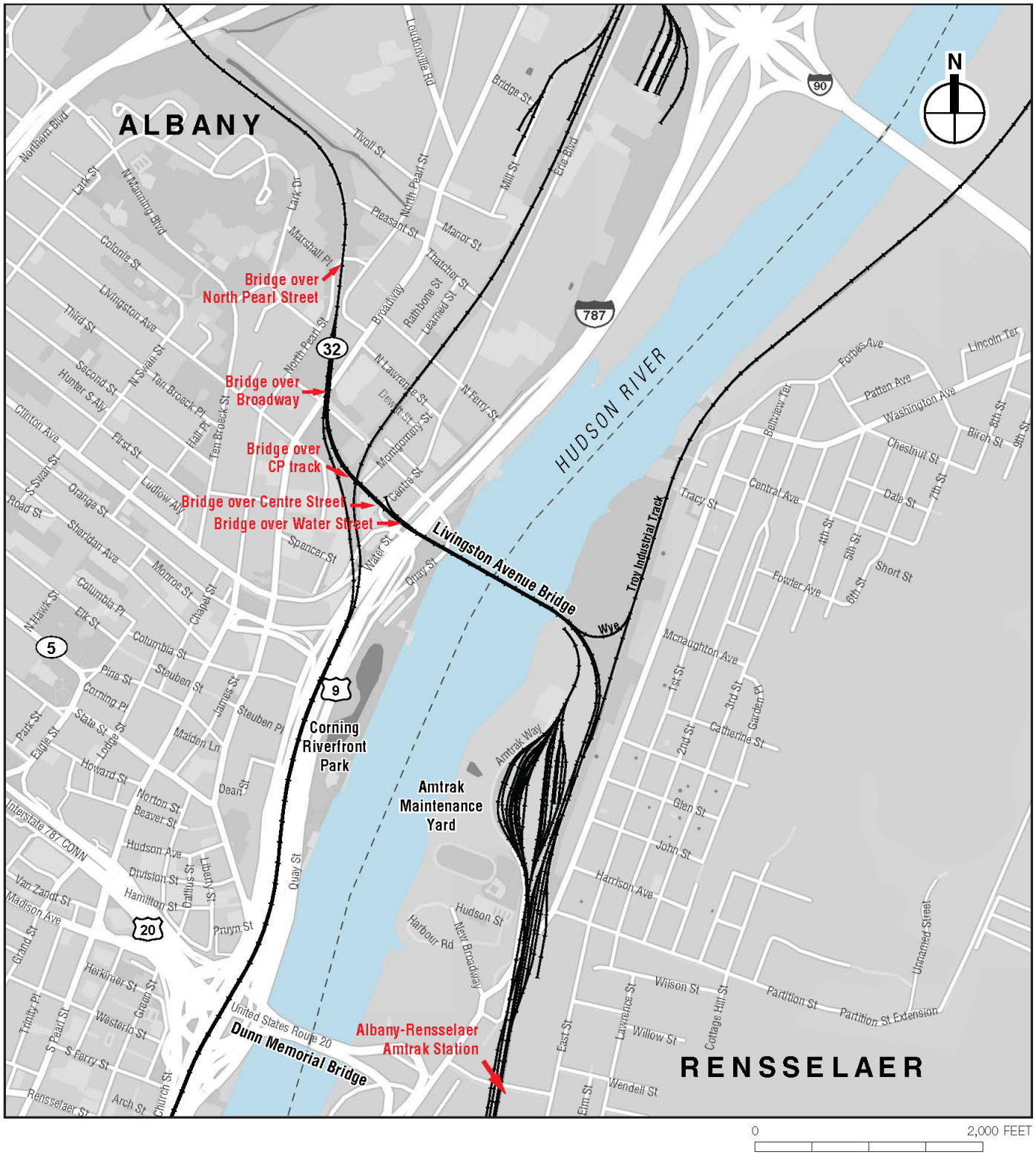
Figure 1-4



Freight Rail Routes Near Albany

Figure 1-5

8.27.19



Track Alignments Near Livingston Avenue Bridge

Figure 1-6

1.5.1 Need to Address Structural Deficiencies and Substandard Conditions

The Livingston Avenue Bridge has nine spans on masonry piers. Over the Hudson River's navigation channel, it includes four through-truss spans approximately 178 feet long and a swing span consisting of two 132-foot-long through-truss spans that pivot on a central pier to open and close the bridge for river traffic. Over the shallower water near the Rensselaer shoreline, the bridge has four through-girder spans approximately 76 feet long.[2] **Figure 1-2** illustrates the bridge elevation and plan.

