Chapter 4: Social, Economic, and Environmental Considerations

4.1 Introduction

This chapter examines the potential social, economic, and environmental consequences of the No Action and Build Alternatives. The chapter includes sections summarizing the Project Alternatives' impacts on the following resources:

- Land Use and Community Character
- Social Conditions
- Economic Conditions
- Cultural Resources
- Visual Resources
- Water Resources
- General Ecology and Wildlife Resources
- Geology
- Air Quality
- Energy and Greenhouse Gas Emissions
- Noise and Vibration
- Utilities and Infrastructure
- Contaminated Materials
- Safety and Security
- Indirect and Cumulative Impacts
- Commitment of Resources

The Livingston Avenue Bridge is an east-west railroad crossing of the Hudson River. The Project site, which is defined to be the limits of disturbance of the Build Alternatives, is located within two cities and two counties separated by the Hudson River—the City of Albany in Albany County and the City of Rensselaer in Rensselaer County (see **Figure 4.1-1**). This section of the Hudson River is not a designated wild, scenic, or recreational river under either the Federal or New York State program.[20] (The nearest designated portion of the river is approximately 40 miles upstream of the Project site.) As a result, Project implementation would not affect wild, scenic, or recreational rivers. Similarly, there are no farmlands within the area that the Project would affect. Therefore, these topics are not addressed in this chapter.

Resources listed above are unique; therefore, the evaluation method and study area varies by resource. For each resource, this chapter describes: (1) the methodology and study area used in the analysis; (2) the affected environment, which is the environmental setting and conditions in the study area; (3) impacts of the No Action Alternative; (4) impacts of the Build Alternatives; and (5) measures to avoid, minimize, and/or mitigate potential adverse impacts, if warranted. Each section addresses the operational impacts of the Build Alternatives. A description of construction activities and the potential for construction-related adverse impacts for each environmental topic is presented in **Section 4.16, "Construction Impacts."**

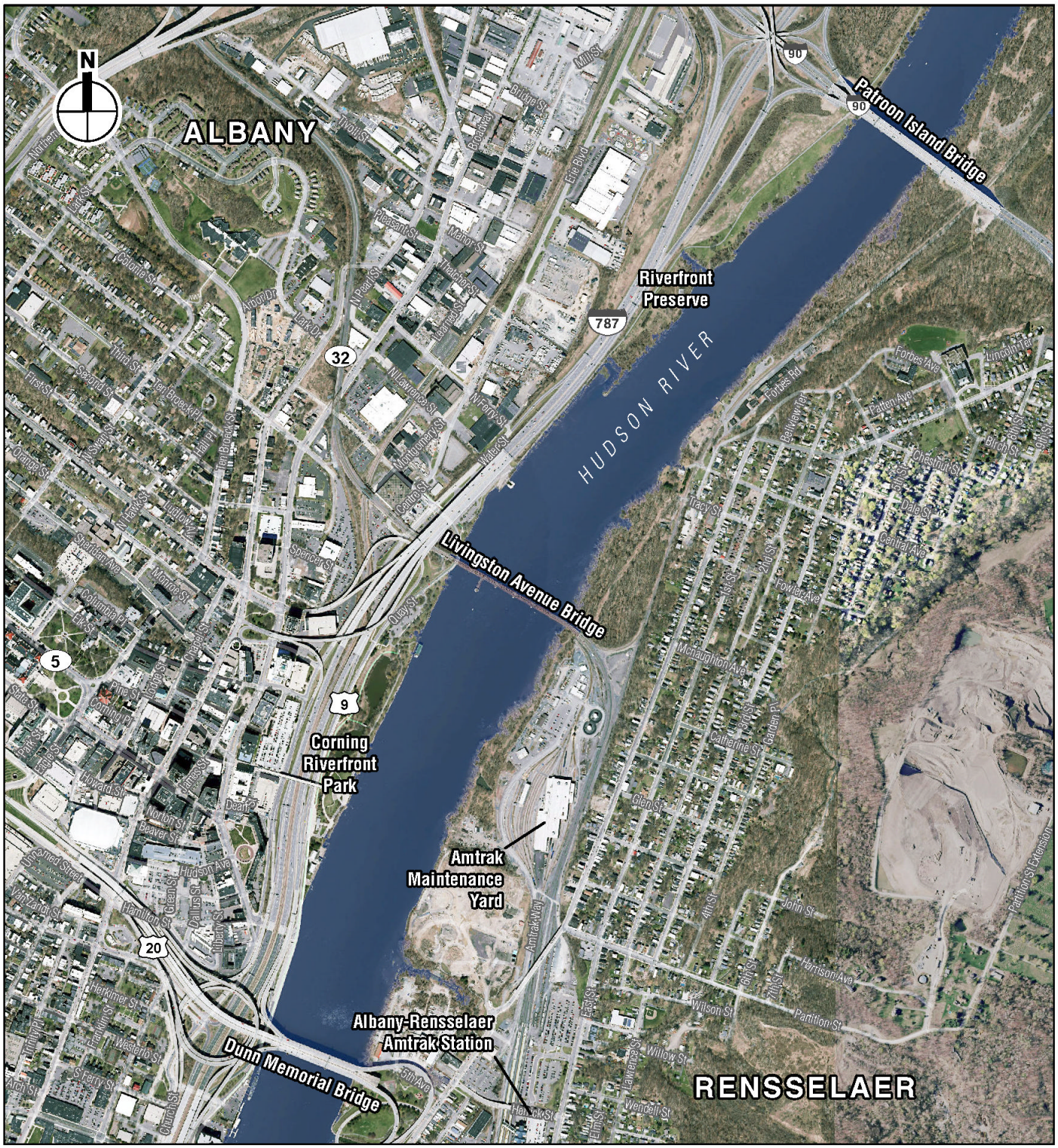
4.2 Land Use and Community Character

4.2.1 Introduction

This section describes the analysis FRA and NYSDOT conducted of the potential long-term impacts of the No Action and Build Alternatives on land use, zoning, and public policies. "Land

[20] The National Wild and Scenic River System (Public Law 90-542; 16 U.S.C. 1271 et seq.) and the New York State Department of Environmental Conservation (NYSDEC) New York State Wild, Scenic and Recreational Rivers Permit Program (Article 15 Title 27 ECL; 6 NYCRR Part 666).

11.18.21



Project Setting

Figure 4.1-1

use" refers to the activity that occurs on land and within the structures that occupy it—for example, residential, commercial, industrial, institutional and community facilities, transportation-related, parks and recreational uses, and vacant land. Public policies are plans established by local municipalities related to land use and development that guide decision-making. Zoning is the method by which municipalities define what land uses are allowed on a given parcel of land and the physical restrictions, such as bulk, height, or setbacks, that have been placed on development. This section describes the Project's compatibility with existing and planned future land uses and zoning. It also describes the permanent property acquisition required for the Build Alternatives.

4.2.2 Methodology and Study Area

FRA and NYSDOT considered the uses and development trends in the area that may be affected by the Project and determined whether the Project would be compatible with those conditions. The analysis also considered the Project's consistency with, and effect on, the area's zoning and other applicable public policies. Direct effects on study area land use and community character would constitute an adverse impact if the change would create land use that would be incompatible with existing or surrounding uses or development patterns or public policies, including zoning, or if the Project would negatively affect community facilities, parkland, or recreational resources. For this assessment, the study area for land use and community character encompasses an area large enough to provide an understanding of land use patterns and trends and encompass the direct and indirect effects of the Build Alternatives. The study area is the area within ¼ mile of the existing Livingston Avenue Bridge (see **Figure 4.2-1**). The Project's potential effect on Section 4(f) resources, including parkland, is presented in **Chapter 6, "Draft Section 4(f) Evaluation."** The Build Alternatives would not affect parklands or facilities that have been funded through the Land and Water Conservation Fund Act (Section 6(f)) or the Urban Park and Recreation Recovery Program (Section 1010), and therefore no further consideration under Section 6(f) or Section 1010 is required.

4.2.3 Affected Environment

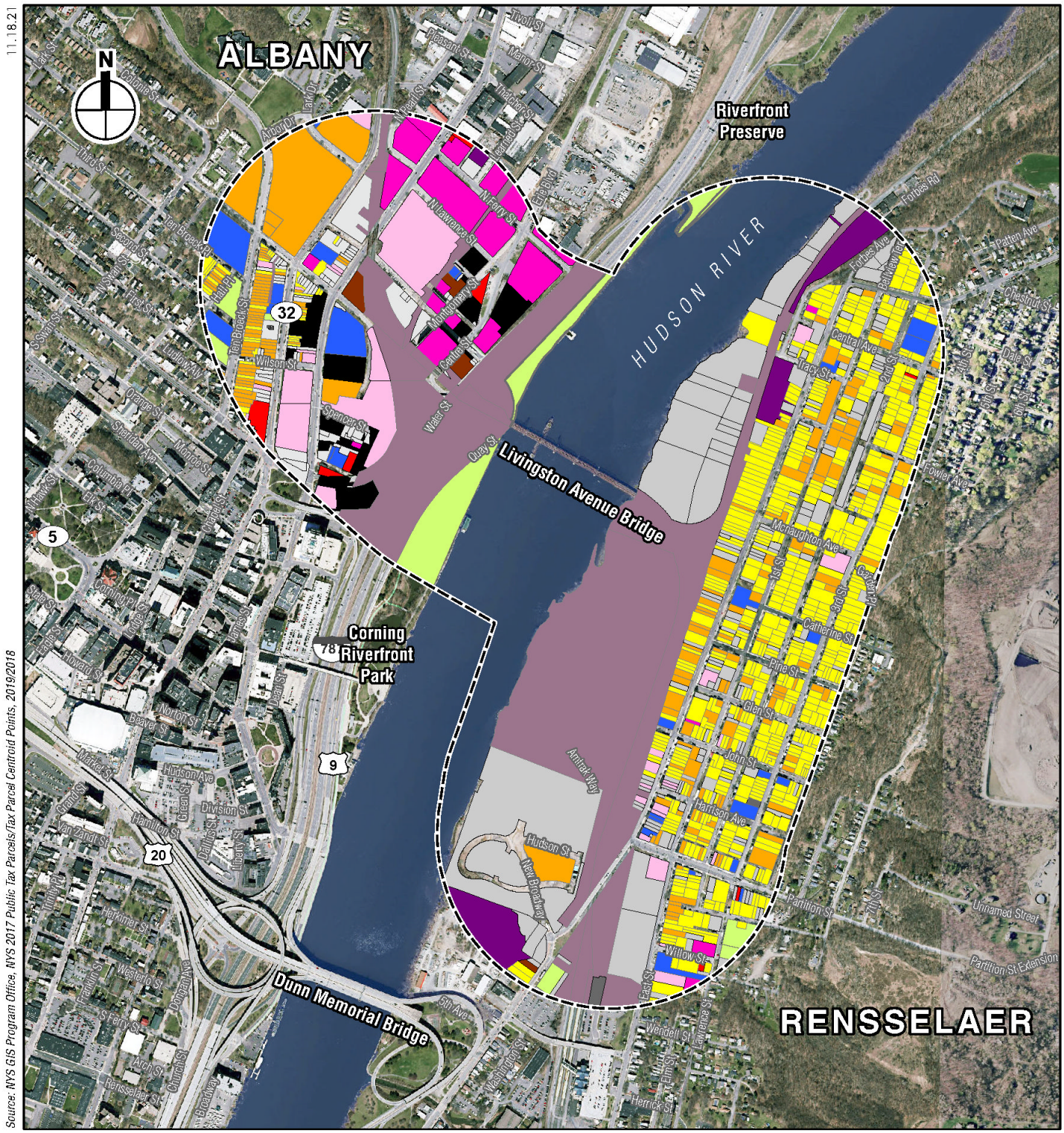
Land used within the study area include those typical for urban settings. In both Albany and Rensselaer, the study area includes a range of industrial, office, commercial, residential, recreational, and institutional uses, as well as vacant parcels (see **Figure 4.2-1**).[21] On wooded and vacant waterfront parcels in Rensselaer there are opportunities for new waterfront development, and two mixed-use development projects—Kiliaen's Landing and De Laet's Landing—are planned in the study area (see **Figure 4.2-2**).

The Cities of Albany and Rensselaer are both part of the Hudson River Valley National Heritage Area[22] and the Hudson River Valley Greenway, and both cities participate in the Greenway community planning program,[23] which seeks, in part, to enhance outdoor recreational activities and enjoyment in the Hudson River Valley through creation of a network of trails and byways. In addition, the Albany portion of the study area is within two State Heritage Areas: the Albany

[21] Land use data were provided by the Cities of Albany (2017) and Rensselaer (2017) in GIS format and tax assessment records. Land uses within approximately 400 feet of the existing bridge were field-verified, where feasible, in February 2019.

[22] Designated by Congress in 1996 to recognize the Hudson Valley's important role in the history and development of the United States.

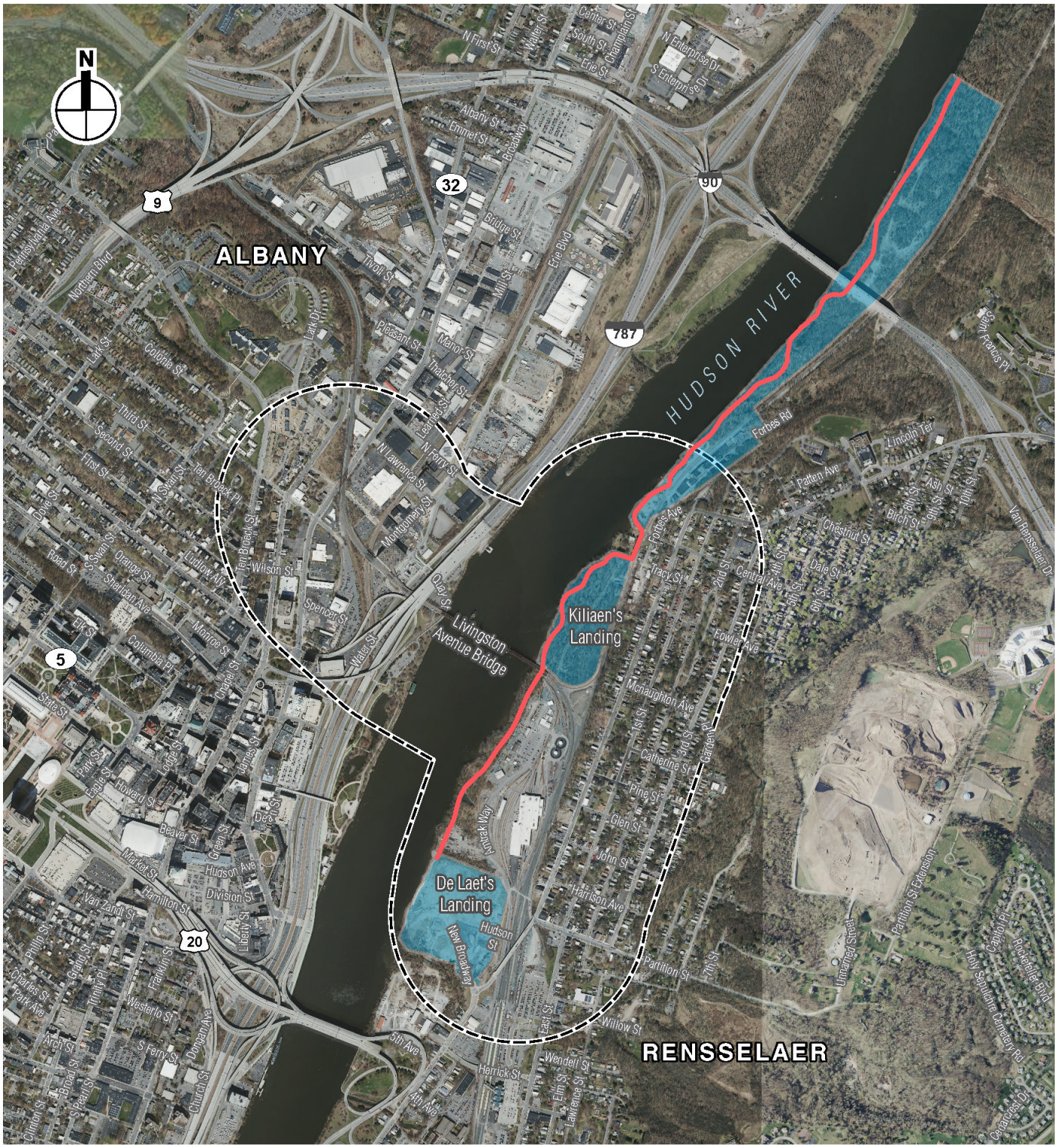
[23] The Hudson River Valley Greenway Act was passed by the New York State legislature in 1991 to provide technical assistance and funding for Greenway Communities to preserve scenic, natural, historic, cultural and recreational resources while encouraging compatible economic development and maintaining the tradition of home rule for land use decision making.



NYSDOT LIVINGSTON AVENUE BRIDGE

Land Use

Figure 4.2-1



Planned Development

Figure 4.2-2

Heritage Area and the Mohawk Valley Heritage Corridor.[24] Plans to improve recreational resources on both sides of the river reflect the objectives of these designations and the local plans that seek to improve public access to the waterfront. Existing and proposed parks and recreational resources that are located in the study area are shown on **Figure 4.2-3**.

The existing and proposed land use, parks and recreational resources, and public policies that guide land use decisions are described below.

4.2.3.1 City of Albany

4.2.3.1.1 General Land Use Description

The Albany portion of the study area is divided by the existing rail tracks and I-787, a major interstate highway that runs north-south along the Hudson River. The existing railroad tracks west of the Livingston Avenue Bridge pass beneath the I-787 roadway viaduct and above the other roadways in the study area. In addition to the Empire Corridor tracks, the study area also includes CP freight tracks passing north-south beneath the Empire Corridor viaduct.

The portion of the study area located to the north and east of the existing rail tracks (primarily in the area of Centre Street, Montgomery Street, Erie Boulevard, and Colonie Street) consists largely of warehouses, parking areas, and some office space. A large former cold storage building, the Central Warehouse, occupies a full block immediately north of the railroad right-of-way. The Central Warehouse building is vacant and has been the subject of speculation and redevelopment plans for a number of years. At the present time, no specific development project is moving forward.[25,26] This area also contains some commercial uses, automotive services, several restaurants and bars, banks, small offices, and showroom facilities.

The area of the study area south and west of the rail tracks consists predominantly of the highway-related roadways of I-787 and its ramps. West of the highway and just south of the railroad tracks, a U.S. post office is at the corner of Broadway and Livingston Avenue. Office buildings line both sides of Broadway (and the east side of North Pearl Street) south of Livingston Avenue. North of the Livingston Avenue, the study area is occupied predominantly by a large apartment complex located on the west side of North Pearl Street from Livingston Avenue to Lark Drive. Lower rise residential uses are located on the blocks between North Pearl Street and Ten Broeck Street.

4.2.3.1.2 Parks and Recreational Resources

Parks line Albany's Hudson River waterfront on both sides of the Livingston Avenue Bridge (see **Figure 4.2-3**). To the south is the 18-acre, City of Albany-owned Corning Riverfront Park (formerly called Corning Preserve), which provides a number of park amenities including playgrounds, walking and biking trails, and picnic areas. To the north of the bridge is the Riverfront Preserve, a nature preserve that extends along the shoreline for approximately 1.5 miles. Close to the Livingston Avenue Bridge, the Riverfront Preserve contains a boat launch and boathouse for the Albany Rowing Center as well as parking for the preserve.

Another recreational resource in the study area is the Mohawk–Hudson Bike–Hike Trail, which runs along the Hudson River passing through Corning Riverfront Park and the Riverfront Preserve. This trailway is part of the larger Canalway Trail that, when complete, will follow the Erie Canal from Buffalo to Albany. Most of the trail is complete to date, with only a few gaps remaining where

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[24] The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) administers the State Heritage Program for areas that exhibit natural and cultural resources of statewide significance.

[25] https://www.timesunion.com/business/article/Two-bidders-vye-for-Albany-s-Central-Warehouse-16241936.php.

[26] https://www.timesunion.com/churchill/article/Churchill-Central-Warehouse-saga-rolls-on-and-16672635.php.

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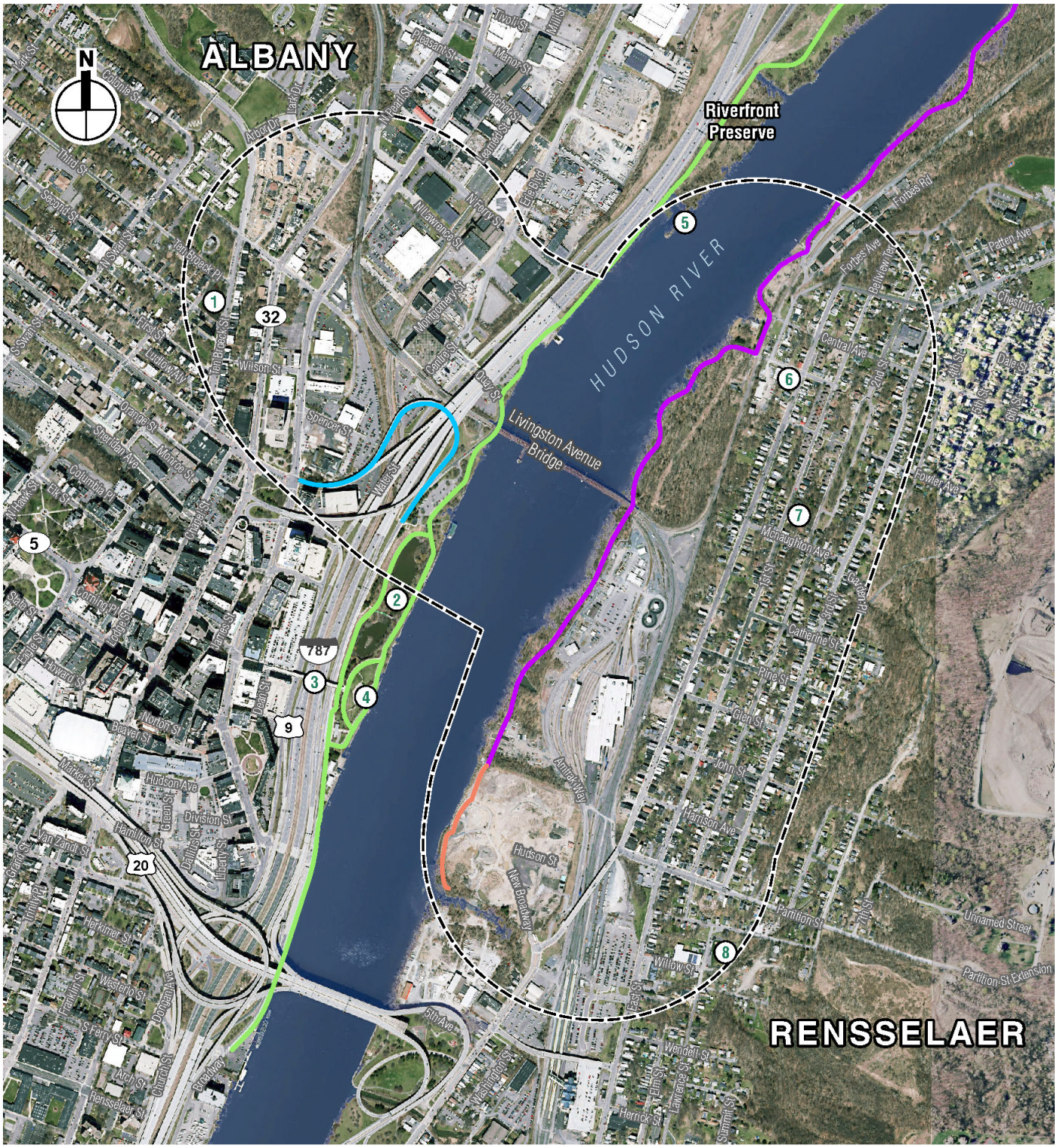

Source: NYS GIS Program Office, 2017

NYSDOT LIVINGSTON AVENUE BRIDGE

Park Land and Recreational Resources

Figure 4.2-3

cyclists must share roadways with vehicular traffic.[27] The Mohawk–Hudson portion of the trail extends along the Mohawk and Hudson Rivers from Rotterdam and passes beneath the Dunn Memorial Bridge (U.S. Routes 9 and 20) and Livingston Avenue Bridge. This trail provides connections and access to other biking and hiking trails in the Albany area and throughout New York State. According to the Mohawk–Hudson Bike–Hike Map,[28] this recreational resource is the region's most continuous bicycle and pedestrian facility and has more than 35 miles of trail (including both on- and off-road sections). In the study area, the bike–hike trail is a paved off-road trail. The segment of the trail in the City of Albany is owned by NYSDOT and maintained by the city.

Van Rensselaer Park is also located within the study area. This park includes playground equipment, park benches, and open lawn areas and occupies a city block bounded by Ten Broeck Street, 2nd Street, Hall Place, and Ten Broeck Place.

In the area beneath the I-787 overpass just north of the Livingston Avenue Bridge, several waterfront parcels are owned by NYSDOT, NYSOGS, and the City of Albany. These parcels are partly occupied by the I-787 right-of-way, and also include parking for the Riverfront Preserve, Corning Riverfront Park, and nearby state office buildings, as described in **Section 3.3.3, "Vehicular Traffic and Parking."** During inclement weather, outdoor concerts are moved to the City of Albany parking lot from an amphitheater and performance space at Jennings Landing, located just outside the southern boundary of the study area in Corning Riverfront Park. The Mohawk-Hudson Bike-Hike Trail and a boat launch are located along the waterfront to the east of the parking lots.

At the time of publication of this EA, NYSDOT is nearing completion of construction on the Albany Skyway project, a plan developed by Capitalize Albany, the city's economic development group, to convert the U.S. Route 9 ramp that extends from Quay Street to Broadway into a pedestrian promenade, with fencing and pathway lighting, closing it to traffic.

In November 2020, the City of Albany released a request for proposals for the Hudson River Waterfront Gateway Improvements project, which will add lighting, landscaping, pedestrian and bicycle improvements, and wayfinding signage at key gateways to the Albany riverfront including the intersection of Colonie Street and Quay Street, just north of the Livingston Avenue Bridge. While the schedule for this project is not known, it could likely be complete by the Livingston Avenue Bridge Project's opening year and is included in the No Action Alternative.

4.2.3.1.3 Zoning and Public Policies

A number of local plans have been drafted to guide development in the study area. These include:

- The Capital District Transportation Committee (CDTC) Metropolitan Planning Organization's *New Visions for a Quality Region*,[29] which commits to collaborating with stakeholders to ensure that any rehabilitation of the Livingston Avenue Bridge includes accommodations for bicycles and pedestrians;
- The City of Albany's Comprehensive Plan, *Albany 2030*,[30] which provided the impetus for a new master plan for Corning Riverfront Park and advocates for a pedestrian/bicycle connection on any Livingston Avenue Bridge replacement;
- The City of Albany Local Waterfront Revitalization Program (LWRP), which recommends increased public access to the waterfront through improved bike trails and shuttle buses and

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27 https://www.ptny.org/bike-canal/map/.

28 Ibid.

29 https://www.cdtcmpo.org/mohhudns.pdf.

30 https://www.albanyny.gov/DocumentCenter/View/3759/Albany-2030-Comprehensive-Plan-wAppendices.

a new nature preserve (including a small-scale environmental education facility, a network of footpaths, and nature-oriented functions of public interest) at Lower Patroon Island, located just north of the Livingston Avenue Bridge;

- The Albany Sustainable Design Assessment Team Report (2007),[31] which recommends a long-term goal of reconfiguring I-787 to regain the connection between downtown Albany and the Hudson River.

In 2017, the City of Albany revised its zoning code so that the zoning designations are consistent with the recommendations of the city's latest adopted comprehensive plan, *Albany 2030*. As shown in **Figure 4.2-4**, the study area along the waterfront is zoned with a Land Conservation District (LC). Most of the study area has a mixed-use zoning designation, primarily Mixed-Use Downtown, Mixed-Use Community Urban, and Mixed-Use Form-Based Warehouse. The western portion of the study area includes a mix of residential districts.

4.2.3.2 City of Rensselaer

4.2.3.2.1 General Land Use Description

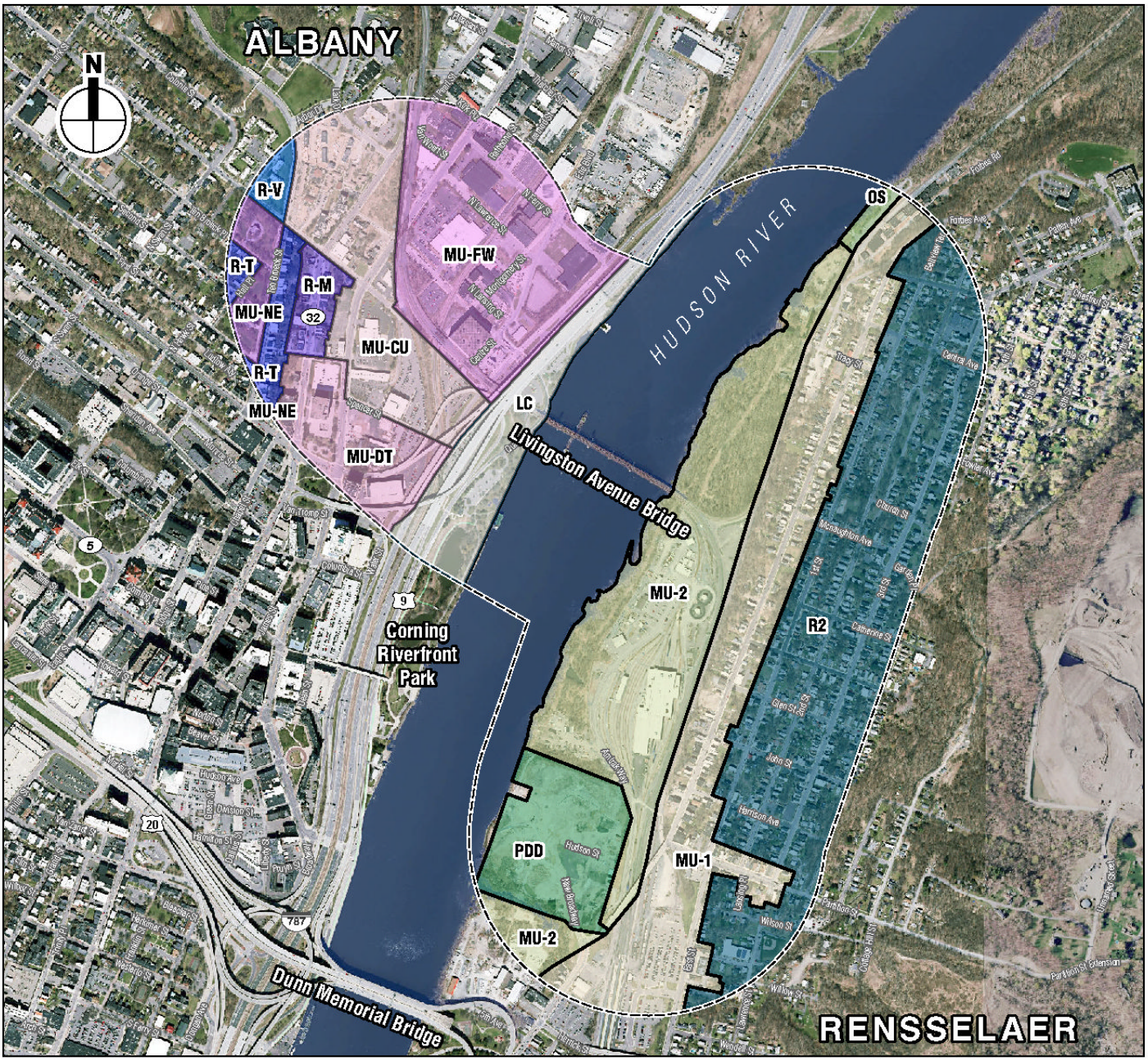
In Rensselaer, the railroad tracks of the Empire Corridor that cross the Livingston Avenue Bridge connect to north-south tracks that run parallel to the Hudson River. South of the bridge, the area west of the railroad tracks (along the waterfront) is occupied by the Amtrak Maintenance Facility. North of the bridge, the area west of the tracks is predominantly vacant, wooded land. The City of Rensselaer has preliminary plans for a new development, Kiliaen's Landing, on 18 acres in this area. The concept includes approximately 350 residential units, restaurants, retail and exhibition space, and a waterfront promenade. In 2018, a Final Generic EIS was completed for the project,[32] and the City of Rensselaer is currently seeking developer interest in the site. To the north of the proposed Kiliaen's Landing site are a municipal boat launch and picnic areas in the city's Riverfront Park, as well as an adaptive reuse of an old mill converted into office and artists' spaces.

The study area east of the rail tracks consists of properties that face Broadway. Land use here is primarily residential, with some commercial and institutional uses and vacant land. This section of Broadway has a mix of single-family homes, small apartment buildings, and limited small-scale retail and neighborhood service establishments. In recent years, a number of small apartment buildings have been completed along Broadway in this part of the study area. Several institutional uses and community centers, including a fire station on the west side of Broadway, are between Partition Street and John Street. There are several places of worship along Broadway, including a Buddhist monastery and several churches.

Along the waterfront to the south of the Amtrak Maintenance Facility, a large mixed-use project is currently under development on the former site of the Rensselaer High School. Called De Laet's Landing, the project will occupy 27 acres and include a mix of residential units, retail space, and office space, as well as waterfront recreational space and improved pedestrian access to the waterfront from the Albany-Rensselaer Amtrak Station (located outside the study area to the south). De Laet's Landing will be developed in phases over a 10- to 15-year period. The first two components of the project broke ground in fall 2016. A waterfront esplanade was completed in

[31] http://councilalbanyna.tripod.com/downloads/Albany%20SDAT%20Report_final.pdf.

[32] Kiliaen's Landing Final Generic Environmental Impact Statement, City of Rensselaer, May 2018.



8.28.19

Source: The City of Albany Department of Development & Planning, 2017. City of Rensselaer Zoning Update 2012

1/4-Mile Study Area

Zoning District Boundary

City of Albany Zoning

- LC - Land Conservation
- MU-CU - Mixed-Use, Community Urban
- MU-DT - Mixed-Use, Downtown
- MU-FW - Mixed-Use, Form-Based Warehouse
- MU-NE - Mixed-Use, Neighborhood Edge
- R-M - Residential, Multi-Family
- R-T - Residential, Townhouse
- R-V - Residential, Village

City of Rensselaer Zoning

- MU-1 - Downtown Mixed-Use District
- MU-2 - Waterfront Mixed-Use District
- OS - Open Space and Conservation District
- PDD - Planned Development District
- R2 - Residential District #2

Zoning

Figure 4.2-4

2018 and a mixed-use building containing office and retail space and 96 apartments[33] was completed in 2019.[34,35]

4.2.3.2.2 Parks and Recreational Resources

There are several parks within the Rensselaer portion of the study area (see **Figure 4.2-3**). At the southwest corner of the Tracy Street/Broadway intersection is a small park with a basketball court and a playground. Another playground is on 1st Street near McNaughton Avenue and a baseball field is in the southeastern portion of the study area, separated from the Project site by residential and commercial land uses.

The City of Rensselaer intends to extend the Rensselaer Riverfront Multi-Use Trail from its existing 0.3-mile segment near the Dunn Memorial Bridge farther north along the eastern shore of the Hudson River, passing beneath the Livingston Avenue Bridge. Greenway maps show trail extensions along the eastern shore of the Hudson River, which includes the study area, to improve connectivity between existing trails. An approximately 1,000-foot-long segment of the riverfront trail system has already been constructed as part of De Laet's Landing. The trail extension, referred to as the Rensselaer Riverfront Multi-Use Trail, would connect the existing esplanade at DeLaet's Landing on the south, which is south of the Livingston Avenue Bridge, to the City's boat launch north of Tracy Street on the north, which is north of the Livingston Avenue Bridge in Rensselaer's Riverfront Park. The City of Rensselaer has secured funding to complete the trail extension, which is currently in design.[36]

4.2.3.2.3 Zoning and Public Policies

The planned waterfront development in the study area is consistent with, and/or was envisioned by, the City of Rensselaer's Comprehensive Plan[37] and the City of Rensselaer LWRP.[38] These plans make additional recommendations for increased public access to the waterfront, including development of Amtrak's property and siting water-dependent recreational and boating uses along the waterfront. The zoning districts (see **Figure 4.2-4**) reflect the objectives of the local plans—the area along the river is predominantly a Waterfront Mixed-Use District, and the De Laet's Landing site is designated as a Planned Development District. East of the waterfront area, the area along Broadway is mapped as a Downtown Mixed-Use zone, and land to the east of the Broadway corridor is mapped for medium-density residential uses (Residential District #2).

4.2.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The existing bridge would continue to operate as it does under existing conditions and NYSDOT would not acquire any new private or public land for conversion to rail right-of-way. The No Action Alternative would have no adverse impacts on neighborhood cohesion, community character, or land development patterns in the study area. The No Action Alternative would not enhance the existing or planned parks and recreational resources in the study area. Under the No

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33 http://www.timesunion.com/local/article/Waterfront-coming-alive-in-Rensselaer-Wednesday-10464059.php.

34 https://www.timesunion.com/news/article/Rensselaer-unveils-new-esplanade-13073028.php.

35 https://www.bizjournals.com/albany/news/2019/05/20/delaets-landing-rensselaer-waterfront-apartments.html.

36 Coordination with William H. Smart, City Engineer, and Ketura Vicks, Director of Planning and Development, City of Rensselaer, January through September 2021.

37 https://rensselaerny.gov/application/files/9115/6356/7853/Comprehensive_Plan_2006.pdf.

38 https://docs.dos.ny.gov/opd-lwrp/LWRP/Rensselaer_C/Index.html. The LWRP was adopted by the City of Rensselaer in May of 1986 (approved by the New York State Department of State [NYSDOS] the following year); the city is currently in the process of updating its LWRP.

Action Alternative, there would be no safe, authorized public access and pedestrian and bicycle access across the bridge. The bridge would continue to be prohibited and pedestrians would continue to illegally trespass on the bridge.

4.2.5 Impacts of the Build Alternatives

The Build Alternatives would replace the Livingston Avenue Bridge in an adjacent alignment either to the north (Build Alternative 1) or south (Build Alternative 2) of the existing bridge. The Build Alternatives would not adversely affect existing neighborhoods or community character in Albany or Rensselaer, as the shift in the alignment would be relatively small and principally at the eastern approach to the bridge. Residential and commercial land use nearest the eastern approach in Rensselaer is buffered by distance and vegetation to the east, the Amtrak Maintenance Facility to the south, and the vacant, wooded parcels to the north. The Build Alternatives would not affect land development patterns, generate new development, divide neighborhoods, isolate part of a neighborhood, or otherwise adversely affect community cohesion. Neither alternative would require the acquisition of any dwellings or businesses or parkland.

The Build Alternatives include a shared use bicycle and pedestrian path across the new bridge that would provide connectivity between two isolated neighborhoods and link parks and trails on both sides of the Hudson River (the path itself would not be considered a park, but rather a transportation right-of-way). Thus, the Project would provide a long-term benefit to the communities, parks, and recreational resources in the study area.

The Build Alternatives would not result in adverse impacts to parks or recreational resources. In Albany, similar to existing conditions, the new bridge would be elevated over the Mohawk-Hudson Bike-Hike Trail, but would be slightly north or south of its existing location before tying into the existing alignment. This would not affect the use or the character of the trail. In Rensselaer, the railroad alignment and wye would also be slightly north or south of the existing location, but this would not preclude the future trail improvements, as described above. NYSDOT will continue to work with the City of Rensselaer to ensure that the Project's design is coordinated with the design of the Rensselaer Riverfront Multi-Use Trail.

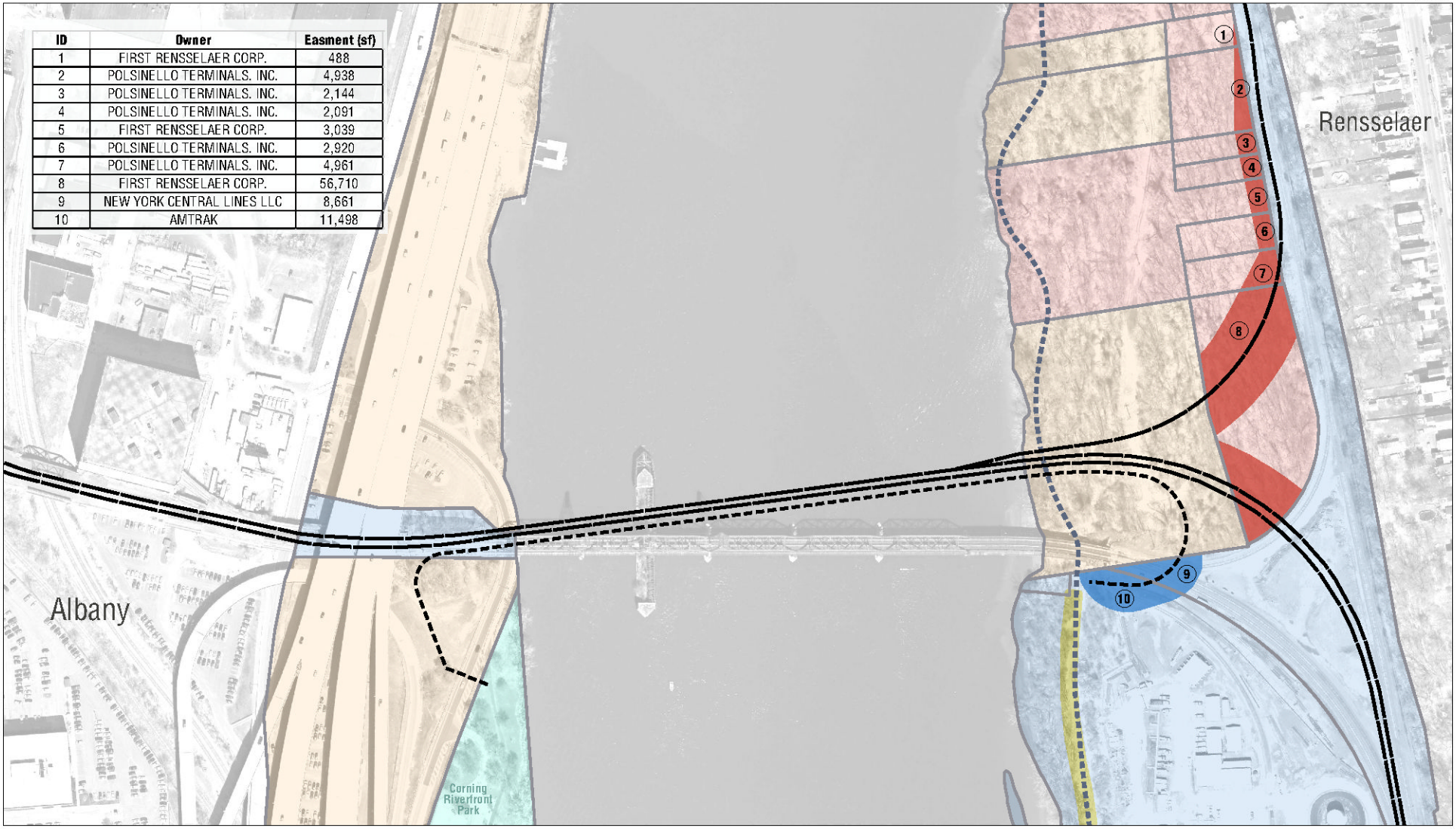
The Build Alternatives would be consistent with the objectives of the Greenway Program and would not adversely affect scenic, cultural, or recreational resources located in the study area. The Build Alternatives would not adversely affect any defining resources in the Albany State Heritage Area or the Mohawk Valley Heritage Corridor or adversely affect the scenic or historic quality that contributes to the area's recognition as the Hudson River Valley National Heritage Area (see **Section 4.6, "Visual Resources and Aesthetic Considerations"**). The Project would support local plans by enhancing waterfront access and providing a safe and secure pedestrian and cyclist connection to the existing and planned paths on either side of the river. The Build Alternatives would be consistent with the goals and objectives identified in the land use plans, including the New York State Coastal Management Program and the City of Albany and City of Rensselaer LWRPs (see **Appendix B-2, "Water Resources and Ecology"**).

The shared-use path planned for both build alternatives along with planned trails and other recreational projects in Albany and Rensselaer would substantially improve non-motorized travel network in the study area and enhance waterfront access by providing a series of connected riverfront trails, scenic viewpoints, and waterfront uses. This would be a regional transportation and recreational benefit and fulfill long-time plans to better connect the east and west shoreline communities along the Hudson River.

Permanent property acquisitions that would be required for each alternative are shown on **Figures 4.2-5 and 4.2-6**. For Build Alternative 1, NYSDOT would acquire approximately 2.2 acres of land in Rensselaer either by fee acquisition or permanent easement, including approximately 1.8 acres programmed for residential use within the proposed 18-acre Kiliaen's Landing development. In Albany, Build Alternative 1 would be built entirely on railroad property and land owned by New York State.

