High Speed Rail Empire Corridor

Tier 1 Final Environmental Impact Statement
Volume 1

EMPIRE CORRIDOR
NEW YORK STATE DEPARTMENT OF TRANSPORTATION
HIGH SPEED RAIL • TIER 1 EIS

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

DEPARTMENT OF TRANSPORTATION UNITED STATES OF AMERICA

U.S. Department of Transportation
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High Speed Rail Empire Corridor Program
Tier 1 Final Environmental Impact Statement (EIS)

Pursuant to:

National Environmental Policy Act of 1969 (42 USC Section 4321 et seq.) Federal Railroad Administration, Procedures for Considering Environmental Impacts (64 FR 28545 and 78 FR Part 2713); Section 4(f) of the U.S. Department of Transportation Act (49 USC 303) and implementing regulations (23 CFR Part 774); Federal Railroad Administration, Procedures for Considering Environmental Impacts (64 Federal Register 28545); National Historic Preservation Act (54 USC 306101 et seq.) and implementing regulations (36 CFR Part 800); Clean Air Act-as amended (42 USC 7401 et seq.) and implementing regulations (40 CFR Parts 51 and 93); the Endangered Species Act of 1973 (16 USC 1531-1544) and implementing regulations (50 CFR Part 402); Clean Water Act (33 USC 1251-1387) and implementing regulations (33 CFR Parts 320 to 324 and 40 CFR Part 230); and Section 6(f) of the Land and Water Conservation Fund Act (36 CFR Part 59).

New York State Environmental Quality Review Act (17 NYCRR Part 15)

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Tier 1 Final Environmental Impact Statement

This Tier 1 Final Environmental Impact Statement (EIS) consists of five volumes:

Volume 1 Environmental Impact Statement, which includes:

- Executive Summary
- Chapter 1, Introduction and Purpose and Need
- Chapter 2, Existing Transportation Conditions and Major Markets
- Chapter 3, Alternatives
- Chapter 4, Social, Economic, and Environmental Considerations
- Chapter 5, Financial Capacity
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- References, Acronyms, Glossary of Terms, and List of Preparers

Volume 2 Appendix A - Track Schematics

Track schematic (11”x17”) plans of the Base Alternative and four Build Alternatives

Volume 3 Appendices B through H

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ES Executive Summary

ES-1. Introduction

The Federal Railroad Administration (FRA) and the New York State Department of Transportation (NYSDOT) have prepared a tiered Environmental Impact Statement (EIS) to evaluate proposed system improvements to intercity passenger rail services along the 464-mile Empire Corridor, connecting Pennsylvania (Penn) Station in New York City with Niagara Falls International Railway Station and Transportation Center in Niagara Falls, New York.

The Empire Corridor is one of eleven designated high-speed rail corridors nationwide, initially authorized under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and supplemented by the Transportation Equity Act for the 21st Century of 1998 (TEA-21). In December 1998, the U.S. Secretary of Transportation announced the official designation of the TEA-21-authorized Empire Corridor as a high-speed rail corridor. On April 16, 2009, President Obama announced a Vision for High-Speed Rail in America and committed to funding this program through the federal American Recovery and Reinvestment Act of 2009 (ARRA). To achieve this vision, the FRA launched the High-Speed Intercity Passenger Rail (HSIPR) Program in 2009,[1] and Congress funded $8 billion through ARRA. Congress continued to fund annual appropriations totaling $2 billion for fiscal years 2009 and 2010,[2] using the framework developed by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).[3] The Fixing America's Surface Transportation Act, or FAST Act, provided funding through 2020 and marked the first time intercity passenger rail programs were included in a comprehensive, multimodal surface transportation bill, authorizing $6.7 billion over five years.[4] The current plans for infrastructure funding by the federal government include funding for Amtrak and intercity passenger rail, to fund initiatives such as improved passenger rail service on the Empire Corridor.

The Tier 1 EIS has been developed in accordance with the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); FRA's NEPA procedures (64 Federal Register [FR] 28545 and 78 FR Part 2713); and the New York State Environmental Quality Review Act (SEQR). NYSDOT, as the SEQR lead agency, has determined that NYSDOT's variance procedures for SEQR (17 New York Codes, Rules and Regulations [NYCRR] Part 15) apply.