Inspections conducted by NYSDOT in 2015 reveal that the bridge has substantial deterioration. The superstructure and substructure are in fair to poor condition, including some components with substantial corrosion and several piers that are in critical condition, including piers that have substantial undermining of the timber foundations that support the stone piers. The bridge was not designed for and does not meet modern seismic codes.

The mechanical portions of the swing span are significantly worn and require near constant maintenance to remain operable. The electrical portions of the bridge are outdated and obsolete. Substantial maintenance effort is required to keep the electrical components operable, and long-term reliability of the mechanical and electrical systems is a serious concern. The existing signal and bridge control system dates from the 1960s and is in generally poor condition. The swing span frequently malfunctions, resulting in delays to passenger trains, freight trains, and boat traffic. In recent years, Amtrak has kept a maintenance team on site to address issues with the swing span which has reduced delays associated with malfunctions. Failure of any component of the existing system would cause delays to trains or, if the bridge was stuck or indicated as unable to open, to river traffic. **Appendix A** of this EA provides more specific information on the bridge condition.

The existing bridge also cannot support train operations at speeds consistent with the speeds on adjacent rail segments. The American Railway Engineering and Maintenance-of-Way Association (AREMA) has a rating system for bridges based on their "live load." Live load relates to the weight of moving (i.e., live) trains, and accounts for the weight of the train and the dynamic effect of the vehicle as it moves. This is affected by the speed of the train and other factors. The AREMA rating system allows for comparison of bridge capacity across different types of trains. The ratings use the "Cooper E-Series," and the current standard for railroad bridges is Cooper E-80, which can accommodate double-stack freight trains.

The bridge's current condition will not accommodate the loads from modern, industry-standard passenger and freight cars and does not meet the Cooper E-80 standard. The Livingston Avenue Bridge was designed for a live load less than half of the value that would meet current design standards; therefore, passenger and freight trains operating over the bridge must comply with restrictions related to weight and speed. In addition to the obsolete design of the bridge, its current deteriorated state further limits train weight and speed on the crossing. As a result, the two-track bridge can be used only by one train at a time. The maximum authorized speed on the bridge is 15 miles per hour (mph), which is lower than could be allowed because of speed limitations of its approach curves and tracks on adjacent rail segments.

In addition, the existing turnout for the north leg of the wye on the east side of the Hudson River has a sharp curve that does not meet current AREMA standards and limits speeds on the north wye track to 15 mph. The wye tracks operate at a permanent slow condition because they are not signalized. Also, both the north leg and the east leg of the wye track operate at restricted speed

---

[2] A **truss span** is a bridge span in which the load is transferred to the piers by steel trusses, which are steel members connected to make adjoining triangles. A truss span with bracing members above the trackbed and trains is referred to as a through-truss. A **girder span** consists of longitudinal beams to support the bridge deck. A grid of "floor beams," or beams that run across from one longitudinal beam to the other, and "stringers," or beams that run from one floor beam to the next, support the bridge deck. The tracks and ballast (if any) are on top of the bridge deck.

due to their poor condition, including areas of wide gauge. **Figure 1-6** illustrates track alignments near the bridge.

The bridge also has non-standard vertical and horizontal clearances, which limit the types of carriages and freight that can traverse the span. The vertical clearance for trains traveling across the bridge is non-standard, at 18 feet 2 inches, compared to the 23-foot vertical clearance standard established by AREMA and used by Amtrak and CSX, and is not high enough to accommodate modern, double-stack freight trains. The bridge and two of the bridges at the west approach have horizontal clearances that are lower than AREMA guidelines and Amtrak standards. While the guidelines and standards call for a horizontal clearance that is a minimum of 9 feet, the Livingston Avenue Bridge has a minimum horizontal clearance of 7'-6½" to centerline of track.

In addition, the existing track geometry and curves throughout the Project limits are also substandard and do not meet Amtrak's current Track Design Specification, Spec No. 63. While Amtrak standards call for minimum track centers (i.e., the distance between two tracks, measured from the centerline of one track to the centerline of the other) of 14 feet and CSX standards call for minimum track centers of 15 feet, the track spacing across the bridge and across the five additional viaducts west of the bridge is approximately 12 feet from centerline of track to centerline of track. Curve lengths and radii (i.e., the tightness of the curves) also do not meet current Amtrak and CSX standards and therefore limit train speeds in the area.