7.5.19

ID	Owner	Easment (sf)
1	FIRST RENSSELAER CORP.	488
2	POLSINELLO TERMINALS. INC.	4,938
3	POLSINELLO TERMINALS. INC.	2,144
4	POLSINELLO TERMINALS. INC.	2,091
5	FIRST RENSSELAER CORP.	3,039
6	POLSINELLO TERMINALS. INC.	2,920
7	POLSINELLO TERMINALS. INC.	4,961
8	FIRST RENSSELAER CORP.	56,710
9	NEW YORK CENTRAL LINES LLC	8,661
10	AMTRAK	11,498



Alternative 1 - Rail
Alternative 1 - Shared-Use Path (SUP)
Existing - Hudson Mohawk Hike Bike Trail/SUP
Planned Riverwalk Trail

Property Boundaries
City of Albany Parkland
State-Owned (various jurisdictions)
Railroad Property
Privately-Owned

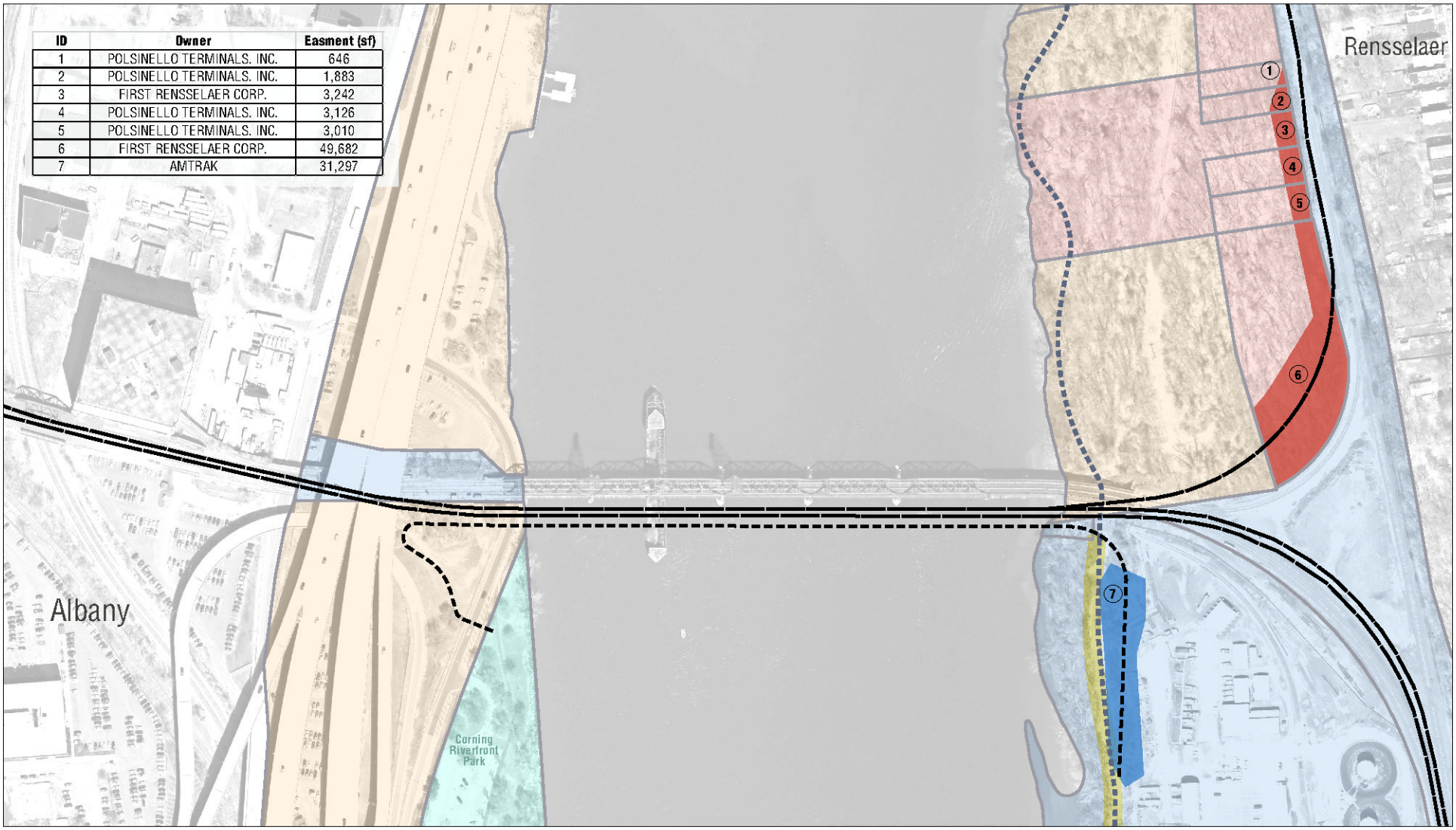
Fee Acquisition
Permanent Easement
Existing SUP Easement

0 250 FEET

Property Acquisitions - Alternative 1

Figure 4.2-5

7.5.19



ID	Owner	Easment (sf)
1	POLSINELLO TERMINALS. INC.	646
2	POLSINELLO TERMINALS. INC.	1,883
3	FIRST RENSSELAER CORP.	3,242
4	POLSINELLO TERMINALS. INC.	3,126
5	POLSINELLO TERMINALS. INC.	3,010
6	FIRST RENSSELAER CORP.	49,682
7	AMTRAK	31,297

Alternative 2 - Rail

Alternative 2 - Shared-Use Path (SUP)

Existing - Hudson Mohawk Hike Bike Trail/SUP

Planned Riverwalk Trail

Property Boundaries

City of Albany Parkland

State-Owned (various jurisdictions)

Railroad Property

Privately-Owned

Fee Acquisition

Permanent Easement

Existing SUP Easement

0 250 FEET

Property Acquisitions - Alternative 2

Figure 4.2-6

For Build Alternative 2, NYSDOT would acquire approximately 2.1 acres of land in Rensselaer either by fee acquisition or permanent easement, including approximately 1.4 acres programmed for residential use within the proposed 18-acre Kiliaen's Landing development. In Albany, Build Alternative 2 would be built entirely on railroad property and land owned by New York State.

4.2.6 Avoidance, Minimization, and Mitigation

Build Alternative 1, and to a lesser extent Build Alternative 2, would encroach upon land that the City of Rensselaer outlined for use as residential development, the Kiliaen's Landing project. The City of Rensselaer is in the process of soliciting developer interest in the site. NYSDOT will coordinate with the City of Rensselaer and the team chosen to develop the site to minimize the encroachment on the Kiliaen's Landing site and ensure seamless connectivity with the proposed riverfront trail system.

Federally funded transportation projects must adhere to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as codified in 42 USC 4601 et seq., and the applicable implementing regulations set forth in 49 CFR Part 24 (collectively, the Uniform Act). The rights of property owners and tenants of real property to be acquired to implement the Project are protected under the Uniform Act, which is intended to ensure that individuals receive just compensation as well as relocation services, including moving payments, replacement housing payments, and other allowable payments related to commercial and residential moving costs, in order to ensure that these individuals do not suffer disproportionate injuries as a result of programs and projects designed for the benefit of the public as a whole, and to minimize the hardship of displacement on occupants of acquired properties.

In the State of New York, acquisition of real property by New York State entities must also adhere to the New York State Eminent Domain Procedure Law (EDPL), which establishes the exclusive procedure by which property is acquired in New York State, ensures just compensation is paid, and establishes opportunities for public participation in the planning of projects necessitating the exercise of eminent domain.

All property acquisitions for the Project would comply with the provisions of the Uniform Act and the EDPL.

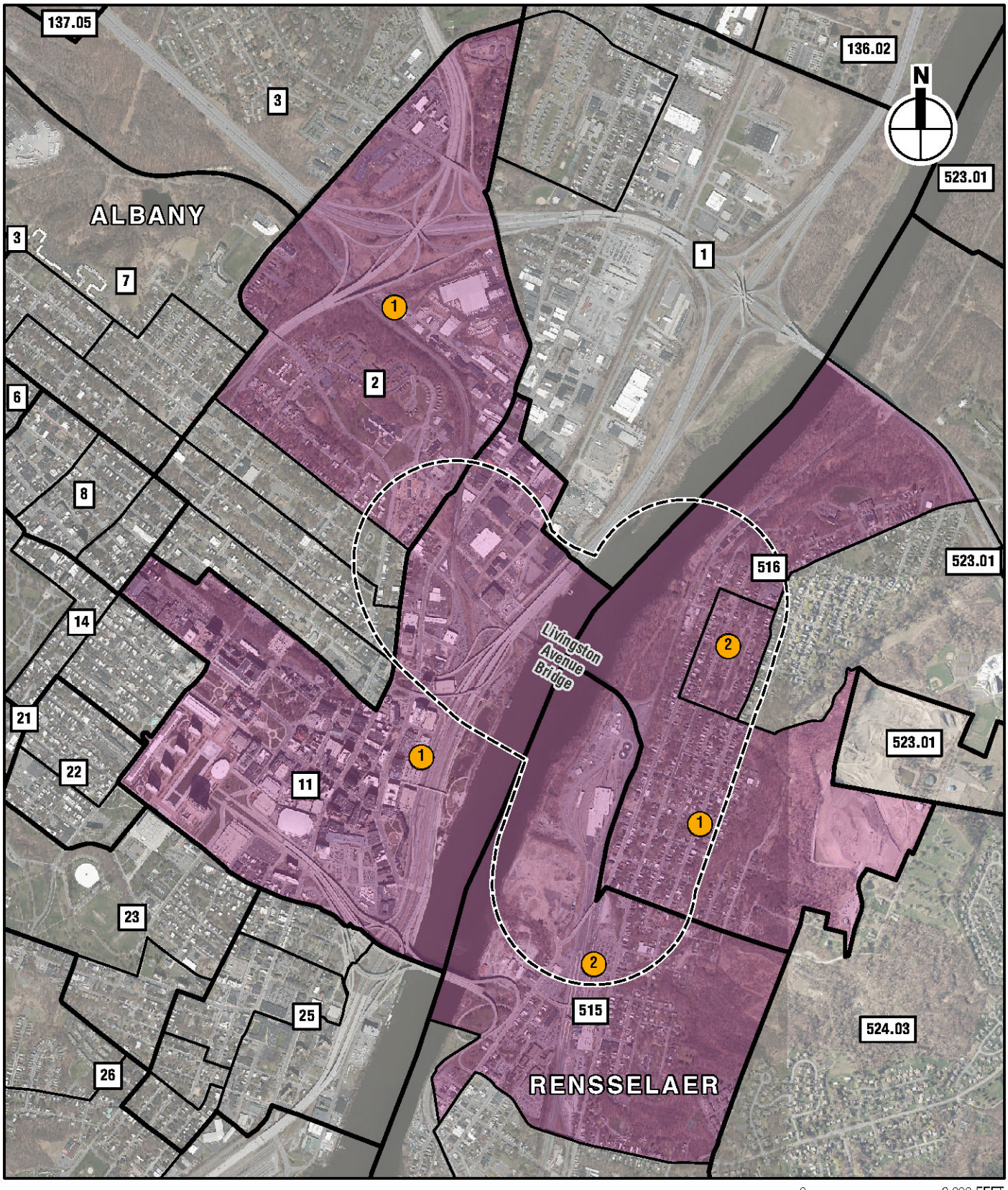
4.3 Social Conditions

4.3.1 Introduction

This section presents the analysis FRA and NYSDOT conducted of the Project's potential impacts on the population residing near the Livingston Avenue Bridge. Operation of the Build Alternatives would not increase rail service on the Empire Corridor or change travel patterns in the region. Therefore, the Project has no potential to cause demographic shifts. This section identifies the social characteristics of the population residing in the study area. A separate analysis of the potential for disproportionate and adverse impacts from the No Action and Build Alternatives on low-income and minority populations is provided in **Chapter 5, "Environmental Justice."**

4.3.2 Methodology and Study Area

FRA and NYSDOT consulted the following data sources to gather useful information in understanding the characteristics of the existing population: 2000 U.S. Census Bureau data, 2010 Census data, and *2015-2019 American Community Survey Five-Year Estimates* (ACS). The study area for social conditions includes the census block groups that fall within the ¼ mile study area used for the land use and community character assessment. As shown on **Figure 4.3-1,** the study area includes Albany County Census Tract 2 Block Group 1 and Census Tract 11 Block Group 1, and Rensselaer County Census Tract 515 Block Group 2 and Census Tract 516 Block Groups 1 and 2.



Social Conditions and
Environmental Justice Study Area

Figure 4.3-1

4.3.3 Affected Environment

4.3.3.1 Population and Demographics

The study area had a total population of 7,710 in 2019, a 6.2 percent decrease from 2010 (see **Exhibit 4.3-1**). The study area's total population was comprised of 3,949 residents in Rensselaer County and 3,761 residents in Albany County. The study area's 3,639 households are about equally divided between Albany and Rensselaer Counties.

Exhibit 4.3-1
Demographic Characteristics

Geographic Area	2010 Population	2010 Households	2019 Population	2019 Households	Population Percent Change (2010 to 2019)
Total Study Area	8,217	3,730	7,710	3,639	-6.2%
Albany Census Tract 2, Block Group 1	2,878	1,145	2,188	925	-24.0%
Albany Census Tract 11, Block Group 1	1,169	705	1,573	893	34.6%
Rensselaer Census Tract 515, Block Group 2	1,066	573	1,322	700	24.0%
Rensselaer Census Tract 516, Block Group 1	2,540	1,082	2,118	916	-16.6%
Rensselaer Census Tract 516, Block Group 2	564	225	509	205	-9.8%
Total Bi-County Region	**463,633**	**183,736**	**466,153**	**191,446**	**0.5%**
Albany County	**304,204**	**122,525**	**306,968**	**126,540**	**0.9%**
Rensselaer County	**159,429**	**61,211**	**159,185**	**64,906**	**-0.2%**

Sources: U.S. Census Bureau, 2010 Census Redistricting Data and 2015-2019 ACS Estimates.

4.3.3.2 Elderly and Disabled Populations

As shown in **Exhibit 4.3-2**, two block groups in the study area have a slightly higher proportion of elderly residents than that of their respective counties: Albany Census Tract 11 Block Group 1, where 20.1 percent of the population is 65 years or older compared to 16.5 percent of Albany County as a whole; and Rensselaer Census Tract 516 Block Group 2, where 19.3 percent of the population is 65 years or older compared to 16.5 percent of all of Rensselaer County. However, the study area overall has a lower proportion of residents aged 65 years or older (12.0 percent) than either Albany or Rensselaer County.

The ACS defines disabled persons as anyone who experienced a long-lasting sensory, physical, mental, or self-care disability or any adult who was not able to leave the home unaccompanied or anyone of working age who had a physical, mental or emotional condition that prevented them from having employment. As shown in **Exhibit 4.3-2**, the study area has a higher percentage of households with at least one disabled person than the bi-county region. The same is true for most unique block groups in the study area compared to their respective counties. The exceptions are Albany Census Tract 2 Block Group 1 and Rensselaer Census Tract 516 Block Group 1. At 69.3 percent, Rensselaer Census Tract 516 Block Group 2 has the highest proportion of households with at least one person with a disability.

Exhibit 4.3-2
Study Area Population: Percent Elderly and Disabled, 2019

Geography	Total Population	Percent 65 or Older	Percent of Households with 1 or More Disabled Persons
Study Area	7,710	12.0	27.8
Albany Census Tract 2 Block Group 1	2,188	5.3	10.5
Albany Census Tract 11 Block Group 1	1,573	20.1	34.9
Rensselaer Census Tract 515 Block Group 2	1,322	11.4	39.4
Rensselaer Census Tract 516 Block Group 1	2,118	11.2	20.1
Rensselaer Census Tract 516 Block Group 2	509	19.3	69.3
Bi-County Region	466,153	16.5	23.1
Albany County	306,968	16.5	21.3
Rensselaer County	159,185	16.5	26.8

4.3.4 Impacts of the No Action Alternative

With the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The existing bridge would remain in service and would continue to undergo routine maintenance. There would be no change in conditions affecting residents in the study area.

Although the existing Livingston Avenue Bridge is meant to serve only rail traffic, pedestrians illegally trespass on a timber deck maintenance walkway via a staircase on the south side of the existing bridge to traverse the river between Rensselaer and Albany. A legal pedestrian and bicyclist crossing over the Hudson River is located south of the study area at the Dunn Memorial Bridge. However, according to the 2008 *Hudson River Crossing Study*,[39] the Dunn Memorial Bridge has steep grades, a double 90-degree turn, and is not ADA-compliant. Under the No Action Alternative, pedestrian and bicycle access across the Livingston Avenue Bridge would continue to be prohibited, and pedestrians would likely continue to trespass on the bridge. Therefore, the safety risks for pedestrians and bicyclists crossing the Livingston Avenue Bridge would continue with the No Action Alternative.

4.3.5 Impacts of the Build Alternatives

A new rail bridge under either of the Build Alternatives would allow the continuation of existing intercity rail service and would accommodate future plans for the Empire Corridor through the area, but it would not alter local travel patterns or result in demographic or population changes in the study area. The shared use path that would be built under either Build Alternative would provide a benefit to the communities on both sides of the river. The shared use path would be ADA-compliant and therefore accessible to all social groups, including elderly and disabled populations, in the study area. (Please refer to **Section 4.16** for a discussion of potential impacts during the Project's construction.)

[39] Capital District Transportation Committee and NYSDOT. *New York Hudson River Crossing Study Final Report*. February 13, 2008. https://www.cdtcmpo.org/images/othercdtcproducts/Hud-River-study.pdf.

4.3.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts on the study area's population. Therefore, mitigation is not required.

4.4 Economic Conditions

4.4.1 Introduction

This section presents the analysis FRA and NYSDOT conducted of the Project's potential impacts on regional and local economies, and the businesses and employment characteristics in the study area.

4.4.2 Methodology and Study Area

FRA and NYSDOT evaluated the Quarterly Census of Employment and Wages (QCEW) data for the study area to provide an overview of general economic conditions.[40] QCEW data for New York State, which are developed through a cooperative program between the State of New York and the U.S. Department of Labor, Bureau of Labor Statistics, provide information on employment by place of work based on reports from employers covered under New York State's Unemployment Insurance Law. Data are available for New York State, metropolitan areas, and counties. This analysis focuses on the data for Albany and Rensselaer Counties at the regional level. The analysis also considers the potential for local impacts to businesses in the study area. The study area used for this analysis is the same as the land use and community character study area (see **Figure 4.2-1** in **Section 4.2, "Land Use and Community Character"**).

4.4.3 Affected Environment

In 2019, an annual average of 288,061 employees worked in the bi-county region of Albany and Rensselaer Counties (see **Exhibit 4.4-1**). This represented a 6.9 percent increase since 2010, a lower growth rate than that of New York State overall, where employment grew by 14.4 percent during that time period. The major employment sectors in the bi-county region are health care and social assistance, comprising 14.4 percent of employment; retail trade, comprising 9.5 percent of employment; accommodation and food services, comprising 6.6 percent of employment; and professional and technical services, comprising 6.3 percent of employment. Health care and social assistance is the top employment sector in both counties individually but commands a slightly higher share of employment in Rensselaer County (15.2 percent) as compared to Albany County (14.2 percent). Retail trade is the second highest employment sector in Rensselaer County (10.3%) followed by manufacturing (9.5 percent). In Albany County, retail trade is also the second highest employment sector (9.3 percent) but is followed by professional and technical services (6.8 percent).

[40] https://statistics.labor.ny.gov/lsqcew.shtm.

Exhibit 4.4-1
Annual Employment (2010 and 2019)

Geographic Area	2010	2019	Percent Change (2010 to 2019)
Bi-County Region			
Albany County	217,793	233,580	7.2
Rensselaer County	51,744	54,481	5.3
Total, Bi-County Region	269,537	288,061	6.9
New York State	8,341,310	9,542,610	14.4

Source: New York State Department of Labor, Quarterly Census of Employment and Wages, https://labor.ny.gov/stats/LSQCEW.shtmhttps://statistics.labor.ny.gov/lsqcew.shtm.

4.4.3.1 Albany

Much of the Albany portion of the study area overlaps with an Empire Zone, an area designated for economic growth as part of a New York State program of tax incentives for local businesses. In addition, the City of Albany is designated for investment as part of another economic incentive program, the Excelsior Jobs program.

The City of Albany has a number of designated Neighborhood Commercial Districts (two are located partially within the study area[41]) and several Business Improvement Districts (BIDs). A small portion of the Downtown Albany BID located near the intersection of Clinton Avenue and Broadway is within the study area. The Downtown Albany BID has three main initiatives: (1) business attraction; (2) operations and quality of life; and (3) marketing and communications.[42]

4.4.3.2 Rensselaer

There are no economic development zones or established business districts within the Rensselaer portion of the study area. Areas zoned for business purposes are discussed in **Section 4.2, "Land Use and Community Character."**

4.4.4 Impacts of the No Action Alternative

With the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The deficiencies with the existing bridge would continue to threaten the long-term viability of freight and passenger rail operations on the Empire Corridor. Rail operations would continue to be restricted due to the bridge's inability to accommodate standard-weight rail cars, and speeds over the bridge would remain at decreased levels due to the limitations of the bridge. The existing bridge would require frequent inspections and repairs and could be subject to temporary or even permanent closure, threatening the viability of the Empire Corridor and the passenger rail traffic, industries, and destinations it serves. In addition to railroad operational limitations, the mechanical features of the swing span would continue to be subject to failure due to age and deterioration, and horizontal clearances would not be improved, leading to delays and limiting the reliability of the navigation channel.

If the Livingston Avenue Bridge had to be closed for a long period (or permanently), there would be negative impacts to regional and national economic activity. In this scenario, rail traffic that currently uses the bridge would have to use a slower route, crossing the Hudson River at another location that would require a circuitous routing and increased travel times for passenger and freight trains. Depending on the routing used, trains would either no longer serve Amtrak's Schenectady and Albany-Rensselaer Stations, or would serve them only via longer routes. (For more

41 http://capitalizealbany.com/doing-business.

42 https://downtownalbany.org/about/bid.

information, see **Section 2.3.1** in **Chapter 2, "Project Alternatives"**). These disruptions to New York State's passenger rail network would weaken the state's transportation infrastructure and decrease its economic competitiveness. In addition, without rail service at the Schenectady and Albany-Rensselaer Stations, some rail- and passenger service-related jobs could be lost.

The rerouting of rail traffic would result in greater expenses to shippers and the loss of a portion of freight traffic to trucking. On a regional level, the higher transportation costs associated with either moving freight via a bypass route or by truck would result in less capital available to purchase additional goods and hire additional employees. Without a direct Albany-Rensselaer connection, CSX would have to eliminate freight rail service to several locations and for several customers. In addition, as truck vehicle miles increase, there would be associated highway congestion, air emissions, and pavement damage and associated costs.

4.4.5 Impacts of the Build Alternatives

There are no differences in local economic impact among the build alternatives. By maintaining passenger and freight rail service on existing routes, the Build Alternatives would have a positive effect on the regional and local economies and employment of Albany and Rensselaer Counties. The Build Alternatives would result in a new rail bridge that would improve operations on the Empire Corridor and eliminate a bottleneck in reliable rail service, thereby protecting the long-term viability of New York State's passenger and freight rail network and resulting in a benefit to regional and national rail operations and related economic activity.

Regional and national economic benefits from the Build Alternatives would include the avoidance of the negative impacts associated with the No Action Alternative (discussed above) as well as positive economic impacts that result from faster and more convenient passenger transportation, freight shipper cost savings, and highway network user savings in comparison to the No Action Alternative.

In terms of local impacts, as described in **Section 4.2, "Land Use and Community Character,"** the Build Alternatives would require the acquisition of some public and privately owned property; however, no businesses would be displaced. In addition, no access routes or parking would be affected by operation of the Build Alternatives. The temporary, and possibly permanent, disruptions to rail service due to the frequent inspection, maintenance, and repair activities associated with the No Action Alternative would not occur with the Build Alternatives (other than standard maintenance), and the reduction in rail disruptions relative to the No Action Alternative would result in an economic benefit by eliminating inefficiencies in travel to, from, and through the region. The Build Alternatives would provide increased resilience for Empire Corridor passenger rail service and an ADA-compliant shared use path connecting the communities in Rensselaer and Albany via improved waterfront access, which is a permanent, long-term benefit to the local community. Therefore, the Build Alternatives would not adversely affect local business activities, and would result in benefits to those activities.

4.4.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts on regional and local economies. Therefore, mitigation is not required.

4.5 Cultural Resources

4.5.1 Introduction

This section presents the evaluation FRA and NYSDOT conducted of the potential permanent effects of the No Action and Build Alternatives on historic properties. This section identifies historic architectural and archaeological resources in the Area of Potential Effects (APE) for the Project, adverse effects of the Project Alternatives on such properties, and proposed measures to resolve

adverse effects through avoidance, minimization, and/or mitigation. **Section 4.16.6** in **Section 4.16, "Construction Impacts,"** presents the evaluation FRA and NYSDOT conducted of the potential temporary impacts of construction activities on historic properties.

4.5.2 Methodology and Study Area

FRA and NYSDOT prepared this analysis in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966[43] (Section 106), and the Advisory Council on Historic Preservation's (ACHP) regulations for implementing Section 106 (36 CFR Part 800). Section 106 mandates that Federal agencies consider the effect of their actions on any properties listed on or determined eligible for listing on the National Register of Historic Places (NR). Consultation with parties with an interest in the historic resources, including the New York State Historic Preservation Office (SHPO) and other interested organizations, is also required.[44] In accordance with 36 CFR 800.4(a)(1), FRA and NYSDOT, in consultation with SHPO, defined an APE for the Project that was appropriate to its scope, scale, and nature. As described below, based on a Cultural Resources Survey for the Project that evaluated a larger preliminary APE as a study area, FRA, NYSDOT, and SHPO agreed that potential effects of the Project on historic properties were limited to direct physical effects related to construction activities. Therefore, the APE was delineated to include areas that could be subject to direct construction impacts as shown in **Figure 4.5-1**.

Steps in the Section 106 process that FRA and NYSDOT have completed, or will complete, include the following:

- On behalf of FRA, NYSDOT initiated Section 106 consultation for the Project with SHPO, in a letter dated March 7, 2012 (see **Appendix B-5, "Cultural Resources"**).
- The New York State Museum completed a Cultural Resources Survey for the Project in 2011 that included an evaluation of historic architectural resources and an evaluation of archaeological resources.[45] The evaluation of historic architectural resources identified National Historic Landmarks (NHLs), properties listed on or determined eligible for listing on the NR, and properties that meet one or more of the NR criteria (36 Part 60) within a broad study area to address potential direct and indirect effects of the Project. The consideration of archaeological resources included a Phase I Archaeological Survey followed by Phase I-level field testing in areas with archaeological potential.[46]

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[43] NHPA (54 USC § 306108).

[44] The New York State Historic Preservation Act of 1980 (NYSHPA) closely resembles NHPA. When a project is being reviewed pursuant to Section 106, the procedures of Section 14.09 of the NYSHPA do not apply, and any review and comment by SHPO must be within the framework of Section 106 procedures (NYSHPA § 14.09(2)).

[45] New York State Museum, Cultural Resources Survey Program. A Cultural Resources Survey Report for Volume II: Architectural Survey of PIN 1935.49.171, Livingston Avenue Bridge/Hudson River, City of Albany/City of Rensselaer, Albany County/Rensselaer County, New York. June 2011.

New York State Museum, Division of Research and Collections. Cultural Resources Reconnaissance Survey Report of 935.49.171, Livingston Avenue Bridge/Hudson River, City of Albany/City of Rensselaer, Albany County/Rensselaer County, New York. Volume I: Archaeological Results. April 2011.

[46] Archaeological investigations typically include three potential phases, with the need for Phases II and III identified in the previous phase: Phase I (documentary research and site reconnaissance to determine the likelihood of encountering archaeological resources); Phase II (field testing and the determination of the integrity, significance, and NR eligibility if any archaeological resources are found); and Phase III (mitigating unavoidable impacts through performance of a data recovery or other form of mitigation).

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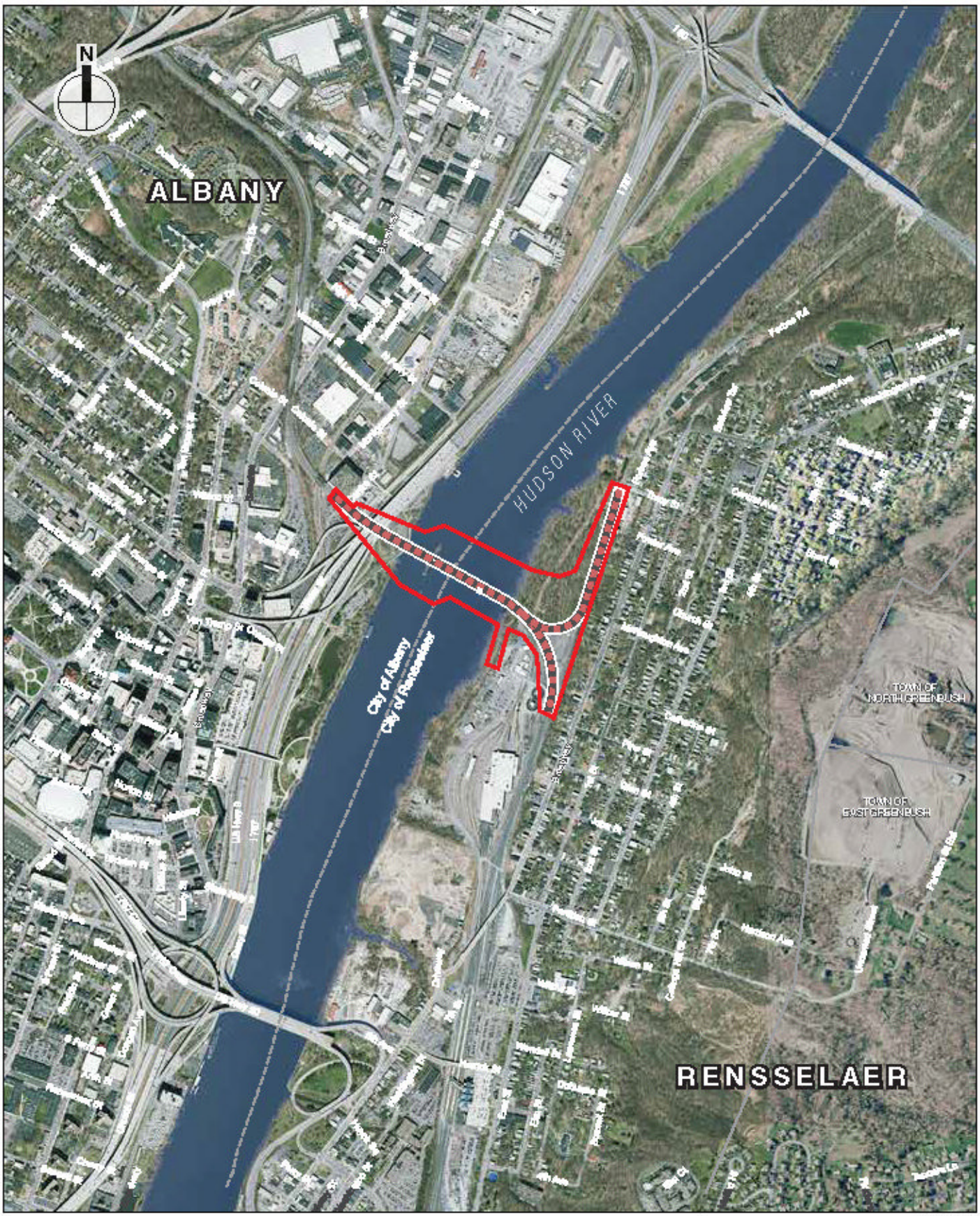

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Project Site

Area of Potential Effect (APE)

NYSDOT LIVINGSTON AVENUE BRIDGE

Project APE
Figure 4.5-1

- On behalf of FRA, NYSDOT submitted the Cultural Resources Survey to SHPO on March 7, 2012 and SHPO concurred with the findings in a May 2012 response (see **Appendix B-5, "Cultural Resources"**).
- On behalf of FRA, NYSDOT sent information about the Project, including a copy of the Cultural Resources Survey, to Tribal Historic Preservation Officers (THPOs) for the Saint Regis Mohawk Tribe, the Stockbridge Munsee Community Band of Mohicans, and the Delaware Tribe. The THPOs responded and identified that they had no concerns but requested that they be notified if human remains or objects of cultural patrimony are encountered during construction of the Project.
- FRA and NYSDOT defined a preliminary APE for the Project (see **Figure 4.5-1**). The May 8, 2012 letter from SHPO indicated that replacement of the bridge would be unlikely to result in indirect adverse effects to historic properties near the bridge, so the APE was subsequently revised to represent the area where direct effects of the Build Alternatives would occur.
- NYSDOT sent Finding Documentation for the Project to SHPO on March 10, 2015. This documentation presented the revised Project APE and included a determination that the Project would have an adverse effect due to the proposed removal of the NR-eligible Livingston Avenue Bridge.
- SHPO responded to the recommended effect determination and requested additional information regarding the consideration of alternatives to the demolition of the Livingston Avenue Bridge on April 29, 2015.
- The Finding Documentation was modified to include more information on alternatives considered and was submitted to SHPO on June 17, 2015.
- FRA and NYSDOT met with Bonney Hartley of the Stockbridge-Munsee Community Band of Mohicans to discuss the Project and resolve concerns on June 26, 2015.
- FRA, NYSDOT, and NYSDOT's design consultant met with SHPO on August 5, 2015 to review the alternatives and discuss additional alternatives. SHPO requested that additional consideration be given to measures to minimize harm to the Livingston Avenue Bridge, such as retaining or rebuilding components of the bridge.
- On November 10, 2015, NYSDOT submitted to SHPO an evaluation of additional alternatives and measures to minimize harm requested by SHPO.
- In December 2015, SHPO responded via telephone that they would issue comments on the effect determination after a public information session and additional outreach to Consulting Parties. Also in December 2015, NYSDOT coordinated with officials from the City of Albany to inquire whether they would like to acquire the structure as a recreational structure.
- FRA invited organizations to participate in consultation pursuant to Section 106 (see **Appendix B-5, "Cultural Resources"**). In May 2017, FRA sent nine organizations invitations to serve as consulting parties for the Project's review and six accepted the invitation and expressed interest in attending a public informational meeting. One additional entity subsequently requested consulting party status and was approved by FRA. Thus, the full list of organizations considered for consulting party status includes the following, with accepted/approved consulting parties in italics:
  - Arbor Hill Neighborhood Association (invited, did not respond)
  - Bridge Line Historical Society (invited, did not respond)
  - *Capital District Transportation Committee (requested consulting party status, approved by FRA)*
  - City of Albany Historian (invited, did not respond)
  - *City of Rensselaer Historian (invited, accepted invitation)*
  - *Historic Albany Foundation (invited, accepted invitation)*

  - *Livingston Avenue Bridge Coalition (invited, accepted invitation)*
  - *National Railway Historical Society Mohawk and Hudson Chapter (invited, accepted invitation)*
  - *New York Central Historical Society (invited, accepted invitation)*
  - Partners for Albany Stories (invited, did not respond).
- FRA and NYSDOT prepared an assessment of effects based on ACHP's Criteria of Adverse Effect (36 CFR § 800.5(a)) and determined that the Project would result in an adverse effect on the historic Livingston Avenue Bridge, but no other historic resources (see below).
- FRA and NYSDOT re-initiated Section 106 consultation with SHPO by letter dated August 24, 2020, including updated Finding Documentation regarding the Project's effects on historic properties. This updated Finding Documentation made a determination that the Project would have an adverse effect due to the proposed removal of the NR-eligible Livingston Avenue Bridge. In a letter dated September 23, 2020, SHPO concurred with FRA and NYSDOT's determination of adverse effect on the Livingston Avenue Bridge and requested that NYSDOT contact the City of Albany to determine their interest in retaining the western portion of the bridge; NYSDOT contacted the City of Albany on this topic in a letter dated October 27, 2020.
- FRA and NYSDOT contacted the THPOs with whom they had consulted earlier to notify them of the adverse effect and provide another opportunity to continue consultation under Section 106 in August 2020. Two of the THPOs responded and identified that they had no concerns but requested that they be notified if human remains or objects of cultural patrimony are encountered during construction of the Project. The other THPO did not respond.
- FRA notified the ACHP of the determination of adverse effect for the historic Livingston Avenue Bridge on December 3, 2020 and invited ACHP to participate in the Section 106 consultation process. In a letter dated January 6, 2021, ACHP declined the invitation to participate.
- In a letter dated September 23, 2020, SHPO concurred that the removal of the Livingston Avenue Bridge would constitute an adverse effect on historic resources. SHPO also concurred that the proposed Project work on the Centre and Water Street Bridges of the Albany Railroad Viaduct would not result in adverse effects to those resources. In the same letter, SHPO requested that outreach to the City of Albany be conducted to inquire as to their interest in retaining a section of the bridge as a pedestrian pier.
- FRA and NYSDOT have considered alternatives that would avoid and/or minimize adverse effects and have identified mitigation measures to resolve adverse effects. These proposed measures were presented to and discussed in a meeting with SHPO on March 10, 2021. These measures are set forth in a Draft Memorandum of Agreement (MOA), which is included in **Appendix B-5** of this EA.
- In letters dated April 27, 2021, FRA informed the USACE and USCG of its determinations related to historic properties under Section 106 and invited those two agencies to participate in the Section 106 process as consulting parties and potentially as signatories.
- On April 28, 2021, the USCG replied in an email, accepting the invitation to be a Section 106 consulting party but not a signatory to the Draft MOA.
- On May 19, 2021, the USACE replied in an email, accepting the invitation to be a Section 106 consulting party and potentially as a signatory to the Draft MOA.
- NYSDOT provided the Draft MOA to SHPO for review and comment on June 2, 2021, and to the USACE and the USCG on June 4, 2021.
- SHPO reviewed the Draft MOA in June and July 2021 and coordinated with NYSDOT regarding revisions.

- In coordination with public review of this EA, FRA and NYSDOT have made the Draft MOA available for public review and comment. FRA and NYSDOT will also share the Draft MOA with the THPOs and Consulting Parties for their review and comment. FRA and NYSDOT will then work with SHPO to address any comments from the public, THPOs, and Consulting Parties, and finalize the MOA. This will conclude the Section 106 process.

4.5.3 Affected Environment

4.5.3.1 Historic Architectural Resources

FRA and NYSDOT identified historic three architectural resources in the APE, the NR-eligible Livingston Avenue Bridge and two other NR-eligible resources in the APE, the Albany Railroad Viaduct and the Central Warehouse and Centre Street railroad spur bridge (see **Exhibit 4.5-1** and **Figure 4.5-2**).

Exhibit 4.5-1
Historic Architectural Resources within the APE

Reference Number*	Name	Location
1	Livingston Avenue Bridge (NR-eligible)	Spanning the Hudson River between Albany and Rensselaer Counties
2	Albany Railroad Viaduct (NR-eligible)	Includes three railroad bridges over streets west of the Hudson River: Centre Street-Erie Boulevard Railroad Bridge and Water Street Railroad Bridge within the APE; and Montgomery Street Railroad Bridge outside the APE (City of Albany)
3	Central Warehouse and Centre Street railroad spur bridge (NR-eligible)	143 Montgomery Street and adjacent bridge carrying railroad spur over Centre Street (City of Albany)—outside of but immediately adjacent to the APE

Note: * See **Figure 4.5-2**

The **Livingston Avenue Bridge** (NR-eligible; see also **Figure 4.5-3**) was built for the New York Central Railroad in 1901-1903 by the American Bridge Company. It is the third successive bridge in this location, preceded by an iron truss bridge in 1872-1875 and the original wood truss bridge of 1864-1866. The current bridge was built on the abutments and piers of the original bridge constructed in the 1860s. It is a riveted steel, Baltimore-truss swing bridge that is 1,272 feet long. A 260-foot-long continuous truss swing span and four fixed trusses span the navigable portion of the Hudson River. The swing span consists of two, four-panel trusses joined by a raised center panel with a polygonal top chord. The fixed trusses are identical six-panel spans. Approach spans, consisting of four through-girder spans, connect the truss bridge to the Rensselaer side of the river. A builder's plate remains on the southeast end post. The piers are mortared cut limestone with continuous timber piles. The swing span pivots 90 degrees clockwise to open the navigation channel on each side of the pivot pier. The span is operated by electric motors from a control booth positioned on top of the swing span truss above the pivot pier. Electricity is provided to the booth by wires suspended from steel frame towers at the ends of the adjacent fixed spans.

The Livingston Avenue Bridge was determined eligible for listing on the NR in 1999. It is eligible under NR Criterion C.[47] The Determination of Eligibility notes that the bridge is architecturally significant as a rare and highly intact example of an early 19th century swing bridge.

[47] NR Criterion C indicates that the property embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or is otherwise distinguished.

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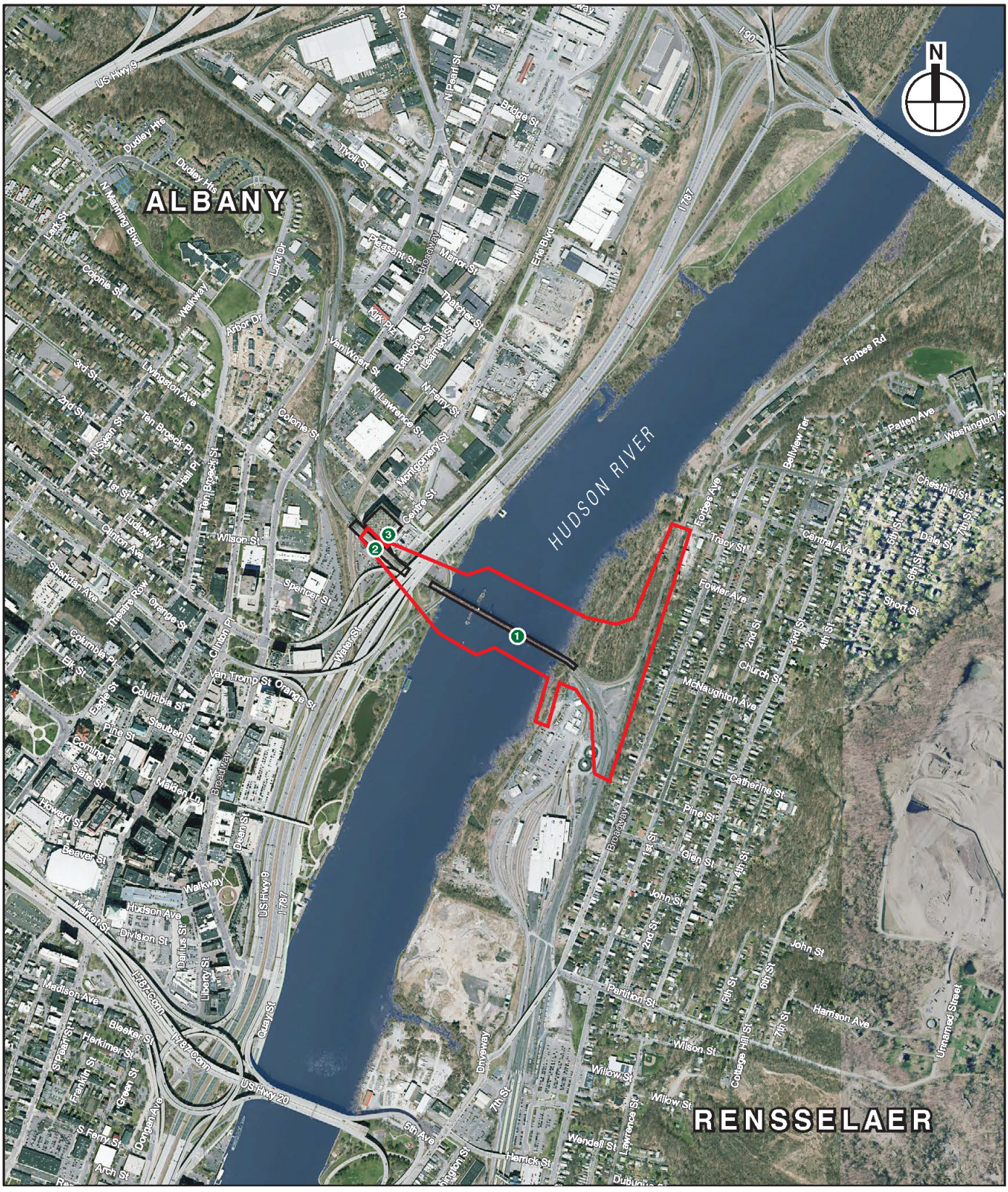

Location of Historic Properties
Figure 4.5-2

View north **1**

View northeast **2**

Historic Architectural Resources:
Livingston Avenue Bridge
Figure 4.5-3

The **Albany Railroad Viaduct** (NR-eligible; see also **Figures 4.5-4 and 4.5-5**) was determined eligible for the NR as part of the Albany-Schenectady 2nd Main Track project (NYSDOT PIN 1935.52). Components of the NR-eligible Albany Railroad Viaduct are the Water Street Railroad Bridge, which is a 1948 deck-girder bridge; the Centre Street-Erie Boulevard Railroad Bridge, a 1928 deck-girder bridge; and the Montgomery Street Railroad Bridge, which is a 1901-1902 through-truss and through-girder bridge.[48] The Centre Street-Erie Boulevard Railroad Bridge and the Water Street Railroad Bridge are located within the APE; the Montgomery Street Railroad Bridge is located immediately adjacent to the western terminus of the APE. The original Albany Railroad Viaduct was built as the western approach to an earlier Hudson River crossing built by the Hudson River Bridge Company according to designs by prominent engineer Julius W. Adams. The original viaduct approach structure in this location consisted of a wood trestle and incorporated three trestle bridges designed by Charles Hilton of the Hilton Bridge Company of Albany. The original wood trestle was replaced with an earthen causeway in the 1870s. The spans were replaced in 1882, at which point the structure was raised in height and transformed into a viaduct. The superstructures of the viaduct were replaced once more in 1901-1902. The earlier masonry walls of the viaduct were retained but encased in concrete at that time. The span over Water Street was replaced in 1947. Documentation notes that elements that embody the historic character of the viaduct include: the three spans over Water, Centre, and Montgomery Streets; the concrete-encased structure that connects them; and distinctive details such as early 20th century date plates in the concrete. The Albany Railroad Viaduct was determined eligible under NR Criterion A,[49] due to the fact that "its various construction episodes [ranging from ca. 1866 to ca. 1947] are associated with the development of early national freight travel and the consolidation and modernization of passenger and freight rail service in the early years of the twentieth century."[50]

The **Central Warehouse and Centre Street Railroad Spur Bridge** (NR-eligible; see also **Figure 4.5-6**) is located at 143 Montgomery Street on the block bounded by Livingston Avenue-Centre Street, Montgomery Street, Colonie Street, and the railroad tracks. It is outside of but immediately adjacent to the APE. Central Warehouse is a large cold storage facility built by the New York Central Railroad in 1927. A bridge that carries a railroad spur from the Albany Railroad Viaduct over Centre Street, adjacent to the Centre Street span of the Albany Railroad Viaduct, and connects to the Central Warehouse is a contributing feature to the NR-eligible resource. It is eligible under NR Criterion A.