FRA and NYSDOT are using a tiered process to complete the environmental review of the High Speed Rail Empire Corridor Program. "Tiering" is a staged environmental review process applied to environmental reviews for complex projects. This initial phase, the Tier 1 EIS, addresses broad corridor-level issues and sets forth a package of follow-on studies, proposals, and projects. The publication of the Tier 1 Draft EIS in the Federal Register, on January 31, 2014, was a major milestone in the tiered review process for this program. This Tier 1 Final EIS considers public and agency

[1] The HSIPR program is funded by the American Recovery and Reinvestment Act of 2009 (ARRA) (Public Law 111-5, 123 Stat. 115) and the Transportation, Housing and Urban Development and Related Agencies Appropriations Act for 2010 (Division A of the Consolidated Appropriations Act, 2010 (Pub. L. 111-117)).

[2] Additional funds under these original appropriations were redistributed again in 2011, after several states returned the grant monies.

[3] The Passenger Rail Investment and Improvement Act of 2008 (PRIIA) (Division B, Title III of Public Law 110-432, 122 Stat. 4907 (October 16, 2008)) authorized the appropriation of funds to establish several new passenger rail grant programs, including capital investment grants to support intercity passenger rail service, high-speed corridor development, and congestion grants. FRA consolidated these and other closely related programs into the High-Speed Intercity Passenger Rail (HSIPR) Program.

[4] FRA, "FAST Act: Overview," accessed June 25, 2017: <https://www.fra.dot.gov/Page/P0919>. The FAST Act did not provide additional funding for the High Speed Rail Empire Corridor Program.

comments received during the public comment period, which closed on April 30, 2014, and identifies a Preferred Alternative. The number and types of comments received during the public comment period, with broad-based support for introducing rail improvements that increase service and travel speeds, reflect the public interest in improvements in the Empire Corridor. Subsequent phases, or tiers, will analyze, at a greater level of detail, individual project improvements based on the decisions made in Tier 1. The Tier 2 NEPA process will include detailed analyses based on refined engineering designs and operational plans. It will identify site-specific environmental consequences, and develop site-specific mitigation measures for the Preferred Alternative. The program will be implemented as a package of separate improvement projects to be planned, designed, and constructed over the next 25 years, as outlined in the Service Development Plan.

The possibility of instituting high-speed rail along the Empire Corridor has been the focus of studies by NYSDOT and others for more than twenty years. Developments in recent years by FRA and NYSDOT/New York State have advanced rail planning and funding at both the federal and state levels, culminating in this Tier 1 Final EIS to evaluate high-speed passenger rail service along the Empire Corridor. Each alternative analyzed in this Tier 1 Final EIS contains the same set of enhancements for the Empire Corridor South (south of Albany/Rensselaer). Those enhancements were developed and agreed by the owners and operators of the Empire Corridor South and set forth in the Hudson Line Railroad Corridor Transportation Plan: Final Report (2005). For the Empire Corridor West (west of Albany/Rensselaer), this Tier 1 Final EIS analyzes new alternative sets of improvements and projects.

CSX Transportation, Inc. (CSXT), a private freight railroad company, owns more than half of the Empire Corridor (Exhibit 2-1). While recognizing the federal NEPA and New York state SEQR legal framework upon which the environmental review process must be based, this Tier 1 Final EIS has also been developed in consideration of two agreements between NYSDOT and CSXT (dated May 28, 2010), "Framework Agreement Concerning Certain Rights and Responsibilities with Respect to New York High Speed Rail" and "Agreement for Progressing a Tier 1 Environmental Impact Statement" (attached as Appendix J).

ES-2. Where is the High Speed Rail Empire Corridor Program?

The Empire Corridor connects the larger cities in New York State, extending north from New York City to Yonkers and Poughkeepsie, turning west at Albany to extend through Schenectady, Utica, Syracuse, Rochester, and Buffalo, and terminating at Niagara Falls. The Empire Corridor consists of three main sections: Empire Corridor South, Empire Corridor West, and Niagara Branch, as shown in Exhibit ES-1.

- **Empire Corridor South** begins at Penn Station in New York City and extends 142 miles along the east side of the Hudson River, from Manhattan (New York County) through the Bronx (Bronx County), Yonkers and Croton-Harmon (Westchester County), Poughkeepsie and Rhinecliff (Dutchess County), to Albany-Rensselaer Station (Rensselaer County).