The signals governing movements across the bridge are directly controlled by the operator in the control cabin on the bridge. The signal system is integrated with the adjacent signal system and the bridge operating system. While NYSDOT recently replaced the signal system throughout the corridor on both sides of the bridge as part of the Albany to Schenectady Double Track project and the Albany-Rensselaer Station 4th Track project, NYSDOT did not replace the signals and controls for the bridge itself. The signal system on the bridge needs replacement and modernization to bring it in compliance with a level of maintenance consistent with a modern signal system. Moreover, all of the equipment controlling the bridge operations is obsolete and should be replaced. While Amtrak maintains the system by replacing parts as they are available, finding parts for the obsolete system has become difficult.

1.5.2 Need to Improve Capacity

High-speed passenger rail service along the Empire Corridor is critical to New York State's economic future and environmental sustainability. To improve intercity passenger rail service while strengthening the freight rail system, FRA and NYSDOT are jointly preparing a Tier 1 Environmental Impact Statement (EIS) for HSIPR Service Development on the Empire Corridor. A Tier 1 Draft EIS was published in January 2014 that evaluates alternatives to introduce higher passenger train speeds on the Empire Corridor and improve reliability, travel times, service frequency, and passenger amenities.[3]

The Livingston Avenue Bridge is a restrictive bottleneck along the Empire Corridor that impedes future HSIPR plans. The current restrictions on bridge operations compromise the short- and long-term utility and vitality of New York's passenger and freight rail service via the Empire Corridor. Improving the existing crossing is an essential component of developing a successful HSIPR corridor in New York State and providing ample connection to New York City. The Empire Corridor Tier 1 Draft EIS identifies the Livingston Avenue Bridge as a location with speed restrictions that reduce capacity on the Empire Corridor, and replacement of the bridge and a related increase in allowable train speed is part of all build alternatives evaluated in the Draft EIS. The *New York State Rail Plan* issued by NYSDOT in 2009 to guide New York State's rail transportation investment strategies identifies the importance of the ongoing and improved operation of the

[3] Tier 1 Draft EIS for High Speed Rail Empire Corridor, January 2014. https://www.dot.ny.gov/empire-corridor/deis.

Empire Corridor as a primary passenger and freight rail route through the state.[4] It also identifies the rehabilitation or replacement of the Livingston Avenue Bridge as necessary to greatly improve the reliability of passenger and freight operations and to benefit boat traffic.

The Empire Corridor serves both passenger and freight traffic and comprises rail owned by CSX, Amtrak, and Metro-North Railroad. From New York City to Rensselaer, the Empire Corridor travels on the east side of the Hudson River, predominantly along the river's edge. It crosses the river between Rensselaer and Albany and then continues westward to Buffalo and beyond. Through Albany, the Empire Corridor follows the CSX Hudson Subdivision. The Empire Corridor is the only passenger rail route between New York City, Albany, Buffalo, and Niagara Falls and also serves as a Class I freight rail route (as defined in 49 CFR 1201). Class I railways refer to lines operated by the nation's seven large, long-haul freight railroad companies[5] and represent the primary corridors in the nation's freight rail network.

The Empire Corridor route is a critical link in domestic and international goods movement, serving Class I railways as well as Class II (regional) and Class III (short-line) railroads. A number of rail lines converge and connect near Albany (see **Figure 1-5**), making the Capital District an important hub for passenger and freight operations in the Northeast.

In addition to providing for east-west connections through upstate New York, the Empire Corridor is a primary north-south railway into New York City. Amtrak operates several passenger routes over the Livingston Avenue Bridge—the Empire Service (between New York City and Niagara Falls), Maple Leaf (between New York City and Toronto), Lake Shore Limited (between New York City and Chicago), Adirondack (between New York City and Montreal), and Ethan Allen Express (between New York City and Rutland, Vermont) routes. As of 2019, before the COVID-19 pandemic temporarily reduced demand for rail travel, on an average weekday Amtrak operated 6 trains in each direction, for a total of 12 trains per day, across the Livingston Avenue Bridge. (Amtrak also operates additional Empire Service each day between New York City and Albany, but these trains terminate at the Albany-Rensselaer Station and do not traverse the Livingston Avenue Bridge.) FRA and NYSDOT anticipate that service will return to similar levels after the pandemic. In addition to the Amtrak passenger service, in 2019 CSX operated an average of five freight trains each day across the bridge, and CP operated one freight train on average each day across the bridge. **Exhibit 1-1** summarizes the train traffic across the bridge.

Exhibit 1-1
Existing (2019) Train Traffic
Across Livingston Avenue Bridge
(Average Weekday)

Train Type	No. Trains
Amtrak Empire Service	4
Amtrak Maple Leaf	2
Amtrak Lake Shore Limited	2
Amtrak Adirondack	2
Amtrak Ethan Allen	2
CSX Freight	5
CP Freight	1
Total	18

Source: Amtrak.com

[4] https://www.dot.ny.gov/divisions/policy-and-strategy/planning-bureau/state-rail-plan.