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[48] Two other bridges located outside of the APE (the North Pearl Street Bridge and the Broadway-Colonie Street Bridge) are commonly considered part of the Albany Railroad Viaduct structure; however, the Cultural Resources Survey for the Project did not identify these as part of the NR-eligible resource. The Broadway-Colonie Street Bridge is individually NR-listed and is a contributing element within the NR-listed Broadway- Livingston Avenue Historic District.

[49] NR Criterion A indicates that the property is associated with events that have made a significant contribution to the broad patterns of history.

[50] Hartgen Archaeological Associates Structure Survey: NYSDOT PIN 1935.52: Albany-Schenectady 2nd Main Track Project, City of Albany and Town of Guilderland, Albany County and City of Schenectady, Schenectady County, New York. Submitted to CHA. Prepared by Hartgen Archaeological Associates, July 2010.

View north (south elevation) **3**

View south (north elevation) **4**

Historic Architectural Resources:
Albany Railroad Viaduct, Water Street Bridge

Figure 4.5-4

View north (south elevation), Central Warehouse in background **5**

View south (north elevation), from beneath Centre Street Railroad Spur Bridge **6**

Historic Architectural Resources:
Albany Railroad Viaduct, Centre Street Bridge
Figure 4.5-5

Central Warehouse, view southwest from Centre Street at Colonie Street **7**

Centre Street Railroad Spur Bridge, view south on Centre Street **8**

Historic Architectural Resources:
Central Warehouse and Centre Street Railroad Spur Bridge

4.5.3.2 Archaeological Resources

As part of the Phase I Archaeological Survey for the Project,[51] an archaeological documentary study was undertaken to document prehistoric and historic-period land use and modern ground disturbance in the APE. Based on this evaluation, areas of archaeological sensitivity within the APE were identified and assigned a level of low, moderate, or high sensitivity. The following section summarizes the results of the documentary study.

4.5.3.2.1 Precontact-Period Archaeological Sensitivity

The Native American occupation along the Hudson River has been well documented for the entire precontact period, through the Paleo-Indian, Archaic, and Woodland periods (ca. 9,000 years BC through AD 1600). The Cultural Resources Survey identified three precontact period sites located within a two-mile radius of the APE. These sites are located on the tributary and drainage system extending along the Hudson River. Between 1900 and 1903, much of the riverfront property in Rensselaer was created with fill material. The area between the railroad tracks and Broadway has not been modified with fill and may yield potential precontact cultural resources. The shoreline of the Hudson River in the City of Albany began to be modified in the 1800s with the canal system. The current boundary of the Hudson River in the City of Albany was reached sometime between 1950 and 1970. Although the current shoreline may be recent, the APE west of I-787 is not composed of manmade land and therefore may yield potential precontact cultural resources. The entire APE has a moderate sensitivity rating for precontact cultural resources due to historic development on the original banks of the Hudson River.

4.5.3.2.2 Historic-Period Archaeological Sensitivity

The available historic maps depicting the area around the Livingston Avenue Bridge show numerous historic features, such as dwellings, commercial buildings, associated outbuildings, and the railroad throughout the APE. However, previous testing in the APE did not identify any historic features or cultural remains.[52] The entire APE has a sensitivity rating of moderate for historic-period archaeological resources, although much of the APE underwent ground disturbance by previous road, railroad, and commercial development.

4.5.3.2.3 Results of Archaeological Field Testing

Because the documentary research concluded that portions of the APE are moderately sensitive for precontact and historic-period archaeological resources, archaeologists conducted field-testing during the fall of 2010 to confirm the presence or absence of such resources. The archaeologists excavated shovel test pits within the APE at 25- and 50-foot intervals. They also excavated four deeper trenches in the northeastern section of the APE. Based on the results of the field-testing, the APE is not considered sensitive for archaeological resources (i.e., it does not have the potential to contain buried archaeological resources).

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[51] The archaeological survey identified four potentially significant archaeological sites within the original Cultural Resources Survey Area, all of which were recommended for further investigation if they would be subject to potential adverse effects because of the Project. These included a historic-period site in the City of Albany identified as Livingston Avenue #1 Site (NYSM #12309), and three historic-period sites in the City of Rensselaer identified as the Livingston Avenue #2 Site (NYSM #12310), Livingston Avenue #3 Site (NYSM #12311), and Livingston Avenue #4 Site (NYSM #12312). All of these sites are located outside of the bounds of the Project APE, and therefore, are not discussed further in this section. Based on the Archaeological Survey, the APE for the Project is not sensitive for archaeological resources.

[52] Barry Dale Cultural Resources Survey Report for the Henry Knox Cannon Trail Restoration Project, Town of Hague, Warren County, New York, and City of Albany, New York. New York State Museum Cultural Resources Survey Program, Albany, New York. 2010.

4.5.4 Effects of the No Action Alternative

Under the No Action Alternative, FRA and NYSDOT would not rehabilitate or replace the Livingston Avenue Bridge. The No Action Alternative would not result in adverse effects to historic resources, as there would be no ground disturbance or excavation, and the Livingston Avenue Bridge would be retained with its context unaltered. Maintenance and repair of the Livingston Avenue Bridge would not adversely affect the historic resource; however, the existing structure would continue to deteriorate, resulting in increased maintenance and eventually requiring the structure to be closed to rail traffic.

4.5.5 Effects of the Build Alternatives

In terms of archaeological resources, there are no archaeological sites or areas of archaeological sensitivity in the APE. Therefore, the Build Alternatives would not affect archaeological resources.

In terms of architectural resources, the Build Alternatives would replace the NR-eligible Livingston Avenue Bridge. FRA and NYSDOT have concluded, and SHPO has concurred, that removal of this resource would constitute an adverse effect under Section 106. FRA and NYSDOT are conducting ongoing consultation with SHPO and other consulting parties regarding this adverse effect.

Additionally, both Build Alternatives would alter the Water Street and Centre Street bridges, which are contributing components of the NR-eligible Albany Railroad Viaduct. At each of these bridges, the beam seats of the bridge abutments that support the bridge girders (i.e., the beam seats and girder bearings) would be modified or replaced and several pairs of deck girders (i.e., bridge beams) would be repositioned to support the new track alignment. At the Water Street bridge, a set of existing deck girders would be removed to accommodate this shift (for more information, see **Section 2.4.2.6.1** in **Chapter 2, "Project Alternatives"**). FRA and NYSDOT have concluded, and SHPO has concurred, that these changes would not constitute an adverse effect because the alterations would not change the characteristics that make the Albany Railroad Viaduct eligible as a NR property.

The proposed modifications are designed to minimize the change in appearance of the Water Street and Centre Street bridges. At the Water Street bridge, an interior pair of girders would be removed and an exterior pair would be shifted inward so that the appearance from the street would be maintained. This would leave an exposed portion of the bridge seats on the outside of the bridge abutments but would not otherwise change the appearance of the structure. At the Centre Street bridge, an interior pair of girders would be shifted and the exterior girders would remain unchanged. Given that the Albany Railroad Viaduct was determined eligible for the NR under NR Criterion A, because of its association with the development of the nation's railroad system, these changes with minimal visibility that would re-use the same materials currently present at the two bridges would not adversely affect the bridges' character.

Both Build Alternatives would have a retaining wall along the south side of the railroad embankment in Albany between the river and Water Street to support the sloping shared use path. The retaining wall would be designed to harmonize with the existing landscape.

No change would occur to the Centre Street spur to the Albany Warehouse and no alterations to the other bridges that comprise the Albany Railroad Viaduct would be required.

Although the proposed changes would directly affect the Water Street and Centre Street bridges and therefore the Albany Railroad Viaduct as a whole, FRA and NYSDOT concluded, and SHPO concurred, that the change would not constitute an adverse effect under either Build Alternative. In a letter dated September 23, 2020, SHPO stated "the proposed Water Street and Center Street bridge work would not significantly impact features that make these bridges eligible for listing in the National Register." In both alternatives, the existing fascia girders would be retained (though sometimes shifted along the bridge seat). No new girders would be used. The existing reinforced

concrete bridge seats and girder bearing pedestals would be repaired and/or reconstructed to conform to the new alignment of the girders above. The existing reinforced concrete abutments would be retained in their entirety. Some partial depth or surface repairs to the abutments may be necessary based on a full condition inspection of the abutments during final design. Changes in the appearance of the component bridges and the larger viaduct that would result from the proposed alterations would be relatively minor and would not change the characteristics of the viaduct that qualify it for inclusion on the NR. The integrity of the property's location, design, setting, materials, workmanship, feeling, or association would not be diminished to an extent that would disqualify the property for inclusion on the NR.

The replacement of the NR-eligible Livingston Avenue Bridge under the Build Alternatives would not affect the character-defining features of other architectural resources in Albany or Rensselaer and, therefore, the Build Alternatives would have no adverse effects on other architectural resources. The maximum height of the proposed bridge (145 feet above Mean High Water) would be lower than the maximum height of the existing structure (151.5 feet above Mean High Water). Although the design of the new bridge would differ to some extent from that of the existing bridge, the replacement bridge would not introduce a new visual, audible, or atmospheric element in the setting of the historic properties in the APE that would be out of keeping with existing conditions. Based on SHPO's May 8, 2012 recommendation, no further analysis of the potential for visual impacts on historic properties was conducted. (The analysis of visual resources is presented in **Section 4.6** below.)

4.5.6 Avoidance, Minimization, and Mitigation

In accordance with Section 106 regulations, an adverse effect finding requires consideration of alternatives that would avoid and/or minimize adverse effects and the identification of mitigation measures to resolve adverse effects. The Build Alternatives would not adversely affect archaeological resources and thus no consideration of alternatives or mitigation is required related to archaeological resources.

4.5.6.1 Alternatives to Avoid or Minimize Adverse Effects

The removal of the NR-eligible Livingston Avenue Bridge would constitute an adverse effect on this historic architectural resource. This section describes the alternatives FRA and NYSDOT considered to avoid or minimize the adverse effect and the mitigation measures that they will incorporate as part of the Project design.

FRA and NYSDOT considered the following alternatives to avoid removal of the historic bridge or to minimize adverse effects related to its removal and assessed whether they would meet the Project purpose and need and be feasible and reasonable:

- **No Action Alternative:** "Do nothing" alternative.
- **Permanent Detour Alternative:** Route train service to alternate routes and leave the existing bridge in place for another use or as an unused monument.
- **Rehabilitation Alternatives:** Rehabilitate the existing Livingston Avenue Bridge to remove structural and seismic deficiencies and continue its use for rail traffic. These include several levels of rehabilitation.
- **Replacement Bridge on New Alignment Alternative:** Build a new bridge at a location farther from the existing bridge and leave the existing bridge in place for another use or as an unused monument.
- **Reuse of Existing Bridge at a New Location:** Relocate the bridge in segments to a new location for reuse.

- **Retention of a Portion of Existing Bridge Adjacent to Replacement Bridge:** Build a new bridge adjacent to the existing bridge and retain a portion of the existing bridge extending from the Albany shoreline for pedestrian use.
- **New Bridge on Existing Alignment with Reconstructed Piers Finished in Reused Cut Stone:** Build a new bridge along the same alignment and remove the old bridge as the replacement bridge is constructed.

FRA and NYSDOT considered adverse environmental impacts, safety, engineering/operational deficiencies, poor transportation service, increased costs, and other factors in determining whether the avoidance alternatives would be feasible and reasonable. None of these alternatives would meet the Project's purpose and need. The alternatives that would remove rail operations from the bridge would redirect trains over much longer routes and substantially deteriorate passenger and freight rail services along this corridor; the alternatives that would retain the existing structure for railroad use would not fully address existing operational constraints. Refer to **Appendix B-5, "Cultural Resources,"** for more information about avoidance alternatives.

4.5.6.2 Mitigation

FRA, in consultation with NYSDOT and SHPO, has developed a Draft MOA that stipulates mitigation measures for the adverse effects to historic properties. FRA and NYSDOT will consult with the THPOs and other consulting parties to complete the MOA prior to construction activities associated with the Project. Measures included in the Draft MOA to mitigate the adverse effect on the Livingston Avenue Bridge include the following:

- Documentation of the Livingston Avenue Bridge following Historic American Engineering Record (HAER) standards;
- Interpretive signage in waterfront parks on both sides of the river that conveys the history of the bridge, the railroad, and the area;
- A requirement that the new bridge be a truss bridge that incorporates key visual elements relating to the existing Livingston Avenue Bridge, the pulley housing and operator's building, as requested by SHPO on April 14, 2021;
- A requirement that NYSDOT actively seek new ownership of the Livingston Avenue Bridge for adaptive reuse or partial reuse at a new location. NYSDOT has begun marketing efforts for the bridge in coordination with publication of this EA. These marketing efforts consist of a combination of print and web-based ads that include an advertisement in the local newspaper for a minimum of 14 days and an announcement posted on the internet for a minimum of 2 months. NYSDOT will only consider viable offers that are consistent with the MOA stipulations. If ownership of the bridge is transferred for reuse, the transfer deed will include a preservation covenant that requires the new owner to retain the feature intact for a specified period of time.

The Draft MOA is included in **Appendix B-5, "Cultural Resources,"** of this EA.

To avoid accidental damage to adjacent resources as a result of construction activities for either Build Alternative 1 or Build Alternative 2, all resources that may be subject to inadvertent damage would be included in a Construction Protection Plan (CPP). FRA and NYSDOT will prepare the CPP in consultation with SHPO and the property owners. The CPP will identify the architectural resources to be included in the plan. It will also set forth the specific measures to be used and specifications that would be applied to protect these architectural resources during the construction period.

4.6 Visual Resources and Aesthetic Considerations

4.6.1 Introduction

This section presents the evaluation FRA and NYSDOT conducted of the potential operational impacts of the No Action and Build Alternatives on visual resources and aesthetic conditions in the vicinity of the Project.

4.6.2 Methodology and Study Area

FRA and NYSDOT assessed visual impacts by evaluating the compatibility of the Build Alternatives with the surrounding context, sensitivity of the viewers, and degree of impact. The assessment of compatibility consisted of consideration of the visual impacts of the Build Alternatives in relation to such elements as scale, form, materials, visual character, and distance between the viewer and the visual resource.

In the absence of FRA-specific guidance for assessment of visual impacts, this analysis was prepared in accordance with the *Guidelines for the Visual Impact Assessment of Highway Projects* (January 2015) prepared by the Federal Highway Administration (FHWA), as appropriate and applicable to the Project. Although the Project is not a highway project, it is similar to one in that it involves new work on a linear transportation corridor and therefore many of the components in the guidance were relevant to the analysis.

In accordance with the FHWA guidelines, the assessment of visual impacts was prepared by:

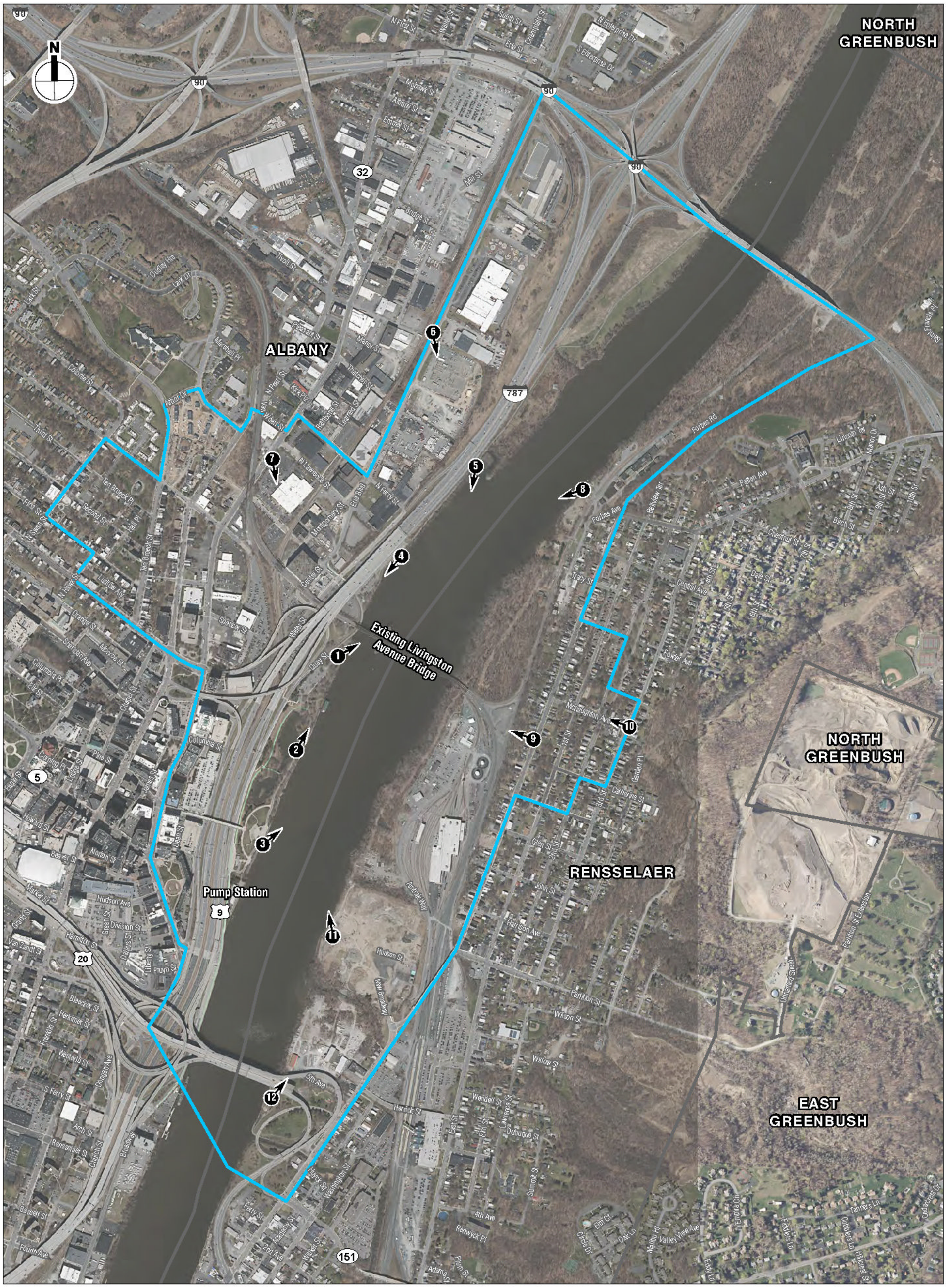
- Identifying an Area of Visual Effect by considering the visibility of Project features through landform, land cover, atmospheric conditions, and limits of sight. For this analysis, the Area of Visual Effect for the Project is bounded by the Patroon Island Bridge (I-90) to the north; the Dunn Memorial Bridge to the south; and eastern and western boundaries that capture the view corridors to the existing and proposed bridges, accounting for topographic conditions (see **Figure 4.6-1**);
- Describing the visual character of the affected environment and the affected population by considering the views that are available to the affected population and the quality of those views;
- Assessing the compatibility of the new infrastructure with the surrounding area and the sensitivity of viewers to the proposed change to determine the degree of impact on visual quality; and
- Characterizing the impact on visual quality as beneficial, adverse, or neutral. A proposed project may benefit visual quality by enhancing visual resources, creating better views of certain resources, and improving the experience of the viewers. Alternatively, it may adversely affect visual quality by degrading visual resources or obstructing or altering desired views.

4.6.3 Affected Environment

The view corridor in the study area is the viewshed upstream and downstream of the Hudson River from the Livingston Avenue Bridge, downstream to the Dunn Memorial Bridge (U.S. Routes 9 and 20), and upstream to the Patroon Island Bridge (I-90). The Hudson River is prominent in the viewshed, which is characterized by an expansive view of the river and the Livingston Avenue Bridge. The Hudson River is approximately a half-mile wide in the vicinity of the Livingston Avenue Bridge. The view corridor created by the river valley allows for distant views that are partially screened where bridges are located.

As a historic and visually interesting structure, the Livingston Avenue Bridge contributes to the visual character of the Hudson River view corridor. In terms of views from the Livingston Avenue Bridge, pedestrians and bicycles are not permitted on the bridge and views from passing trains

7.15.19



Visual Resource Study Area

City/Town Boundary

Photograph View Direction and Reference Number

0 1,000 FEET

NYSDOT LIVINGSTON AVENUE BRIDGE

Area of Visual Effect

Figure 4.6-1

are somewhat limited due to fencing and the speed of the train, which prevents extended durations of the view.

In accordance with FHWA guidance, FRA and NYSDOT identified viewsheds or key views within the Area of Visual Effect to represent what neighbors of the Project site would see from stationary locations such as residences and what visitors and travelers would see as they move through the landscape. The key views, shown on **Figure 4.6-1**, are depicted in photographs 1 through 12 on **Figure 4.6-2** through **Figure 4.6-7**.

4.6.3.1 City of Albany

Corning Riverfront Park in Albany extends between the Livingston Avenue Bridge and the Riverfront Pump Station. It is accessible at the southern end of the park via the Hudson River Way pedestrian bridge (also known as the Pine Street Connector), which spans I-787, Quay Street, and Front Street. The Livingston Avenue Bridge is visible from most locations within Corning Riverfront Park. Photographs 1, 2, and 3 provide representative views of the bridge from Corning Riverfront Park. The Albany Skyway provides an additional location from which viewer groups would experience views of the Livingston Avenue Bridge. Users of the Albany Skyway would only have views of the bridge from the portion of the Skyway located east of I-787.

The Mohawk-Hudson Bike-Hike trail (described in more detail in **Section 4.2**) is adjacent to the waterfront through Corning Riverfront Park and extends north of the Livingston Avenue Bridge through the Riverfront Preserve (see **Section 4.2**). The Riverfront Preserve is accessible to the public and provides access to the Hudson River. The Riverfront Preserve also provides several amenities, which include the trail, overflow parking for Corning Riverfront Park, and a boat launch. Photographs 4 and 5 represent views from the Riverfront Preserve, including the boat launch and a portion of the trail. Awareness of the bridge is high along the waterfront with medium to long duration of views by the park and trail users.

The most notable views of the Livingston Avenue Bridge for Albany motorists are from I-787 and the immediately adjacent and parallel roadways and ramps such as Quay Street, Front Street, and the Clinton Street ramps. Pedestrians are not permitted on I-787, but many sidewalks exist along parallel roadways and within Corning Riverfront Park (discussed above). Many portions of these roadways lack any substantial screening and therefore provide direct views of the Hudson River and Livingston Avenue Bridge. Since the bridge is often directly in front of the observer from most locations along these roadways, awareness of the bridge and duration of views are moderate to high.

Areas to the west of I-787 are characterized by industrial and commercial properties. Residential areas are located inland, several blocks or more from the Hudson River. Most industrial and warehouse buildings in the area range in height from one to three stories and many have outdoor storage or parking areas. Some views of the Hudson River and Livingston Avenue Bridge are possible from inland locations where gaps in buildings and vegetation exist; however, most locations at street level have numerous features in the built environment that screen views and prevent high awareness of the bridge (see Photographs 6 and 7). Views are possible from many north- and east-facing windows on upper stories of office buildings. Where views are possible from these upper stories of buildings, awareness of the bridge is generally higher due to the prominence of the Hudson River view corridor from those vantage points.

4.6.3.2 City of Rensselaer

The Rensselaer portion of the study area includes waterfront locations on the eastern bank of the Hudson. The Rensselaer Boat Launch (Photograph 8) provides public access to the waterfront and views of the Hudson River and its bridges, and downtown Albany. Picnic tables and areas for fishing are located at the boat launch. Views of the surrounding open space are abundant, but the most notable features of the boat launch are the access to and views of the Hudson River. While

View looking east at the Livingston Avenue Bridge from Corning Riverfront Park just south of the bridge **1**

View looking toward Livingston Avenue Bridge from Corning Riverfront Park south of Riverfront Grill restaurant **2**

View looking north toward Livingston Avenue Bridge from Corning Riverfront Park near Pine Street Connector **3**

View looking south toward Livingston Avenue Bridge from Albany Boat Launch (NYSDOT owned property) **4**

View looking south toward Livingston Avenue Bridge from Mohawk-Hudson Bike-Hike Trail **5**

View looking south toward Livingston Avenue Bridge from Erie Boulevard near Thatcher Street **6**

View looking east toward Livingston Avenue Bridge from Broadway at North Lawrence Street **7**

View looking south toward Livingston Avenue Bridge from Rensselaer Boat Launch **8**

View looking west toward Livingston Avenue Bridge from Broadway residence **9**

View looking west toward Livingston Avenue Bridge from Macnaughton Avenue and Third Street **10**

View looking north toward Livingston Avenue Bridge from DeLaet's Landing **11**

View looking north toward Livingston Avenue Bridge from Riverfront Park (Rensselaer) **12**

there are some locations where a park visitor can view the Livingston Avenue Bridge, these viewing locations are not characteristic of the views from the park as a whole and viewer awareness of the bridge is relatively low. Where views of the Livingston Avenue Bridge do exist, they are from a distance, since the northern edge of the park is approximately 1.7 miles from the bridge. Since most park visitors use the main portion of the park with more limited views of the Livingston Avenue Bridge, durations of views are short. This view approximates the views of boaters in the Hudson River in the northern portion of the Area of Visual Effect. Boaters within the Area of Visual Effect have high awareness of the bridge and views of long duration.

Along the Hudson River north of the Livingston Avenue Bridge, the proposed Kiliaen's Landing project would introduce new views of the Hudson River and the Livingston Avenue Bridge from an expanded waterfront open space at the Rensselaer Boat Launch, a waterfront trail, and several residential buildings. Depending on the final configuration of the development project, views to the Livingston Avenue Bridge and the Hudson River viewshed are likely to be available. These views could be prominent from certain locations and for certain viewer groups, and awareness of these views could be high, particularly for recreational users of the expanded park and waterfront trail.

Views of the bridge and the Hudson River from the low-density residential neighborhoods along Broadway and areas to the east are largely obscured by the hilly terrain and dense vegetation. Photographs 9 and 10 looking toward the bridge from Broadway and Macnaughton Avenue/Third Street, respectively, depict typical views from residential areas in Rensselaer. Some viewers located on higher ground, and those in the upper stories of some buildings, do have limited views of the upper portions of the bridge. Where views are possible, awareness of the bridge is generally low due to the presence of intervening buildings and vegetation.

To the south of the existing bridge, public views of the Livingston Avenue Bridge are available from De Laet's Landing and the recently constructed section of the riverfront trail system (Photograph 11). Views from the Riverfront Park in Rensselaer, which is located at the southern end of the Area of Visual Effect, are limited. The support structure of the Dunn Memorial Bridge and adjacent lumber yard generally screen views of the Livingston Avenue Bridge to the north. (see Photograph 12). Land uses to the north of Riverfront Park include a hardware store, lumber yard, and the Amtrak Maintenance Facility.

Motorists and pedestrians traveling along roadways in Rensselaer have limited brief views of the Livingston Avenue Bridge. In general, existing buildings and vegetation along the Hudson River screen views towards the river. Where screening does not occur and the Livingston Avenue Bridge is visible, it is generally not a prominent feature within the viewshed due to the presence of other buildings in the foreground. Therefore, while limited views are possible from some roadways within the study area, awareness is relatively low. Views of the Livingston Avenue Bridge from the Dunn Memorial and Patroon Island Bridges are distant and partially obscured by fences and barricades.

4.6.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The No Action Alternative would not result in any adverse impacts to visual resources or aesthetic conditions in the Area of Visual Effect. The planned Rensselaer waterfront development would result in additional viewers and public views of the historic existing bridge.

4.6.5 Impacts of the Build Alternatives

4.6.5.1 Project Features

Both Build Alternatives would replace the existing Livingston Avenue Bridge, an NR-eligible Baltimore-truss swing bridge, with a new bridge on an adjacent alignment. The proposed new bridge would have a vertical lift span (instead of a swing span) with through-truss and girder approach spans. Towers flanking the movable span of the proposed new bridge would have

machinery houses atop them. The tops of the towers would be 6.5 feet lower than the top of the existing catenary cable towers, with a height of 145 feet above mean high water, as compared to the height of 151.5 feet above mean high water for the existing Livingston Avenue Bridge. **Figure 4.6-8** is a visual simulation of the proposed bridge with the movable span in raised and lowered positions.

Both Build Alternatives would include a shared use path for bicycles and pedestrians connecting the future proposed Rensselaer Riverfront Multi-Use Trail on the east side of the river with the Mohawk-Hudson Bike-Hike Trail on the west side, with approach ramp structures that connect from the bridge to the trails. The path would be a 12-foot-wide walkway to provide two-way pedestrian and bicycle traffic across the river. The walkway would include scenic overlooks at each end of the movable span to provide an area for pedestrians to collect and bicyclists to dismount when the bridge is opening/closing and the walkway gates are closed.

Navigational lighting as required by the USCG would illuminate the navigation channel. The maintenance walk would have walkway-level lighting to provide full-time access to the lift span machinery houses. The shared used walkway across the bridge would include additional lighting to provide a properly illuminated walkway across the bridge.

In addition to replacing the Livingston Avenue Bridge, both Build Alternatives would modify the bridge approach tracks on both sides of the river and the historic Albany Railroad Viaduct in Albany. To minimize the change in appearance of the Water Street and Centre Street bridges, which currently each have four girder pairs that support tracks spanning the roads, both Build Alternatives would reposition several pairs of the existing deck girders while maintaining the existing exterior girders.

At the Water Street rail bridge, an interior pair of girders would be removed to accommodate the shift and an exterior pair would be shifted inward. This would leave an exposed portion of the bridge seats on the outside of the bridge abutment but would not otherwise change the appearance of the structure. At the Centre Street rail bridge, an interior pair of girders would be shifted and the exterior girders would remain unchanged.

In addition, both Build Alternatives would have a retaining wall along the south side of the railroad embankment in Albany between the river and Water Street to support the sloping shared use path. The design of the retaining wall would be visually compatible with the existing landscape.

4.6.5.2 Hudson River View Corridor

Both Build Alternatives would provide an enhancement for visual resources in the Area of Visual Effect by providing new scenic overlooks of the Hudson River view corridor from the shared use pathway on the proposed bridge. While pedestrians were at one time permitted on the existing bridge, the sidewalk was closed to the public about 30 years ago due to the condition of the structure and substandard access points to the bridge. As a result, both Build Alternatives would enable views of the Hudson River view corridor that are not currently available to the public. This would be a benefit to visual resources.

Under either Build Alternative, the Project would result in the removal of the Livingston Avenue Bridge, which contributes to the character of the Hudson River view corridor. In replacing the historic bridge with a new bridge, this aspect of the corridor would be altered. The new bridge would have a lift span rather than a swing span and would differ in truss design and other respects. However, overall, the scale and overall visual character of the proposed bridge would be comparable to that of the existing bridge.

Because the alignment, height, and dimensions of the new bridge would not differ substantially from the existing bridge under either Build Alternative, views of the bridge and the Hudson River view corridor as a whole would not be significantly changed from existing conditions. The change in design of the new bridge would be minimally perceptible to those farther away and more

Proposed Replacement Bridge with Moveable Span in Raised Position

Proposed Replacement Bridge with Moveable Span in Lowered Position

Proposed Replacement Bridge

Figure 4.6-8

noticeable to the transient viewer groups at the northern end of Corning Riverfront Park, the southern end of the Riverfront Preserve, and the Albany Skyway. In addition, the future residents of Kiliaen's Landing and users of the proposed public waterfront uses may notice the change, depending on the timing of that proposed development in relation to the construction of the replacement bridge. Views to other aspects of the Hudson River view corridor would not be blocked or substantially changed, and the durations of these views would remain the same.

The Build Alternatives would not substantially alter nighttime views of the bridge or create obtrusive light pollution. The existing bridge currently has walkway lighting to provide access to the operator's house atop the movable bridge span as well as flood lighting to facilitate the operation of the movable span in low light conditions. The additional lighting for the shared use pathway would not be substantially different from the lighting on the existing bridge or materially affect visual resources or aesthetic conditions in the Area of Visual Effect.

The bridge approach track work, alterations to the Albany Railroad Viaduct, and the retaining wall would not be perceptible except from areas immediately adjacent to the improvements. These improvements would not result in adverse impacts since the overall appearance of the bridge approach areas would not change.

In conclusion, the Project would not obstruct views or adversely affect visual quality by degrading visual resources. The Project would benefit visual quality by enhancing visual resources, creating more views of the Hudson River view corridor than exist today, and improving the experience of the viewers.

4.6.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts to visual resources and aesthetic conditions in the Area of Visual Effect. The Build Alternatives would enhance visual opportunities in the Project area by incorporating new scenic overlooks into the design of the Project. Measures to enhance visual resources in the study area—namely, the new scenic overlooks—have been incorporated into the design of the Project.

4.7 Water Resources

4.7.1 Introduction

This section presents FRA's and NYSDOT's assessment of the potential operational impacts of the No Action and Build Alternatives on water resources. Water resources include surface waters, wetlands, groundwater, floodplains, and the coastal zone.

4.7.2 Methodology and Study Area

The evaluation of water resources considered the requirements of Federal and state regulations and the status of the Project site and its vicinity with respect to water resource protection and management programs. The study area used to evaluate surface water, groundwater, floodplain, and coastal zone impacts is the Project site and adjacent areas with the potential to affect water resources as a result of the Project. For wetlands, the study area extends an additional 500 feet from the Project site. The affected environment was characterized using a range of data sources, including the following:

- Maps of the area prepared by the NYSDEC, USCG, U.S. Geological Survey (USGS), USACE, Federal Emergency Management Agency (FEMA), and USFWS;
- A Navigation Study completed for the Project in June 2018 (see **Appendix D, "Navigation Study"**);
- Field reconnaissance conducted in November 2010 and September 2020;

- Wetland Delineation Reports completed in March 2011 and September 2020 (see **Appendix B-2, "Water Resources and Ecology"**); and
- Coastal Zone Consistency Analysis, prepared in accordance with the New York State Coastal Management Program (CMP) and the Cities of Albany and Rensselaer LWRPs (see **Appendix B-2, "Water Resources and Ecology"**).

4.7.3 Affected Environment

4.7.3.1 Surface Waters

The portion of the Hudson River in the study area is tidal and designated as a Class C Fresh Surface Water per NYSDEC's Protection of Water regulations under Article 15, Title 5 of the Environmental Conservation Law (ECL) (6 NYCRR Parts 701 and 703), which implements the Clean Water Act in New York State. The Water Pollution Control Act as amended in 1972, also known as the Clean Water Act, seeks to restore and maintain the chemical, physical, and biological integrity of waters of the United States. As set forth in NYSDEC's regulations, the best usage for Class C waters is fishing, and these waters shall be suitable for fish, shellfish, and wildlife propagation and survival. According to applicable standards, the water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. Based on a review of the NYSDEC Geographic Information Systems (GIS) data maps for regulated streams, the Hudson River is the only regulated stream in the study area.

Section 404 of the Clean Water Act requires authorization from the Secretary of the Army, acting through USACE, before dredged or fill material may be discharged into waters of the United States. Activities authorized under Section 404 must comply with Section 401 of the Clean Water Act, which requires a Water Quality Certificate (either from the state where the discharge would occur or from an interstate water pollution control agency) that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act.

Section 303(d) of the Clean Water Act requires states to identify Impaired Waters, where specific designated uses are not fully supported. The Clean Water Act requires that the states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDL) for these waters.[53] The main stem of the upper Hudson River near the Livingston Avenue Bridge is listed on the Final New York State 2016 Section 303(d) List of Impaired/TMDL Waters (2017) as being impaired for polychlorinated biphenyls (PCBs) originating from sediment contamination.[54] The upper Hudson River main stem is included on the Draft 2018 Section 303(d) List for the same reasons (see **Section 4.7.3.2** for further discussion of PCB contamination).[55]

4.7.3.2 Water and Sediment Quality

Sediment quality of the Hudson River in and within the vicinity of the Project site is generally considered to be degraded.[56] Sediment core and grab sampling, along with side-scan sonar and sediment profile imagery, show that the river bottom in the vicinity of the Project site consists of sediments that range from muddy sand to sandy gravel, as defined by NYSDEC.[57] Muddy sand (sand with >10 percent mud) is found along the eastern shore and a small portion of the western

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[53] A TMDL is a pollution budget and includes a calculation of the maximum amount of a pollutant that can occur in a waterbody and allocates the necessary reductions to one or more pollutant sources.

[54] Available from: http://www.dec.ny.gov/chemical/31290.html.

[55] Ibid.

[56] Hudson River Estuary Biocriteria Final Report, submitted to NYSDEC by Versar, Inc. and Tetra Tech, Inc., May 2003.

[57] NYSDEC 2006a Hudson River Estuary Sediment Type Map. Metadata available from: http://gis.ny.gov/gisdata/metadata/nysdec.hudson.sed.type.html#1.

shore, just north of the existing bridge (see **Figure 4.7-1)**. The remainder of the river bottom is sand (sand with <10 percent mud and <10 percent gravel) and gravelly sand (sand with >10 percent gravel), along with a small portion of sandy gravel (gravel with <10 percent sand and <10 percent mud) in the deepest waters.[58] Depths in the vicinity of the Project site range from less than 6 meters (20 feet) downstream from the existing bridge to greater than 11 meters (36 feet) upstream from the bridge[59] (see **Figure 4.7-2**). Surface currents in the vicinity of the existing bridge, as recorded at the Albany Hydrological Station, reach between about 2 and 3 feet per second (fps). Water level elevation in this tidal portion of the upper Hudson River, as measured at the Hudson River Environmental Conditions Observing System (HRECOS) Albany Hydrological Station, fluctuates by approximately 5 to 7 feet.

Immediately north of the existing Livingston Avenue Bridge, as well as the western shoreline and the eastern shoreline starting about 750 feet to the north, are characterized as areas of sediment deposition. The eastern shoreline north and south of the existing bridge has non-depositional areas that are subject to erosion (see **Figure 4.7-3**). Most of the bottom sediments in the remaining study area are dynamic environments subject to erosional (i.e., dynamic scour) and depositional processes (i.e., dynamic drift-regions characterized by deposition in lee of obstacles, such as the existing bridge piers, with scour sometimes present along the edges of obstacles).[60]

Sediments in the Hudson River have a long history of contamination due to discharge of PCBs into the river to the north of the Troy Dam. From approximately 1947 to 1977, the General Electric Company (GE) discharged as many as 1.3 million pounds of PCBs from its capacitor manufacturing plants at the Hudson Falls and Fort Edward facilities into the Hudson River. PCBs are classified by the U.S. Environmental Protection Agency (USEPA) as a potential carcinogen, and most uses of PCBs were banned in 1979. PCBs have a very low solubility in water, and therefore, adhere to sediments and suspended organic matter, and bioaccumulate in fatty tissues of most organisms. In 1984, the 200 miles of the river between Hudson Falls and the Battery in New York City was placed on USEPA's National Priorities List of the country's most contaminated hazardous waste sites. Sediment PCB levels in the Hudson River generally decrease from north to south. Elevated levels of PCBs are present in Hudson River sediment upstream of the Troy Dam near Albany, approximately 7.5 miles from the Livingston Avenue Bridge.

The primary health risk associated with PCBs is their potential for accumulation in the human body through eating contaminated fish. Since 1976, high levels of PCBs in fish have led New York State to close various recreational and commercial fisheries and to issue advisories restricting the consumption of fish caught in the Hudson River. USEPA's February 2002 Record of Decision (ROD) for the Hudson River PCBs Superfund Site addresses the risks to people and ecological receptors associated with PCBs in the sediments of the Upper Hudson River. It called for the targeted, environmental dredging of approximately 2.75 million cubic yards of PCB-contaminated sediment from a 40-mile segment of the Upper Hudson River. Phase 1 dredging occurred between May and November of 2009, removing PCB-contaminated sediment from a 6-mile segment of the Hudson River near Fort Edward, NY. Phase 2 dredging occurred between June 2011 and fall 2015, removing PCB contaminated sediment within the remaining portion of the Upper Hudson River designated for cleanup.

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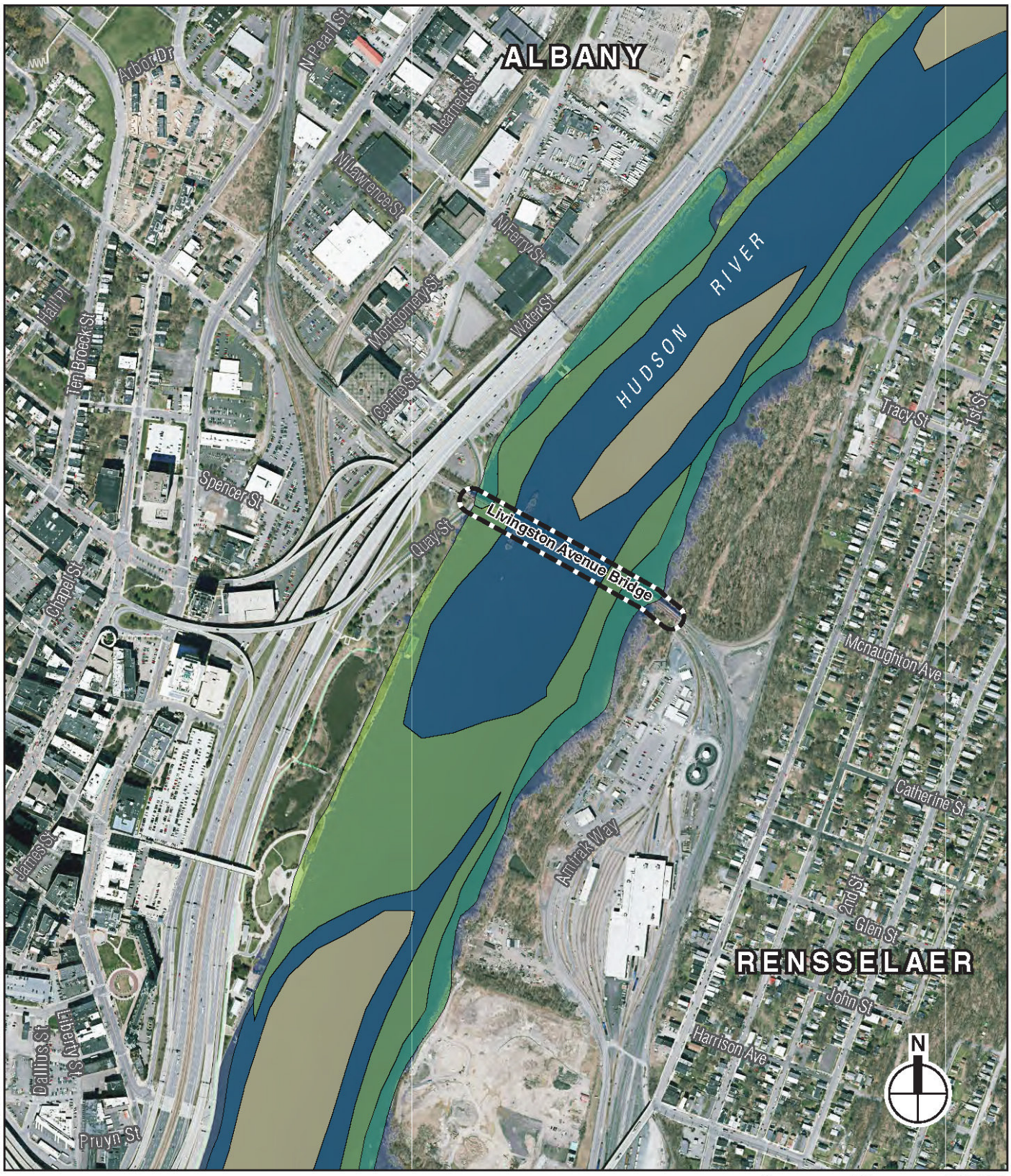
[58] Ibid.