- **Empire Corridor West** extends 294 miles west from Albany-Rensselaer Station to just east of the Buffalo-Exchange Street Station, passing through the Mohawk Valley from the Capital District cities of Albany (Albany County) and Schenectady (Schenectady County), through the central-western New York cities of Utica (Oneida County), Syracuse (Onondaga County), and Rochester (Monroe County) in the Finger Lakes District, and Buffalo (Erie County) on Lake Erie. Outside of these metropolitan areas, the railroad also passes through the more rural counties of

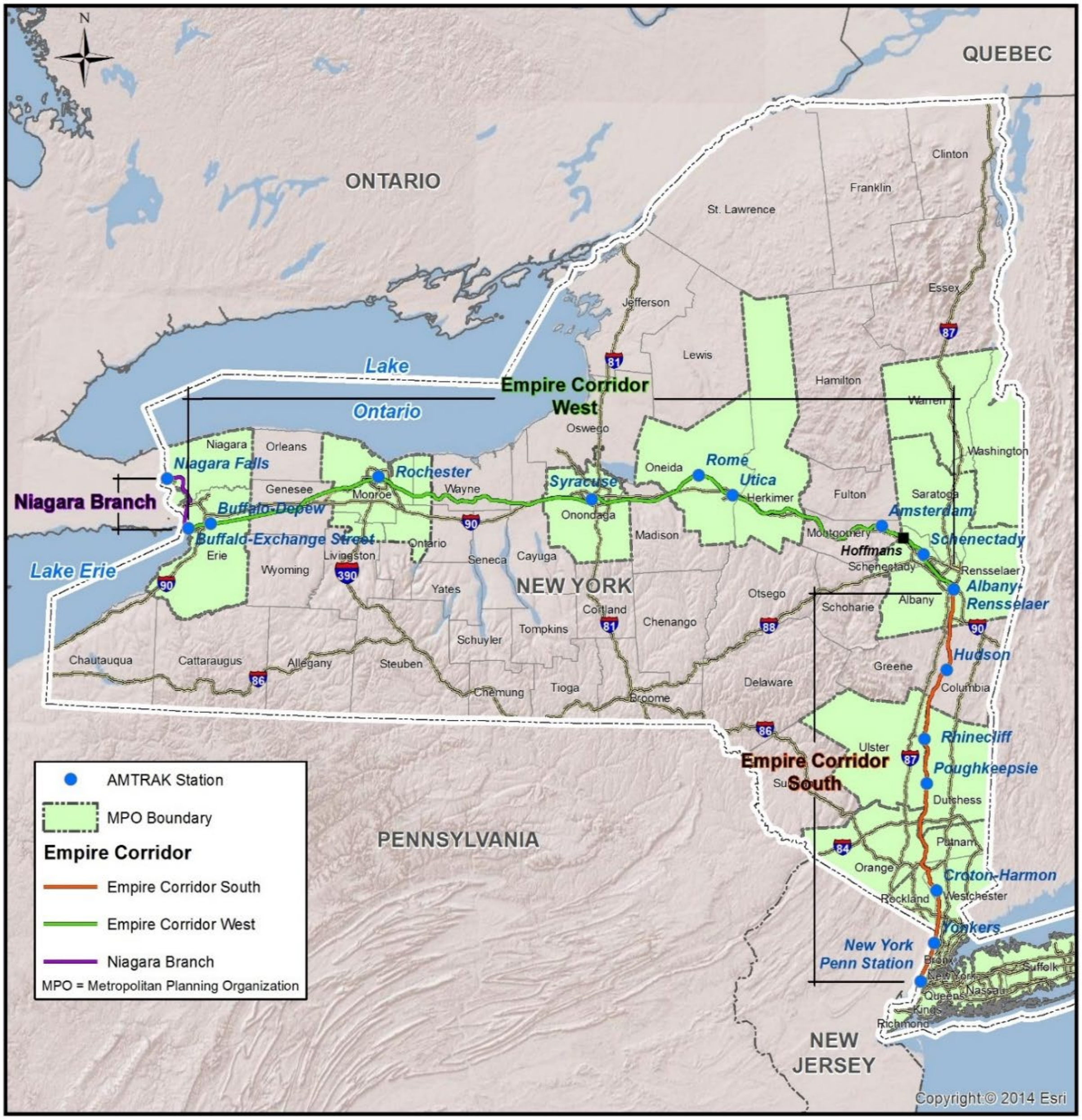


Exhibit ES-1—Program Location Map

Montgomery, Herkimer, Madison, Cayuga, Wayne, and Genesee.