[5] Railroads in North America are organized by size, with Class I the largest. Amtrak and seven national long-haul freight railroads, including CP and CSX, are designated as Class I railroads.

High-speed passenger rail service along the Empire Corridor is critical to New York State's economic future and environmental sustainability. NYSDOT is seeking to improve intercity passenger rail service on this designated high-speed corridor while strengthening the freight rail system. Improving the existing crossing is an essential component of developing a successful HSIPR corridor in New York State and providing ample connection to New York City.

1.5.3 Navigational Need

The Livingston Avenue Bridge is a swing span bridge over a navigable section of the Hudson River. It is operated by a bridge operator working in an operator's house on the bridge above the center of the swing span. In recent years, the bridge has opened for ships an average of 300 times a year. Improving the reliability of the movable span is important for maintaining the navigation channel past Albany.

There is no record of damage to the bridge from barge or vessel strikes.

As part of the design for the Project, NYSDOT conducted a Navigation Study of the Hudson River at the existing Livingston Avenue Bridge. To conduct this study, NYSDOT collected information from boat operators, including marinas, commercial users, and others, regarding navigational needs near the existing bridge. The Navigation Study is included in **Appendix D** of this EA. General findings of the study include:

- Openings of the bridge are most frequently requested by sightseeing tour boats and by tug boats transporting construction materials and equipment.
- Commercial users of the bridge noted that requesting and obtaining a bridge opening has been unreliable due to technical difficulties or the operator being unavailable.
- Multiple users noted that passage through the bridge can be difficult due to the bridge's limited horizontal clearance (of 100 feet), pier skew, and curvature of the river.

The Navigation Study concluded that increasing the horizontal clearance of the navigable channel beneath the bridge would make passage easier and faster for recreational and commercial users, and increasing the reliability of the bridge operations would be greatly beneficial to commercial users that require bridge openings.

1.6 Project Goals and Objectives

To evaluate the Project Alternatives developed as part of the environmental review process, NYSDOT established Project goals. The Project goals, and related objectives that illustrate how those goals can be achieved, are listed in **Exhibit 1-2**.

1.7 Project Schedule and Contact Information

Following completion of environmental review in accordance with NEPA and SEQRA, final design will occur, permits can be issued, and right-of-way acquisition will occur. It is anticipated that the construction duration for the Project would be three years. Assuming funding is available when NEPA is complete, Project completion could occur in 2025.

Exhibit 1-2
Project Goals and Objectives

Project Goals	Related Objectives
Goal 1: Improve passenger rail operations, service reliability, and operational flexibility	• Improve the bridge such that it can support simultaneous two-track operation, thereby removing delays to rail traffic. • Increase operational speeds along the bridge to a minimum of 30 mph.* • Correct all identified track deficiencies on the bridge and its approaches to meet current design standards. • Improve operations by providing a signal system that meets current standards and is consistent with the signal systems recently completed on the two adjacent rail projects (Albany to Schenectady Double Track and Albany-Rensselaer 4th Track projects). • Ensure consistency with plans for the Empire Corridor and HSIPR program. • Accomplish Goal 1 in a cost-effective manner.
Goal 2: Improve the load capacity of the corridor and remove existing structural operational limitations	• Maintain or improve freight movement across the bridge. • Provide a river crossing capable of meeting current AREMA live-load standards (Cooper E-80). • Provide a river crossing with a design life of a minimum of 100 years. • Provide a river crossing that meets AREMA structural design criteria. • Provide a river crossing with a track vertical clearance of 23 feet and 14-foot track centers, which will comply with Amtrak standards. • Provide the geometric clearances required by AREMA, CSX, and Amtrak for dual-track operation. • Accomplish Goal 2 in a cost-effective manner.
Goal 3: Minimize conflicts with navigational traffic	• Provide a river crossing that meets or exceeds existing horizontal navigational clearances. • Avoid or minimize disruptions to river traffic during bridge construction. • Avoid or minimize delays to trains or river traffic during bridge operation. • Accomplish Goal 3 in a cost-effective manner.

Note: * 30 mph is the maximum feasible speed on the existing bridge, given the curve of the approach tracks.

The following people may be contacted for more information on this EA:

FEDERAL RAILROAD ADMINISTRATION

Brandon Bratcher
Environmental Protection Specialist

Please contact through email:
Brandon.bratcher@dot.gov

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

Mark Jakubiak
Project Manager
New York State Department of Transportation
Main Office Rail Projects Group
50 Wolf Road POD 2-4
Albany, NY 12232
livingstonavebridge@dot.ny.gov