[59] NYSDEC 2008 Hudson River Estuary Bathymetry 30m-grid - New York State. Metadata available from: http://gis.ny.gov/gisdata/metadata/nysdec.hre_30m_grid.xml.

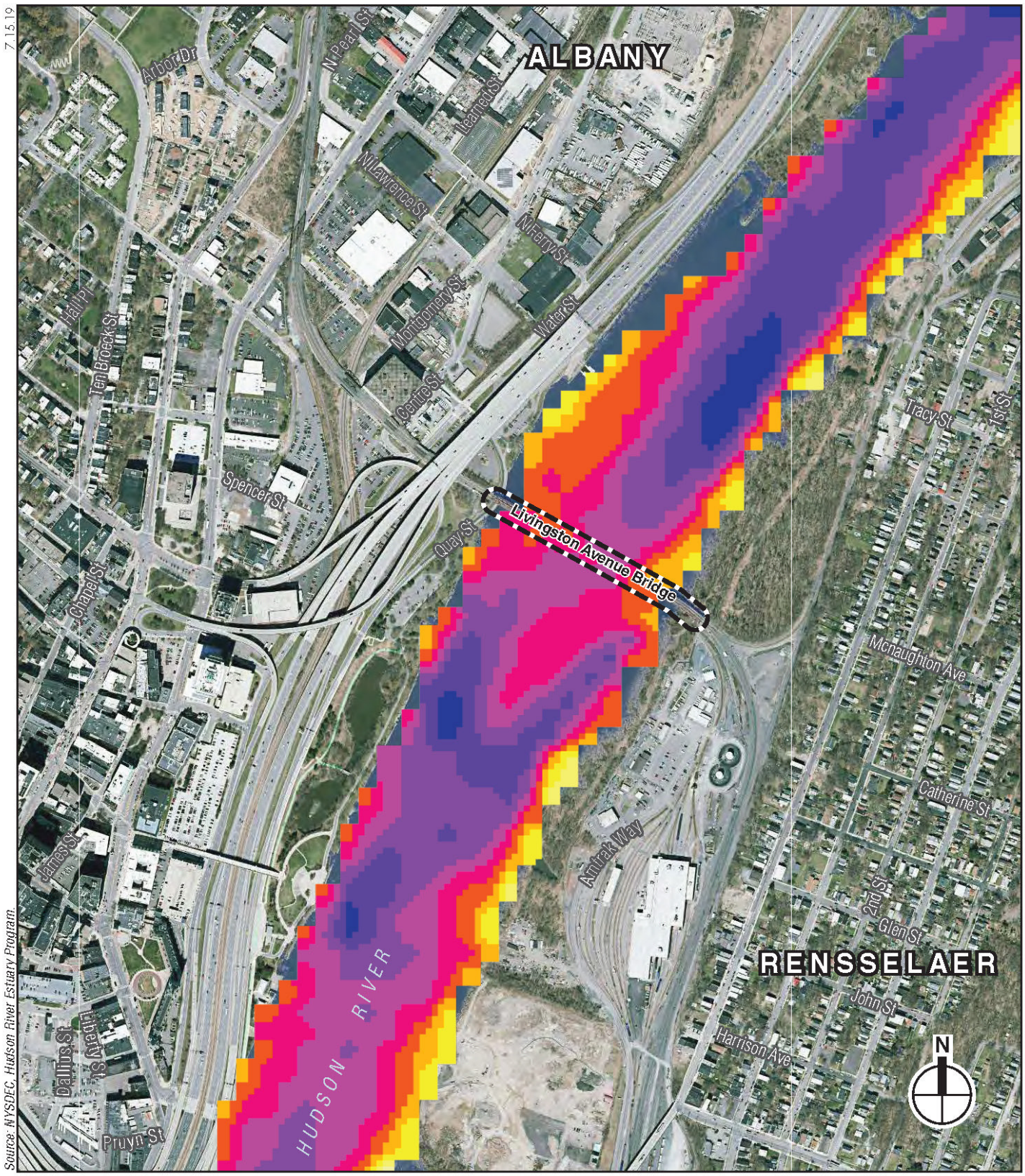
[60] NYSDEC 2006b Hudson River Estuary Sediment Environment Map. Metadata available from: http://gis.ny.gov/gisdata/metadata/nysdec.hudson.sed.environ.html.



NYSDOT LIVINGSTON AVENUE BRIDGE

Sediment Type

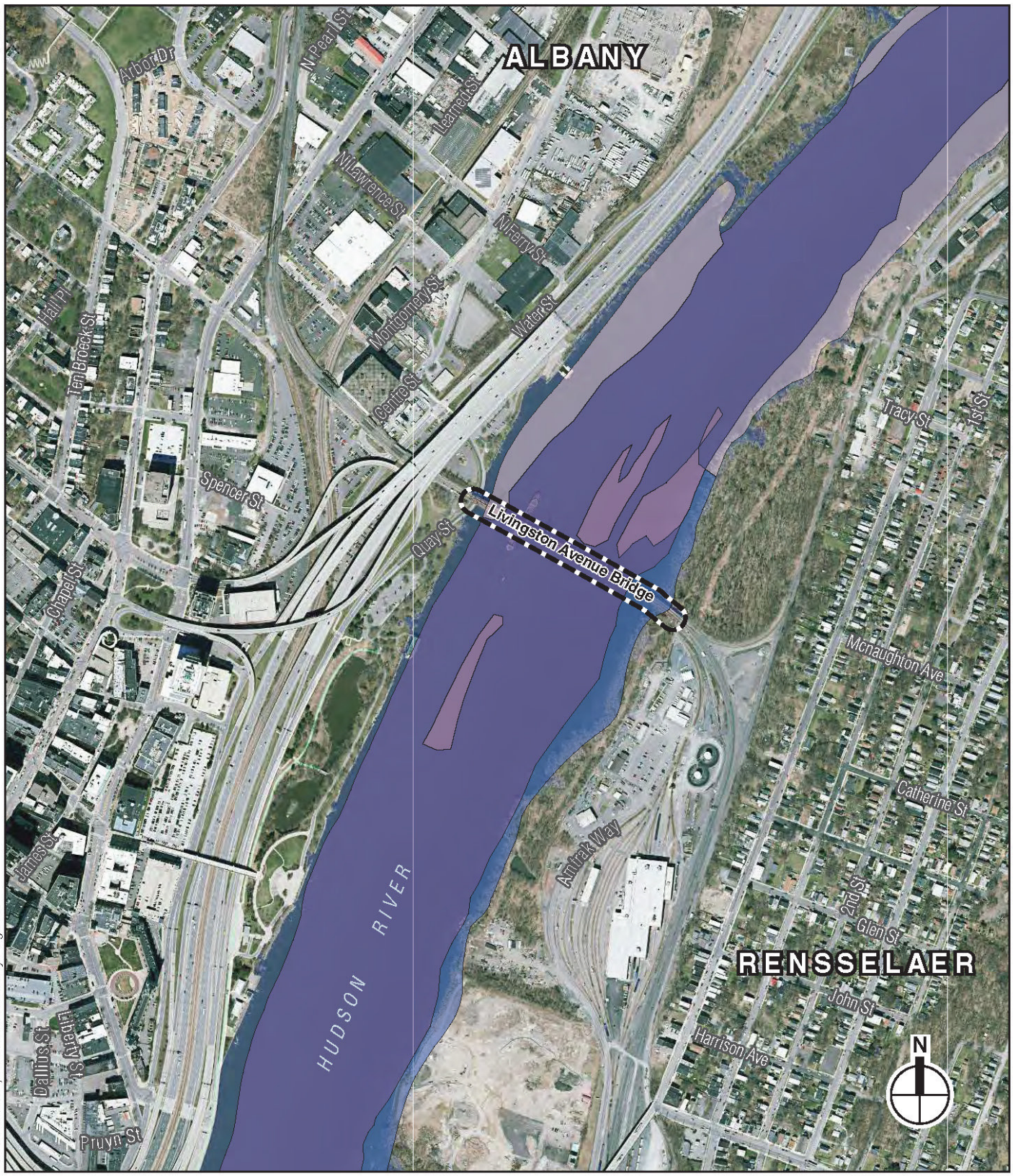
Figure 4.7-1



Water Depth

Figure 4.7-2

7.15.19



Source: NYSDEC, Hudson River Estuary Program.

- Existing Livingston Avenue Bridge
- Deposition - uresolved thickness
- Dynamic - drift
- Dynamic - scour
- Erosion - non-depositon

NYSDOT LIVINGSTON AVENUE BRIDGE

Sediment Environment

Figure 4.7-3

4.7.3.3 Wetlands

Executive Order 11990, "Protection of Wetlands," and USDOT Order 5660.1a, "Preservation of the Nation's Wetlands," require Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practical alternative to such construction and the proposed action includes all practicable measures to minimize harm to the wetland. New York State regulates freshwater wetlands under Article 24 of the ECL (6 NYCRR Parts 663, 664, and 665). Wetlands in the study area are described below (see also the **Wetland Delineation Report** in **Appendix B-2, "Water Resources and Ecology"**).

4.7.3.3.1 Federal Wetlands

The USFWS National Wetland Inventory (NWI) maps two wetlands in the study area: the Hudson River, a riverine tidal wetland with unconsolidated bottom that is permanently flooded (NWI category R1UBV); and in the western portion of the study area, a riverine unknown perennial wetland with unconsolidated bottom that is permanently flooded (NWI category R5UBH) that discharges to the west bank of the Hudson River just north of the rail bridge (see **Figure 4.7-4**).

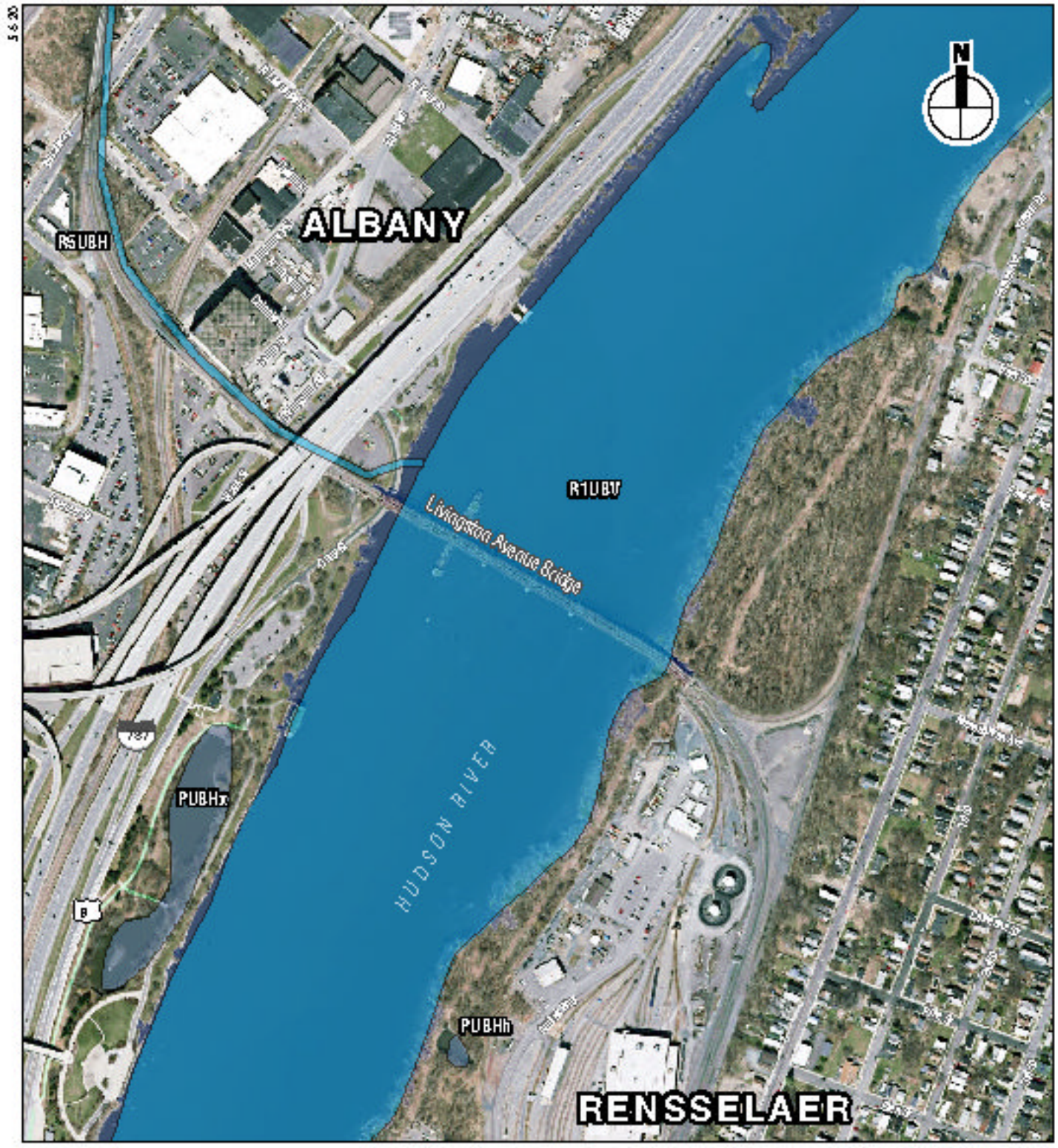
FRA and NYSDOT evaluated the study area for the presence of unmapped wetlands in accordance with the criteria defined in the 1987 USACE Wetland Delineation Manual and the 2012 USACE Northcentral and Northeast Regional Supplement in September 2020. One wetland was delineated within the study area. "Wetland B" is along an unpaved path on the east side of the Hudson River (Rensselaer) approximately 450 feet north of the existing rail tracks and about 300 feet from the river shoreline (see **Figure 4.7-5**). As detailed in **Appendix B-2**, Wetland B is an approximately 3,050-square-foot (0.07-acre) non-adjacent wetland that occurs in a slight topographic depression. Hydrology indicators include surface water, soils saturated at the surface, a sparsely vegetated concave surface, a thin muck surface, and a shallow aquitard. The wetland is dominated by Japanese stiltgrass (*Microstegium vimineum*), with lesser duckweed (*Lemna minor*) covering the water surface. FRA and NYSDOT will consider Wetland B as a jurisdictional wetland for the evaluation of wetland impacts, pending a response from USACE regarding an Approved or Preliminary Jurisdictional Determination.

FRA and NYSDOT also identified a potential wetland along the Canadian Pacific Railway freight tracks that cross beneath the existing Empire Corridor tracks on the west side of the Hudson River (Albany), approximately 100 feet south of the Empire Corridor tracks (see **Figure 4.7-5**). It is an undelineated area dominated by common reed (*Phragmites australis*). The presence or absence of wetland hydrology and hydric soil indicators were not able to be confirmed during the September 2020 wetland delineation. FRA and NYSDOT did not delineate the small area of *Phragmites* because it occurs along a railroad track siding owned by others.

An ephemeral stream, "Ephemeral Stream A," is also present in the study area on the east side of the Hudson River (Rensselaer). This stream is a small, sparsely vegetated scour channel that appears to flow only during and shortly after precipitation events. The stream originates upland and drains into the Hudson River at the bridge pier. Hydric soils are not present, the hydrology source is ephemeral, and the stream channel is sparsely vegetated. Therefore, this drainage feature was not delineated as a wetland. FRA and NYSDOT will consider Ephemeral Stream A as jurisdictional Waters of the United States for permitting purposes.

4.7.3.3.2 State Wetlands

The Hudson River in the vicinity of the Livingston Avenue Bridge is tidal but does not include any New York State-mapped tidal wetlands. The northern boundary of tidal wetlands in the Hudson River mapped by NYSDEC is about 123 river miles south of the Livingston Avenue Bridge, to the south of the Governor Mario M. Cuomo Bridge. In addition, a review of the NYSDEC Environmental Resource Mapper for Albany and Rensselaer (Troy South Quadrangle), accessed on May 4, 2020, indicates there are no NYSDEC-mapped freshwater wetlands or regulated

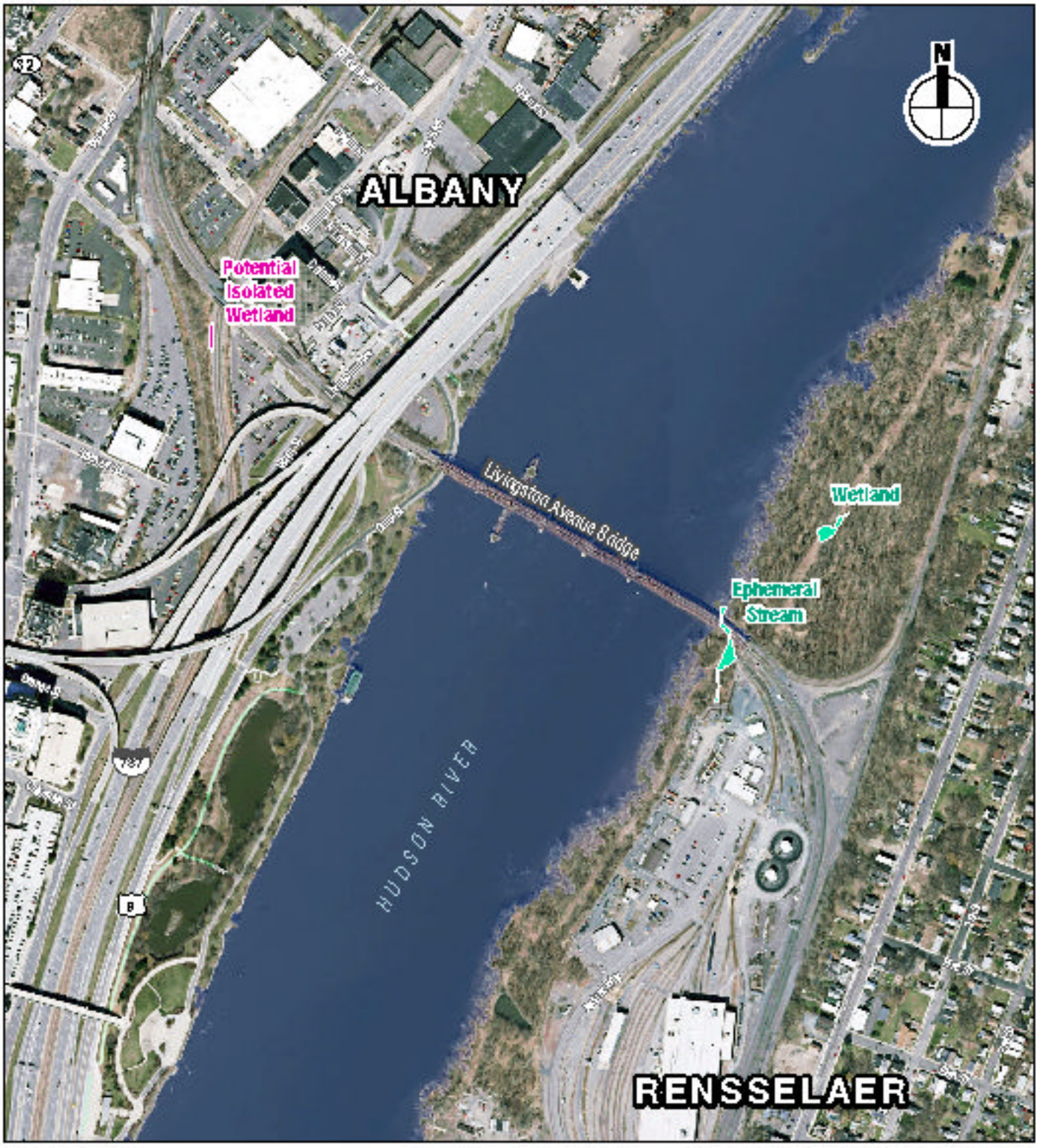


NWI Wetlands

- *Freshwater Pond (PUB, PAB)*
- *Riverine (R)*

NWI Wetlands

Figure 4.7-4



Field Observed Wetlands

adjacent areas in the study area. This was confirmed during the September 2020 wetland evaluation.

4.7.3.4 Floodplains

The Project site spans both Albany and Rensselaer Counties, which are mapped separately by FEMA. The most recent Flood Insurance Rate Map (FIRM) for Albany County on the west side of the river was released on March 16, 2015; the most recent FIRM for Rensselaer County on the east side of the river was released on March 18, 1980. Portions of the Project site within and on both sides of the river are within the 100-year floodplain (see **Figure 4.7-6)**.

According to the 2015 Preliminary FIRM for the Project site in Albany County, a portion of the Project site on the west side of the river is within the 100-year floodplain (1 percent annual-chance flood event) in Zone AE with a base flood elevation of +21 feet NAVD88.[61] According to the 1980 FIRM for the Project site in Rensselaer County (the effective FIRM for this side of the Hudson River), portions of the Project site on the east side of the river are within Zone B, which indicates areas that are either between the limits of the 100-year and 500-year floodplain boundaries, are subject to 100-year flooding with average depths of less than one foot, or where the contributing drainage area is less than one square mile, or are protected from the base flood by levees. The base flood elevation in this area is +21 feet NGVD29.[62] The elevation of the top of the rail of the existing bridge ranges from approximately +31 to +35 feet NAVD88, which is above the base flood elevations identified by both FIRMs.

Federal Executive Order 11988, "Floodplain Management," as amended, requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. USDOT Order 5650.2, "Floodplain Management and Protection," contains policies and procedures for implementing Executive Order 11988. For actions with a significant encroachment in the floodplain, the USDOT Order requires FRA to make a finding that the proposed action is the only practicable alternative and that an evaluation was conducted to identify whether other alternatives are available to avoid or reduce adverse impacts on the floodplain. New York State regulations, which seek to minimize flood hazards and losses, are found in 6 NYCRR 502 - Floodplain Management for State Projects.

4.7.3.5 Groundwater

Groundwater in the study area is classified by NYSDEC as Class GA waters, i.e., fresh groundwater with best usage as a source of potable water. NYSDEC GIS data files indicate that the study area is in a Principal Aquifer Area, which identifies "aquifers known to be highly productive or whose geology suggests abundant potential water supply, but which are not intensively used as sources of water supply by major municipal systems at the present time."[63] As such, Project activities would be subject to the applicable requirements found in 6 NYCRR Part 703 (Public Wells, Private Wells, and Reservoirs). No municipal drinking water wells, wellhead influence zone, or reservoirs are within the study area, according to the Departments of Health in Albany and Rensselaer Counties (see **Appendix B-1, "General Correspondence"**). There are no known supply or observation wells in or near the Project site. The two nearest USGS observation wells are USGS Well No.424115073495301, in the City of Albany approximately four miles northwest of the Project site, and Well No. 423534073423401, in the Town of East Greenbush approximately four miles southeast of the Project site in Rensselaer County.

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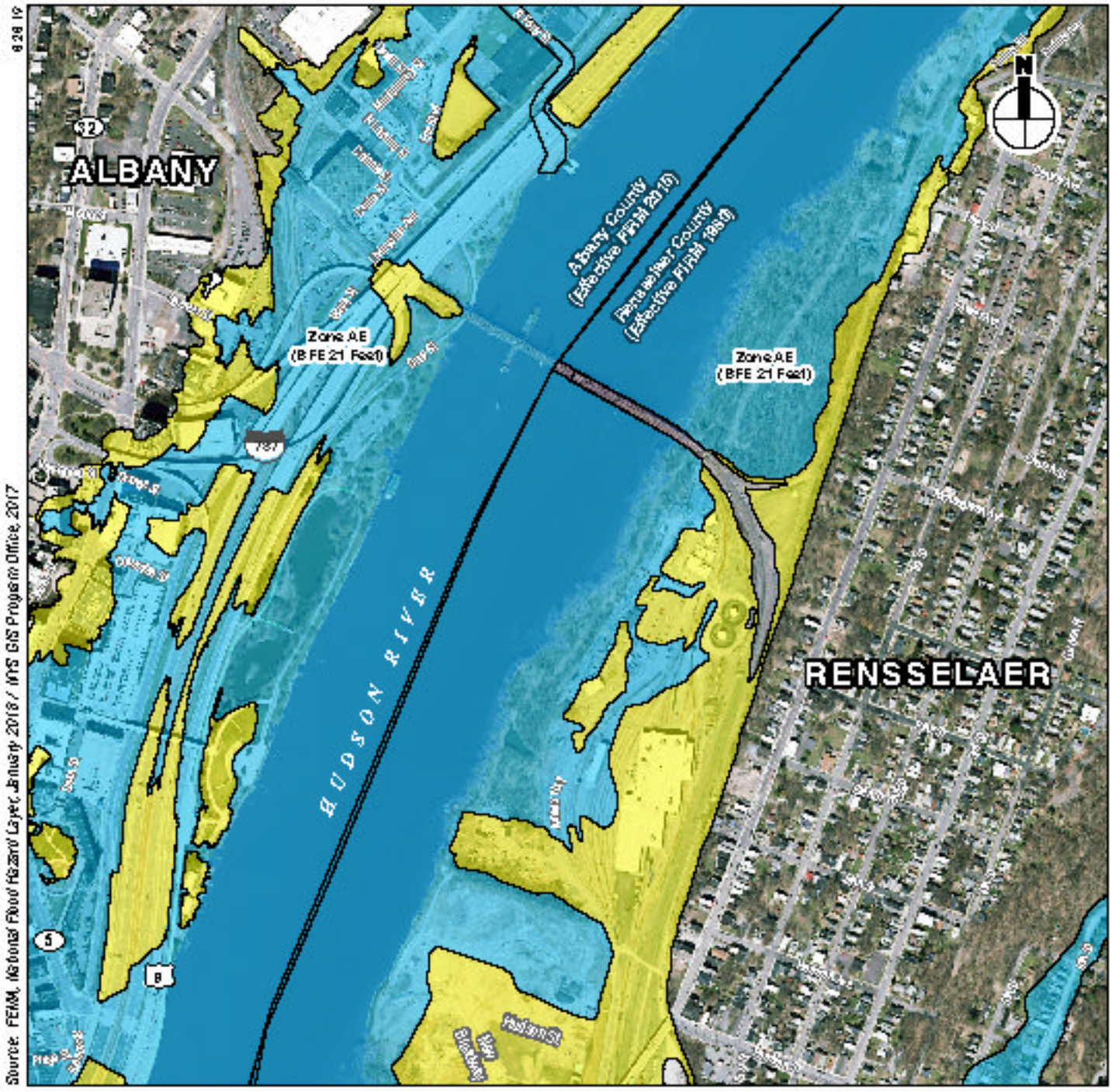
61 North American Vertical Datum of 1988.

62 National Geodetic Vertical Datum of 1929.

63 NYSDEC's Division of Water Technical & Operational Guidance Series (TOGS) 2.1.3, Primary and Principal Aquifer Determinations, October 23, 1990.



NOTE: Base Flood Elevation (BFE) for Albany County references North American Vertical Datum of 1988 (NAVD 88). BFE for Rensselaer County references the National Geodetic Vertical Datum of 1929 (NGVD 29).

FEMA Floodplains

Figure 4.7-6

USEPA defines a sole or principal source aquifer as an aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. All designated sole or principal source aquifers are referred to as sole source aquifers (SSAs). Based on a review of the USEPA-designated SSA Areas (using Federal Register Notices, Maps, and Fact Sheets), the Project site is not within an SSA Area. Additionally, the Project site is not within the New York City watershed; thus, coordination with the New York City Department of Environmental Protection is not required.

Based on topographic features, groundwater in the study area flows toward the Hudson River basin. Precipitation recharges groundwater in the study area through the pervious surfaces that dominate the area.

4.7.3.6 Stormwater Management

The existing stormwater controls and drainage within the study area consist of earthen drainage swales along the top of the railroad embankment slope. The stone ballast in the rail bed is permeable and does not collect stormwater or runoff. The bridge itself is an open truss deck, so all rain, snow, and other stormwater discharges directly into the Hudson River.

The study area is within the urbanized area of the Cities of Albany and Rensselaer. Both of these municipalities are designated by NYSDEC as regulated MS4s (operators of Municipal Separate Stormwater Sewer Systems). This designation requires the municipalities to develop a stormwater management program in accordance with NYSDEC guidelines. This stormwater management program requires that private developers submit Stormwater Pollution Prevention Plans (SWPPPs) for proposed projects for review by the municipality. NYSDOT is designated by NYSDEC as a non-traditional MS4, requiring it to develop its own stormwater management program; project SWPPPs prepared by non-traditional MS4s do not require review and approval from local MS4s.

NYSDEC regulations and stormwater management requirements classify rivers and streams according to size, or "stream order." As described in the *New York State Stormwater Management Design Manual*, "A network of streams drain each watershed. Streams can be classified according to their order in that network. A stream that has no tributaries or branches is defined as a first-order stream. When two first-order streams combine, a second-order stream is created, and so on."[64] Different stormwater design criteria apply to different order (size) streams; according to NYSDEC regulations, the Hudson River is a "seventh order" stream and therefore stormwater management practices at the Project site are not required to meet the NYSDEC stream channel protection volume requirements.[65] The channel protection volume stormwater quantity requirements are intended to protect stream channels from erosion, which is of lower concern for large channels (like seventh order streams) due to the size of the channel and the watershed relative to the discharge.

NYSDEC requires stormwater controls for new development and redevelopment on existing impervious surfaces. For new development, stormwater management practices treat the water quality volume, the volume of runoff generated from the 90th percentile rain event, intended to improve water quality by capturing and treating runoff from small, frequent storm events that tend to contain higher pollutant levels.[66] For redevelopment, stormwater management involves a combination of reducing any increases in stormwater and treating increased volumes on-site, to the extent feasible given site constraints.

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[64] NYSDEC. New York State Stormwater Management Design Manual, January 2015, p. 4-16.

[65] Stormwater quantity controls are not required when the site discharges directly to tidal waters or fifth order or larger streams: NYSDEC. New York State Stormwater Management Design Manual, January 2015, p. 4-8.

[66] NYSDEC. New York State Stormwater Management Design Manual, January 2015, p. 4-2.

Under Section 402 of the Clean Water Act, stormwater discharges to waters of the United States require authorization via a National Pollutant Discharge Elimination System (NPDES) permit or an authorized state permit program. New York State has established the State Pollutant Discharge Elimination System (SPDES) program, under the jurisdiction of NYSDEC, for regulating wastewater and stormwater discharges to groundwaters and surface waters. Because the SPDES program has been determined to be at least as protective of New York State's waters as prescribed by the Clean Water Act, USEPA has approved New York State's SPDES program for the control of wastewater and stormwater discharges. Activities requiring a SPDES permit include point source discharges of wastewater into surface or ground waters of New York State, including the intake and discharge of water for cooling purposes, constructing or operating a disposal system, discharge of stormwater, and construction activities that disturb one acre or more.

As described in **Section 4.7.3.1**, Section 303(d) of the Clean Water Act requires states to identify Impaired Waters, where specific designated uses are not fully supported because of water quality, and the portion of the Hudson River at the Livingston Avenue Bridge is listed on the Final New York State 2016 Section 303(d) List of Impaired/TMDL Waters for PCBs within the river's sediment. However, the Project site is not in an area that directly discharges to a watercourse on the list of Section 303(d) segments impaired by pollutants related to construction activity (e.g., silt, sediment, or nutrients).

4.7.3.7 Coastal Zone

The study area is within the regulated Coastal Zone in New York State. The Coastal Zone Management Act of 1972 requires that Federal activities within a state's coastal zone be consistent with that state's Federally approved coastal zone management plan. New York State has a Federally approved coastal zone management program; the enforceable coastal policies are those in the New York State Coastal Management Program (CMP) together with policies of any approved Local Waterfront Revitalization Program.[67] The City of Rensselaer adopted an LWRP in 1987, and the City of Albany adopted an LWRP in 1991; both cities are currently in the process of revising their LWRP documents.[68,69] While the 44 specific policies of these two LWRPs closely mirror those of the New York State CMP, several policies have additional provisions specific to the City of Rensselaer waterfront and to the City of Albany waterfront or its Waterfront Revitalization Area subareas. The state and local policies are presented in the Coastal Zone Consistency Analysis in **Appendix B-2, "Water Resources and Ecology."**

4.7.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The No Action Alternative would not have adverse impacts on water resources in the study area. The No Action Alternative would not require new construction and no change to the navigable waterway would occur. Maintenance of the existing bridge would continue to be needed and would intensify. The bridge would continue to malfunction frequently, resulting in delays to boat traffic.

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[67] Local governments may participate in a state's Coastal Management Program by preparing and adopting a LWRP, which provides more detailed implementation of the Coastal Management Program. In New York State, state agency actions must be consistent with LWRPs that are approved by the New York State Secretary of State to the maximum extent practicable, and when the Federal government has concurred with the incorporation of an LWRP into the state program, Federal agency actions must be consistent with the approved LWRP.

[68] https://docs.dos.ny.gov/opd-lwrp/LWRP/Rensselaer_C/Index.html.

[69] https://docs.dos.ny.gov/opd-lwrp/LWRP/Albany_C/Index.html.

4.7.5 Impacts of the Build Alternatives

4.7.5.1 Surface Waters

Operation of trains over the replacement bridge under both Build Alternatives would be similar to the operation over the existing bridge and would not result in adverse impacts to surface waters or water quality. While areas of scouring and sedimentation would initially shift due to the new location of piers for the replacement bridge, the spacing of the piers for the Build Alternatives would be similar to those of the existing bridge, resulting in magnitude of scouring and deposition similar to that of the existing condition.

4.7.5.2 Wetlands

Neither of the Build Alternatives would affect Wetland B or the undelineated wetland in Albany because these resources are not within the Project site and impacts are not anticipated due to the distance from the Project site. Construction activities would be designed to avoid impacts to Wetland B (see **Section 4.16.8** later in this document). Build Alternative 1 would not impact Ephemeral Stream A; however, one support pier for Build Alternative 2 (the Preferred Alternative) would be within a portion of Ephemeral Stream A. As discussed above, while the ephemeral stream was not delineated as a wetland, FRA and NYSDOT will consider Ephemeral Stream A as jurisdictional Waters of the United States for permitting purposes. **Section 4.16, "Construction Impacts,"** presents an evaluation of temporary impacts to wetlands and the regulatory permits required for Project construction activities.

4.7.5.3 Floodplains

The Build Alternatives would affect floodplains and flood hazards in the same manner. Both alternatives would place new bridge piers within the floodplain in a similar location to the existing bridge, but unlike the existing bridge, the new bridge would be designed to be resilient to severe storms. All bridge components, including the superstructure and mechanical and electrical equipment, would be resilient to storm surges and flooding.

The Build Alternatives would result in similar placement of material within the 100-year floodplain, resulting in localized changes in water circulation around the bridge piers that would not adversely impact flooding or floodplain storage. Given the minor modifications to the floodplain that would result from the Build Alternatives, adverse impacts to the floodplain or flooding of areas adjacent to the study area are not anticipated.

The Build Alternatives would not alter the stream cross-section within the 100-year floodplain of the Hudson River. The existing bridge superstructure is above the 100-year flood elevation and the proposed superstructure would also not encroach on the flood elevation. The Build Alternatives would not significantly encroach on the floodplain, interrupt any other transportation facility required for emergency vehicles, or impact natural beneficial floodplain values. The NYSDOT Regional Hydraulics Engineer will perform a floodplain hydraulic analysis during the advance detail plan phase for the Project.

In accordance with the provisions of 6 NYCRR 502 - Flood Plain Management for State Projects, NYSDOT has considered and evaluated the practicality of alternatives to any floodplain encroachments. The proposed action would not constitute a significant encroachment into the floodplain, as defined by USDOT Order 5650.2, "Floodplain Management and Protection," since it would not result in: a considerable probability of loss of human life; likely future damage that could be substantial in cost or extent, inducing interruption of service on or loss of a vital transportation facility; or a notable adverse impact on natural and beneficial floodplain values.

4.7.5.4 Groundwater

Operation of trains over a replacement bridge under either Build Alternative would be similar to the operation over the existing bridge and would not result in adverse impacts to groundwater resources.

4.7.5.5 Stormwater Management

Stormwater management under either Build Alternative would be the same. The drainage patterns under either Build Alternative would not be notably different than existing conditions. The bridge approaches would not have additional impervious area and the majority of the bridge would retain an open deck. Both Build Alternatives would replace a portion of the open bridge deck with ballasted reinforced concrete deck pans. If required, after analysis of the detailed design for the new bridge and shared use path, additional surface drainage facilities would be installed to protect the water quality of the Hudson River.

Preliminary assessment indicates that stormwater quantity controls are not required because the Project would outlet into a seventh order stream (the Hudson River). Therefore, no mitigation of peak stormwater discharges to pre-Project rates would be required. However, the Project may be required to provide treatment for stormwater quality. Green stormwater treatment practices would provide stormwater quality treatment and include measures for preservation of natural features and reduction of proposed impervious cover in the new development, which minimizes the volume of water quality treatment required. FRA and NYSDOT will assess the potential for this requirement during final design.

The Project site is not within a watershed requiring enhanced phosphorous removal described in SPDES General Permit for Stormwater Discharges from Construction Activity GP-0-20-001 Appendix C – Watersheds Requiring Enhanced Phosphorus Removal.

4.7.5.6 Coastal Zone

Portions of the study area are within the designated coastal zone. As a result, the Project must be reviewed by NYSDOS for consistency with applicable coastal policies. These policies include supporting, promoting, and encouraging well-suited development, including but not limited to residential and commercial uses, water-dependent or waterfront uses, and waterway uses; protecting ecological resources; protecting or improving water quality; minimizing flooding and erosion; and minimizing other environmental impacts to resources. FRA and NYSDOT evaluated the Build Alternatives for consistency with the policies in the New York CMP and the approved Rensselaer and Albany LWRPs and concluded that the replacement bridge under either Build Alternative would be consistent with all applicable coastal zone policies (see **Appendix B-2, "Water Resources and Ecology"**).

4.7.6 Avoidance, Minimization, and Mitigation

Implementation and construction of the Project would be subject to a number of Federal, New York, and local permits and approvals. The potential relevant permits are as follows:

- USCG Section 9 Permit
- USACE Section 404 Permit and Section 10 Permit
- NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001)
- NYSDEC Floodplain Variance
- NYSDEC Water Quality Certification (Section 401) of the Clean Water Act
- NYSDOS Coastal Zone Consistency Certification Statement and Local Waterfront Revitalization Certification

- NYSOGS Grants or License of Land Underwater (New York State Public Lands Law § 6-75.7b)

NYSDOT will seek a Section 10 permit under the Rivers and Harbors Act of 1899 from the USCG/USACE. During final design and permit review, additional information will be developed, including:

- For Build Alternative 2, FRA and NYSDOT will confirm the Federal jurisdiction of Ephemeral Stream A with USACE.
- The NYSDOT Regional Hydraulics Engineer will perform a floodplain hydraulic analysis during the advance detail plan phase for the Project.
- If required, after analysis of the detailed design for the new bridge and shared use path, additional surface drainage facilities would be installed to protect the water quality of the Hudson River.
- FRA and NYSDOT will assess the need for stormwater treatment during final design.

The Build Alternatives would not result in adverse impacts to wetlands, floodplains, or groundwater since NYSDOT will adhere to all permit conditions. Therefore, no measures to mitigate impacts to these resources beyond the permit stipulations would be required.

4.8 General Ecology and Wildlife Resources

4.8.1 Introduction

This section assesses the potential operational impacts of the No Action and Build Alternatives on general ecology and wildlife resources. It describes the existing terrestrial and aquatic natural resources (i.e., plants, mammals, birds, fish, aquatic macroinvertebrates, and threatened, endangered, and special concern species) in the study area and considers the potential for the Project to impact these resources. **Section 4.16.9** in **Section 4.16, "Construction Impacts,"** evaluates potential for construction of the Project to result in temporary impacts on general ecology and wildlife resources.

4.8.2 Methodology and Study Area

This evaluation of operational effects of the Project Alternatives on general ecology and wildlife resources complies with the requirements of Federal and state regulations and incorporates the current status of the study area with respect to ecological and wildlife resource protection programs. For terrestrial resources, the study area for the assessment of ecological and wildlife resources extends about 400 feet from the Project site, but for threatened and endangered species, it extends ½ mile from the Project site so as to encompass potential nesting, roosting, or other sensitive habitats that could be nearby. For aquatic resources, the study area is the Upper Hudson River Estuary. FRA and NYSDOT characterized the affected environment using a range of data sources, including the following:

- USGS topographic maps;
- USFWS Information, Planning, and Consultation (IPaC) database results (reviewed on October 26, 2018, and November 3, 2021) on Federally listed terrestrial species within a half-mile radius from the Project site;
- NMFS maps and information regarding Federally listed aquatic species in the study area;
- USFWS NWI maps;
- New York State National Heritage Program database;
- Results of field reconnaissance conducted by NYSDOT contractors in November 2010 and September 2020.

The assessment of potential impacts on ecological resources considers whether there would be any loss or fragmentation of habitat within the study area, potential impacts on wildlife species, and whether threatened or endangered species would be affected as a result of Project operation.

4.8.3 Affected Environment

4.8.3.1 Aquatic Resources

4.8.3.1.1 Significant Habitat

The study area is in the Upper Hudson River Estuary, which includes the tidal freshwater sections of the Hudson River from Poughkeepsie to the Troy Dam. The Upper Hudson River Estuary is considered a Significant Habitat Complex by the USFWS. It is recognized for its regionally significant habitat for anadromous[70] fish and globally rare tidal freshwater wetland communities and plants. The complex also supports significant concentrations of other fish and wildlife.[71]

4.8.3.1.2 Essential Fish Habitat

The Magnuson-Stevens Act requires Federal agencies to consult with NMFS on Federal actions that may adversely affect areas designated as Essential Fish Habitat (EFH). The law defines EFH as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. NMFS has established EFH for nearly 1,000 species of fish. Adverse impacts to EFH, as defined in 50 CFR 600.910(A), include any impact that reduces the quality and/or quantity of EFH. Adverse impacts may include:

- Direct impacts such as physical disruption or the release of contaminants;
- Indirect impacts such as the loss of prey or reduction in the fecundity (number of offspring produced) of a managed species; and
- Site-specific or habitat-wide impacts that may include individual, cumulative, or synergetic consequences of a Federal action.

NMFS has designated the overall tidal Hudson River Estuary as EFH for a number of federally managed fish species under its jurisdiction, as shown in **Exhibit 4.8-1**. All of these species have at least one or more life history stages for which NMFS has designated some portion of the Hudson River Estuary as EFH. However, these species prefer salinities of at least 15 parts per thousand (ppt), which is much higher than the salinities found in the freshwater tidal region of the river near Albany. None of the species for which EFH has been designated in the Hudson River are known to migrate into the Hudson River beyond the upper limit of the salt front more than 60 miles south of the Livingston Avenue Bridge. While these species would not occur within the study area, prey for these species (e.g., herring, benthic invertebrates) could occur in the study area and are considered as contributing to foraging requirements for EFH designated species. **Appendix B-2-1** provides the consultation with NMFS with respect to EFH in the vicinity of the Project site.

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[70] Anadromous fish are fish born in freshwater that spend most of their lives in saltwater and return to freshwater to spawn.

[71] USFWS Significant habitat complexes of the New York Bight watershed, Upper Hudson River Estuary, Complex 33, 1997. https://nctc.fws.gov/pubs5/web_link/text/upp_hud.htm.

Exhibit 4.8-1
Species with Essential Fish Habitat in the Hudson River Estuary: Life Stages Present

Species	Eggs	Larvae	Juveniles	Adults
Summer flounder (*Paralicthys dentatus*)		X	X	X
Winter flounder (*Pleuronectes americanus*)	X	X		X
Windowpane flounder (*Scopthalmus aquosus*)	X	X	X	X
Atlantic herring (*Clupea harengus*)		X	X	X
Red hake (*Urophycis chuss*)	X	X	X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Atlantic butterfish (*Peprilus triacanthus*)		X		
Longfin inshore squid (*Doryteuthis pealeii*)	X			
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata*)			X	X
Clearnose skate (*Raja eglanteria*)			X	X

Source: NMFS Essential Fish Habitat Mapper (https://www.habitat.noaa.gov/application/efhmapper/index.html)

4.8.3.1.3 Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV), or underwater plants that grow in shallow water, is a valuable habitat type that may be present in aquatic environments. These areas are important nurseries for juvenile fish and provide refuge for smaller species of fish and invertebrates from predators. The plants improve water quality by providing oxygen and stabilizing the bottom. SAV can also protect shoreline habitat from erosion. The NYSDEC Hudson River Estuary Program, in collaboration with numerous partners, has supported the mapping of SAV within the Hudson River Estuary via aerial imagery in 1997, 2002, 2007, 2014, and 2016, and 2018. In the past, dense bands of water celery (*Vallisneria americana*) have been present along both shorelines within the Upper Hudson Estuary in the vicinity of the Project site. The most recent data suggests that no submerged aquatic vegetation is found within the river in the vicinity of the Project site, but it has the potential to occur on the basis of the results of past submerged aquatic vegetation mapping (see **Figure 4.8-1**). The closest, most recently documented patch of submerged aquatic vegetation is within an embayment of Corning Riverfront Park approximately ¼ mile downstream of the Livingston Avenue Bridge. Water celery is the predominant native aquatic plant in the tidal Hudson River and is an important contributor to primary production, nutrient transport, and sediment dynamics.[72] Water celery can improve water quality and increase clarity by increasing dissolved oxygen concentrations through photosynthesis and by trapping suspended sediment through increased friction, respectively. Water celery beds support substantial aquatic macroinvertebrate communities which provide forage for many species of fish and birds.[73] As such, water celery beds enhance the overall biodiversity of the Hudson River ecosystem.[74] Other submerged aquatic vegetation that may associate with water celery beds include Eurasian watermilfoil (*Myriophyllum spicatum*), hornwort (*Ceratophyllum dermersum*), western waterweed (*Elodea muttallii*), water-nymphs (*Najas* sp.), and claspingleaf pondweed (*Potamogeton perfoliatus*).