- The **Niagara Branch** extends 28 miles west, from east of Buffalo-Exchange Street Station to Niagara Falls (Niagara County).

ES-2.1. What is the transportation corridor used for?

The existing Empire Corridor has been a vital transportation route of national significance for almost

200 years. The corridor developed along the historic "Water Level Route" that followed the canal system connecting Lake Erie and the Hudson River to transport goods and services to and from New York City. The Empire Corridor helped to establish New York City as an international trade center, connecting markets in Canada and the Midwest with Albany (providing connections to Montreal and Boston) and New York City. For many decades, the railroad was operated by the New York Central Railroad as a four-track mainline between Albany and Buffalo carrying passenger and freight trains on express and local tracks. As part of cost-saving measures that started in the late 1950s, tracks were removed, and the line exists today as a double track system through upstate New York (between Albany and Buffalo), where it is a heavily used shared-use corridor with freight, and continues as a single track on portions of the line extending north to Niagara Falls.

The Empire Corridor runs along the population and economic spine of the state, connecting all of New York State's major metropolitan areas. The corridor is essential to New York for its ability to efficiently transport large numbers of passengers and goods annually that would otherwise be transported via highway and air travel corridors. It is distinguished by its diversity of ownership and the mix of passenger and freight usage, as the National Railroad Passenger Corporation's (Amtrak's) Empire Service shares trackage with CSXT and the Metropolitan Transportation Authority's Metro-North Railroad (Metro-North).

Empire Corridor South is dominated by commuter travel and carries a much greater frequency of intercity passenger rail services and only a limited number of freight trains. The Metro-North, the second busiest commuter railroad in the United States based on ridership, operates the Hudson Line commuter rail service between Poughkeepsie and Grand Central Terminal, New York City (NYC), cross-town from Penn Station, NYC. In 2019, Metro-North operated between roughly 59 (weekend) and 85 (weekday) daily roundtrips along the Hudson Line. In 2019, Amtrak operated thirteen daily roundtrips (weekdays) along Empire Corridor South between Albany-Rensselaer and New York City, with eleven daily roundtrips on the weekends. In addition to Empire Service to Buffalo and points beyond (four daily roundtrips), this section of track also accommodates Amtrak service that extends north of Schenectady Station on the Canadian Pacific Railway to Montreal, Canada (Adirondack—one daily roundtrip) and Vermont (Ethan Allen Express—one daily roundtrip). There is also one daily connecting service from Albany-Rensselaer to Boston, Massachusetts.

Passenger service on Empire Corridor South has shared use of the tracks with limited freight operations of approximately four trains a day.

Empire Corridor West is a two-track line that is the busiest freight track in the state, carrying one of the highest volumes on the CSXT system nationwide. This is the only railroad crossing upstate/western New York that can accommodate the maximum freight rail car weight (315,000 pounds). The entire line west of Hoffmans (west of Albany) also has adequate clearance for double-stack intermodal trains. CSXT operates this as a high-volume railroad that is heavily used by 50 to 60 daily freight trains.

In 2019, Amtrak operated a total of four daily roundtrips along Empire Corridor West. Amtrak operates three daily round trips to Niagara Falls (Empire Service), with one continuing on to Toronto (Maple Leaf Service). The other daily service trip continues from Buffalo-Depew Station to Chicago (Lake Shore Limited). In addition to these four trips, two trips offer service to Schenectady, one on the Adirondack Service continuing to Montreal and one on the Ethan Allen Express continuing to Rutland, Vermont.

The **Niagara Branch** is primarily a passenger railroad, since there is a freight bypass route used by CSXT that provides modern clearances for freight service to Niagara Falls. Of the four daily westbound passenger trains operated by Amtrak along Empire Corridor West from Albany to Buffalo, three continue on to Niagara Falls.

ES-2.2. What is the purpose and need for the program?