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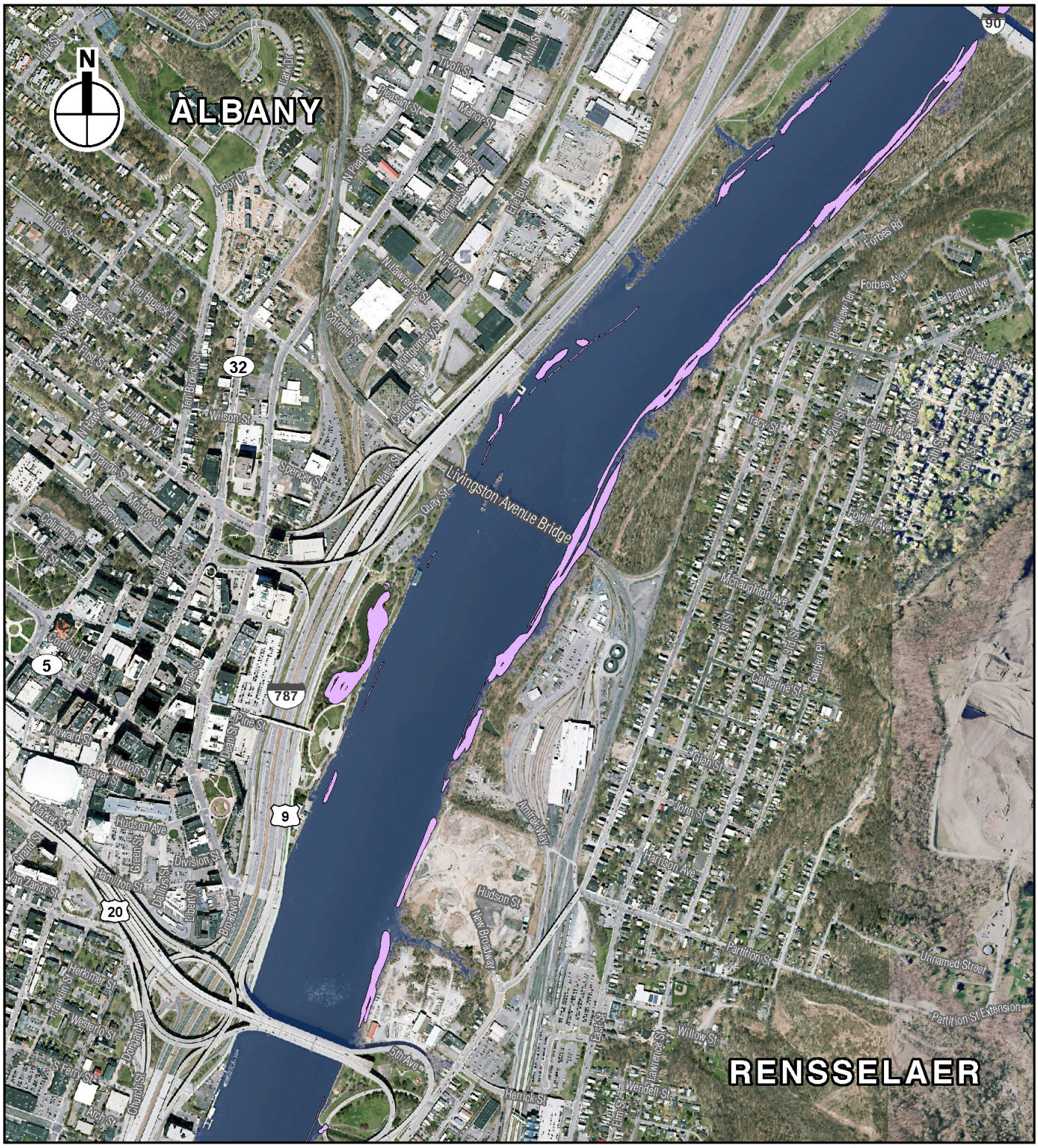
[72] Ecology of Hudson River Submerged Aquatic Vegetation, Final Report to the NYSDEC, by S. Findlay, D. Strayer, M. Bain, and W.C. Neider, 2006.

[73] Freshwater Biology Volume 48, Issue 11, Strayer et al, November 2003.

[74] NYSDEC. Ecology and distribution of Hudson River SAV. Hudson River Submerged Aquatic Vegetation Project compact disk. Hudson River National Estuarine Research Reserve. Released March 2007.



NOTE: Data are a combination of layers from the 1997, 2002, 2007, 2014, 2016, and 2018 SAV data sets, representing a culmination of all areas where SAV habitat has been documented

Submerged Aquatic Vegetation

Figure 4.8-1

4.8.3.1.4 Aquatic Biota

Freshwater species commonly associated with the type of sandy substrates found in the study area make up the benthic macroinvertebrate community in the study area. Oligochaetes and crustaceans (mostly amphipods and isopods) are the most dominant benthic taxa in the freshwater tidal regions of the Hudson River near Albany[75] and are most likely common in the study area. Zebra mussels (*Dreissena polymorpha*), a non-native invasive species found in tidal freshwater areas of the Hudson River with sandy substrates, are also likely to be present in the study area.

A diverse community of fish is present in the study area, with over 80 resident and migratory fish species documented in the tidal freshwater portion of the river.[76] Species of recreational, commercial, ecological, and/or conservation importance include: Atlantic sturgeon, shortnose sturgeon (*Acipenser brevirostrum*), American eel (*Anguilla rostrata*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), striped bass (*Morone saxatilis*), white perch (*Morone americana*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), and yellow perch (*Perca flavescens*). The anadromous alewife and blueback herring (collectively referred to as "river herring") are important forage species for predators such as striped bass (migrant) and largemouth bass (resident) and are integral to the process of trophic transfer between marine and fresh waters.

American shad, river herring, and striped bass are anadromous species that are seasonally abundant in the study area. Shad and herring migrate from the open ocean during spring to spawn in various tidal and non-tidal reaches of the Hudson (and various unblocked tributaries). Striped bass also enter the lower tidal river from coastal waters to spawn each spring. These species may be present in the study area from spring through fall, after which most species will have undertaken migration to coastal waters. In contrast, catadromous American eels can remain in the tidal freshwater river as adults, only later returning to the waters of the central North Atlantic to spawn. Young eels (elvers) subsequently return to freshwater areas such as the upper Hudson River as they mature. Resident species such as largemouth bass, smallmouth bass, white perch, and yellow perch may exhibit seasonal variations in abundance based on their movements within the river, but could be near the study area throughout the year simply because of the persistent freshwater conditions.

Federally endangered Atlantic and shortnose sturgeon migrate, spawn, and forage within the Hudson River system and may be present in the study area during portions of their life history. The NMFS has designated critical habitat for Atlantic sturgeon along the length of the tidal Hudson River (see **Section 4.8.3.3, "Endangered, Threatened, and Special Concern Species,"** for more information).

4.8.3.2 Terrestrial Resources

The terrestrial study area consists primarily of developed areas with non-native invasive plant species, manicured lawn, and successional woods. The Project site is a rail corridor, along which herbicides are used on track ballast and embankment side slopes.

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[75] Hudson River Estuary Biocriteria Final Report, submitted to NYSDEC by Versar, Inc. and Tetra Tech, Inc., May 2003.

[76] American Fisheries Society Symposium 45: "Changes in Fish Assemblages in the Tidal Hudson River, R. Daniels et al. 2005, pages 471-503.

4.8.3.2.1 Habitats

The majority of the upland study area is highly developed with a mix of residential, transportation infrastructure, industrial, and commercial uses, and are best categorized as Terrestrial Cultural[77] communities. The Terrestrial Cultural communities in the study area include paved road/path[78], railroad[79], urban structure exterior[80], and mowed lawn[81] ecological communities. Of these Terrestrial Cultural communities, only the mowed lawn ecological community has more than sparse vegetation, and is dominated by crabgrass (*Digitaria sanguinalis*), Kentucky bluegrass (*Poa pratensis*), and common plantain (*Plantago major*). The paved road/path, railroad, and urban structure exterior ecological communities occur both west and east of the river. The mowed lawn ecological community primarily occurs on the western shoreline, in Corning Riverfront Park. In the park, a concrete wall associated with an access road is at the western bridge abutment and the western riverbank is armored with boulder riprap north and south of the wall. In addition, portions of the study area are undeveloped and categorized as a Forested Uplands[82] community, specifically the successional southern hardwoods[83] ecological community. The successional southern hardwoods ecological community north of the existing bridge on the eastern bank of the river (within a 7-acre woodlot) is dominated by box elder (*Acer negundo*), eastern cottonwood (*Populus deltoides*), black locust (*Robinia pseudoacacia*), Asiatic bittersweet (*Ampelopsis brevipedunculata*), European buckthorn (*Rhamnus cathartica*), and garlic mustard (*Alliaria petiolata*). A small (0.07-acre) freshwater wetland (see the description of Wetland B in **Section 4.7.3.3.1**) is also in this portion of the study area. The successional southern hardwoods community east of the existing railyard is dominated by Norway maple (*Acer platanoides*), tree of heaven (*Ailanthus altissima*), Japanese knotweed (*Reynoutria japonica*), box elder, white snakeroot (*Ageratina altissima*), and silver maple (*Acer saccharinum*). These species are common to the region, and many are considered invasive/non-native species (e.g., Asiatic bittersweet,

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77 Edinger et al. 2014 defines the Terrestrial Cultural subsystem as "communities that are either created and maintained by human activities, or are modified by human influence to such a degree that the physical conformation of the substrate, or the biological composition of the resident community as it existed prior to human influence."

78 Edinger et al. 2014 defines the paved road/path ecological community as "a road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface."

79 Edinger et al. 2014 defines the railroad ecological community as "a permanent road having a line of steel rails fixed to wood ties and laid on a gravel roadbed that provides a track for cars or equipment drawn by locomotives or propelled by self-contained motors. There may be sparse vegetation rooted in the gravel substrate along regularly maintained railroads. The railroad right of way may be maintained by mowing or herbicide spraying."

80 Edinger et al. 2014 defines the urban structure exterior ecological community as "the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials (glass, plastics, etc.) in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; occasionally vascular plants may grow in cracks. Nooks and crannies may provide nesting habitat for birds and insects, and roosting sites for bats."

81 Edinger et al. 2014 defines the mowed lawn ecological community as "residential, recreational, or commercial land, or unpaved airport runways in which the groundcover is dominated by clipped grasses and there is less than 30 percent cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50 percent cover. The groundcover is maintained by mowing and broadleaf herbicide application."

82 Edinger et al. 2014 defines the Forested Uplands subsystem as "upland communities with more than 60 percent canopy cover of trees (greater than 5 meters tall); these communities occur on substrates with less than 50 percent rock outcrop or shallow soil over bedrock.

83 Edinger et al. 2014 defines the successional southern hardwoods ecological community as "a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed."

European buckthorn, garlic mustard, Norway maple, tree of heaven, Japanese knotweed, and black locust). The two successional southern hardwoods ecological communities represent the most sizable natural habitat within the study area, but are of marginal quality due to their small total size, high amount of edge relative to total area, and isolation within heavily developed surroundings.

4.8.3.2.2 Wildlife

The terrestrial habitats in the study area support mostly disturbance-tolerant, generalist species of wildlife. Mammals that are known or expected to occur in these habitats include common urban-adapted species such as white-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), eastern coyote (*Canis latrans*), white-footed mouse (*Peromyscus leucopus*), Norway rat (*Rattus norvegicus*), raccoon (*Procyon lotor*), muskrat (*Ondatra zibethicus*), big brown bat (*Eptesicus fuscus*), and Virginia opossum (*Didelphis virginiana*). Examples of reptiles and amphibians that may occur in the study area include northern water snake (*Nerodia s. sipedon*), garter snake (*Thamnophis sirtalis*), painted turtle (*Chrysemys picta*), snapping turtle (*Chelydra s. serpentina*), green frog (*Rana clamitans*), spring peeper (*Pseudacris crucifer*), and northern red-backed salamander (*Plethodon c. cinereus*).

The 2000–2005 New York State Breeding Bird Atlas documented 59 species as either confirmed, probably, or possibly nesting in the survey block that includes the Project site (Block 5972D) (see **Appendix B-2, "Water Resources and Ecology"**). The majority of these species have the potential to nest in the study area on the basis of their habitat associations, and include mostly disturbance-tolerant songbirds such as American robin, gray catbird, downy woodpecker, European starling, house sparrow, rock pigeon, mourning dove, black-capped chickadee, and red-winged blackbird. The state-endangered peregrine falcon (*Falco peregrinus*) nests on the Dunn Memorial Bridge, approximately 0.75 mile south of the existing bridge, and the home range of the individuals associated with this nest may extend into the study area (see **Section 4.8.3.3, "Endangered, Threatened, and Special Concern Species"**). Many of the species of birds breed in the study area are year-round residents and would therefore also be present during winter. Bald eagles (*Haliaeetus leucocephalus*) frequently occur along the Hudson River during winter and have the potential to occur in the study area. Waterfowl that are likely to occur on the river during winter include mute swan (*Cygnus olar*), Canada goose (*Branta canadensis*), ring-necked duck (*Aythya collaris*), common goldeneye (*Bucephala clangula*), hooded merganser (*Lophodytes cucullatus*), and common merganser (*Mergus merganser*), among others. Wading birds, such as snowy egret (*Egretta thula*), great egret (*Ardea alba*), and great blue heron (*Ardea herodias*) may occasionally occur along the river's shallow edges in search of fish at any time of year.

Birds observed in the study area during the September 8, 2020 wildlife survey include American crow, fish crow, blue jay, Carolina wren, European starling, downy woodpecker, Canada goose, common yellowthroat, black-capped chickadee, northern cardinal, least flycatcher, white-breasted nuthatch, gray catbird, northern flicker, red-eyed vireo, and house sparrow. The survey coincided with the fall migration period for most migratory bird species that breed in New York State. Of the birds observed during the survey, however, all but least flycatcher are expected to breed in the study area. An active osprey nest and two adult ospreys were also observed on the top of the eastern swing span tower of the Livingston Avenue Bridge. Mammals, including tracks or signs, that were observed during the survey included white-tailed deer, eastern coyote, and eastern gray squirrel. Garter snake was the only species of reptile or amphibian observed in the study area.

4.8.3.3 Endangered, Threatened, and Special Concern Species

The Endangered Species Act (ESA) of 1973 (16 USC §§ 1531-1544) forbids any government agency, corporation, or citizen from taking (i.e., harming or killing) endangered animals without a permit. Once a species is listed as threatened or endangered, the ESA requires that "critical habitat" be designated for that species, including areas necessary for the recovery of the species. Federal agencies may not authorize, fund, or carry out any action that "destroys or adversely

modifies" critical habitat. FRA and NYSDOT reviewed Federal and New York State databases for information regarding listed species and habitats in the study area. Descriptions of these species are provided below, and a summary of their status and potential to be present in the study area is provided in **Exhibit 4.8-2**.

Exhibit 4.8-2
Endangered, Threatened, and Special Concern Species Potentially Present in the Study Area

Common Name	Scientific Name	Status	Likelihood of Being Present in the Study Area
Shortnose sturgeon	*Acipenser brevirostrum*	Federally endangered; NYS endangered	Potentially yes
Atlantic sturgeon	*Acipenser oxyrinchus*	Federally endangered	Potentially yes
Northern long-eared bat	*Myotis septentrionalis*	Federally threatened; NYS threatened	Extremely remote
Bald eagle	*Haliaeetus leucocephalus*	Protected by Bald and Golden Eagle Protection Act; NYS threatened	May pass through
Peregrine falcon	*Falco peregrinus*	NYS endangered	May pass through
Osprey	*Pandion haliaetus*	NYS Special Concern	Yes; nest on bridge
Cobra clubtail dragonfly	*Gomphus vastus*	NYS rare	Yes
Alewife floater	*Anodonta implicata*	NYS rare	Yes

According to the NMFS ESA Section 7 Mapper, the Federally listed Atlantic sturgeon (endangered) and the state- and Federally listed shortnose sturgeon (endangered) and critical habitat for Atlantic sturgeon are present in the study area.[84] **Appendix B-2-1** provides the consultation with NMFS with respect to shortnose and Atlantic sturgeon and Atlantic sturgeon critical habitat in the vicinity of the Project site, including a letter of concurrence issued by NMFS on September 28, 2021 indicating that the Project is not likely to adversely affect any NMFS ESA-listed species or designated critical habitat.

According to the USFWS IPaC database[85], one Federally listed and one candidate terrestrial species may be present in the study area: northern long-eared bat (*Myotis septentrionalis*; threatened) and monarch butterfly (*Danaus plexippus*; candidate). Bald eagles have the potential to occur in the study area during winter, and although bald eagles are no longer Federally listed as threatened or endangered, they remain Federally protected under the Bald and Golden Eagle Protection Act. They are also state-listed as threatened in New York. **Appendix B-2-1** provides the consultation with USFWS with respect to northern long-eared bats and monarch butterfly, birds protected under the Migratory Bird Treaty Protection Act, and eagles protected under the Bald and Golden Eagle Protection Act, in the vicinity of the Project site.

According to the New York Natural Heritage Program,[86] the state-listed peregrine falcon (*Falco peregrinus*; endangered) and the state- and Federally listed shortnose sturgeon (endangered) have the potential to occur in the study area. Two species identified as rare in New York, the cobra clubtail dragonfly (*Gomphus vastus*) and a freshwater mussel, the alewife floater (*Anodonta*

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[84] NMFS ESA Section 7 Mapper available at https://www.greateratlantic.fisheries.noaa.gov/protected/section7/listing/index.html. Accessed January 28, 2019.

[85] USFWS IPaC database available at https://ecos.fws.gov/ipac/. Accessed November 3, 2021.

[86] Correspondence from Andrea Chaloux, NYNHP, to Andrew Freed, NYSDOT, dated February 19, 2019.

implicata), have the potential to occur in the study area. Osprey (species of special concern) was the only state-listed species observed during the September 8, 2020 wildlife survey.

4.8.3.3.1 Shortnose Sturgeon

The shortnose sturgeon is a Federally and state-listed endangered species that can occur in riverine, estuarine, and marine environments along the Atlantic coast of North America. The only known New York population of shortnose sturgeon occurs in the Hudson River. In rivers on the northern end of their range (including the Hudson River), shortnose sturgeon are amphidromous—i.e., they spawn in fresh water but regularly enter saltwater habitats during their life. In general, adult shortnose sturgeon primarily occur in either saline estuarine waters or, more rarely, coastal waters, between spawning cycles, while juveniles tend to remain in the estuary. The Hudson River shortnose sturgeon population currently appears to be stable and has recovered from a significant decline due to overfishing and habitat degradation that started in the late 1800s and continued well into the 20th century.[87]

Shortnose sturgeon are distributed throughout the Hudson River, though their distribution varies by life stage and time of the year. Shortnose sturgeon of all life stages have the potential to be present in the vicinity of the Livingston Avenue Bridge for at least some of the year. Foraging juveniles and adults could be present all year long. Spawning adults have the potential to be present from mid-March to mid-May, and early life stages can be present through June. Adult shortnose sturgeon range between RM 23 and RM 110 during the summer months, at least 33 miles south of the study area (the Livingston Avenue Bridge is at RM 145), and then congregate in overwintering areas at specific locations within that range.[88,89] Juvenile shortnose sturgeon overlap with adults in their distribution and are typically found downstream of Catskill (RM 107). Non-spawning adults are not likely to occur in the vicinity of the Livingston Avenue Bridge, while spawning adults and early life stages (i.e., eggs and larvae) occur during a short period of time during the spring, generally between March and mid-July. Juveniles could also be present in the spring, although they are more likely to occur downriver. Non-spawning adults typically range downstream of Catskill and are rarely collected upstream of that location. Pre-spawning adults overwinter as a group in deep channel habitats near Sturgeon Point (RM 86) and downstream of the spawning grounds near Albany (RM 118-152), which includes the Project site. Spawning activity is known to occur in the study area (from RM 131 to 152) and is concentrated near the bottom at water depths of about 1 to 10 meters (3 to 33 feet), currents ranging from approximately 0.2 to 1.8 meters per second (0.7 to 6 fps), and over substrates of gravel, cobble, and/or boulders with little interstitial silt or organic material.[90] After spawning occurs, adults disperse quickly to the mid-Hudson area downstream of Catskill. The spawning migration in the Hudson River begins in the spring, when adults leave the concentrated overwintering area (roughly between Hyde Park and Kingston) and move upriver to the spawning grounds near Albany.

Because newly hatched larvae are subject to passive transport,[91] larvae hatching at the Troy Dam (RM 152) would drift through the Project site (RM 145). In the Hudson River, the larval life stage generally occurs between Albany and Poughkeepsie.[92] Larval shortnose sturgeon are collected

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87 Transactions of the American Fisheries Society, Volume 136, "Year-Class Strength and Recovery of Endangered Shortnose Sturgeon in the Hudson River, New York," by R.J. Woodland and D.H. Secor, 2007, pages 2-81.

88 NMFS Biological Opinion – Tappan Zee Bridge Replacement. F/NER/2013/9592. April 10, 2013.

89 River Miles in the Hudson River are measured from RM 0 at the Battery (Lower Manhattan).

90 Final Recovery Plan for the Shortnose Sturgeon (*Acipenser brevirostrum*), prepared by the Shortnose Sturgeon Recovery Team for the NMFS, 1998, page 104.

91 Copeia, Volume 1995 "Ontogenic Behavior of Shortnose Sturgeon" by A. Richmond, and B. Kynard, pages 172-182.

92 Ibid.

most frequently near Albany (RM 126-141) and primarily during the month of May.[93] Larvae begin moving downstream of the spawning grounds within four weeks of hatching, and leave the vicinity of the Livingston Avenue Bridge by early to mid-July. Juvenile and adult shortnose sturgeon may occur year-round in all habitat types (i.e., substrate, salinity) in the species' range in the Hudson River, from the mouth to the upstream limit at the Troy Dam.[94] **Appendix B-2-1** provides the consultation with NMFS with respect to shortnose sturgeon in the vicinity of the Project site, including a letter of concurrence issued by NMFS on September 28, 2021 indicating that the Project is not likely to adversely affect any NMFS ESA-listed species or designated critical habitat.

4.8.3.3.2 Atlantic Sturgeon

The New York Bight Distinct Population Segment of the Atlantic sturgeon, which includes sturgeon from the Hudson River, is Federally listed as endangered. Juvenile Atlantic sturgeon could potentially occur in the study area at any time throughout the year; however, sub-adult and adult Atlantic sturgeon and early life stages occur in the Hudson River seasonally during the late spring to fall months and potentially occur in the study area during those months. Atlantic sturgeon spend most of their lives in marine waters along the Atlantic coast. Adults migrate from the ocean upriver to spawn in fresh water above the salt front in the Hudson River from late April to early July. The primary spawning area for Atlantic sturgeon is near Hyde Park, New York (RM 83), downriver from the Project site (RM 145).[95] Additional data collected in 2014 confirmed the presence of a few spawning individuals upstream of RM 120 from late April through late July[96], suggesting that Atlantic sturgeon spawn further upstream in the Hudson River than previously suspected, including in the vicinity of the Project site. Females migrate from the river back to marine waters following spawning, but males may remain in the river until October or November. Larval Atlantic sturgeon can occur between RM 37 and RM 92 and juvenile Atlantic sturgeon are primarily found between RM 42 and RM 66, but range farther downriver as well. Early life stages (i.e., eggs, larvae, and smaller juveniles) are relatively intolerant of salinity; young-of-year Atlantic sturgeon exhibit poor survival at salinities ranging from 5 to 10 ppt, and older juveniles (Age-1 and Age-2) may tolerate salinities up to 12 ppt.

Based on the spatial distributions and seasonal movement patterns within the Hudson River, all life stages of Atlantic sturgeon could be present in the action area. Spawning adults and early life stages could be present from approximately March through September, and non-spawning adults could occur year-round. Juveniles could also be found in the action area year-round, although they are more likely to migrate downriver or to marine habitats in the winter months.

NMFS has designated critical habitat for Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) for the length of the tidal Hudson River from Lower Manhattan to the Troy Dam (about 7 miles north of the Livingston Avenue Bridge);[97] the study area is within the critical habitat boundaries. For Atlantic sturgeon, the physical or biological features (PBFs) of critical habitat that are essential to the conservation of the species include:

- PBF #1—Hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0 to 0.5 parts per thousand (ppt) range) for settlement of fertilized eggs, refuge, growth, and development of early life stages.

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93 Based on utilities monitoring data, 2000-2009.

94 NMFS Biological Opinion – Tappan Zee Bridge Replacement. F/NER/2013/9592. April 10, 2013.

95 Ibid.

96 Fox, D. and K. Hattala. 2014 Personal communication with NMFS. April 2014.

97 NMFS Endangered and Threatened Species; Designation of Critical Habitat for the Endangered New York Bight, Chesapeake Bay, Carolina and South Atlantic Distinct Population Segments of Atlantic Sturgeon and the Threatened Gulf of Maine Distinct Population Segment of Atlantic Sturgeon. Final Rule. 82 Federal Register 39160-39274, August 17, 2017.

- PBF #2—Aquatic habitat with a gradual downstream salinity gradient of 0.5 to up to as high as 30 ppt and soft substrate downstream (e.g., sand, mud) between the river mouth and spawning sites for juvenile foraging and physiological development.
- PBF #3—Water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites necessary to support: unimpeded movement of adults to and from spawning sites; seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary; and staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (e.g., at least 1.2 meters (3.9 feet)) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river.
- PBF #4—Water between the river mouth and spawning sites, especially in the bottom meter of the water column, with temperature, salinity, and oxygen values that, combined, support: spawning; annual and interannual adult, subadult, larval, and juvenile survival; and larval, juvenile, and subadult growth, development, and recruitment (e.g., 13°C to 26°C for spawning habitat and no more than 30°C for juvenile rearing habitat, and 6 milligrams per liter (mg/L) dissolved oxygen (DO) or greater for juvenile rearing habitat).

The Project site contains physical and biological features identified under PBFs 1, 3, and 4. Optimal habitat for juvenile foraging and physiological development (PBF 2) does not occur in the vicinity of the Project site, which is in lower salinity waters typically less than 0.5 ppt. **Appendix B-2-1** provides the consultation with NMFS with respect to Atlantic sturgeon and Atlantic sturgeon critical habitat in the vicinity of the Project site, including a letter of concurrence issued by NMFS on September 28, 2021 indicating that the Project is not likely to adversely affect any NMFS ESA-listed species or designated critical habitat.

4.8.3.3.3 Northern Long-Eared Bat

The northern long-eared bat (Federally and state-listed as threatened) is a cave-hibernating bat of eastern North America that has recently undergone severe population declines due to the outbreak of white-nose syndrome, a fungal disease that kills bats during the winter hibernation period. Northeastern U.S. populations as a whole have declined by 98 percent as a result of the disease. As of 2015, northern long-eared bat populations had declined approximately 99 percent in New York State.[98] Non-hibernating northern long-eared bats generally inhabit mature, closed-canopy, intact forest within heavily forested landscapes and require tracts of unbroken forest for both foraging and breeding, and they are sensitive to urbanization. As discussed earlier, the majority of the study area is developed with an urbanized mix of residential, transportation infrastructure, industrial, and commercial uses, and wildlife habitat is limited to a small woodlot and a recreational park consisting of manicured lawn and a manmade, ornamental pond. No large, unbroken forest is present in the area. Given the lack of preferred habitat of northern long-eared bats in the study area and the current rarity of the species in the region, the potential for occurrence of the northern long-eared bat at the Project site or in the study area is extremely remote. **Appendix B-2-1** provides the consultation with USFWS with respect to northern long-eared bats in the vicinity of the Project site, as well as a verification letter from USFWS dated November 3, 2021, indicating that the Project is consistent with the Programmatic Biological Opinion (PBO) for northern long-eared bats issued on January 5, 2016.

4.8.3.3.4 Bald Eagle

Bald eagle populations in New York have grown dramatically over the past few decades. Bald eagles are listed in New York State as threatened and Federally protected by the Bald and Golden

[98] NYNHP Northern Long-Eared Bat, *Myotis septentrionalis*. Available at https://guides.nynhp.org/northern-long-eared-bat/, updated March 8, 2019.

Eagle Protection Act. Bald eagles nest along the Hudson River, usually near large areas of tidal mudflat and away from areas with moderate to heavy levels of human activity and shoreline development. As such, bald eagles are not known to nest in the study area, and nests were not observed during site reconnaissance surveys. Bald eagles are present during the winter along the Hudson River, typically congregating in old, dominant trees with open flight paths and clear views of the surroundings,[99]which the study area is lacking. NYNHP did not include bald eagles in the list of species documented at the Project site or within the study area,[100] but they may occasionally pass over the open water in search of fish during the non-breeding season.

4.8.3.3.5 Peregrine Falcon

The peregrine falcon is globally widespread and common in many areas. While this species is currently listed in New York State as endangered, populations in New York have grown dramatically since the 1980s and NYSDEC has therefore proposed reducing its status to special concern. Peregrine falcons traditionally nest on cliff ledges, but they will also commonly nest on bridges, buildings, and other tall artificial structures, often in cities. As of 2010, territorial pairs were most commonly found at cliff sites, but more young peregrine falcons were produced at building sites.[101] Peregrine falcons do not nest on the Livingston Avenue Bridge, but they nest on other nearby Hudson River bridges, including the Dunn Memorial Bridge, 0.75 miles to the south. Individuals associated with this nest site may occasionally pass through the study area in search of prey.

4.8.3.3.6 Osprey

A pair of ospreys and their nest were observed on the eastern swing span tower of the Livingston Avenue Bridge during the September 2020 wildlife survey. The osprey is a species of special concern in New York that has been proposed by NYSDEC to be delisted during the next revision of the list of endangered, threatened, and special concern species because populations in the state have recovered significantly in recent decades following steep range-wide declines that occurred throughout the mid-1900s. Ospreys are now commonly found in New York almost anywhere there are large waterbodies, and they readily nest on a variety of artificial structures that include utility poles, buoy towers, bridges, and platforms erected specifically for use by ospreys.

4.8.3.3.7 Cobra Clubtail

The cobra clubtail is an uncommon dragonfly, considered rare in New York State, that inhabits areas with large, sandy-bottomed rivers and large lakes. Adults usually occur in the riparian zone canopy, but during breeding, they are usually found on sandy shorelines or in low overhanging vegetation. A large population was recently discovered along the mid-Hudson River from Albany to Schuylerville, and a short distance up the Mohawk River. The cobra clubtail is present in the vicinity of the study area[102] and therefore has the potential to occur at the Project site.

4.8.3.3.8 Alewife Floater

The alewife floater is an uncommon freshwater mussel, considered rare in New York State, that occurs from Nova Scotia to Quebec, and south to North Carolina. In New York, the species is only known to occur in the freshwater tidal Hudson River and the upper Delaware River. In the Hudson River, the species occurs from Dutchess County north to the confluence with the Mohawk River at Waterford. It occurs in both running water and quiet standing water with cobble or stony

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[99] Landscape Ecology, Volume 14, Issue 6 “The influence of research scale on bald eagle habitat selection along the lower Hudson River,” C.M. Thompson and K. McGarigal, 2002, pages 569-586.

[100] NYNHP 2019.

[101] 2010 Peregrine Falcone Season Results, NYSDEC, Division of Fish, Wildlife and Marine Resources, Endangered Species Unit, B.A. Loucks, 2010.

[102] Correspondence from Andrea Chaloux, NYNHP, to Andrew Freed, NYSDOT, dated February 19, 2019.

substrates where it burrows into the substrate. Although unlisted, this species is thought to be in decline. Hudson River populations of the alewife floater have been heavily impacted by the zebra mussel (*Dreissena polymorpha*) invasion. The alewife floater may occur within the study area.[103]

4.8.3.4 Invasive Species

Conditions for invasive plants and animals are favorable in the study area due to the high levels of development and human activity. The degraded habitat conditions present are most suitable to these generalist, human-subsidized species. Invasive species known to occur in the study area include Japanese knotweed (*Polygonum cuspidatum*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), Oriental bittersweet (*Celastrus orbiculatus*), European starling (*Sternus vulgaris*), and house sparrow (*Passer domesticus*). Zebra mussels are likely present in the river.

4.8.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The No Action Alternative would have no effect on aquatic biota, terrestrial wildlife and habitats, or threatened and endangered species. With the No Action Alternative, the existing bridge and approach tracks would not be altered, and no new construction related to the bridge would occur in the study area.

4.8.5 Impacts of the Build Alternatives

4.8.5.1 Aquatic Resources

Operation of the replacement bridge under either of the Build Alternatives would not substantively differ from the operation of the existing bridge. As a result, there would be no change in impacts to aquatic resources in the Hudson River compared to existing conditions. Water and sediment quality would not change, and the same species and communities of aquatic biota would continue to occur as at present.

For Build Alternative 1 (replacement on an adjacent north alignment), the size of the piers supporting the replacement bridge would be greater than those of the existing bridge (total pier footprints would be approximately 0.74 acres for Build Alternative 1, compared to 0.42 acres for the existing bridge). Overall, the extent of sediment deposition and scour in this section of the river would not change significantly. As discussed in **Section 4.7.3.2**, most of the river in the vicinity of the Project site is a dynamic environment subject to erosion ("dynamic scour"), which typically occurs around obstacles such as bridge abutments. Some small areas of "dynamic drift" (areas characterized by deposition in the lee of obstacles) are present north of the existing bridge's piers on its eastern side, and south of the existing bridge below the large pier. A replacement bridge to the north of the existing bridge in Build Alternative 1 would likely result in a small shift in this current spatial distribution of areas with scour and sediment deposition. For example, sediment deposition in the lee of the existing bridge's piers would decrease following their removal and sediment would instead accumulate in the lee of the replacement bridge's piers. Because the replacement bridge's three easternmost piers would be spaced slightly farther apart than those of the existing bridge (approximately 77 feet versus approximately 71 feet), scouring and deposition attributable to bridge piers on the eastern side of the river may change slightly but would not result in adverse impacts to submerged aquatic vegetation on the eastern bank of the river. The westernmost side of the replacement bridge would have more piers than the existing bridge (three versus two) and the piers would be spaced more closely together (approximately 48 feet versus 132 and 179 feet), resulting in a change in the current scour and deposition pattern in the vicinity of the bridge. No

[103] Ibid.

submerged aquatic vegetation are known to occur in the vicinity of the location of Build Alternative 1's western piers, and therefore, submerged aquatic vegetation would not be affected by any potential change in river hydrodynamics along the west bank of the river due to Build Alternative 1. The potential for shifts in the spatial distribution of areas with scour and sediment deposition within the study area due to Build Alternative 1 would not result in significant adverse impacts to aquatic habitat or aquatic biota.

For Build Alternative 2 (replacement on an adjacent south alignment), because the size (total pier footprints would be 0.5 acres for Build Alternative 2 and 0.42 acres for the existing bridge) and number (eight piers for Build Alternative 2 and nine piers for the existing bridge) of piers that would support the replacement bridge in Build Alternative 2 are nearly the same as those of the existing bridge, and because the alignment of Build Alternative 2 would be closer to the existing bridge than the alignment of Build Alternative 1, potential changes in scour and sediment deposition due to the replacement bridge under Build Alternative 2 would be minimal. Unlike Build Alternative 1, the three easternmost piers for Build Alternative 2 would be spaced slightly closer together than those of the existing bridge (approximately 62 feet versus approximately 71 feet), and as such, scouring and deposition attributable to bridge piers on the eastern side of the river may change slightly but would not result in adverse impacts to any submerged aquatic vegetation on the eastern bank of the river. The westernmost side of the replacement bridge under Build Alternative 2 would be similar to Build Alternative 1. It would have more piers than the existing bridge (three rather than two) and the piers would be spaced more closely together (approximately 54 feet versus 132 and 179 feet), resulting in a change in the scour and deposition pattern in the vicinity of the bridge. For the same reasons discussed for Build Alternative 1, the potential change in scour and deposition within the vicinity of the replacement bridge with Build Alternative 2 would not result in significant adverse impacts to submerged aquatic vegetation, aquatic habitat, or aquatic biota.

Any non-motile benthic invertebrates within the footprint of the replacement bridge (0.74 acre for Build Alternative 1 or 0.5 acre for Build Alternative 2) would be lost. This is a minimal loss of bottom habitat and benthic invertebrates compared to the availability of similar habitat that would still be available in the region. Additionally, demolition of the existing bridge would restore approximately 0.4 acres of bottom habitat currently occupied by its piers, partially offsetting the benthic habitat lost due to construction of the replacement bridge. The net loss of 0.34 acre of bottom habitat with Build Alternative 1 or 0.1 acre of bottom habitat with Build Alternative 2 would not result in adverse impacts to populations of benthic fauna or their predators.

Because the height above the water surface and width of the deck of the replacement bridge (23.3' by 48.3') would be similar for either Build Alternative to that of the existing bridge (23.3' by 38.2'), shading from the replacement bridge would be similar to the existing bridge and would be almost entirely offset by the removal of the existing bridge. The slightly greater width of the replacement bridge would result in a negligible net increase in shading that would not result in adverse impacts to benthic organisms, submerged aquatic vegetation, or other aquatic biota. Overall, operation of either Build Alternative would not have significant adverse impacts to aquatic resources of the Hudson River.

4.8.5.2 Terrestrial Resources

Potential impacts of the operation of the Build Alternatives are limited to noise disturbances generated by train pass-bys across the bridge and the permanent loss of woodland (three acres with Build Alternative 1 and two acres with Build Alternative 2) on the east bank of the river to realign the east approach slightly to the north. Given that the woodland area is of marginal value to birds and other wildlife due to its small size and large amount of edge habitat, the permanent loss of 2 or 3 acres of this habitat would not result in an adverse impact to wildlife, especially given the availability of similar habitat in the region. The permanent loss of woodland with either alternative would reduce the number of individuals able to inhabit it, but would not change the

assemblage of wildlife present; the same wildlife species would continue to inhabit the remaining portions of the woodlot. The reduced number of individuals of some species would not adversely affect the size or viability of their local populations.

Because the study area has been developed with the present land uses for many years and the existing bridge has been in operation for more than a century, the wildlife communities in the study area have already been shaped in part by existing noise levels. These communities are primarily composed of generalists and disturbance-tolerant species that will inhabit areas with high noise levels and otherwise degraded habitat conditions. Operation of the replacement bridge under either Build Alternative would not increase disturbance levels above what is currently attributable to the existing bridge, and thus, any species currently inhabiting the area, including migratory birds, would continue to occur in the area in the future. Individual animals currently inhabiting the area are habituated to existing noise levels from rail traffic; operation of the replacement bridge under either Build Alternative would not elicit negative physiological or behavioral responses, and would not alter reproductive success. Overall, noise resulting from operation of either Build Alternative would not have any adverse impacts to wildlife.

4.8.5.3 Endangered, Threatened, and Special Concern Species

Threatened, endangered, or special concern species that have the potential to occur within the study area include Atlantic sturgeon, shortnose sturgeon, northern long-eared bat, bald eagle, peregrine falcon, cobra clubtail, and alewife floater. In addition, a pair of ospreys (special concern) currently nest on the eastern swing span tower of the Livingston Avenue Bridge. As detailed below, because operation of the replacement bridge under either Build Alternative would not result in notable changes to aquatic or terrestrial habitat within the vicinity of the replacement bridge, it is reasonable to conclude that either Build Alternative may affect but is unlikely to adversely affect the Atlantic sturgeon, shortnose sturgeon, northern long-eared bat, bald eagle, peregrine falcon, cobra clubtail, alewife floater, or osprey. FRA completed Section 7 consultations with NMFS dated January 26, 2021 and September 21, 2021, with concurrence issued by NMFS on September 28, 2021, and with USFWS on November 3, 2021 with respect to the Federally listed species. FRA also submitted a Biological Assessment for the monarch butterfly, a candidate species, to USFWS on November 15, 2021. **Appendix B-2-1** includes this consultation record.

4.8.5.3.1 Shortnose and Atlantic Sturgeon

Relative to the benthic acreage near the Project site at RM 145, the permanent loss of 0.34 acre of bottom habitat with Build Alternative 1 is equivalent to approximately 0.25 percent of the available benthic habitat. The majority of this loss would occur over gravelly sand substrate documented in the navigation channel, which provides potential habitat for spawning and early life stages of both sturgeon species. The area affected by the replacement bridge piers would be small in comparison to the surrounding habitat that would continue to be available to sturgeon, including spawning adults, within the study area. Areas of sandy gravel are present upstream and downstream of the Project site, bordered by sand and gravelly sand, and since it has a greater proportion of gravel compared to sand, these areas would provide more favorable spawning habitat for shortnose and Atlantic sturgeon. Additionally, where the existing bridge is removed, the bottom habitat would be restored through natural redistribution of river bottom material into the former footprint, making this area available for spawning. With the exception of the spring months, it is not likely that shortnose or Atlantic sturgeon are using the study area as foraging habitat as these areas are typically found well downstream of the spawning grounds. The majority of the benthic substrate within the study area is coarse-grained sand and gravel, rather than the fine-grained silt and mud that sturgeon are thought to prefer as foraging habitat. Based on this information, the small loss of benthic habitat resulting from the implementation of Build Alternative 1 is not likely to adversely affect shortnose or Atlantic sturgeon in the Hudson River.

With a net loss of 0.1 acre of soft bottom habitat in the footprint of the foundation piles, Build Alternative 2 would modify less benthic habitat, including critical habitat for Atlantic sturgeon, and

have less of an effect on fish and other benthic organisms than Build Alternative 1 and therefore is also not likely to adversely affect shortnose or Atlantic sturgeon in the Hudson River.

FRA concluded that the effect of the habitat modification resulting from the Project would be too small to be meaningfully measured or detected and would be insignificant, and received concurrence from NMFS on September 28, 2021, as indicated in **Appendix B-2-1.**

4.8.5.3.2 Atlantic Sturgeon Critical Habitat

Operation of either Build Alternative would result in the permanent conversion of waters resulting in the loss of benthic habitat within designated critical habitat for Atlantic sturgeon. Construction of the replacement bridge and demolition of the existing bridge would result in the modification of bottom habitat, including gravelly sand substrate identified in the navigation channel. As described above, given that the benthic habitat that would be lost as a result of the Project is small (0.34 acres for Build Alternative 1 and 0.1 acres for Build Alternative 2) in comparison to the amount of similar habitat in the vicinity, there is more favorable habitat (i.e., sandy gravel) just upstream and downstream of the existing bridge, and the substrate in the footprint of the existing bridge would be restored with material similar to the surrounding substrate, habitat modification resulting from the Project would not result in significant adverse impacts to Atlantic sturgeon critical habitat. The replacement bridge would not create a physical barrier to passage between the river mouth and spawning sites and would not impede the movement of adults to and from spawning sites, seasonal movement of juveniles, or staging, resting, or holding of subadults or spawning adults. The Project would not affect water depth, flow, dissolved oxygen, salinity, temperature, or the ability for sturgeon to migrate through the area. **Appendix B-2-1** provides the consultation with NMFS with respect to Atlantic sturgeon critical habitat in the vicinity of the Project site.

4.8.5.3.3 Northern Long-Eared Bat

The land cleared for either Build Alternative would represent a negligible loss of low quality, fragmented woodland that is not likely to represent suitable habitat for northern long-eared bats and would not adversely affect the size or viability of any remaining local population. The fragment of woodland in which the majority of the clearing would occur is not considered to be valuable or high quality habitat for northern long-eared bats because of its small size, high edge to area ratio, second stage growth, limited amount of large dead or dying trees, and heavily developed surroundings. As a conservative measure, to avoid the potential removal of an active roost tree, no tree clearing would take place from June 1 to July 31. **Appendix B-2-1** contains FRA's Section 7 consultation with USFWS with respect to northern long-eared bat.

4.8.5.3.4 Bald Eagle and Peregrine Falcon

The Build Alternatives would not notably increase disturbance levels above what is generated by the existing bridge, and therefore, would not have the potential to result in adverse impacts to the bald eagle or peregrine falcon. Neither bald eagles nor peregrine falcons nest on or in close proximity to the bridge, and as such, there would be no potential for the Build Alternatives to disturb or disrupt breeding activity. Because urban, bridge-nesting peregrine falcons are highly tolerant of and habituated to human disturbance, activities from the Build Alternatives would not have the potential to negatively impact hunting opportunities or other behaviors of the pair of peregrine falcons that nest on the Dunn Memorial Bridge, approximately 0.75 miles away. FRA will initiate consultation with USFWS under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act to request concurrence with these findings.

4.8.5.3.5 Osprey

Ospreys have become highly habituated to human activity and now commonly nest throughout New York State wherever there are large bodies of water. They have been proposed by NYSDEC to be removed from the list of endangered, threatened, and special concern species during the next revision. In compliance with the Migratory Bird Treaty Act, and to avoid direct impacts to nesting ospreys, the osprey nest on the Livingston Avenue Bridge will be removed during the

winter, when the nest is inactive. FRA and NYSDOT will coordinate with the USFWS and NYSDEC prior to removal. Upon their return to the area in the spring, these ospreys should easily establish a new nesting site on one of the many other tall, artificial structures along this section of the Hudson River and remain a part of the area's breeding population. Following completion of construction, the replacement bridge will once again represent a potential nesting site for these or other ospreys in the area. For these reasons, no adverse impacts to ospreys at the individual or population level would be expected to occur from the construction and operation of the Build Alternatives.

4.8.5.3.6 Cobra Clubtail

Tree clearing on the eastern bank of the river that would occur under either Build Alternative would potentially eliminate some riparian habitat of the cobra clubtail dragonfly, but occurrence of the species in this area is unconfirmed. Loss of a small section of shoreline vegetation (approximately 300 linear feet for Build Alternative 1 and 150 feet for Build Alternative 2) would not result in a substantial reduction in the amount of comparable riparian habitat available to the cobra clubtail along the Hudson River, and would not result in adverse impacts to the species' local or regional populations.

4.8.5.3.7 Alewife Floater

Upon removal of the existing bridge, the area of river bottom currently occupied by the bridge's piers would gradually accumulate sediment and return to benthic habitat, thereby largely offsetting any loss to the new bridge's support piers. The permanent loss of 0.34 acre of bottom habitat with Build Alternative 1 would constitute a negligible reduction in benthic habitat available to the alewife floater in the freshwater tidal region of the Hudson River. The direct loss of a few individuals that could potentially occur within the areas of sediment that would be removed to install the piles would not substantially affect the size or viability of the Hudson River population, which numbers in the millions. Therefore, Build Alternative 1 would not adversely affect populations of the alewife floater or its habitat.

With a net loss of 0.1 acre of soft bottom habitat in the footprint of the foundation piles, Build Alternative 2 would affect a smaller amount of potential alewife floater habitat. As with Build Alternative 1, the direct loss of any individuals inhabiting the small area of river bottom in which piles would be installed would not adversely affect the size or viability of the local population.

4.8.5.4 Significant Habitat Areas

Operation of the replacement bridge under either Build Alternative would not adversely affect the Tidal Hudson River Estuary EFH or the ecology of the Upper Hudson River Significant Habitat Complex. FRA concluded that the net loss of approximately 0.32 acres (Build Alternative 1) or 0.08 acres ((Build Alternative 2) of bottom habitat would not result in significant adverse effects to EFH and received concurrence from NMFS on March 1, 2021, as presented in **Appendix B-2-1.** As discussed in **Section 4.8.5.1**, shading caused by the replacement bridge would be almost entirely offset by removal of the existing bridge and have no adverse impact to submerged aquatic vegetation.

4.8.5.5 Invasive Species

Executive Order 13112 – Invasive Species seeks to prevent the introduction of invasive species and provide controls to minimize the economic, ecological, and human health impacts that invasive species can cause. Due to the high levels of development and human activity in the study area, habitat conditions are highly degraded and favorable for non-native invasive plants and animals. During Project construction for either Build Alternative, NYSDOT will implement best management practices (such as washing construction equipment) to minimize the introduction of new invasive species to the area, and to limit benefits to any that are already present. As such,

there would be no change in the status of invasive species from the existing condition under either Build Alternative.

4.8.6 Avoidance, Minimization, and Mitigation

Operation of the Build Alternatives would not result in significant adverse impacts to natural resources. Therefore, mitigation measures are not required. **Appendix B-2-1** provides the consultations with NMFS and USFWS regarding EFH and threatened and endangered species that could be affected by the Project. **Section 4.16, "Construction Impacts,"** discusses timing restrictions for construction work in the Hudson River to protect spawning Atlantic and shortnose sturgeon and their eggs and larvae, and other measures to mitigate potential impacts to natural resources during construction. In addition, during Project construction for either Build Alternative, NYSDOT will implement best management practices (such as washing construction equipment) to minimize the introduction of new invasive species to the area, and to limit benefits to any that are already present.

4.9 Geology

4.9.1 Introduction

This section presents FRA's and NYSDOT's assessment of the potential impacts of the No Action and Build Alternatives related to geology, topography, and soils.

4.9.2 Methodology and Study Area

FRA and NYSDOT used maps published by the USGS and the USDA Natural Resources Conservation Service (NRCS) web soil survey to obtain information on the topography and geology at the Project site. Information gathered from prior projects in the vicinity of the Project site was also used. The assessment of potential impacts on geology considers whether the Project Alternatives would result in any loss or change to geology characteristics, properties, or functions within the study area.

4.9.3 Affected Environment

In Albany, based on information gathered during the construction of I-787 in 1952, the subsurface in the vicinity of the Livingston Avenue Bridge consists of several layers of silty sand ranging from fine to coarse. There are lenses of soft plastic clay in the upper layers of sand and occasional cobbles and small boulders in the deeper coarse sand layers. The rock layer occurs fairly consistently at about 40 feet below the surface and consists of a soft shale rock with recovery rates over 70 percent in most locations. Subsurface information from the construction of the Patroon Island and Dunn Memorial Bridges shows that the soil properties are similar to those in the vicinity of the Livingston Avenue Bridge. The recorded rock layer at the Patroon Island and Dunn Memorial Bridges varies between 20 and 80 feet in depth. A very hard layer of soil occurs consistently around 40 feet deep in locations where the recorded rock surface is deeper. Based on the original plans for the Livingston Avenue Bridge, the existing abutment and pier foundations consist of timber piles. It is unlikely that these timber piles extend to the rock layer.

In Rensselaer, topography is variable across the site. Topographic maps indicate that Project site elevations range from 0 at the shore of Hudson River to approximately 30 feet at the railroad embankment. Slopes in the wooded area north of the bridge and in the vicinity of Tracy Street generally ranging from 0 to 15 percent. According to the NRCS web soil survey, three soil types are present on site, dominated by Udorthents, sandy. Both Udorthents, sandy and Udorthents, loamy soil types are soils that have been altered through either soil removal or soil removal and replacement.

The City of Rensselaer anticipates that the Kiliaen's Landing Development would require 9 to 15 feet of fill in the area adjacent to the Livingston Avenue Bridge to meet the requirements of the National Flood Insurance Program and enhance the long-term viability and sustainability of the site.[104]

4.9.4 Impacts of the No Action Alternative

Under the No Action Alternative, FRA and NYSDOT would not rehabilitate or replace the Livingston Avenue Bridge. The No Action Alternative would have no effect on geology, topography, or soils.

4.9.5 Impacts of the Build Alternatives

NYSDOT will perform a geotechnical investigation prior to construction of the new bridge under either Build Alternative to determine the suitability of the existing soils for the track bed and the depth to bedrock at proposed bridge pier locations. NYSDOT will incorporate any necessary precautions or measures and engineering practices to address unfavorable conditions. Through the use of test borings, NYSDOT will identify design and construction requirements for the earthwork and bridge foundation. This will include consideration of vibration and possible settlement of the existing bridge, which would still be in operation, during construction of the new bridge's deep foundations. As discussed in **Section 4.16, "Construction Impacts,"** NYSDOT will require the use of pile installation that limits vibration near the existing bridge, to avoid potential damage to that structure. The specific pile installation measures will be determined during final design after a detailed geotechnical study is performed to determine the susceptibility of the existing structure to vibration. The new bridge under either Build Alternative would be constructed to meet modern seismic codes. The Build Alternatives would not result in any substantial change to local topography and would not affect existing soil and rock strata except for the locations directly displaced to construct the new bridge foundations. Previously disturbed geology conditions would be changed temporarily during construction as supports for the temporary pier and spud barges are installed, and any required soil movement is undertaken to create a level staging area. Geology conditions would be properly restored where necessary and practicable using established engineering practices. Geology characteristics, properties, and functions within the study area would not be adversely affected by the Build Alternatives. The design of the Build Alternatives takes into account the geological and soil conditions of the Project site and will incorporate any necessary precautions or measures to address unfavorable conditions. Therefore, no adverse impacts related to geology, topography, or soils are anticipated for ether Build Alternative.

4.9.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts related to geology, topography, or soils. Therefore, mitigation measures are not required. NYSDOT will perform a geotechnical investigation prior to construction of the new bridge under either Build Alternative to identify design and construction requirements for the new bridge.

4.10 Air Quality

4.10.1 Introduction

FRA and NYSDOT analyzed the potential local and regional impacts of the Project on air quality. Neither Build Alternatives would lead to an increase in the number of trains using the bridge compared to the No Action Alternative. However, both Build Alternatives would shift the rail alignment either to the north or south of the existing bridge, allow for trains to operate at higher

[104] Kiliaen's Landing Final Generic Environmental Impact Statement, City of Rensselaer, May 2018, p. 3-22.

speeds, and allow for an increase in weight of the freight loads transported across the bridge. No changes in the amount of boat traffic would result from the Build Alternatives, but boats may experience shorter waits for bridge openings and there would be fewer delays due to bridge malfunction, which could reduce localized diesel emissions from boat traffic. The operational impacts of the Build Alternatives are presented below in comparison to the No Action Alternative. Project-level conformity to the State Implementation Plan (SIP) is also presented in this section. The potential temporary impacts on localized air quality related to construction activities are addressed in **Section 4.16.10** in **Section 4.16, "Construction Impacts."**

4.10.2 Methodology and Study Area

The Clean Air Act (CAA), as amended in 1990, is the primary basis for regulating air pollutant emissions. As required by the CAA, USEPA promulgated, and revises periodically, regulations that established National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), ozone, nitrogen dioxide (NO_2), lead, sulfur dioxide (SO_2), and particulate matter (PM) regulated in two size categories: respirable PM smaller than 10 micrometers (PM_{10}), and fine respirable PM smaller than 2.5 micrometers ($PM_{2.5}$). These are sometimes referred to as criteria pollutants.

The pollutants of concern for the Build Alternatives are those related to diesel emissions from passenger and freight trains that operate on the Empire Corridor. Pollutant emissions from diesel combustion contain nitrogen oxides (NO_x, including both nitrogen oxide and NO_2), PM, and CO, which can potentially affect local concentrations near diesel sources; and volatile organic compounds (VOCs), which along with NO_x can react photochemically to form ozone and may be of concern on a regional scale. Lead and SO_2 are not of concern from diesel sources.

FRA and NYSDOT evaluated the potential impacts of the Build Alternatives on air quality by considering:

- Whether local concentrations of NO_x, CO, or PM would change at nearby sensitive locations (e.g., residences, public waterfront uses) as a result of the Build Alternatives;
- Whether the changes in bridge operating conditions would affect regional pollutant burdens; and
- Whether the Project would conform to the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards.

4.10.3 Affected Environment

4.10.3.1 NYSDEC Air Monitoring Data

Representative criteria pollutant concentrations measured in recent years at NYSDEC air quality monitoring stations nearest to the Project site are presented in **Exhibit 4.10-1.** The recently monitored levels did not exceed the NAAQS.

Exhibit 4.10-1
Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentration	NAAQS
CO	Loudonville 0101-33	ppm	8-hour(1)	1.5	9
CO	Loudonville 0101-33	ppm	1-hour(1)	0.7	35
SO_2	Loudonville 0101-33	ppb	3-hour	2.4	500
SO_2	Loudonville 0101-33	ppb	1-hour(2)	2.47	75
PM_{10}	Rochester 27001-22	µg/m^3	24-hour	37	150
$PM_{2.5}$	Albany Co. HD 0101-13	µg/m^3	Annual	6.1	12\
$PM_{2.5}$	Albany Co. HD 0101-13	µg/m^3	24-hour	19.7	35
NO_2	Botanical Gardens 7094-06/7094-10	ppb	Annual	12.36	53
NO_2	Botanical Gardens 7094-06/7094-10	ppb	1-hour(3)	50.5	100
Lead	Wallkill 3566-09	µg/m^3	3-month	0.01	0.15
Ozone	Loudonville 0101-33	ppm	8-hour	0.057	0.070

Notes:

(1) The 1-hour and 8-hour CO values are based on the latest available data from 2019.

(2) The 1-hour value is based on a three-year average (2015-2017) of the 99th percentile of daily maximum 1-hour average concentrations. USEPA replaced the 24-hour and the annual standards with the 1-hour standard.

(3) The 1-hour value is based on a three-year average (2015-2017) of the 98th percentile of daily maximum 1-hour average concentrations.

Source: NYSDEC, New York State Ambient Air Quality Report (2019, 2020).

USEPA, Air Quality System Data Mart Annual Data (2019, 2020). https://www.epa.gov/outdoor-air-quality-data. Accessed December 22,2021.

4.10.3.2 NAAQS Attainment Status and State Implementation Plans

The CAA defines U.S. geographic regions that have been designated as not meeting one or more of the NAAQS as non-attainment areas. When an area is designated as non-attainment by USEPA, the state is required to develop and implement a SIP, which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the Clean Air Act, followed by a plan for maintaining attainment status once the area is in attainment. The Albany-Schenectady-Troy region (which includes Albany and Rensselaer County) is currently in attainment for all criteria pollutants. However, Albany and Rensselaer Counties are classified as a "Former Subpart 1" non-attainment area under the 1997 8-hour ozone NAAQS. A recent court decision, the South Coast II decision, held that transportation conformity determinations must be made in areas that were either nonattainment or maintenance for the 1997 ozone NAAQS.[105] Therefore, per the South Coast II decision, the transportation conformity process is being completed for the Albany-Schenectady-Troy region.[106]

Because the proposed Project is receiving federal funding, it must conform to SIPs applicable to the Project site. An area's Metropolitan Planning Organization (MPO), which is an entity responsible for transportation planning, together with the state, is responsible for demonstrating conformity with respect to the SIP on metropolitan long-range transportation plans and Transportation Improvement Programs (TIPs). USEPA must then concur with such conformity determinations. FRA has final approval of conforming plans and TIPs. Conformity of Federal actions related to transportation plans, programs, and approval, funding, or implementation of FRA-funded projects must be ad-

[105] U.S. Court of Appeals for the District of Columbia Circuit in South Coast Air Quality Mgmt. District v. EPA ("South Coast II," 882 F.3d 1138), February 16, 2018.

[106] "Albany-Schenectady-Troy 1997 8-Hour Ozone Non-Attainment Area Transportation/Air Quality Conformity Determination, Draft for Public Review May 3, 2019, prepared by NYSDOT Environmental Science Bureau, Capital District Transportation Committee; and Adirondack/Glens Falls Transportation Council.

dressed according to the requirements of 40 CFR Part 93 Subpart A (transportation conformity regulations).

4.10.4 Impacts of the No Action Alternative

In the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced and, in the short-term, the condition of the bridge would continue to worsen and delays would increase, possibly worsening air quality due to inefficient train and boating operations. In the No Action Alternative, two additional passenger trains would operate on the bridge in accordance with Amtrak's plans.

As described in **Chapter 1, "Project Purpose and Need,"** because of the bridge's design and condition, passenger and freight trains operating over the bridge are subject to loading and speed restrictions. This condition would remain in the No Action Alternative, and the two-track bridge would continue to be used by only one train at a time with reduced speed limits in place.

If the bridge eventually deteriorates to the point that it needs to be closed, this would require rail traffic to be re-routed via a longer route for trips north of Albany (this is discussed in **Section 2.3.1** in **Chapter 2, "Project Alternatives"**). In this scenario, passenger service to Albany-Rensselaer Station and Schenectady Station would be terminated, and some freight rail deliveries to customers on both sides of the Hudson River would need to be rerouted or shifted to trucks. This scenario would involve longer travel routes that would therefore result in increased air emissions associated with diesel trains, automobiles, or freight trucks.

4.10.5 Impacts of the Build Alternatives

The Project would allow an increase in the speed of trains operating across the bridge and would allow freight trains with heavier rail cars. Under the Build Alternatives, the new bridge would have the same track capacity as the existing bridge, one track in each direction. No increase in the number of trains each day is planned as a result of either Build Alternatives.

4.10.5.1 Localized Pollutants (Microscale Analysis)

Adverse impacts to local air quality would not result from the Build Alternatives. The alignment shift under either of the Build Alternatives would not bring rail operations notably closer to existing sensitive receptors than the existing alignment. No change in the amount of boat or train traffic would occur with the Build Alternatives compared to the No Action Alternative. Boats may experience shorter waits for bridge openings and there would be fewer delays due to bridge malfunction, which could reduce localized diesel emissions from boat traffic. Passenger and freight trains would operate at higher speeds. This more efficient operation would result in a decrease in diesel emissions. With a new bridge, freight trains could potentially carry heavier loads, although restrictions may currently exist elsewhere on the Empire Corridor to prevent the operation of heavier freight trains. Diesel emissions from heavier freight trains would not result in localized air quality impacts.

4.10.5.2 Regional Pollutants

The Project would not meaningfully affect regional pollutant burdens since it would not:

- Increase or decrease vehicle miles traveled;
- Generate additional or heavier train trips;
- Affect land use development patterns;
- Result in a shift in travel patterns; or
- Substantially increase or decrease automobile operating speeds.

Since transporting freight by rail is more efficient and less polluting than truck and barge, the long-term effect of the Project would be improved air quality.

4.10.5.3 Project-Level Conformity

The conformity requirements of the Clean Air Act and regulations promulgated thereunder limit the ability of Federal agencies to assist, fund, permit, and approve projects in non-attainment areas or maintenance areas that do not conform to the applicable SIP. Conformity is regulated under two categories—Transportation Conformity and General Conformity.

4.10.5.3.1 Transportation Conformity

Section 176(c) of the Clean Air Act of 1977, as amended (42 USC § 7506), forbids any department, agency, or instrumentality of the Federal government from engaging in, supporting in any way or providing financial assistance for, licensing or permitting, or approving, any activity which does not conform to a SIP after the activity has been approved or promulgated. As defined in Section 176(c)(1), conformity to an implementation plan means conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards; and that such activities will not:

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

Projects that are funded and approved by FRA are subject to the transportation conformity regulations at Subpart A of 40 CFR Part 93. As indicated above, the Project would not cause or contribute to any new violation of any NAAQS, increase the frequency or severity of any existing violation of any NAAQS; or delay the timely attainment of any NAAQS or any required interim emissions reductions or other milestone. Therefore, the Project would conform to the SIP.

4.10.5.3.2 General Conformity

In some cases, if construction non-road emissions are considered to not be included in the SIP (transportation conformity covers on-road emissions, and the SIP includes forecast growth for non-road construction engines), general conformity may also apply. A general conformity applicability analysis is required under Section 176(c) of the Clean Air Act since the Project would require Federal permits from USACE and USCG. An applicability analysis is the process of determining whether a Federal action (such as issuing a permit) must be supported by a general conformity determination. As described in 40 CFR § 93.153, the applicability analysis may find that a conformity determination is not required if, among other things, the Federal action:

- Is part of a continuing response to an emergency or disaster;
- Is covered by an existing transportation conformity determination;
- Will result in no emissions increase or an increase in emissions that is clearly *de minimis*;
- Is presumed to conform (e.g., based on comparisons with other projects); or
- Will result in total direct and indirect emissions of the criteria pollutants or precursors that is less than the *de minimis* rates contained in 40 CFR § 93.153(b). The *de minimis* rates applicable to the study area will be 50 tons of VOC, or 100 tons of NO_x, CO, $PM_{2.5}$, PM_{10}, or SO_2.

Actions taken by FRA, including a decision to fund or approve the Project, are subject to general conformity; therefore, general conformity would apply to the Project. An applicability analysis has been undertaken for the Project's construction, which is based on analyses prepared for much larger bridge replacement projects. Based on analyses for other projects, construction activities would not result in annual pollutant emissions exceeding the above general conformity thresholds.

For example, the Portal Bridge Capacity Enhancement Project Final EIS (FEIS)[107] included a conformity analysis for that project, which involved a rail bridge replacement along Amtrak's Northeast Corridor in northern New Jersey. According to FRA's ROD for that project, "the FEIS included an estimate of pollutant emissions based on capital construction costs and similar transportation projects within the region. It was determined that the estimated annual emission rates of each pollutant would be well below the conformity thresholds." The Portal Bridge project evaluated in that document included two bridges with multiple tracks, approximately 9,000 feet long each, at a total construction cost of $1.4 billion—which is much larger than the Livingston Avenue Bridge Project.

The Portal Bridge example illustrates why additional analysis is not needed. The construction means and methods are alike for both projects, but the scale of construction for the Livingston Avenue Bridge is much less intensive. Because freight traffic would not change with the proposed project, it is not a relevant consideration in the conformity analysis. Therefore, since the Portal Bridge project analysis concluded that that large construction project would have emissions below the general conformity thresholds, it can be concluded that construction emissions for the smaller Livingston Avenue Bridge Project would also be well below the general conformity thresholds, and that a conformity determination is not required for the Project.

4.10.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts on air quality. Therefore, measures to avoid, minimize or mitigate air quality impacts are not required.

4.11 Energy and Greenhouse Gas Emissions

4.11.1 Introduction

FRA and NYSDOT evaluated the potential long-term impacts of the Project on energy usage, greenhouse gas (GHG) emissions, and resilience by considering:

- The net energy usage of the Build Alternatives;
- Potential GHG emissions that would be generated by the Build Alternatives; and
- The ability of the new infrastructure to withstand the impacts of future severe weather events.

GHGs are those gaseous constituents of the atmosphere, both natural and manmade, which absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. Water vapor, carbon dioxide (CO_2), nitrous oxide, methane, and ozone are the primary greenhouse gases in the Earth's atmosphere. CO_2 is by far the most abundant and, therefore, the most influential GHG. CO_2 is emitted from any combustion process (both natural and manmade); from some industrial processes such as the manufacture of cement, mineral production, metal production, and the use of petroleum-based products; from volcanic eruptions; and from the decay of organic matter. CO_2 is removed (sequestered) from the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans. CO_2 is included in any analysis of GHG emissions. The total GHG impact can be measured as CO_2 equivalent (CO_2e), which is a sum of GHG emissions multiplied by a "global warming potential" (GWP)—a factor that weights the warming effectiveness of each pollutant relative to CO_2 (e.g., the GWP of CO_2 is 1, other GHGs have higher GWP).

[107] FRA. Portal Bridge Record of Decision, December 15, 2008. https://www.fra.dot.gov/eLib/Details/L01425.

4.11.2 Methodology

FRA and NYSDOT conducted the assessment consistent with guidance from the USDOT and FHWA regarding climate change, including but not limited to USDOT's adaptation plan[108] and USDOT's Climate Change Clearinghouse.[109] FRA guidance recommends that an assessment of irreversible and irretrievable energy resource commitment and the potential for energy conservation be performed as part of evaluations being conducted in accordance with NEPA. Consistent with Executive Order 12185, *Conservation of Petroleum and Natural Gas* (December 17, 1979), the assessment should focus on alternatives with the potential to conserve petroleum and/or natural gas. NEPA guidelines require a discussion of major direct energy (e.g., energy consumed by vehicles using a proposed facility) and/or indirect energy (e.g. construction energy, change in automobile use) impacts as well as the energy conservation potential of each alternative.

In accordance with NYSDOT's Energy Analysis Guidelines for TIPs and Long Range Plans, detailed energy and GHG analyses are performed only for regionally important projects. The Livingston Avenue Bridge Project is not identified as regionally important since it would not increase vehicle miles traveled. As a result, FRA and NYSDOT have determined that detailed energy and GHG analyses are not warranted. A qualitative assessment is also consistent with the Federal Transit Administration's (FTA) *Greenhouse Gas Emissions from Transit Projects: Programmatic Assessment.*[110]

4.11.3 Affected Environment

As discussed in NYSDEC's policy related to evaluations of energy use and climate change in environmental analyses, climate change will have broad impacts to the environment, including rising sea levels, increases in temperature, and changes in precipitation levels.[111] Although this is occurring on a global scale, the environmental impacts of climate change will also be experienced at local scales. New York State has established sustainability initiatives and goals for reducing GHG emissions and for adapting to climate change.

The Livingston Avenue Bridge currently induces energy use by passenger and freight locomotives and this energy use results in both direct and indirect GHG emissions. Since passenger and freight transportation by rail are substantially more efficient than on-road or in-water transportation, which are the most common alternatives, the net effect is lower energy use and GHG emissions. According to a 2009 study of rail and truck fuel efficiency, freight movement by rail is generally more efficient than by truck, with fuel efficiency ratio ranging from 1.9 to 5.5 on a ton-mile basis.[112] When accounting for factors such as route circuity and range, fuel savings can be considerable, ranging up to 1,100 gallons per carload.

As described in **Chapter 1, "Project Purpose and Need,"** the existing Livingston Avenue Bridge is structurally deficient, and as such, Amtrak and CSX must operate trains at slower speeds (15 mph) and at lower maximum weight along this segment of the Empire Corridor than elsewhere on the route. The one-track operation of the bridge can cause substantial delays to passenger and

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[108] USDOT. U.S. Department of Transportation Adaptation Plan 2014: Ensuring Transportation Infrastructure and System Resilience. 2014.

[109] USDOT. https://www.transportation.gov/sustainability/climate/about-center.

[110] FTA. Greenhouse Gas Emissions from Transit Projects: Programmatic Assessment. FTA Report No. 0097. January 18, 2017.

[111] NYSDEC. DEC Policy: Assessing Energy Use and Climate Change in Environmental Impact Statements. July 15, 2009.

[112] FRA, Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors, November 19, 2009.

freight rail traffic. The unreliable swing mechanism of the bridge results in unpredictable and substantial delays to both rail and river traffic.

4.11.4 Impacts of the No Action Alternative

Under the No Action Alternative, FRA and NYSDOT would not rehabilitate or replace the Livingston Avenue Bridge. In the No Action Alternative, the reduced efficiency that is occurring today would continue and could worsen. The potential for required closure and additional maintenance would increase, resulting in increased emissions from traffic shifted to on-road modes, as well as emissions associated with increased maintenance. If the bridge eventually deteriorates to the point that it needs to be closed, this would require rail traffic to be re-routed via a longer route for trips north of Albany (this is discussed in **Section 2.3.1** in **Chapter 2, "Project Alternatives"**). In this scenario, passenger service to Albany-Rensselaer Station and Schenectady Station would be terminated. This scenario would involve less efficient travel modes that would therefore result in increased energy consumption and related GHG emissions.

4.11.5 Impacts of the Build Alternatives

The Build Alternatives would replace the existing bridge with a new bridge, allowing passenger and freight trains that use the bridge to operate at higher speeds and carry heavier loads. The ability to increase speed across the bridge could result in increased fuel, and therefore, energy used to power locomotives. However, the new bridge would substantially improve the reliability of the freight rail network, and freight rail is a much more efficient mode of transport than trucks or barges. A shift in the mode of transport from truck or barge to rail would likely represent reduced net energy use. Overall, any changes associated with the Build Alternatives would be small but beneficial.

There would also be emissions associated with construction—both direct emissions from construction activity and indirect emissions associated with materials manufacture such as cement and steel. However, over the lifetime of the Project, these would be offset by the increased efficiencies in moving freight, with newer equipment that meets more stringent emissions requirements than the locomotives currently operating on the Empire Corridor, and a reduction of emissions due to improving the passage of boats beneath the bridge.

4.11.6 Avoidance, Minimization, and Mitigation

The Project would not cause an increase in GHG emissions from either bridge operations or rail operator use of the bridge over the long term. Since no adverse impacts would occur, no mitigation is required.

4.12 Noise and Vibration

4.12.1 Introduction

FRA and NYSDOT evaluated the potential noise and vibration impacts associated with the Build Alternatives by comparing existing noise levels with the projected future noise levels at sensitive receptors near the Project site. Ambient noise and vibration levels could change because of the shift in the rail alignment, increased number and speed of trains crossing the bridge, or increased weight of freight trains crossing the bridge. This section presents the evaluation of the potential for adverse noise and vibration impacts from the operation of the Project Alternatives. **Section 4.16.11** in **Section 4.16, "Construction Impacts,"** addresses the potential for construction-related noise and vibration impacts.

4.12.2 Methodology and Study Area

FRA and NYSDOT conducted the analysis by following the methodology developed by FTA and documented in *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018. To examine potential airborne noise and vibration and ground-borne noise impacts during operation, the FTA guidance lays out a three-step approach: a screening procedure to identify whether any sensitive uses are within distances that could be affected by the Project; general noise assessment and general vibration assessment methodology to identify locations with the potential for impacts; and, where appropriate, detailed methodology for each type of analysis.

4.12.2.1 Airborne Noise

FRA and NYSDOT conducted a general noise assessment in accordance with FTA guidance to evaluate the impacts of the Build Alternatives on airborne noise. This involves conducting a screening assessment to identify whether any noise-sensitive locations are present that could be affected by a project, and when such locations are present, conducting the general noise assessment to evaluate impacts.

The FTA guidance manual defines airborne noise impact criteria based on three noise-sensitive land use categories:

- **Noise Land Use Category 1:** Tracts of land where quiet is an essential element of the intended purpose;
- **Noise Land Use Category 2:** Residences and buildings where people normally sleep (where nighttime sensitivity to noise is greatest – e.g., homes, hospitals, and hotels); and
- **Noise Land Use Category 3:** Institutional land uses with daytime and evening use (e.g., schools, libraries, theaters, parks/recreational areas and churches where avoiding speech interference is critical).

In accordance with the FTA guidance, evaluation of noise impacts associated with rail projects is warranted when noise-sensitive land uses are within 750 feet of a rail line with a clear line of sight to the tracks, or within 375 feet of the rail line if there are intervening buildings. The noise metric used to characterize noise exposure at Category 1 and Category 3 sites is the hourly L_{eq}, or $L_{eq(h)}$. This hourly metric should represent the hour of noisiest railroad activity during hours of noise sensitivity. The noise metric used to characterize noise exposure at Category 2 land uses, where nighttime noise sensitivity is of concern, is the L_{dn}. This is a 24-hour day/night noise descriptor, which weights nighttime noise levels by adding a 10 dBA (A-weighted sound level) penalty during nighttime hours (10 PM–7 AM) to account for this noise sensitivity. FTA guidance identifies 65 dBA as the upper limit for acceptable noise levels for Category 1 and 2 land uses. The upper limit for acceptable noise levels is 70 dBA for Category 3 land uses, which are less sensitive to noise.

For the Livingston Avenue Bridge Project, FRA and NYSDOT conducted a general noise assessment to evaluate the impacts of the Project Alternatives on sensitive receptors within the screening distance, which include residences and Corning Riverfront Park in Albany, residences along Broadway adjacent to the bridge approach in Rensselaer, and future residences to be constructed along the Hudson River immediately north of the bridge in Rensselaer. The Corning Riverfront Park sensitive receptor represents the impacts in the portions of the park immediately adjacent to the rail right-of-way. Other locations in the park are farther from the Project site and would therefore experience less noise.

The general noise assessment methodology consists of determining the Project noise exposure (i.e., the noise generated by the Project alone) at 50 feet from the centerline of track, adjusting for distance (from the track to the receptor location), and comparing the calculated levels with impact criteria based on land use categories. FRA's Chicago Rail Efficiency and Transportation Efficiency (CREATE) model was used, which calculates hourly-equivalent (L_{eq}) and day-night (L_{dn}) noise

levels taking into account the type of trains (freight versus passenger, diesel versus electric), the number of locomotives on each train and length of train, the number of trains per day, the speed of the trains, characteristics of the track, and the time of day.

4.12.2.2 Vibration and Ground-borne Noise

The FTA guidance identifies three types of sensitive land uses for analysis of vibration and ground-borne noise:

- **Vibration Land Use Category 1: High Sensitivity**—Buildings where low ambient vibration is essential for the operations within the building, which may be well below levels associated with human annoyance. Typical land uses are vibration-sensitive research and manufacturing, hospitals, and university research operations.
- **Vibration Land Use Category 2: Residential**—This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals.
- **Vibration Land Use Category 3: Institutional**—This category includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

FRA and NYSDOT conducted a vibration screening analysis in accordance with the FTA guidance to identify whether any sensitive uses are within the specified screening distances—600 feet, 200 feet, and 120 feet, for Vibration Land Use Categories 1, 2, and 3, respectively. Based on a review of current aerial photography and land use maps, residences are within the vibration-screening distance (i.e., 200 feet) for both of the Build Alternatives. Consequently, a general vibration assessment was conducted. Impacts to vibration-sensitive land use were evaluated based on vibration and ground-borne noise criteria, which depend on the number of events of the same source per day. Ground-borne vibration is expressed in terms of vibration velocity levels in units of VdB, while ground-borne noise is expressed in terms of decibels (dB).

4.12.3 Affected Environment

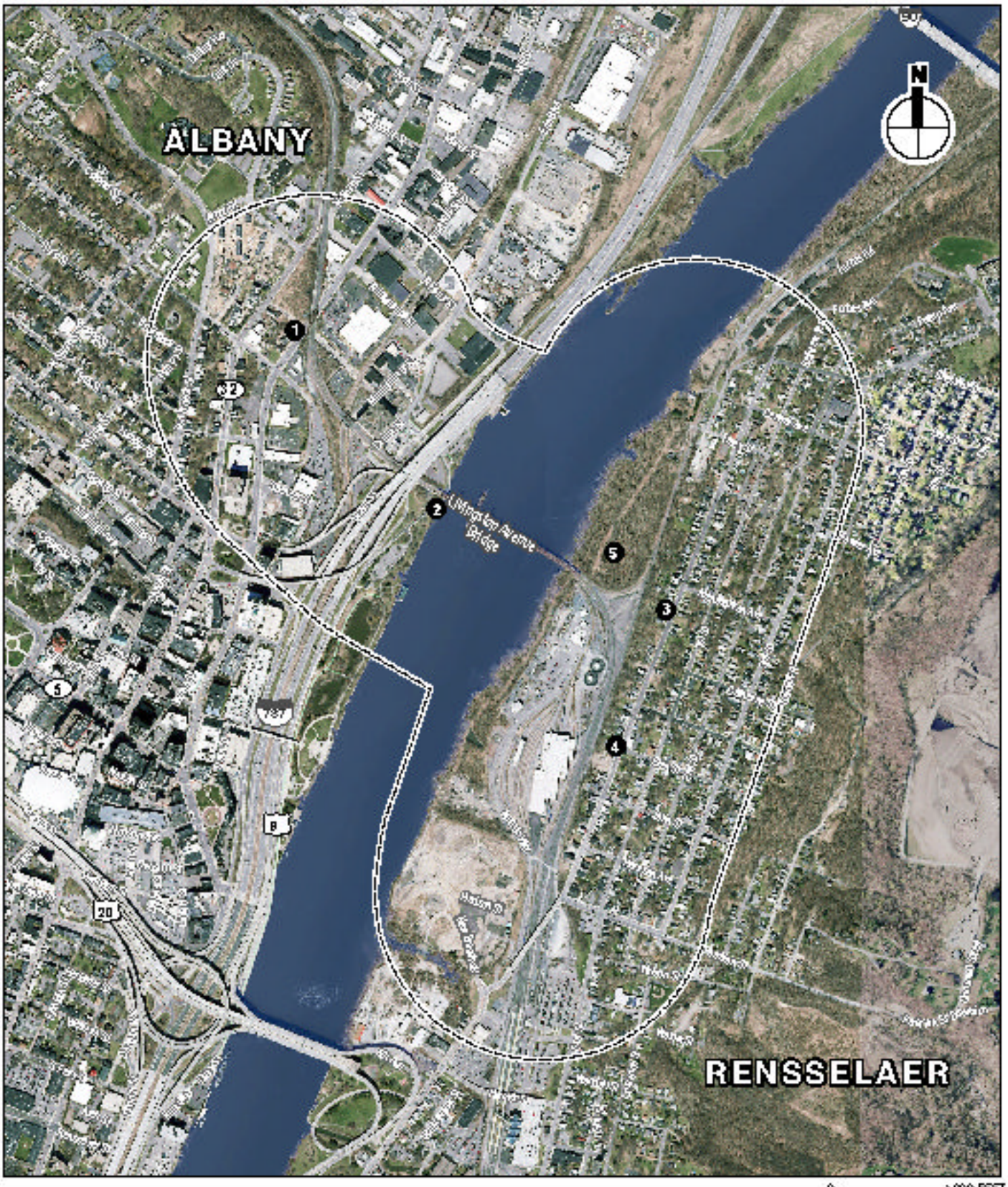
4.12.3.1 Airborne Noise

Exhibit 4.12-1 summarizes the existing train movements and train speed that were used in the CREATE model of existing conditions.

Exhibit 4.12-1
Existing Train Movements

Segment Description	Operator	No. Trains, Peak Hour	No. Trains, 7 AM–10 PM	No. Trains, 10 PM–7 AM	Number of Cars per Train	Number of Locomotives per Train	Maximum Speed (mph)
Western bridge approach in Albany	Passenger	3	12	2	8	1	30
Western bridge approach in Albany	Freight	1	3	3	12	1	30
Troy Industrial Track in Rensselaer	Passenger	3	6	2	8	1	15
Troy Industrial Track in Rensselaer	Freight	1	0	1	12	1	15
Eastern bridge approach in Rensselaer	Passenger	3	18	4	8	1	15
Eastern bridge approach in Rensselaer	Freight	1	3	4	12	1	15

Figure 4.12-1 shows the location of the five sensitive receptors that FRA and NYSDOT selected for the general noise assessment based on a review of aerial photographs and Albany and Rensselaer GIS data and tax assessment records. Due to their proximity to the Project site, these receptors represent the nearby sensitive noise receptors with the greatest potential to experience noise increases as a result of the Build Alternatives. Sensitive receptors farther from the Project site would be less likely to experience noise increases as a result of the Build Alternatives.



Noise Receptor Locations
Figure 4.12-1

Exhibit 4.12-2 presents calculated noise levels at the five receptor sites. Receptor 5 is currently a vacant, wooded area that is proposed for redevelopment with a large, multi-building residential complex, Kiliaen's Landing. FRA and NYSDOT calculated these noise levels based on the existing train movements in accordance with the general noise assessment methodology. Ambient noise levels at these receptors reflect current train activity.

Exhibit 4.12-2
Calculated Existing Noise Levels at Receptor Sites

Site	Location	Noise Land Use Category	Distance from Railroad (feet)	Noise Metric	Existing Noise Level*
1	Residences near approach tracks, Albany	2	122	Outdoor L_{dn}	69.0 dBA
2	Corning Riverfront Park, Albany	3	99	Outdoor $L_{eq(1)}$	70.9 dBA
3	Residences along Broadway north of bridge, Rensselaer	2	50	Outdoor L_{dn}	67.9 dBA
4	Residences along Broadway south of bridge, Rensselaer	2	30	Outdoor L_{dn}	74.7 dBA
5	Future location of Kiliaen's Landing residential development	2	80***	Outdoor L_{dn}	64.5 dBA

Notes:
* See **Figure 4.12-1** for receptor locations.
** Existing noise levels were calculated based on the existing train movements using the General Noise Assessment methodology in the FTA guidance.
*** Assumed minimum distance from rail tracks for the future development at Kiliaen's Landing.

4.12.3.2 Vibration and Ground-borne Noise

FRA and NYSDOT calculated existing vibration and ground-borne noise levels at the four residential sites (i.e., Sites 1, 3, 4, and 5) using the general vibration assessment methodology. FTA guidance does not apply to the park uses at receptor Site 2. **Exhibit 4.12-3** shows the existing vibration and ground-borne noise levels at the four residential receptor sites. Based on the analysis, neither vibration nor ground-borne noise levels currently exceed the FTA impact thresholds for Land Use Category 2 at Sites 3 or 4. However, the FTA impact threshold for ground-borne noise is exceeded at Sites 1 and 5 in the existing condition.

Exhibit 4.12-3
Existing Vibration and Ground-Borne Noise Levels

Receptor Site	Vibration Land Use Category	Ground-Borne Vibration Impact Assessment: FTA Impact Threshold (VdB)	Ground-Borne Vibration Impact Assessment: Vibration Level (VdB)	Ground-Borne Noise Impact Assessment: FTA Impact Threshold (dBA)	Ground-Borne Noise Impact Assessment: Total Noise Level (dBA)
1	2	80	79	43	44
3	2	80	74	43	39
4	2	80	76	43	41
5	2	80	79	43	44

4.12.4 Impacts of the No Action Alternative

4.12.4.1 Airborne Noise

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. In the No Action Alternative, two additional passenger trains would cross the bridge during the daytime. All other train characteristics (e.g., length, number of engines, etc.) would be the same as in the existing condition. **Exhibit 4.12-4** presents the results of the general noise assessment for the No Action Alternative. The No Action Alternative would not result in noise impacts at any of the receptors and future noise levels would be similar to that of the existing condition.

Exhibit 4.12-4
Noise Impact Evaluation of No Action Alternative (in dBA)

Receptor Site	Noise Land Use Category	Noise Descriptor	Existing Noise Level[1]	Impact Criteria for Project Noise Exposure:[2] Moderate Impact	Impact Criteria for Project Noise Exposure:[2] Severe Impact	No Action Alternative Project Noise Exposure Level	Total No Action Noise Level	Impact Assessment
1	2	L_{dn}	69.0	63.6	68.8	51.3	69.1	No Impact
2	3	$L_{eq(1)}$	70.9	65.0	70.1	0.0	70.9	No Impact
3	2	L_{dn}	67.9	62.8	68.1	44.1	68.0	No Impact
4	2	L_{dn}	74.7	68.1	72.9	58.1	74.8	No Impact
5	2	L_{dn}	N/A	60.5[3]	65.9[3]	N/A	64.5	No Impact

Notes:
1 Existing noise levels were calculated based on the existing train movements.
2 Threshold of Project-generated noise at which a moderate impact or severe impact would occur.
3 For a receptor that does not yet exist but would be constructed and occupied in the future, impact thresholds are based on predicted No Action noise levels.

4.12.4.2 Vibration and Ground-borne Noise

Exhibit 4.12-5 shows the general vibration assessment results for the No Action Alternative at the four future residential receptors. The No Action Alternative would not result in increased vibration levels at any of the sites. However, as in the existing condition, the FTA impact threshold for ground-borne noise would be exceeded at Sites 1 and 5 with the No Action Alternative. Ground-borne noise at Sites 3 and 4 would be within the acceptable range.

Exhibit 4.12-5
Vibration Impact Evaluation of No Action Alternative

Receptor Site	Vibration Land Use Category	Vibration Impact Assessment: FTA Impact Threshold (VdB)	Vibration Impact Assessment: No Action Vibration Level (VdB)	Vibration Impact Assessment: Impact?	Ground-Borne Noise Impact Assessment: FTA Impact Threshold (dBA)	Ground-Borne Noise Impact Assessment: No Action Noise Level (dBA)	Ground-Borne Noise Impact Assessment: Impact?
1	2	80	79	NO	43	44	YES
3	2	80	74	NO	43	39	NO
4	2	80	76	NO	43	41	NO
5	2	80	79	NO	43	44	YES

4.12.5 Impacts of the Build Alternatives

4.12.5.1 Airborne Noise

The Project would not result in an increased number of trains operating on the bridge compared to the No Action Alternative. However, train speeds would increase, with passenger trains operating at 40 mph and freight trains at 35 mph on the bridge and west approach tracks, and passenger trains operating at 30 mph and freight trains at 25 mph on the east approach tracks. On the wye track just east of the bridge, speeds would continue to be limited to 15 mph for passenger trains and 10 mph for freight trains (see **Section 2.4.2.7** in **Chapter 2, "Project Alternatives"**). Additionally, it is assumed that the Kiliaen's Landing development would not result in any residential uses within 80 feet of the railroad alignment, which would be necessary to avoid potential noise and vibration impacts.

Exhibit 4.12-6 presents the results of the general noise assessment for Build Alternative 1 at the five receptor sites. Build Alternative 1 would not result in noise impacts at any receptor. As described in **Section 2.4.2**, the Project under either Build Alternative would use continuous welded rail. This would eliminate the noise that results from jointed tracks and offset the change in noise levels due to the alignment shift and more frequent and faster train service than in the existing conditions. Total predicted Project-generated noise levels with Build Alternative 1 would be less than existing noise levels generated by the existing railroad (see **Appendix B-3, "Noise,"** for the complete analysis).

Exhibit 4.12-6
Noise Impact Evaluation of Build Alternative 1 (in dBA)

Receptor Site	Noise Land Use Category	Noise Descriptor	Existing Noise Level[1]	Impact Criteria for Project Noise Exposure:[2] Moderate Impact	Impact Criteria for Project Noise Exposure:[2] Severe Impact	Project Noise Exposure Level	Total Build Alternative 1 Noise Level	Impact Assessment
1	2	L_{dn}	69.0	63.6	68.8	0.0	64.1	No Impact
2	3	$L_{eq(1)}$	70.9	65.0	70.1	0.0	64.5	No Impact
3	2	L_{dn}	67.9	62.8	68.1	0.0	64.9	No Impact
4	2	L_{dn}	74.7	68.1	72.9	0.0	69.5	No Impact
5	2	L_{dn}	64.5[3]	60.5	65.9	0.0	61.5	No Impact

Notes:
1 Existing noise levels were calculated based on the existing train movements.
2 Threshold of Project-generated noise at which a moderate impact or severe impact would occur.
3 No Action noise level because this receptor does not yet exist.