The purpose of the High Speed Rail Empire Corridor Program is to introduce higher passenger train speeds on the Empire Corridor and to improve reliability, travel times, service frequency, and passenger amenities. By improving passenger rail service along the corridor, the High Speed Rail Empire Corridor Program will attract additional passengers, increase travel choices, and contribute to a balanced, multi-modal transportation system.

The need for the program is that existing Empire Corridor passenger rail service is negatively impacted by inadequate service levels, operational constraints (track conditions, alignment, and obsolete or inadequate track and signal systems), and delays resulting from pervasive conflicts with freight traffic. As a result, it is not viewed by travelers as a dependable, attractive transportation option, particularly to and from points west of Albany-Rensselaer. For example, the trip from Buffalo to New York City can be made in less than two hours by air and under seven hours by car, compared to approximately eight hours by the existing Empire Corridor passenger service provided by Amtrak.

Despite these constraints and service problems, ridership on the Empire Corridor had increased by 54 percent (561,881 passengers) over 17 years to 1.6 million passengers in 2019.[5] Since 2001, ridership on the Buffalo to Albany portion of the corridor has more than doubled, at the same time freight and commuter rail volumes have grown. Projections through 2035 indicate that freight traffic will continue to increase, and forecasts for the Metro-North Hudson Line through 2022 also predict substantial increases. The Hudson Line ridership increased 50 percent over 25 years to reach 17.4 million passengers in 2019, an increase of 5.8 million passengers. Congestion is expected to only worsen as demand for intercity passenger, commuter, and freight rail services all continue to grow on these shared-track systems.

Despite the growth in ridership, there is still a need for the program. Existing and forecasted socioeconomic and transportation market conditions in the Empire Corridor indicate an opportunity for an improved Empire Corridor passenger rail service to further grow, offering a viable, alternative mode of intercity travel in the Empire Corridor.

The Empire Corridor West's connections to the Niagara region highlight its importance as a rail corridor for both freight and passenger rail. The Buffalo-Niagara Region is an important gateway to Canada for international trade. The four highway bridges and two rail bridges across the Niagara River comprised the second busiest commercial border crossing of the entire Canada-U.S. border.[6]

Existing inadequate infrastructure to support rail operations limits Empire Corridor service. Simulated existing passenger service along Empire Corridor West indicates that passenger train on-time performance (OTP) is less than 48 percent, with an average train speed of approximately 50 miles per hour (mph) and an average train lateness of almost 28 minutes.[7] Simulated existing freight

[5] This Tier 1 Final EIS describes 2019 rail ridership, OTP, and schedule as the latest available pre-pandemic condition. Ridership reported for the corridor excludes the ridership on the Lake Shore Limited, Adirondack, and Ethan Allen Express services.

[6] Ontario Ministry of Transportation and NYSDOT, *Bi-National Transportation Strategy for the Niagara Frontier*, December 2005.

[7] LTK Engineering Services. *Rail Network Operations Simulation Results*. Prepared for New York State Department of Transportation. June 2012. Network simulations for this Tier 1 EIS reflect the rail network along Empire Corridor West. The *Hudson Line Corridor Railroad Transportation Plan*, 2005, includes rail operations network simulation results and proposed actions for Empire Corridor South.

train performance along Empire Corridor West indicates over 38 train minutes of delay per 100 freight train miles operated, indicating congestion ahead, and a high variability in average freight train trip times, indicating service inconsistency.

For Amtrak's current rating of reliability on its routes, 80 percent on-time performance (OTP) is considered to be a "passing" grade. In 2019, Amtrak rated the Empire Service between New York and Albany as having 91 percent of on-time customers (where customers arrive within 15 minutes), but the full Empire Service operating between New York to Niagara Falls only operated with 66 percent of on-time customers (considered by Amtrak to be a failing grade). Of the other routes operating on Empire Corridor in 2019, only the Ethan Allen Express received a passing OTP (85 percent). The Adirondack had a 2019 customer OTP of 73 percent, and the Maple Leaf had an OTP of 67 percent.