Exhibit 4.12-7 presents the results of the general noise assessment for Build Alternative 2 at the five receptor sites. Build Alternative 2 would not result in noise impacts at any receptor. Similar to Build Alternative 1, Build Alternative 2 would use of continuous welded rail, which would eliminate the noise that occurs from jointed tracks and offset the change in noise levels due to the alignment shift and more frequent and faster train service. The total predicted Project-generated noise levels for Build Alternative 2 would be less than the existing noise levels generated by the existing railroad (see **Appendix B-3, "Noise,"** for the complete analysis).

Exhibit 4.12-7
Noise Impact Evaluation of Build Alternative 2 (in dBA)

Receptor Site	Noise Land Use Category	Noise Descriptor	Existing Noise Level[1]	Impact Criteria for Project Noise Exposure:[2] Moderate Impact	Impact Criteria for Project Noise Exposure:[2] Severe Impact	Project Noise Exposure Level	Total Build Alternative 2 Noise Level	Impact Assessment
1	2	L_{dn}	68.1	62.9	68.2	0.0	64.1	No Impact
2	3	$L_{eq(1)}$	70.9	65.0	70.1	0.0	70.4	No Impact
3	2	L_{dn}	67.9	62.8	68.1	0.0	63.2	No Impact
4	2	L_{dn}	74.7	68.1	72.9	0.0	69.5	No Impact
5	2	L_{dn}	64.5[3]	60.5	65.9	0.0	61.3	No Impact

Notes:
1 Existing noise levels were calculated based on the existing train movements.
2 Threshold of Project-generated noise at which a moderate impact or severe impact would occur.
3 No Action noise level because this receptor does not yet exist.

4.12.5.2 Vibration and Ground-borne Noise

Exhibit 4.12-8 presents the results of the general vibration assessment for Build Alternative 1. Build Alternative 1 would not result in adverse vibration or ground-borne noise impacts. As described in **Section 2.4.2**, the Project under either Build Alternative would use continuous welded rail. This would eliminate the vibration that occurs from jointed tracks and offset any increase in vibration related to the alignment shift or faster train service.

Exhibit 4.12-8
Vibration Impact Evaluation of Build Alternative 1

Receptor Site	Vibration Land Use Category	Vibration Impact Assessment: FTA Impact Threshold (VdB)	Vibration Impact Assessment: Action Vibration Level (VdB)	Vibration Impact Assessment: Impact?	Ground-Borne Noise Impact Assessment: FTA Impact Threshold (dBA)	Ground-Borne Noise Impact Assessment: Action Noise Level (dBA)	Ground-Borne Noise Impact Assessment: Impact?
1	2	80	74	NO	43	39	NO
3	2	80	71	NO	43	36	NO
4	2	80	77	NO	43	42	NO
5	2	80	78	NO	44	43	NO

Exhibit 4.12-9 presents the results of the general vibration assessment for Build Alternative 2. Similar to Build Alternative 1, Build Alternative 2 would not result in adverse vibration or ground-borne impacts. As with Build Alternative 1, Build Alternative 2 would use continuous welded rail, which would offset any increase in vibration related to the alignment shift or faster train service.

Exhibit 4.12-9
Vibration Impact Evaluation of Build Alternative 2

Receptor Site	Vibration Land Use Category	Vibration Impact Assessment: FTA Impact Threshold (VdB)	Vibration Impact Assessment: Action Vibration Level (VdB)	Vibration Impact Assessment: Impact?	Ground-Borne Noise Impact Assessment: FTA Impact Threshold (dBA)	Ground-Borne Noise Impact Assessment: Action Noise Level (dBA)	Ground-Borne Noise Impact Assessment: Impact?
1	2	80	74	NO	43	39	NO
3	2	80	69	NO	43	34	NO
4	2	80	77	NO	43	42	NO
5	2	80	77	NO	44	42	NO

4.12.6 Avoidance, Minimization, and Mitigation

Operation of the Build Alternatives would not result in adverse noise or vibration impacts. Therefore, no mitigation measures are required. Either Build Alternative would use continuous welded rail, which would avoid the potential for vibration that occurs from jointed tracks and offset any increase in vibration related to the alignment shift or increased speeds of train service.

4.13 Utilities and Infrastructure

4.13.1 Introduction

FRA and NYSDOT identified utilities and railroad infrastructure within the Project site that could be affected by the Build Alternatives. This section identifies the Project's impacts on existing utilities and the provisions needed to address any conflicts with local utilities.

4.13.2 Methodology and Study Area

FRA and NYSDOT identified existing utilities through a review of utility record drawings and base maps obtained from a variety of utility providers, and conducted utility surveys to verify the location of the utilities in the Project site. This review was last conducted in 2015, and will be repeated by NYSDOT during final design. Utilities are defined as privately, publicly, or cooperatively owned lines, facilities or systems for producing, transmitting, or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity, including any fire or police signal system or street lighting system, which directly or indirectly serves the public.

4.13.3 Affected Environment

The Livingston Avenue Bridge has electric service to power the swing span, navigational lighting, track signalization equipment, and the swing bridge operations office. A City of Rensselaer sewer pipeline, an underground fiber optic service line, and a Niagara Mohawk Power Corporation power line cross the railroad right-of-way near the bridge.

Exhibit 4.13-1 lists the known overhead and underground utilities within the existing railroad right-of-way.

Exhibit 4.13-1
Utilities Affected by the Build Alternatives

Owner	Type	Location/Side	Length
CSX	Overhead power and lights	Parallel to tracks in railroad right-of-way and on bridge	750 feet
CSX	Buried (approaches) and overhead (bridge) communication (signal)	Parallel to tracks in railroad right-of-way and on bridge	N/A
New York State Office of Technology	Fiber optic	Crosses the railroad right-of-way	N/A
Niagara Mohawk Power Corporation	Overhead power	Crosses the railroad right-of-way on the east bank of the river	N/A
Rensselaer County Sewer District	Sewer main	Crosses the railroad right-of-way on the east bank of the river	N/A

4.13.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The No Action Alternative would not result in any adverse impacts to existing utilities or railroad infrastructure because there would be no new construction and the additional train operation will not impact existing utilities.

4.13.5 Impacts of the Build Alternatives

The Build Alternatives would involve the replacement of the CSX-owned overhead power, lights, signal cable, and track control equipment. The existing bridge would be powered from the Albany side of the bridge during construction. The new bridge would be temporarily powered from the existing bridge during construction before the new bridge is complete from abutment to abutment. NYSDOT would schedule any temporary power outages on the bridge to avoid interruption to rail traffic.

Both Build Alternatives would likely require relocation of the fiber optic line that crosses the railroad right-of-way and passes in front of the west abutment of the existing bridge adjacent to Quay Street. The construction contractor would install a new fiber optic line while maintaining service on the existing line. A short-term disruption in service would be required to switch over to the new line, which NYSDOT would schedule in coordination with the service provider to minimize customer inconvenience.

Due to the location of proposed pier and abutment footings, Build Alternative 1 would require relocation or temporary protection of the overhead power line owned by Niagara Mohawk Power Line Corporation and the sewer main maintained by the Rensselaer County Sewer District. FNYSDOT would coordinate the design of Build Alternative 2 with the planned riverfront trail system to avoid impacts to these utilities.

For all utility relocations, NYSDOT would enter into a utility relocation agreement with the affected provider and would seek to minimize service interruptions. Neither Build Alternative would result in any adverse impacts on railroad infrastructure, utilities or utility services.

4.13.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts to utilities or infrastructure and therefore would not require any mitigation. NYSDOT's contractor would perform all work related to the protection or relocation of existing utilities in accordance with utility agreements between NYSDOT and the owner of the utility.

4.14 Contaminated Materials

4.14.1 Introduction

FRA and NYSDOT assessed the likelihood of encountering contaminated materials at the Project site and the potential for exposure to them during and after construction of the Build Alternatives. Contaminated materials are defined as potentially harmful substances that may be present in soil, groundwater, sediment, surface water, or building materials and may pose a threat to human health or the environment. Soil and groundwater can be contaminated due to past or present uses on a project site or on neighboring properties. The assessment is summarized below. Specific methods that would be employed to protect public health, worker safety, and the environment in the event that contaminated materials are encountered during Project construction are discussed in **Section 4.16.13** in **Section 4.16, "Construction Impacts."**

4.14.2 Methodology and Study Area

A contaminated materials site screening was conducted in accordance with NYSDOT's *The Environmental Manual* (TEM)[113] to evaluate the potential presence of contaminated materials at the Project site. The screening included the following:

- An environmental database search consistent with current industry standards, including American Society of Testing and Materials (ASTM) E1527-13 (the databases searched were consistent with the standard although this study does not constitute a comprehensive Phase I Environmental Site Assessment). A report summarizing the environmental database search was prepared by Toxics Targeting, Inc. of Ithaca, New York. A copy of the report is attached as **Appendix B-6, "Contaminated Materials."**
- A review of historical fire insurance maps to determine previous on-site and adjacent land uses.
- A site reconnaissance and general characterization from public rights-of-way.
- A review of plans provided by CSX and NYSDOT's design engineers for the Livingston Avenue Bridge to identify the likelihood of encountering asbestos-containing materials (ACM), and PCB-containing electrical equipment on the bridge.
- A determination of the need for further investigations to identify and quantify potential contamination and related liabilities.

4.14.3 Affected Environment

In 1984, USEPA declared 200 miles of the Hudson River a CERCLIS (i.e., Superfund) site based on the historic release of PCBs into the river.[114] From approximately 1947 to 1977, GE released as much as 1.3 million pounds of PCBs from its capacitor manufacturing plants at the Hudson Falls and Fort Edwards facilities directly and indirectly into the Hudson River.[115] Information regarding the Hudson River PCBs site was compiled by Toxics Targeting and included in **Appendix B-6, "Contaminated Materials."** PCBs in sediment or surface water are addressed in **Section 4.7, "Water Resources."**

In addition to the potential PCB-contaminated sediment in the Hudson River, FRA and NYSDOT identified the following concerns related to contaminated materials in and near the Project site:

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[113] New York State Department of Transportation, *The Environmental Manual* (2010).

[114] CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) is a database maintained by USEPA as part of the Superfund program.

[115] https://www.epa.gov/hudsonriverpcbs.

- Numerous sites currently have, or once had, petroleum above-ground storage tanks (ASTs) and/or underground storage tanks (USTs) containing fuels. Some of these tanks have been removed, and others, although no longer in use, may remain buried in place or within basements. Reported and unreported spills from such tanks nearby may have affected subsurface conditions at the Project site, particularly any tanks at the Amtrak Maintenance Facility in Rensselaer and Quackenbush Square in Albany.
- Bedding and ballast on the rail right-of-way could be contaminated due to anthropogenic fill materials (of unknown origin) and/or releases from railroad operations (including both routine herbicide use and releases from locomotives or equipment repair activities). Fill material of unknown origin was used to fill areas of Albany Basin, Little Basin, and Erie Canal in the study area (north of the existing Livingston Avenue Bridge).
- The railroad ties and bridge timbers within the Project site likely include creosote-treated wood. New York State Law (ECL Article 27, Title 25) exempts railroads from phasing out the use of creosote and creosote-treated products, but proper management of removed creosote-treated wood is required.
- Based on the age of the existing bridge, and the document/drawing review, lead-based paint, ACM, and PCB-containing electrical equipment are likely present on the bridge.
- In addition to materials on the bridge, any existing subsurface utility lines, whether currently used or remaining from historical operations, may be coated with asbestos or encased in "transite," an ACM.
- Auto-related, train-related, and industrial facilities have historically occupied the study area. Reported and unreported spills from these sites may have affected local groundwater quality.

According to the Albany Community Development Agency, the Corning Preserve Tidal Ponds in Corning Riverfront Park in Albany was identified as a potential Brownfield Opportunity Area (BOA) in 2004. Based on recommendations from Albany Community Development Agency personnel and community input, the site was selected for further investigation. A grant application package for further inventory and investigation was submitted under the NYSDOS BOA program. The site is no longer listed on the NYSDOS BOA list at the time of this report.[116] The City of Albany is currently in the process of nominating the North Warehouse District, which includes most of the Project study area in Albany, to the state BOA list.[117]

4.14.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. The No Action Alternative would not result in adverse impacts related to contaminated materials. Applicable regulatory requirements relating to management of lead-based paint (on existing painted surfaces) and known or potentially PCB-containing items (e.g., transformers and other electrical equipment), would be followed for any maintenance work. Remediation of sites already known to regulatory agencies would continue.

4.14.5 Impacts of the Build Alternatives

Based on the records review and past and current land use on and near the Project site, contaminated materials are likely to be encountered during Project construction. The measures that NYSDOT will require the contractor to implement during construction to avoid impacts related to contaminated materials are described in **Section 4.16.13** in **Section 4.16, "Construction Impacts."** With implementation of these measures, no adverse impacts related to contaminated materials would result during construction and demolition activities.

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[116] http://opdgig.dos.ny.gov/#/map/BOA.

[117] https://www.albanynywaves.com/.

Following completion of the Project, rail operations across the bridge would not be notably different from the No Action Alternative or the existing condition.

4.14.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts related to contaminated materials with the implementation of the best management practices and adherence to Federal, state, and local laws described above. Therefore, no mitigation is required.

4.15 Safety and Security

4.15.1 Introduction

FRA and NYSDOT have reviewed safety and security considerations related to the design and operation of the Project.

4.15.2 Methodology and Study Area

FRA guidance requires that environmental reviews address safety and security concerns, including potential pedestrian and traffic hazards as well as transit user and employee security issues. Specific regulations relevant to safety and security are discussed below. The safety procedures and security systems that Amtrak implements to protect rail employees, passengers, river traffic, and the general public are described below.

4.15.3 Affected Environment

4.15.3.1 Pedestrians, Bicycles, and Vehicular Traffic

Pedestrians trespass on the bridge for access across the Hudson River between Albany and Rensselaer. The only other nearby pedestrian crossing over the river is at the Dunn Memorial Bridge, but it is less desirable as a crossing in many ways: it is significantly higher and longer than the Livingston Avenue Bridge and farther from many destinations in Albany and Rensselaer. The trespassing is a safety concern for Amtrak and CSX. Warning signs are at either end of the bridge to alert against trespassing, but there are no other security or protection measures in place at this location. Trespassing is not only a burden to rail operations, but it also impacts the opening of the bridge to allow for the passage of waterborne traffic.

A vehicular accident analysis was performed for streets that may be affected by construction activities for the Build Alternatives. This information is presented in **Section 4.16.4.4** in **Section 4.16, "Construction Impacts."**

4.15.3.2 Employees

Amtrak and CSX comply with all applicable Federal safety regulations and industry standards, including FRA 49 CFR Part 214: Railroad Workplace Safety; FRA 49 CFR Part 237: Bridge Safety Standards; National Fire Protection Association (NFPA) regulations; OSHA regulations; and AREMA regulations. Signaling and communications are currently in place to prevent any trains from entering the bridge when the movable span is open or when personnel are on site for repairs. Personnel undergo Amtrak safety training before they are permitted on site. Amtrak inspects all bridge structural components regularly and repairs them as needed.

In 2006, Amtrak instituted a System Safety Program that applies to all Amtrak facilities, including the Project site. The program provides guidance on hazard management, incident reporting, inspection, maintenance and repair of current facilities and stock, training and certification, emergency response, environmental management, drug and alcohol programs, and a number of security policies. One section of the System Safety Program is devoted to employee safety, with a particular focus on field safety.

4.15.3.3 Passengers

There are no recorded rail accidents within the railroad right-of-way or high rail accident locations within the study area. Amtrak maintains and updates a Passenger Train Emergency Response Plan, approved by FRA. The plan includes train operations on the Empire Corridor and therefore also covers the Project site. Amtrak also conducts Passenger Train Emergency Response Training.

4.15.3.4 Boat Traffic

Navigational collisions, while rare, are also a concern for the railroads. In January 2019, chunks of river ice tore several boats from their moorings upriver of Albany. The unmoored boats traveled downstream, striking several bridges, and one boat, a passenger cruise ship, became lodged against the Livingston Avenue Bridge.[118] Trains operated at slow speed over the bridge for several hours until the bridge was inspected and the speed restrictions were lifted.

4.15.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Livingston Avenue Bridge would not be rehabilitated or replaced. Amtrak and CSX would continue to adhere to current regulations regarding worker and passenger safety. The No Action Alternative would not improve safety or security in the Project site.

4.15.5 Impacts of the Build Alternatives

FRA and NYSDOT have performed a preliminary hazard analysis to assess all possible hazards associated with the Build Alternatives. The preliminary hazard analysis found that a replacement bridge would provide enhanced safety and security versus the existing condition. NYSDOT will undertake a final hazard analysis during the Project's final design.

4.15.5.1 Pedestrians, Bicycles, and Vehicular Traffic

Pedestrian and bicycle safety would be improved through the provision of the shared use path on the bridge, which would eliminate the current safety concern regarding trespassing. The path would be 12 feet wide to provide two-way pedestrian and bicycle traffic across the river. It would have a bicycle-height railing on the outboard side and a pedestrian security fence and bicycle-height railing on the inboard side to prevent unauthorized access from the walkway onto the railroad tracks. The walkway would include scenic overlooks at each end of the movable span to provide an area for pedestrians to collect and bicyclists to dismount when the bridge is opening/closing and the walkway gates are closed. The walkway would have additional lighting, cameras, and other security devices to ensure safe operation of the movable bridge span and prevent pedestrians and bicyclists from being on the movable span during operation.

The shared use path approach ramps would connect to existing or proposed surface shared use paths. The approach ramps would descend at a maximum grade of 5 percent and widen to a 14-foot walkway once off of structure per the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Pedestrian Facilities and Americans with Disabilities Act.

The Build Alternatives would not require any permanent modifications or impacts to the streets and highways near the Project site. Both Build Alternatives would shift the western abutment of the rail bridge from its existing location, which would improve sightlines and traffic safety along Quay Street.

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[118] https://www.timesunion.com/news/article/Breaking-Bridges-closed-after-boats-get-loose-in-13560816.php.

4.15.5.2 Construction Employees

Construction and operation of the Project would comply with all relevant Federal, state, and local safety regulations, including: FRA 49 CFR 214: Railroad Workplace Safety; FRA 49 CFR 237: Bridge Safety Standards; NFPA regulations; OSHA regulations; and AREMA regulations.

During construction of the Project, NYSDOT would develop written Safe Work Plans to identify potential hazards and safety measures to be implemented for the protection of workers at the Project site and the general public in the vicinity of the Project.

Examples of specific safety design elements for the Project include:

- Manufacturer-recommended work areas, service clearances, and staging requirements for all bridge operation equipment.
- Fire Department approvals and/or permits as may be required for systems and equipment such as: diesel fueling system, sprinkler and standpipe systems, and certain air conditioning systems and air compressors.
- Material Safety Data Sheets (MSDSs) for paints, coatings, sealers, and chemical substances.

With the implementation of the safety measures described above, no adverse impacts to safety or security of employees would result from the Project.

4.15.5.3 Passengers

The Build Alternatives would improve the structural and operational reliability of the existing Livingston Avenue Bridge and increase the safety of the freight and passenger trains traveling over the bridge.

4.15.5.4 Boat Traffic

The Build Alternatives would provide navigational benefits by improving the reliability of the bridge and minimizing delays during bridge openings and closings. To prevent and/or minimize future accidents due to an off-center channel, navigation channel fenders and a dolphin system would be incorporated to protect the piers from all aberrant vessels.

4.15.6 Avoidance, Minimization, and Mitigation

The Build Alternatives would not result in adverse impacts related to operational safety or security; therefore, no mitigation is required.

4.16 Construction Impacts

4.16.1 Introduction

This section describes the anticipated construction process for the Build Alternatives and assesses the potential for temporary adverse environmental and socioeconomic impacts during construction. Both Build Alternatives would likely be constructed using the same general construction sequencing and methods. This section includes: a discussion of key Project construction elements; an overall description of the construction sequencing and the estimated Project schedule; and an analysis of the potential for temporary impacts during the construction period. The No Action Alternative would not involve any construction and is therefore not discussed in this section.

This section includes a general description of the construction means and methods anticipated for the Project. These are based on the preliminary engineering and NYSDOT's past experience on similar projects. While the construction techniques used for the Project would ultimately be determined by the contractor, the potential for environmental impacts and types of mitigation measures described herein would likely be the same.

4.16.2 Construction of Key Elements

Construction of the new bridge under either Build Alternative would involve mobilization and establishing staging areas, installing bridge piers and abutments, building the superstructure, reconstructing the wye track and potentially modifying the Troy Industrial Track, modifying the Water and Centre Street bridges, and decommissioning and removing the existing bridge once rail traffic is moved onto the new bridge.

4.16.2.1 Construction Staging Areas

As with many major transportation infrastructure construction projects, staging areas would be determined by NYSDOT's construction contractor. A likely location for a primary construction staging area would be on the property adjacent to the Livingston Avenue Bridge in Rensselaer where the City of Rensselaer is proposing a new residential development, Kiliaen's Landing. If the portion of the development site would be available for the duration of Project construction, this would be a convenient construction staging site. An access road would be constructed from Tracy Street to the staging area (see **Figure 4.16-1**), a distance of approximately 1,100 feet, using an existing utility easement/corridor. Access to the staging area from the south could also be provided via the Amtrak maintenance yard to the south of the existing bridge. This staging location would provide water access for material and equipment deliveries via barge. The water in this area is too shallow for barges to reach the shoreline, so a temporary pier (also referred to as falsework) that extends to the navigation channel could be erected. The pier would likely consist of a temporary pile bent structure constructed span by span with the pile driver/crane walking out on each span to construct the next span. (Use of a temporary gravel causeway would be preferred from a construction standpoint but would result in the potential for adverse impacts to submerged aquatic vegetation and fish spawning habitat, if they are present in the area.)

The pier needed for Build Alternative 1 would likely be 20 feet wide and 150 feet long from the edge of the river's eastern shoreline, and would be to the north of the existing bridge. The pier needed for Build Alternative 2 would likely be 20 feet wide and 100 feet long and located south of the existing bridge. The contractor would design the pile bent structure, but it is likely to consist of a platform supported on 14-inch-diameter steel piles, with four to five piles per bent (i.e., a row of piles fastened by a pile cap or bracing that run across the width of the platform). This would result in an estimated seven spans with four to five piles each for Build Alternative 1 and five spans with four to five piles each for Build Alternative 2. The piles would be installed using pre-drilling and vibratory hammering, if necessary after pre-drilling, to the greatest extent practicable. If necessary, the piles would be driven the last few feet to their final depth using an impact hammer in conjunction with a soft start and cushion block. Overall, pile installation for the temporary pier would occur over a duration of about 5 weeks. The in-water construction zone would be surrounded by a turbidity curtain during pile installation and pile removal to limit adverse impacts to water quality away from the zone.

The temporary pier would be installed prior to work on the new bridge's eastern approach piers. The pile installation equipment, excavators, and cranes would use the temporary pier during cofferdam and bridge construction. For either Build Alternative, the pile bent structure would be needed for the entire construction period and would be removed when the construction of the replacement bridge is complete, including full removal of all piles. This temporary pier would facilitate the delivery of concrete and other material. A temporary haul road to construction access would be constructed between the pier and Amtrak yard.

An off-site staging area would be used for the erection of the float-in spans and lift tower sections. The primary mode of transport between the off-site staging area and the on-site staging area would likely be barges. During construction, the barges would be moored using four 14-inch square spud piles pushed 5 to 10 feet into the river bottom. Additional means to drive the spud piles to the desired depth would only be used as necessary and would likely comprise use of equipment available on the barge to push or hammer them to the desired depth. If hammering is

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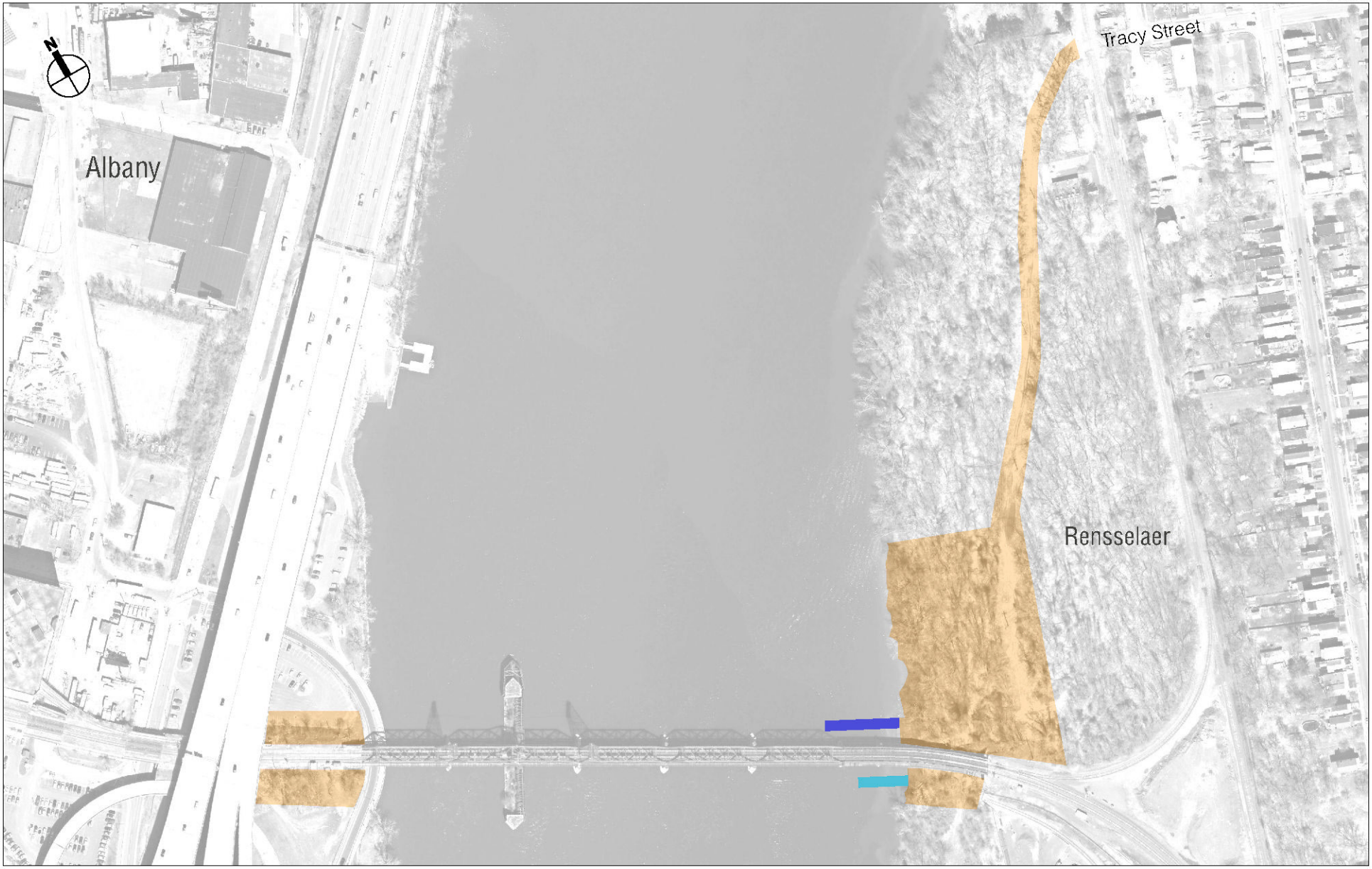

Construction Staging Area and Acess Route (Alternatives 1 & 2)

In-Water Temporary Pier (Alternative 1)

In-Water Temporary Pier (Alternative 2)

0 250 FEET

Construction Staging Areas

Figure 4.16-1

required, a cushion block would be used. The barges would move throughout the site for the duration of construction. For Build Alternative 2, a smaller construction staging area would also be required just to the south of the existing bridge along the eastern shoreline (part of the Amtrak property just north of the maintenance facility).

In addition to the primary staging area and the off-site staging area, temporary construction staging space would also be needed on the west side of the Hudson River in Albany. A likely location for this staging site is in the area between Quay Street and I-787 (state-owned property to the north and south of the existing bridge). Partial closure of NYSOGS Lot 11 under the I-787 overpass would be required and approximately 20 parking spaces in the parking lot just north of the existing bridge would be displaced during the construction period.

4.16.2.2 Bridge Piers

The new bridge piers would most likely be supported by steel H-piles. However, the use of drilled shafts or mini-piles is also possible. NYSDOT will require the use of pile installation that limits vibration near the existing bridge, to avoid potential damage to that structure. The specific pile installation measure will be determined during final design after a detailed geotechnical study is performed to determine the susceptibility of the existing structure to vibration. Piers would be constructed by installing a steel sheet pile cell by vibration hammering and creating a concrete tremie seal,[119] dewatering the cell, dredging inside the cell to the required depth, and then installing the pile within (the contractor would potentially elect to instead install the deep foundations first, and then dredge, based on his/her chosen equipment). Water recovered during dewatering within the sheet pile cells would be treated as necessary prior to discharge back to the Hudson River.

Based on the likely footprint area of each sheet pile cell and the total depth of excavation including the depth of the concrete tremie seal, approximately 19,500 cubic yards of dredged material would be removed during construction of the nine piers associated with Build Alternative 1 (northern alignment). Approximately 14,500 cubic yards of dredged material would be removed during construction of the eight piers associated with Build Alternative 2 (southern alignment). Dredged material would likely be placed in a dump scow, dewatered, and then transported for disposal in compliance with applicable regulations. Approximately 20 to 25 disposal trips would occur over the course of construction. Installation of the bridge piers, including the dredging efforts, would take approximately 12 months.

4.16.2.3 Abutments

The new bridge abutments would also likely be supported on steel H-piles. The H-piles would be installed using land-based equipment. A small amount of excavation dewatering could potentially be required, depending on the elevation of groundwater near the shoreline. Any discharge would be treated prior to being returned to the river.

4.16.2.4 Superstructure

Once the bridge piers are in place but prior to construction of the superstructure, Build Alternative 1 (replacement on an adjacent north alignment) would require modification to the existing Livingston Avenue Bridge so that the swing bridge could continue to operate without interference from the new structure to its south. Specifically, the existing swing span would be modified so that it could swing in the opposite direction.

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[119] A tremie seal is a concrete slab at the bottom of an excavation area that, in combination with containment around the area, minimizes water intrusion into the area. The tremie seal is installed underwater and after it has hardened, the excavation can be dewatered.

Both Build Alternatives would require staged construction of the approach spans, where the new bridge would tie into the existing bridge (see **Section 4.16.3** for a discussion of staging).

For either Build Alternative, the new bridge superstructure truss spans would be constructed on barges at the off-site staging area and floated into place. The shorter girder spans would be placed using barge- or track-mounted cranes to lift the individual spans into place.

4.16.2.5 Channels and Fenders

The dolphin and fender system that would protect the bridge piers would be installed using barge-mounted equipment after the existing bridge has been entirely removed. The fender piles would comprise about 60 14-inch diameter piles made of either timber or fiberglass composite and would be installed using pre-drilling followed by vibratory hammering. Dolphins would be constructed as sheet pile cells, which would be installed using a vibratory hammer. Installation of the dolphin and fender system would take approximately 6 months.

4.16.2.6 Wye Track and Other Track Work

Following construction of the new bridge and prior to decommissioning and removal of the existing bridge, the bridge tracks would be tied into the existing approach tracks east and west of the bridge. In Rensselaer, the wye track alignment for Build Alternative 2 (southern alignment) would be slightly shifted from the existing wye track alignment. Build Alternative 1 (northern alignment) would require a more substantial shift in the location of the wye track alignment, along with raising the elevation of the Troy Industrial Track (where the mainline tracks swing close to the industrial track). Since the work would be farther from the existing alignment, the new wye track alignment for Build Alternative 1 would require a less staged construction than Build Alternative 2.

Build Alternative 1 would require that the profile of the Troy Industrial Track between the mainline and wye tracks be increased. The profile would likely be adjusted incrementally using overnight and weekend track outages.

In addition, the shared use path would be tied in to existing shared use paths on both sides of the river. Retaining walls would be constructed to support the shared use path as it slopes down to grade.

4.16.2.7 Water and Centre Street Rail Bridges

Both Build Alternatives would require changes to two rail bridges in Albany, the bridges over Water and Centre Streets. As described in **Section 2.4.2.6.1** in **Chapter 2, "Project Alternatives,"** at each of those bridges, the beam seats of the bridge abutments that support the bridge girders (i.e., the beam seats and girder bearings) would be modified or replaced and several pairs of deck girders (i.e., bridge beams) would be repositioned to support the new alignment. At the Water Street bridge, a set of existing deck girders would be removed to accommodate this shift. Under either Build Alternative, the beam seats and girder bearings would be modified or replaced. This would be accomplished by building a temporary support frame in front of the bridge abutments and then replacing the beam seat concrete. Once that is complete, modifications to deck girders would be made, including removing one girder pair from the Water Street bridge and shifting girder pairs on both bridges to shift the track locations. Existing tracks would also be realigned on trackbeds that are not relocated.

4.16.2.8 Existing Bridge Decommissioning and Removal

Decommissioning and removal of the existing bridge would occur once the new bridge is fully operational. The means and methods for decommissioning and removing the existing Livingston Avenue Bridge and its approaches would be determined by the construction contractor. The bridge superstructure could be removed span-by-span using a barge and a multi-wheeled crawler or crane and then transported to and disassembled in the staging yard. Several of the existing pier

footings are elevated from the river bottom and surrounded by a sheet pile cell. The existing stacked stone piers would likely be pulled apart with an excavator situated on a barge, without the use of cofferdams. The excavator could then pull out the pier footings and the timber piles would be cut off below the mud line.

4.16.2.9 Material Transport and Debris Removal

A combination of modes (e.g., barge, rail, and truck) would be used for material transport and debris removal. All materials would be disposed of in accordance with applicable regulations.

4.16.2.10 Vessels

In-water construction activities would be supported by an estimated six boats, including one crew boat, one safety boat, up to two staging barges, and two tug boats. Vessel drafts would range from 5 to 10 feet. Most of these boats would operate between the construction zone and a suitable landing site for construction activity, such as the Port of Coeymans, an industrial marine terminal on the Hudson River approximately 12 miles south of the Livingston Avenue Bridge. Vessel speeds are expected to be less than five knots for push boats and tugs and less than 10 knots for crew boats working within the immediate vicinity of the bridge.

4.16.3 Construction Schedule and Sequencing

4.16.3.1 Construction Schedule

The entire construction period would last approximately three years. More specifically, construction of Build Alternative 1 (northern alignment) would likely extend 3 to 3.5 years. Build Alternative 2 (southern alternative) would likely extend 2.75 to 3 years. The general construction schedule discussed here is typical for a movable rail bridge replacement project. To some extent, the nature of in-river work limits equipment access and feasible construction techniques. The actual Project schedule will require consideration of in-water work restrictions and other limitations intended to protect fish spawning, fish migration, birds, and/or other considerations. Such restrictions and construction work windows would be defined and formalized during the preliminary design and permitting stage.

Construction activities would typically occur between 7 AM and 7 PM on weekdays. However, some time-critical activities may occur overnight and on weekends. In addition, construction activities that would affect active rail tracks (i.e., the Empire Corridor, Troy Industrial Track, and the wye) would be staged to occur overnight and on weekends to avoid disruptions to train service.

4.16.3.2 Construction Sequence

The new replacement bridge would be constructed alongside the existing bridge. When it is complete and connecting tracks have been tied in to the existing Empire Corridor and Troy Industrial Track, train traffic would be shifted to the new bridge, and the old bridge and its tracks would be removed. While construction means and methods for the Project would be ultimately determined by the contractor, the potential staging for each Build Alternative would likely be similar to the description below. Additional construction information and drawings are presented in **Appendix A-3, "Conceptual Staging."** Both Build Alternatives would involve:

- Mobilization and staging;
- Construction of bridge piers, bridge abutments, and approach tracks within 14 feet of active tracks;
- Installation of the bridge spans, lift, and rail on new structure, with the exception of the span near the existing swing span to maintain the navigation channel;
- Reposition existing girders on Water Street and Centre Street bridges;

- Float in truss span at the existing swing span;
- Completion of rail installation and switchover to new bridge; and
- Demolition of existing bridge.

In addition to the construction elements above, Build Alternative 1 would also require retrofitting the existing swing span to swing in the opposite direction as an early stage before construction of bridge piers, abutments, and approach tracks.

4.16.4 Transportation

4.16.4.1 Rail Traffic

The majority of track work affecting the existing Empire Corridor, Troy Industrial Track, and wye tracks would be performed during nighttime closures to minimize disruptions to rail traffic. Nonetheless, the construction of either Build Alternative would involve some disruption to rail traffic. Build Alternative 1 (northern alignment) would maintain through train traffic at all times and would require two weekend track closures on the Troy Industrial Track and wye tracks. Build Alternative 2 (southern alignment) would require three nighttime closures to all train traffic, one nighttime closure, and two additional weekend track closures on the Troy Industrial Track and wye tracks. All track closures impacting through trains would occur at night. Both Build Alternatives would require two major weekend track outages (i.e., for more than 12 hours).

4.16.4.2 River Traffic/Navigable Waters

Impacts to river traffic during the construction period would be minimized through a combination of float-in/float-out techniques (e.g., off-site assembly of new bridge spans) and construction staging. Some limited closures to river traffic would be required. For Build Alternative 1, closures totaling approximately four days are required (two closures of two days each), and for Build Alternative 2, a single two-day closure of the navigation channel would be required. These closures would be properly noticed through the USCG and other appropriate agencies. Overall, the impacts to river traffic during the construction period of either Build Alternative would be temporary and of short duration.

4.16.4.3 Vehicular / Pedestrian / Cyclists

Construction-related vehicles would access the Albany construction area from Colonie Street or Water Street. Construction-related vehicles would access the Rensselaer construction area via Tracy Street. It is anticipated that construction workers would park in the staging area.

FRA and NYSDOT have developed a proposed work zone traffic control program to minimize the temporary impacts to vehicular, pedestrian, and bicycle traffic that would occur in Albany under both Build Alternatives. The work zone traffic control program and details on the detours that would be required are presented in **Appendix A-3, "Conceptual Staging,"** and **Appendix A-4, "Detour Routes,"** and summarized as follows:

1. During a two-month construction period for the west bridge abutment and west end span:

- Quay Street would be closed and NYSDOT would install signage in accordance with standard procedures for a detour via the NYS Route 5 connector to Broadway to North Ferry Street to Erie Boulevard.
- Access to the Corning Riverfront Park parking lot south of the railroad crossing would be closed due to a one-way (northbound) traffic pattern. Access to the Jennings Landing (amphitheater) parking facilities would also not be allowed from Quay Street.
- Pedestrian and cyclist access to the Mohawk-Hudson Hike-Bike Trail would be maintained by erecting a pedestrian canopy through the work area under the railroad bridge. Access would

be interrupted during heavy lift operations or other operations that may present a risk to the public.

2. During two 2-week periods for work on the Water Street and Centre Street bridges:

- Water Street and Centre Street would each be closed for a two-week period from Quay Street to Livingston Avenue and traffic would be redirected for access to parking (NYSOGS Lots 12A and 12B) and the street network beyond. Large truck traffic would be restricted from using the Colonie Street exit from southbound I-787.
- The pedestrian walkway along Water Street would be relocated to Centre Street for the duration of the Water Street bridge construction;
- Water and Centre Streets would be closed concurrently for bridge resetting over the span of two weekends.

In addition, partial closure of NYSOGS Lot 11 under the I-787 overpass would be required, displacing approximately 20 parking spaces just north of the existing bridge (see **Figure 3-2** in **Chapter 3, "Transportation,"** for the location of this parking lot).

4.16.4.4 Accidents / Safety

A vehicular accident analysis was performed for streets that may be affected by construction activities for the Build Alternatives. Data were obtained from NYSDOT's Accident Location Information System for the three-year period between November 1, 2013 and October 31, 2016. Streets included in the study consist of Broadway, Centre Street, U.S. Route 9 to Broadway, Colonie Street, Erie Boulevard, North Ferry Street, North Lawrence Street, Livingston Avenue, Water Street, and Quay Street. Collision diagrams and a summary table are contained in **Appendix B-7, "Accident Report Summary and Collision Diagrams."** A total of 45 accidents occurred in this network during the study period. No accidents were reported on Quay Street, but three collisions occurred at its signalized intersection with Water Street. Four collisions occurred at the unsignalized intersection of North Ferry Street and Broadway. Accident rates were calculated for individual segments and compared to the statewide average where possible. However, since traffic volume data were not available for all streets, accident rates could not be completed for all segments. The statewide average for urban, two-lane, undivided streets is 2.30 accidents per million vehicle miles (acc/mvm). Statewide average accident rates for urban intersections, measured in accidents per million entering vehicles (acc/mev), range from 0.01 to 0.47 acc/mev, depending on type of facility (three-leg, four-leg, ramp, signal, sign, merge; one to five lanes). Half of the accidents in the study group occurred at the intersections of Broadway/Livingston Avenue and the U.S. Route 9 ramp/Broadway. Using volumes obtained from the NYSDOT Traffic Data Viewer, accident rates were calculated to be 0.99 acc/mev for Broadway/Livingston Avenue and 0.35 acc/mev for the U.S. Route 9 ramp/Broadway.

Existing accident history analyzed in this study does not indicate any existing safety deficiencies or accident-prone locations that would be exacerbated by Project construction or by increased traffic volumes on detour routes. If Quay Street is closed at any time during bridge construction, northbound traffic would be detoured through the unsignalized intersection of North Ferry Street and Broadway. Since the additional traffic would be making right turns from Broadway onto Ferry Street, the potential for collisions would not increase. The same traffic would then turn right from Ferry Street onto Water Street. There were no intersection-related accidents at this location and no collisions in the linear segment south of the intersection. To account for high traffic speeds it is advisable to post advance signing (a combination of static signs and portable variable message signs) on the I-787 southbound off ramp and Water Street in advance of the intersection with North Ferry Street to alert approaching vehicles of the changed traffic patterns associated with the detour.

Collisions recorded at the Water Street/Quay Street/Colonie Street intersection are typical for signalized intersections with high traffic volumes during peak travel periods. The combination of

Water Street traffic exiting from I-787 and commuters from the New York State parking lot exiting Quay Street create potential for collisions despite the presence of a traffic signal. Optimized signal phasing and timing may alleviate delays for impatient motorists that are a leading cause of signalized intersection collisions.

4.16.4.5 Public Transportation

Transit services in the Albany area are provided by CDTA, which operates buses on a network of routes. Three CDTA bus routes operate in the vicinity of the Project site. The CDTA No. 114 Madison-Washington route runs along Quay Street and loops around to Water Street. The CDTA No. 224 Albany-Troy route operates along Water Street through the study area. The CDTA No. 525 Albany Riverfront Express route runs along Quay Street to Water Street, pulls through the New York State-owned parking lot located between Quay and Water Streets beneath Interstate 787, and then follows Colonie Street, Centre Street, Livingston Avenue, and Water Street. These routes pass under the Livingston Avenue Bridge and the Water and Centre Street bridges and would be affected during the two-month closure of Quay Street described above and the two-week closure of Water and Centre Streets. The work zone traffic control program will address this impact. Therefore, no impacts to scheduled public transit would occur.

CDTA also operates the Special Travel Available by Request (STAR) paratransit system, which is complementary to their fixed route system, and can operate within a ¾-mile radius of the fixed bus route. Any STAR service that potentially utilizes Quay Street, Water Street, or Centre Street in the vicinity of the Project would be required to follow the detour routes for all traffic during construction-related closures.

4.16.5 Land Use, Community Character, and Social and Economic Conditions

Construction activities would take place within the Empire Corridor right-of-way and adjacent lands, including the wooded area at the Kiliaen's Landing site in Rensselaer. In Albany, Corning Riverfront Park and the Riverfront Preserve would not be used for staging under either Build Alternative and would remain open throughout the construction period. However, access to the Corning Riverfront Park parking lot at the northern end of the park would be impeded for approximately two months due to the restriction of traffic on Quay Street for work on the bridge abutment. Both of the Build Alternatives would require use of a portion of the parking lot (NYSOGS Lot 11) north of the bridge in Albany for the duration of construction, which is not used as a parking lot for Corning Riverfront Park or the Riverfront Preserve, and its temporary use as a construction staging area would not impact park users' ability to access either park. To the north of Quay Street, the City of Albany parking lot would continue to be available for Riverfront Preserve parking and event parking at Corning Riverfront Park, and as a rain location for concerts.

A portion of Quay Street and a portion of the Mohawk–Hudson Bike–Hike Trail would be closed during the overhead installation of the new bridge spans and the removal of the existing bridge. Water and Centre Streets would also have short-term closures to allow for beam seat reconstruction and then span shifting/demolition. As discussed in **Section 4.16.4**, NYSDOT would develop detour routes to enable access during construction. The Mohawk–Hudson Bike–Hike Trail would close only when there is active structural lifting overhead, most of which could be done at night. With the pedestrian canopy in place, the trail would only experience a few short closures lasting several hours each time. The magnitude of these closures would depend in part on the selected span arrangement and the placement of the new piers.

The small park at the intersection of Broadway and Tracy Street in Rensselaer may experience more vehicle pass-bys and more traffic-related noise during the construction period. Similarly, users of Corning Riverfront Park and the Riverfront Preserve may notice construction activity and construction-related noise. These temporary impacts would not constitute an adverse effect to parks and recreational resources.

Access to the construction staging area at the Rensselaer waterfront would be via an existing sewer easement that is the proposed future alignment of the Rensselaer Riverfront Multi-Use Trail. NYSDOT will coordinate with the City of Rensselaer to ensure that there would be no adverse impact on this proposed recreational resource.

Construction activities would have limited, if any, adverse impacts on local residents or businesses. Construction traffic and increases in noise and dust may temporarily affect local land uses in the vicinity of the Project site, including Corning Riverfront Park and the Riverfront Preserve, a limited number of residences, and the aforementioned parking lots. However, the most disruptive activities would be of limited duration and removed in distance from existing residences and businesses, which would minimize the adverse impacts on active land uses. The Project is in an area that can be considered an environmental justice community, and therefore, any adverse impacts from the construction or operation of the Build Alternatives would occur in an environmental justice community. There is discussion of construction impacts in **Section 5.5, "Identification of Disproportionate Adverse Effects."**

As described in **Section 4.16.4**, several roadways near the Project site in Albany would require temporary detours during the construction period. These modifications to existing traffic patterns would be temporary and would not have a significant effect on land use patterns in the study area.

Construction activities would generate jobs, resulting in economic benefits to the local and regional economy. For instance, construction workers would likely spend some of their income on local goods and services, such as food and drink, recreation, and medical services. The higher cost of Build Alternative 1 ($356.90 million, compared with $330.78 million for Build Alternative 2), could lead to a larger positive impact on the local economy due to the larger amount of public spending involved. However, the increase in construction jobs would be temporary and would not have long-term, growth-inducing impacts on local communities.

4.16.6 Cultural Resources

As described in the Draft Memorandum of Agreement (MOA) for this Project (see **Section 4.5, "Cultural Resources"**), to avoid accidental damage to adjacent historic properties as a result of construction activities associated with the Livingston Avenue Bridge Project, all historic properties that are near construction activities and subject to potential inadvertent damage would be included in a Construction Protection Plan (CPP). FRA and NYSDOT will prepare the CPP in consultation with SHPO and the property owners. The CPP will identify the architectural resources to be included in the plan. It will also set forth the specific measures to be used and specifications that would be applied to protect these architectural resources during the construction period.

4.16.7 Visual Resources and Aesthetic Considerations

During construction, there would be an increase in the level of activity within the study area. As the Project proceeds, cranes and other large pieces of equipment would be visible from much of the study area. However, construction of the Livingston Avenue Bridge Project would not substantially alter important views. As described in **Section 4.6, "Visual Resources and Aesthetic Considerations,"** the locations in the study area from which substantial views of the Livingston Avenue Bridge are currently available are recreational resources along the Hudson River Corridor (including Corning Riverfront Park and Jennings Landing, the Riverfront Preserve, the Mohawk-Hudson Bike-Hike Trail, and the Rensselaer Boat Launch), the roadways and rail corridors that transect the study area, and the river itself, from which boaters have uninhibited views of the bridge. The views to visual resources that motorists and rail passengers experience are generally of short duration, due to the relatively high speeds at which they tend to travel through the study area. Boaters in the immediate vicinity of the bridge and pedestrians in nearby recreational areas would experience the longest duration and closest range views of the replacement bridge construction area. For the duration of construction, cranes, barges and other construction equipment, as well as staging areas on both sides of the Hudson River would be

visible to boaters and pedestrians. These changes would be temporary and of short duration, and therefore would not constitute an adverse effect to visual resources.

4.16.8 Water Resources

Wetland B, which is along the unpaved waterfront path in Rensselaer, is outside the construction staging area in Rensselaer but is within the vicinity of the construction access road to that staging area. The construction access road to the staging area in Rensselaer (see **Figure 4.16-1**) would be sited to avoid impacts to Wetland B. Construction activities would be conducted under a NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001), which is required for construction activities affecting more than one acre. Build Alternative 1 would result in approximately five acres of land disturbance, whereas Build Alternative 2 would result in approximately four acres of land disturbance. A SWPPP would be implemented, and construction activities would comply with NYSDEC technical standards for erosion and sediment control. Implementation of erosion and sediment control measures identified in the SWPPP would minimize potential impacts to water quality of the Hudson River from the discharge of stormwater runoff during land-disturbing construction activities. The conditions of SPDES permits and SWPPPs include best management practices that ensure the control of stormwater runoff.

Construction of the Build Alternatives would require in-water construction activities, which would have the potential to result in resuspension of bottom sediment and sediment-bound contaminants that would be localized and temporary. Because the sediment would dissipate shortly after the disturbance, construction activities would not adversely affect water or sediment quality. Sediment types within the study area are primarily sand and gravely sand, which are not easily resuspended and would quickly settle. Sediment resuspended within the smaller areas of muddy sand along the eastern shore and a small portion of the western shore would be expected to dissipate quickly. Dredged material would be collected onto a barge and disposed of offsite in compliance with applicable regulations. As such, dredging would not resuspend PCBs (see **Section 4.16.13, "Contaminated Materials"**) or other sediment contaminants into the water column and affect surrounding areas. All in-water work for Build Alternatives 1 and 2 would be conducted in accordance with state and Federal regulations and permit conditions, including a Section 401 Water Quality Certification, SPDES permit, and Section 404 permit.

Demolition of the existing bridge would also have the potential to result in resuspension of bottom sediment. The existing bridge would be demolished by removing parts of the superstructure by barge or crane and transporting them to the staging area for further disassembly. Piers would be removed with an excavator and their timber support piles would be cut below the mud line. Use of turbidity curtains and floating booms would minimize the potential for sediment resuspended during the bridge removal activities to result in significant adverse impacts to water or sediment quality.

With either Build Alternative, groundwater dewatering may be required during construction in certain locations, depending on the types of foundations to be used for the bridge, the location of utility trenches, and construction means and methods. This would occur at sites of excavation on land, such as for the bridge abutments and the easternmost pier, to eliminate groundwater that seeps into the excavation. The limited dewatering that could be required would not change the natural direction of groundwater flow or result in depletion of the groundwater supply. During dewatering, groundwater samples would be collected prior to construction as a part of the Phase II subsurface investigation (see **Section 4.16.13, "Contaminated Materials"**). These samples would be tested for contaminants and the results compared to the NYSDEC surface water quality standards, among other standards, to determine the need for treatment prior to discharge to surface water. Discharge would be conducted in accordance with applicable requirements of SPDES permit for discharge to surface water. Discharge of water would also be conducted in accordance with applicable Federal requirements and/or other guidelines or regulations for the

discharge to surface water, as applicable. The construction period would not result in adverse impacts on groundwater resources, aquifers, or reservoirs within the vicinity of the Project site.

4.16.9 General Ecology and Wildlife Resources

4.16.9.1 Aquatic Biota

As discussed in **Section 4.16.8, "Water Resources,"** construction of the replacement bridge, demolition of the existing bridge, and upland soil disturbing activities under the Build Alternatives would not affect water or sediment quality in the Hudson River, and therefore, would not impact habitat conditions for fish and other aquatic biota. Construction activities would result in the temporary loss of benthic habitat within the footprint of the piles supporting the temporary pier and in the footprint of the spud piles as the construction barges are moored throughout the site over the course of construction. Benthic invertebrates unable to move away from these areas would be lost. Following the completion of the replacement bridge, the temporary pier would be removed, restoring benthic habitat within the footprint of the piles. Benthic organisms are expected to quickly recolonize the areas previously occupied by the temporary pier piles, as similar habitat is present in the surrounding area that would be unaffected or minimally impacted by the project activities and would serve as the source of colonizing invertebrates.

Prior to construction of the temporary pier, NYSDOT will undertake a survey of submerged aquatic vegetation and the pier would be installed so as to minimize the potential to affect submerged aquatic vegetation (e.g., adjust location and install piles in a manner that minimizes bottom disturbance and disturbance to submerged aquatic vegetation beds, if present to the greatest extent possible). Because the temporary pier would be narrow (only 20 feet wide) and elevated above the surface of the water, light would reach the water beneath the pier over the course of a day, minimizing the potential for shading impacts to submerged aquatic vegetation that may be present beneath the pier. The spud piles for the barges would also be placed to avoid any indirect effects to submerged aquatic vegetation identified in the pre-construction survey to the greatest extent possible, and in a manner that minimizes bottom disturbance.

Underwater noise from pile driving can cause lethal injury to fishes if the level and duration of the noise is great enough. However, lethal impacts to fish from pile driving are mostly limited to the driving of very large piles (e.g., eight-foot diameter) when fish are in very close proximity to the pile (within 33 feet).[120] The diameter of the piles for the temporary pier, the spud barges, and the permanent bridge piers for both Build Alternatives would be small (14 inches) and require far less force to install than the large piles that can produce potentially lethal underwater noise levels during impact hammering. More commonly, pile-driving noise has sub-lethal physiological or behavioral impacts on fish, by causing recoverable injury or avoidance of the area and other temporary behavioral changes. Following best management practices for pile installation,[121] noise would be minimized by using a vibratory hammer to the greatest extent possible, or by tapping the pile to deter fish from the area before impact hammering. If piles are drilled rather than hammered, noise levels would not result in acoustic impacts to fish. The spud piles supporting the barges would be allowed to sink into the sediment under their own weight, and if required, equipment available on the barge would be used to push or hammer them to the desired depth, using a cushion block if hammering is needed. Should pile driving or other in-water activities associated with construction cause habitat avoidance by aquatic organisms, the extent of the area that would

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[120] Journal of Fish Biology, Volume 75, "The Effects of Anthropogenic Sources of Sound on Fishes, A.N. Popper and M.C. Hastings, 2009, pages 455-489.

[121] National Oceanic and Atmospheric Administration (NOAA) "Impacts to Marine Fisheries Habitat from Nonfishing Activities in the Northeastern United States, Technical Memorandum NMFS-NE-209," U.S. Department of Commerce, NOAA, NMFS, Northeast Regional Office, Gloucester, Massachusetts, 2008.

be avoided at any one time would be negligible relative to the amount of suitable habitat that would remain available nearby.

Pile installation would be limited to periods outside of the spawning season for shortnose sturgeon and Atlantic sturgeon to avoid impacts to this endangered species (see **Section 4.16.9.3, "Threatened and Endangered Species,"** for further discussion). With these measures in place, pile installation required to construct the replacement bridge under either of the Build Alternatives would not adversely affect fishes or other aquatic organisms in the Hudson River.

4.16.9.2 Terrestrial Habitats and Wildlife

Potential impacts to wildlife from a construction project can occur indirectly, because of construction noise, or directly, because of habitat loss. Noise pollution can lead to changes in wildlife community composition, decrease reproductive success, and alter predatory-prey dynamics.[122] However, noise generated during the construction of either Build Alternative would not adversely affect wildlife in the study area because the study area already has existing levels of anthropogenic noise from rail operations on the existing bridge, traffic along I-787, and other sources associated with the commercial, residential, and industrial land uses in the surrounding area. Wildlife communities in the study area have been established under these existing disturbances, and as such, wildlife in the area is composed of primarily urban-adapted, generalist species. Construction would not increase noise levels above the existing conditions to the extent that it would alter species assemblages or otherwise negatively change wildlife in the surrounding area from its present state. Some birds and mammals would potentially relocate in response to the construction noise, but would be likely to easily acquire suitable alternative habitat given that comparable, small woodland fragments are ubiquitous in the surrounding landscape. Any such relocation away from the area of disturbance would not significantly affect these individuals in the long-term.[123] Overall, noises generated during construction would not adversely affect wildlife in the study area.

Woodland acreage would be cleared under both Build Alternatives (Build Alternative 1 would involve clearing three acres and Build Alternative 2 would involve clearing two acres) on the east bank of the river. As discussed in **Section 4.8, "General Ecology and Wildlife Resources,"** this area is part of a small deciduous woodlot that is of marginal quality as habitat for native wildlife due to its small size, fragmentation, and heavily developed surroundings. The loss of acreage in this woodlot would reduce the number of individuals able to inhabit it, but would not change the assemblage of wildlife species present; the same wildlife species would continue to inhabit the remaining portions of the woodlot. The reduced number of individuals of some species would not impact the size or viability of their local populations. Overall, land disturbance required for construction under either Build Alternative would not adversely affect wildlife at the individual, population, or community level.

4.16.9.3 Threatened and Endangered Species

4.16.9.3.1 Shortnose and Atlantic Sturgeon

As indicated in **Section 4.8, "General Ecology and Wildlife Resources,"** spawning adults and early life stages (eggs and larvae) of shortnose sturgeon have the potential to occur within the study area during a short period of time in the spring (generally between March and mid-July). Atlantic sturgeon spawning adults and early life stages have the potential to occur from March

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[122] Conservation Biology, Volume 22, "Impacts of Chronic Noise from Energy-Sector Activity on Abundance of Songbirds in the Boreal Forest, E.M. Bayne, L. Habib, and S. Boutin, 2008, pages 1186-1193.

[123] Biological Conservation, Volume 97, "Why Behavioral Responses May Not Reflect the Population Consequences of Human Disturbance, J.A. Gill, K. Norris, and W.J. Sutherland. 2001, pages 265-268.

through September. Juveniles and non-spawning adults could be present in the study area year-round, although juveniles of both species are more likely to occur downriver.

Construction of the Project would result in temporary impacts to sturgeon resulting from vessel traffic, sediment resuspension, underwater noise during pile driving, and temporary loss of foraging habitat, none of which would result in significant adverse impacts to either species. Detailed discussion of these impacts is included in **Appendix B-2-1**, which provides FRA's completed consultation with NMFS regarding shortnose and Atlantic sturgeon dated September 28, 2021. Following work windows recommended by NMFS,[124] no in-water construction would occur from March 1 through September 30 to protect spawning shortnose and Atlantic sturgeon and their eggs and larvae. Once installed, work could occur within the sheet pile cells during the March 1 to September 30 window. The measures that would be implemented to minimize potential impacts on all life stages of shortnose and Atlantic sturgeon would include:

- Seasonal timing restrictions to avoid in-water construction and bridge demolition during the spawning period (March 1 through September 30). Work within the sheet pile cells would occur during this time period.
- Use of small-diameter piles that produce less underwater noise during installation.
- Use of pre-drilling to install piles and vibratory hammering (if necessary after pre-drilling) to the greatest extent practicable before cushioned impact hammering in order to minimize underwater noise levels; slow removal of temporary piles using a vibratory hammer.
- Tapping of piles prior to the start of impact hammering in order to give fish an opportunity to relocate before underwater sound levels become increasingly greater.
- Use of a turbidity curtain during installation of the temporary pier piles, fender and dolphin system, and during removal of temporary pier piles and existing bridge piers.
- Dredged sediments from within dewatered sheet pile cell would be placed in a scow, dewatered, and transported offsite for disposal, and water would be treated prior to being discharged back to the river.
- Use of nets, tarps, and pans during demolition of the bridge superstructure, and removal of any debris that falls into the water.
- Limited number of vessels at any given time during construction, all with shallow drafts (5 to 10 feet) and maintaining low speeds (less than 5 knots for push boats and tugs, and less than 10 knots for crew boats).
- Use of posted lookouts and measures to slow down and avoid any observed sturgeon when operating project vessels in areas where they may be present.

4.16.9.3.2 Atlantic Sturgeon Critical Habitat

As indicated in **Section 4.8, "General Ecology and Wildlife Resources,"** the Project site contains physical and biological features identified under PBFs 1, 3, and 4 within Atlantic sturgeon critical habitat. Construction of the Project would result in temporary impacts resulting from vessel traffic, sediment resuspension, underwater noise during pile driving, and temporary loss of foraging habitat. Detailed discussion of these impacts is included in **Appendix B-2-1**, which provides FRA's consultation with NMFS regarding critical habitat for Atlantic sturgeon. The addition of construction vessels would be intermittent, temporary, and restricted to a small portion of the overall Project site on any given day, such that the risk of a vessel strike caused by the Project would be minimal. Sediment resuspension resulting from pile installation would have insignificant effects on water quality, would be intermittent and localized to the vicinity of construction activities, and would be minimized through the use of a turbidity curtain. The area of increased underwater noise would extend a maximum of 394 feet from the pile being installed,

[124] NMFS correspondence for the Project dated April 15, 2013.

and the Hudson River is sufficiently wide enough (950 feet) to allow sturgeon to avoid the ensonified area while continuing to forage and migrate. While foraging habitat would be temporarily lost in the footprint of the temporary pier piles and the spud piles supporting the barges, similar habitat would continue to be available within the study area, and benthic organisms are expected to quickly recolonize these areas once the temporary piles are removed. Based on the analysis provided in **Appendix B-2-1** and with the implementation of measures to minimize these impacts, as described above, FRA concluded that construction of the Project would not result in significant adverse impacts to Atlantic sturgeon critical habitat and received concurrence from NMFS on September 28, 2021.

4.16.9.3.3 Northern Long-Eared Bat

As discussed in **Section 4.8, "General Ecology and Wildlife Resources,"** the study area lacks large, unbroken tracts of forested habitat with which the northern long-eared bat is associated, which, combined with the near extinction of local populations, makes it unlikely that the species would occur near the Project site. Nevertheless, because it is still possible that northern long-eared bats could roost within the area of disturbance, all tree clearing for the Livingston Avenue Bridge Project would be limited to October 31 to March 31, during the winter hibernation period, to follow recommended guidelines of the USFWS and avoid potential impacts that could result from the removal of active roost trees and foraging habitat.[125] The land cleared for either Build Alternative would represent a negligible loss of low-quality woodland that would not significantly impact the size or viability of any remaining local population of northern long-eared bats. The fragment of woodland in which the majority of the clearing would occur is not considered to be valuable or high quality habitat for northern long-eared bats given its small size, high edge to area ratio, second stage growth, limited amount of large dead or dying trees, and heavily developed surroundings. Overall, with the winter tree clearing restriction in place, Project construction would not adversely affect to the northern long-eared bat. **Appendix B-2-1** provides the consultation with USFWS with respect to northern long-eared bats in the vicinity of the Project site, and the USFWS determination that the Project is consistent with the activities analyzed in the USFWS's January 5, 2016 Programmatic Biological Opinion. The Project may affect the northern long-eared bat; however, any take that may occur as a result of the Project is not prohibited under the Endangered Species Act Section 4(d) rule adopted for the northern long-eared bat at 50 CFR Section 17.40(o).

4.16.9.3.4 Bald Eagle

Bald eagles have the potential to occur within the study area during the winter, sitting on ice floes, searching for fish, or passing by as they move up or down the river corridor. Bald eagles are easily disturbed by human activities, even during winter.[126] During wintertime construction for either Build Alternative, bald eagles may avoid the section of river within the study area and instead forage elsewhere up- or down-river where disturbance levels are lower. Based on Federal guidelines for minimizing disturbances to bald eagles,[127] which recommend a maximum buffer distance of 0.5 miles between bald eagles and extremely loud noises,[128] it can be conservatively estimated that bald eagles would avoid a maximum of 0.5 miles of river in each direction from the bridge during construction. Displacement of eagles from this area would represent a negligible and temporary reduction in the amount of foraging habitat available on the upper Hudson River. In turn, the potential exclusion of wintering bald eagles from this small section of river would not reduce food availability or otherwise affect their energetic condition. Overall, Project construction would not adversely affect bald eagles at either the individual or population level.

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[125] USFWS 2014.

[126] Journal of Wildlife Management, Volume 61, "Flushing Responses of Wintering Bald Eagles to Military Activity, M.V. Stalmaster and J.L. Kaiser, 1997, pages 1307-1313.

[127] https://www.fws.gov/northeast/ecologicalservices/eagleguidelines/constructionnesting.html.

[128] USFWS 2007.

4.16.9.3.5 Peregrine Falcon

The closest peregrine falcon nest to the Project site is on the Dunn Memorial Bridge, approximately 0.75 mile to the south, but peregrine falcons have large home ranges and the birds associated with this nest have the potential to occur within the study area in search of prey. Urban peregrine falcons, particularly those that nest on bridges, have a particularly high tolerance of human disturbance, and construction activity from either Build Alternative would have no direct or indirect impacts to these individuals. Urban peregrine falcons primarily hunt pigeons, whose abundance would not be affected by the construction of the Build Alternatives. Peregrine falcons do not inhabit woodlands and would not lose habitat as a result of the tree clearing for the Build Alternatives. As such, construction of the Build Alternatives would not directly or indirectly affect peregrine falcons or their habitat.

4.16.9.3.6 Cobra Clubtail

Cobra clubtail dragonflies occur in riparian vegetation and on sandy shorelines along the Hudson River in the vicinity of the Project site. Tree clearing on the eastern bank of the river that would occur under the Build Alternatives would potentially eliminate some riparian habitat of the cobra clubtail, but occurrence of the species in this area is unconfirmed. Loss of this short section of shoreline vegetation (approximately 300 feet for Build Alternative 1 and 150 feet for Build Alternative 2) would not result in a significant reduction in the amount of comparable riparian habitat available to the cobra clubtail along the Hudson River, and would not adversely affect the species' local or regional populations.

4.16.9.3.7 Alewife Floater

The alewife floater is known to occur in the tidal freshwater section of the Hudson River. The small amount of habitat loss and the minimal amounts of sediment suspension that may occur during the construction of the Build Alternatives would not result in adverse impacts to the alewife floater because the habitat loss would be minimal and the sediment suspension would be limited and temporary. The direct loss of any individuals inhabiting the small area of river bottom in which piles would be installed would not adversely affect the size or viability of the local population.

4.16.9.3.8 Osprey

A pair of ospreys and their nest were present on the east side of the Livingston Avenue Bridge during the September 2020 wildlife survey. The osprey is a species of special concern in New York that has been proposed by NYSDEC to be delisted during the next revision of the list of endangered, threatened, and special concern species because populations in the state have recovered significantly in recent decades. In compliance with the Migratory Bird Treaty Act, and to avoid direct impacts to nesting ospreys, the osprey nest on the Livingston Avenue Bridge will be removed during the winter, when the nest is inactive. FRA and NYSDOT will coordinate with the USFWS and NYSDEC prior to removal. Upon their return to the area in the spring, these ospreys should easily establish a new nesting site on one of the many other tall, artificial structures along this section of the Hudson River and remain a part of the area's breeding population. Ospreys are highly habituated to human activity, and Project construction activities would not have the potential to disturb osprey hunting and breeding activity in the vicinity of the Project site. Following completion of construction, the replacement bridge will once again represent a potential nesting site for these or other ospreys in the area. For these reasons, no adverse impacts to ospreys at the individual or population level would be expected to occur from construction of the Build Alternatives.

4.16.9.4 Significant Habitat Areas

As discussed above, construction of the Build Alternatives would not result in significant adverse impacts to aquatic biota or habitat conditions within the Hudson River. Therefore, Project construction would not result in adverse impacts to the Upper Hudson River Estuary Significant

Habitat Complex, Essential Fish Habitat of the Hudson River Estuary, or submerged aquatic vegetation.

4.16.9.5 Invasive Species

Due to the high levels of development and human activity in the study area, habitat conditions are degraded and favorable for the many non-native invasive plants and animals currently present. During Project construction for either Build Alternative, NYSDOT will implement best management practices (such as washing construction equipment) to minimize the introduction of no new invasive species to the area, and to limit benefits to any that are already present. As such, there would be no change in the status of invasive species from the existing condition under either Build Alternative. As such, there would be no change in the status of invasive species from the existing condition.

4.16.10 Air Quality

Construction of the Project would result in emissions from on-site construction equipment and the transport of construction materials. In general, most construction engines are diesel-powered, and produce relatively high levels of NO_x and PM. Some construction activities also emit dust. As defined in CFR Part 80 Subpart I, diesel fuel sulfur content is limited to 15 parts per million (ppm) for nonroad engines, marine engines, and wholesale purchaser consumers in the locomotive and marine sectors. Ultra-low-sulfur diesel fuel (ULSD) would be used exclusively for all diesel engines throughout the construction sites, including tug boats (if appropriate); therefore, sulfur oxides emitted from construction activities would be negligible.

To further minimize emissions from construction, the Livingston Avenue Bridge Project would incorporate the following measures, to the extent feasible:

- *Utilization of Newer Equipment.* USEPA's Tier 1 through 4 standards for nonroad engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons. All nonroad construction equipment (excluding marine engines—see below regarding marine engines) used for the Project with a power rating of 50 horsepower or greater would meet at least the Tier 2 emissions standard. All nonroad engines in the Project rated less than 50 horsepower would meet at least the Tier 2 emissions standard.
- *Clean Fuel*. ULSD fuel would be used exclusively for all diesel engines throughout the construction site.
- *Idling Restrictions.* All efforts will be made to address heavy duty vehicle idling at the Project site in order to reduce fuel usage (and associated costs) and emissions. On-road diesel fueled trucks are subject to New York's heavy duty vehicle idling prohibition. These vehicles may not idle for more than five consecutive minutes except under certain specific conditions as described in Subpart 217-3. In addition to enforcing the on-road idling prohibition, all reasonable efforts will be made to reduce non-productive idling of nonroad diesel powered equipment.
- *Dust Control*. Strict dust control plans would be prepared and implemented for the construction of the Project. For example, stabilized truck exit areas would be established where applicable for washing off the wheels of all trucks that exit the construction sites. Truck routes within the sites would be either watered as needed or, in cases where such routes would remain in the same place for an extended duration; the routes would be stabilized, covered with gravel, or temporarily paved to avoid the re-suspension of dust. All trucks hauling loose material would be equipped with tight fitting tailgates and their loads securely covered prior to leaving the sites. In addition to regular cleaning by local agencies, streets adjacent to the sites would be cleaned as frequently as needed. Water spray would be used for all excavation, demolition, and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. Loose materials would be watered, stabilized with a

biodegradable suppressing agent, or covered. The emissions reduction program would reduce dust emissions by at least 50 percent for demolition, excavation, stockpiles, and handling of materials.

Based on analyses prepared for much larger bridge replacement projects, construction activities for the Livingston Avenue Bridge Project would not result in annual pollutant emissions exceeding the general conformity thresholds. With the implementation of above listed emission reduction measures, there would be no potential for a significant adverse effect on air quality during construction.

4.16.11 Noise and Vibration

Noise and vibration from construction equipment and construction vehicles traveling to and from the study area would occur during Project construction. The level of impact of these noise and vibration sources depends on the characteristics of the construction equipment and activities, the number of pieces of equipment being operated together, the schedule, and the distance of the nearest sensitive receptors from the construction activity. This section summarizes the results of the construction noise and vibration assessment that FRA and NYSDOT performed for the Build Alternatives in accordance with FTA's noise and vibration guidance manual, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

4.16.11.1 Noise

FTA guidelines recommend evaluating construction activities against the one-hour L_{eq} thresholds of 90 dBA at residences during daytime hours, 80 dBA at residences during nighttime hours, and 100 dBA at commercial receptors. Construction-related noise is calculated by assuming that the two loudest pieces of construction equipment that would operate simultaneously would do so continuously for one hour during both the daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) periods. **Exhibit 4.16-1** shows the FTA general assessment impact criteria for construction noise.

Exhibit 4.16-1
General Assessment Impact Criteria for Construction Noise (dBA)

Land Use	Construction Noise Impact Threshold: One-Hour L_{eq} —Daytime Threshold (7 AM – 10 PM)	Construction Noise Impact Threshold: One-Hour L_{eq} —Nighttime Threshold (10 PM – 7 AM)
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

In addition to the FTA criteria, the Albany Noise Ordinance (§ 255-32 Building operations) also has regulations related to construction noise. It states, "It shall be unlawful for any person conducting any building operations between the hours of 10:00 p.m. and 7:00 a.m. to operate or use any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoists or other apparatus, the use of which is attended by loud or unusual noise, except upon written permission from the Commissioner of Buildings and then only in case of emergency."

Potential construction equipment that could be used on this Project and the emission noise levels at a distance of 50 feet are as follows:

- Backhoe (80 dBA)
- Excavator (85 dBA)
- Impact pile driver (101 dBA)

- Jackhammer (88 dBA)
- Paver (85 dBA)
- Rail saw (90 dBA)
- Truck (84 dBA)

Using the FTA's general construction noise analysis procedures, FRA and NYSDOT evaluated the potential for construction-related noise impacts for the two Build Alternatives at nearby sensitive receptors. They considered the noise associated with construction of the new bridge (from abutment to abutment) and from track realignment work on the Rensselaer and Albany approaches to the bridge, which is presented below.

4.16.11.1.1 Construction of the New Bridge

The FTA evaluation methodology for construction impacts involves analyzing the noise from the two noisiest pieces of construction equipment operating simultaneously to determine the distance at which noise levels would be high enough for an impact to occur. For construction of the new bridge and demolition of the existing bridge (up to the abutments on either side of the river), the noisiest two pieces of equipment would be a pile driver and jackhammer.

The construction activity that would involve use of a pile driver and jackhammer would be approximately 550 feet from the nearest business (a commercial printing press in Albany) and approximately 600 feet from the nearest residential properties (residential properties along Broadway in Rensselaer) with either of the Build Alternatives. Construction activity would be about 100 feet from the nearest parks, Corning Riverfront Park and the Riverfront Preserve in Albany, with either Build Alternative.

As shown in **Exhibit 4.16-2**, during the daytime, the two noisiest pieces of equipment (pile driver and jackhammer) operating simultaneously for bridge construction would not result in noise impacts at the nearest existing residential, commercial, or industrial properties. During nighttime (i.e., 10 PM–7 AM), the two noisiest pieces of equipment (rail saw and truck) operating simultaneously also would not result in noise impacts at the nearest existing residential, commercial, or industrial properties because these receptors are beyond the distance at which construction noise levels would reach or exceed impact thresholds, which is 180 feet (maximum distance of impact). Depending on the final site layout of the Kiliaen's Landing project in Rensselaer and the timing for its occupancy in comparison to the timing of bridge construction, there may be residential uses at Kiliaen's Landing within the impact threshold distance of either Build Alternative.

Exhibit 4.16-2
Results of General Construction Noise Assessment, Bridge Construction and Demolition

Phase	Land Use	Impact Threshold (dBA)	Predicted Construction Noise at Distance of 50 Feet (dBA)	Maximum Distance of Impact[1]	Distance to Closest Receptor	Impact Assessment
Daytime Construction (7 AM – 10 PM)[3]	Residential	90	101	182 feet	600 feet[5]	No impact
Daytime Construction (7 AM – 10 PM)[3]	Commercial and Industrial	100	101	57 feet	550 feet	No impact
Daytime Construction (7 AM – 10 PM)[3]	Park[2]	100	101	57 feet	99 feet	No impact
Nighttime Construction (10 PM – 7 AM)[4]	Residential	80	91	177 feet	600 feet[5]	No impact
Nighttime Construction (10 PM – 7 AM)[4]	Commercial and Industrial	100	91	18 feet	550 feet	No impact
Nighttime Construction (10 PM – 7 AM)[4]	Park[2]	100	91	18 feet	99 feet	No impact

Notes:

1 The maximum distance of impact is the distance at which construction noise levels would reach or exceed impact thresholds.

2 Since FTA guidance does not include impact criteria for parks, the commercial criteria were used.

3 Daytime noise levels assume simultaneous operation of a pile driver and jackhammer.

4 Nighttime noise levels assume simultaneous operation of a rail saw and truck.

5 Depending on the final site layout of the Kiliaen's Landing project in Rensselaer and the timing for its occupancy in comparison to the timing of bridge construction, there may be residential uses at Kiliaen's Landing within approximately 80 feet of bridge construction with either Build Alternative 1 and within approximately 160 feet with Build Alternative 2.

4.16.11.1.2 Construction of Approach Tracks

Construction work on the approach tracks in Albany and Rensselaer under either Build Alternative would be approximately 360 feet from the nearest business (a commercial printing press in Albany), approximately 30 feet from the closest residences in Rensselaer on Broadway, and approximately 122 feet from the nearest residences in Albany. Depending on the final site layout of the Kiliaen's Landing project in Rensselaer and the timing for its occupancy in comparison to the timing of bridge construction, there may also be residential uses at Kiliaen's Landing within approximately 80 feet of the approach tracks construction in Rensselaer with either Build Alternative. Construction activity would be about 100 feet from the nearest parks, Corning Riverfront Park and the Riverfront Preserve in Albany.

The FTA evaluation methodology for construction impacts involves analyzing the noise from the two noisiest pieces of construction equipment operating simultaneously to determine the distance at which noise levels would be high enough for an impact to occur. Based on that approach, during the daytime, the two noisiest pieces of equipment (rail saw and truck) operating simultaneously on the approach tracks would have the potential to result in impacts at the nearest residences, the residences within 60 feet of the construction zone in Rensselaer. During nighttime (i.e., 10 PM–7 AM), operation of the two noisiest pieces of equipment (also a rail saw and truck) would have the potential to result in noise impacts at additional residences in Rensselaer and Albany, up to a distance of about 180 feet from the construction work. No commercial or industrial businesses would be close enough to experience adverse noise impacts from construction during daytime or nighttime.

To avoid this potential adverse noise impact on nearby residences related to work on the approach tracks, NYSDOT would require the construction contractor to use a portable noise barrier/curtain with a Sound Transmission Class (STC) rating of STC 30 or greater during daytime construction within 60 feet of residences. With the barrier/curtain measure, the track construction would not result in potential noise impacts at any nearby sensitive receptors during the daytime. During nighttime construction when the threshold for impact is lower, a portable noise barrier/curtain would be used for construction on the approach tracks occurring within 180 feet of residences in both Rensselaer and Albany. With this measure in place, an adverse effect would still occur at residences within 60 feet

of the construction activity (which are located in Rensselaer) and therefore no construction activities would be conducted within 60 feet of residences at night.

More information about the results is presented in **Exhibit 4.16-3**.

Exhibit 4.16-3
Results of General Construction Noise Assessment, Approach Tracks

Phase	Land Use	Impact Threshold (dBA)	Predicted Construction Noise at Distance of 50 Feet (dBA)	Maximum Distance of Impact[1]	Distance to Closest Receptor	Impact Assessment
Daytime Construction (7 AM – 10 PM)[3]	Residential	90	91	56 feet	30 feet (Rensselaer)	Impact if no mitigation is provided (residences in Rensselaer)
Daytime Construction (7 AM – 10 PM)[3]	Commercial / Industrial	100	91	18 feet	360 feet	No impact
Daytime Construction (7 AM – 10 PM)[3]	Park[2]	100	91	18 feet	100 feet	No impact
Nighttime Construction (10 PM – 7 AM)[4]	Residential	80	91	177 feet	30 feet (Rensselaer) 122 feet (Albany)	Impact if no mitigation is provided (residences in Rensselaer and Albany)
Nighttime Construction (10 PM – 7 AM)[4]	Commercial / Industrial	100	91	18 feet	360 feet	No impact
Nighttime Construction (10 PM – 7 AM)[4]	Park[2]	100	91	18 feet	100 feet	No impact

Notes:

1 The maximum distance of impact is the distance at which construction noise levels would reach or exceed impact thresholds.

2 Since FTA guidance does not include impact criteria for parks, the commercial criteria were used.

3 Daytime noise levels assume simultaneous operation of a rail saw and truck.

4 Nighttime noise levels assume simultaneous operation of a rail saw and truck.

4.16.11.2 Vibration

Exhibits 4.16-4 and 4.16-5 show architectural and structural damage risk and perceptibility distances for the types of construction activities that would occur with either Build Alternative. Architectural damage includes cosmetic damage, such as cracked plaster, etc. Architectural damage is not considered to pose any risk of structural damage. As shown in **Exhibit 4.16-4**, pile driving has the greatest potential to result in architectural damage to most building types. While not shown in the table, controlled blasting also can result in high vibration levels in excess of 100 VdB with resultant damage to existing structures. For most other construction activities, damage occurs only for structures that are very close to the construction activity (i.e., less than 25 feet away) or are highly fragile buildings. For fragile and highly fragile buildings respectively, FTA guidance recommends a limit of peak particle velocities (PPV) of 0.2 and 0.12 inches per second or 94 and 90 VdB. Since the use of driven piles would be limited for the Build Alternatives and no controlled blasting is anticipated, the likelihood of vibration-related adverse impacts would be small.

Exhibit 4.16-4
Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate Lv* at 25 ft
Pile Driver (impact)	0.644	104
Pile Driver (sonic)	0.170	93
Clam Shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall in soil)	0.008	66
Hydromill (slurry wall in rock)	0.017	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Note: * Root mean square (RMS) velocity in decibels (VdB) re 1 micro-inch/second.
Source: *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

Exhibit 4.16-5
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_v *
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Note: * RMS velocity in decibels (VdB) re 1 micro-inch/second
Source: *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

4.16.12 Utilities

There is a fiber optic line beneath the west abutment of the existing bridge that would likely require relocation for both Build Alternatives. The fiber optic would be relocated and then switched over, causing a short-term disruption.

The existing bridge would be powered from the Albany side of the bridge during construction. The new bridge would be temporarily powered from the existing bridge during construction before the new bridge is complete from abutment to abutment. NYSDOT would schedule any temporary power outages on the bridge to avoid interruption to rail traffic. There should be no other effect on utilities. The contractor would be responsible for providing his own power with grid power or generators, except to power the new bridge.

Due to the location of proposed pier and abutment footings, Build Alternative 1 would require relocation or temporary protection of the overhead power line owned by Niagara Mohawk Power Line Corporation and the sewer main maintained by the Rensselaer County Sewer District. FNYSDOT would coordinate the design of Build Alternative 2 with the planned riverfront trail system to avoid impacts to these utilities.

For all utility relocations, NYSDOT would enter into a utility relocation agreement with the affected provider and would seek to minimize service interruptions.

4.16.13 Contaminated Materials

As discussed in **Section 4.14, "Contaminated Materials,"** contaminated materials are likely to be encountered during Project construction. The Build Alternatives would require substantial subsurface disturbance in specific areas such as locations of new bridge supports and new track work. Soils and dredged materials would be generated during the drilling and installation of the bridge piers. Excavations may also be required for new or relocated utilities.

To prevent potential resuspension of PCBs or other sediment contaminants in the Hudson River during the installation of the bridge piers, dredged material would be collected onto a barge, dewatered, and then transported for disposal in compliance with applicable regulations. Dewatering effluent would be treated in accordance with NYSDEC requirements prior to being discharged back to the river. During the landside construction activities, common railroad contaminants may be encountered. These contaminants include: suspected PCB-containing equipment (transformers, fluorescent light ballast, hydraulic equipment and electrical feeder cables), creosote (railroad ties), spilled or leaked liquids (gasoline, oil, cleaning solvents, etc.), polycyclic aromatic hydrocarbons (PAHs), and metals. PCB-contaminated dredged material may be encountered during construction of the bridge foundation.

Prior to construction, NYSDOT will conduct a Phase II subsurface investigation in areas where excavation would occur. This would include the collection and laboratory analysis of soil samples and groundwater samples to characterize subsurface conditions prior to construction. Dewatering would be required during deeper excavations for utilities and bridge support structures, and of dredged materials from the Hudson River. Water quality testing would be performed to ensure compliance with applicable discharge permit/approval requirements and, if necessary, pre-treatment would be conducted prior to discharge. Requirements could include treatment measures such as settling basins to separate sediments from the groundwater prior to their discharge to surface waters.

To minimize the potential for impacts to the community and construction workers, all excavation and construction work involving subsurface disturbance would be performed under a Remedial Action Plan and Construction Health and Safety Plan, which would be prepared based on the findings of the Phase II investigation. These plans would address the management (and, if necessary) remediation of anticipated environmental conditions and contingencies should other or more extensive contamination be encountered during construction. These plans would present measures for managing contaminated on-site soil and groundwater in accordance with applicable Federal, state, and local regulations. Contaminated soil management includes guidelines for temporary on-site stockpiling and off-site transportation and disposal.

Any excavated soil, fill, wood, and other materials requiring off-site disposal would be managed in accordance with applicable laws and requirements, and, as necessary, tested in accordance with the requirements of the intended receiving facility. Transportation of all material leaving the site would be in accordance with applicable requirements covering licensing of haulers and trucks, placarding, truck routes, and manifesting. Areas where contamination is discovered during excavation activities would be delineated and remediated in accordance with all applicable regulations and notification requirements. Both known and unexpectedly encountered petroleum storage tanks would be properly closed and removed in accordance with all applicable regulations. Unregistered tanks would be registered with NYSDEC, as required. Any associated soil and/or groundwater contamination would be remediated as required by NYSDEC's Petroleum Spill Program.

Prior to any construction activities that might disturb potential asbestos-containing materials, a comprehensive asbestos survey of the areas to be disturbed would be conducted. Any activities with the potential to disturb structures with lead-based paint would be performed in accordance with the applicable Occupational Safety and Health Administration (OSHA) regulation (OSHA 29 CFR 1926.62 - Lead Exposure in Construction). The railroad ties and bridge timbers within the

Project site likely consist of creosote-treated wood. New York State Law (ECL Article 27, Title 25) exempts railroads from phasing out the use of creosote and creosote-treated products, but regulates their disposal when they are removed.

4.17 Indirect and Cumulative Impacts

4.17.1 Introduction

Cumulative impacts are the incremental consequences of an action when added to past and reasonably foreseeable future actions. The analysis of cumulative impacts considers resources, ecosystems, and human communities that could be affected cumulatively when the impacts of the Project Alternatives are combined with other planned projects.

4.17.2 Future Projects—Land Development

Future land development projects in the study area include:

- The Hudson River Waterfront Gateway Improvements project, which will add lighting, landscaping, pedestrian and bicycle improvements, and wayfinding signage at key gateways to the Albany riverfront including the intersection of Colonie Street and Quay Street, just north of the Livingston Avenue Bridge;
- Kiliaen's Landing, an 18-acre mixed-use development planned for area just north the Livingston Avenue Bridge in Rensselaer;
- Rensselaer Riverfront Multi-Use Trail, which will traverse the study area in Rensselaer at the water's edge;
- De Laet's Landing, a mixed-use development in the southern portion of the Rensselaer study area.

Each of these projects is included in the No Action Alternative for the Livingston Avenue Bridge Project and has been included in the baseline conditions used for analysis in this EA; therefore, in combination with the Project under either Build Alternative, these projects would not lead to any substantial adverse effect on resources discussed in the EA. Cumulatively, these projects together with the shared use path over the bridge that would be constructed under either of the Build Alternatives would improve the non-motorized travel network in the study area and enhance waterfront access by providing a series of connected riverfront trails, scenic viewpoints, and waterfront uses. This would be a regional transportation and recreational benefit and fulfill long-time plans to better connect the east and west shoreline communities along the Hudson River.

4.17.3 Future Projects—Transportation

The Livingston Avenue Bridge Project is an important improvement to the Empire Corridor rail line, which extends from New York City to Niagara Falls and is the premier rail corridor in New York State for both passenger and freight movement. The Empire Corridor High Speed Rail Program, which is a separate initiative from the Livingston Avenue Bridge Project, seeks to introduce higher train speeds on the Empire Corridor and to improve reliability, travel times, service frequency, and passenger amenities with the goals of making rail travel more desirable and increasing ridership. FRA and NYSDOT are currently preparing a Tier 1 EIS for the Empire Corridor High Speed Rail Program; a Draft EIS was published in January 2014.[129] While the Livingston Avenue Bridge Project EA is not part of the tiered EIS process for Empire Corridor, replacement of the Livingston

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

Avenue Bridge, together with a number of other planned improvements to the Empire Corridor, would enable full operation of the Empire Corridor High Speed Rail Program.

4.17.4 Commitment of Resources

In accordance with NEPA and the CEQ implementing procedures under 40 CFR Part 1500, this EA includes an analysis of any irreversible or irretrievable commitments of resources that would occur if the Livingston Avenue Bridge Project is constructed.

Implementation of the Project involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the Project would be an irreversible commitment during the time period that the land is used for a transportation facility. However, if a greater need arises for the use of the land, or if the transportation facility is no longer needed, the land can be converted to another use. There is currently no reason to believe that such a conversion will be necessary or desirable.

Construction of the Build Alternatives, described in **Section 4.16, "Construction Impacts,"** would require considerable amounts of construction materials such as concrete, steel, wood, and other building materials. NYSDOT and its contractors would consume energy in the form of fossil fuels and electricity during the construction and operation of the new bridge. These materials are generally not retrievable. However, they are readily available, are not in short supply, and their use for the Project would not have an adverse impact on their continued availability for other purposes. In addition to materials, NYSDOT would require funding and human labor to design, build, and operate the Project. NYSDOT endeavors to minimize the use of irretrievable resources and to conserve and reuse resources whenever possible. The Project would also require a substantial one-time expenditure of both state and Federal funds, which are not retrievable.

The commitment of these resources is based on the concept that the residents of the Cities of Albany and Rensselaer, New York State, and the greater region would benefit by the improved quality of the passenger and freight rail system. These benefits are anticipated to outweigh the commitment of resources.