Current passenger rail service is also infrequent relative to travel demand. For example, there is a strong travel market between New York City and Albany, and passenger rail captures only 11 percent of that travel market. In 2019, 13 weekday trips were available, with the earliest Albany arrival time of approximately 9:50 a.m.; this limited service does not accommodate business weekday schedules. Furthermore, although maximum authorized speeds (MAS) along portions of the Empire Corridor are 79 mph on the Buffalo to Hoffmans (west of Albany) segment and 110 mph on the Hoffmans to New York City segment (refer to Figure ES-1), actual operating speeds along much of the rail corridor are considerably lower due to track conditions, alignment, and obsolete or inadequate track and signal systems which constrain capacity and speed.

ES-2.3. What are the goals and objectives of the program?

NYSDOT proposes to undertake the High Speed Rail Empire Corridor Program to improve intercity passenger service in New York State through infrastructure investments and operational improvements, which will enhance the attractiveness of the service to existing and potential riders, increase the market share of intercity passenger rail, and contribute to an overall balanced transportation network. Improvements in service include tangible and measurable gains in operational reliability and travel time reductions of scheduled train trips; an increase in the frequency of train trips; and support of economic development, mobility, and environmental sustainability goals.

NYSDOT has identified the following performance objectives for the High Speed Rail Empire Corridor Program as measurable objectives that directly relate to the program purpose and need to reduce infrastructure constraints to accommodate existing and projected demand:

- Improve system-wide on-time performance (OTP) to at least 90 percent;
- Reduce travel time along all segments of the Empire Corridor;
- Increase the frequency of service (number of daily round trips) along Empire Corridor West beyond the existing four daily round trips;
- Attract additional passengers;
- Reduce automobile trips, thereby reducing highway congestion;
- Minimize interference with freight rail operations.

These six performance objectives are used to evaluate and rank the high-speed rail alternatives developed for the High Speed Rail Empire Corridor Program. The environmental impacts and costs of these alternatives are also considered, as presented in this Tier 1 Final EIS, and were an important factor in selecting the Preferred Alternative.

In addition, NYSDOT identified the following transportation-related goals for the program:

- Increase travel choices and improve quality of life by providing additional commuting and travel options for residents and workers;
- Contribute to economic revitalization by accommodating forecasted growth in population and employment and corridor rail freight operations and by accommodating and attracting additional tourists;
- Improve environmental quality by facilitating rail use and reducing reliance on automobile travel, thereby reducing fuel use and greenhouse gas (GHG) emissions.

ES-2.4. Why is this EIS being conducted?

The purpose of this Tier 1 EIS is to address broad, corridor-level issues associated with higher speed passenger rail service along the Empire Corridor and to set forth a package of follow-on (Tier 2) studies, proposals, and projects. The Tier 1 EIS evaluates a range of alternatives to meet the program needs of reducing infrastructure constraints and accommodating existing and projected demand in the Empire Corridor. It identifies broad-based operational changes and investments in infrastructure and rolling stock (locomotives and passenger coaches) necessary to achieve the performance objectives, and estimates the capital and operating costs of the different alternatives. As a result of the Tier 1 EIS, FRA and NYSDOT selected an alternative which best meets the program needs, in consultation with the Empire Project Advisory Committee, other agencies, and the public.

This Tier 1 EIS accomplishes the following:

- Defines the purpose and need for the proposed action including performance objectives (Chapter 1);
- Documents the need for the proposed action by analyzing existing conditions (Chapter2 and Appendices B, D, and E);
- Develops criteria and screens alternatives to eliminate those that do not meet the purpose and need of the proposed action (Appendix C) (Chapter 3);
- Identifies the range of reasonable alternatives to be considered, consistent with the current and planned use of the corridor, existing services within and adjacent to the program area, and other planned improvements (Chapter 3);
- Identifies the general alignments and right-of-way requirements of the reasonable alternatives (Chapter 3);
- Identifies the travel times, service schedule, frequencies, and stations serviced for the reasonable alternatives (Chapter 3);

- Identifies environmental constraints and considerations and performs high-level environmental review and analysis of conceptual alternatives under consideration[8] (Chapter 4);
- Identifies the infrastructure and equipment investment requirements for each of the reasonable alternatives (Chapter 5);
- Establishes the timing and sequencing of individual capital improvements to implement the proposed action (Chapter 5);
- Evaluates the alternatives according to the program purpose and need and impact upon existing freight service, and compares the likely environmental impacts among alternatives (Chapter 6);
- Documents the public outreach and agency coordination process used to solicit input on the alternatives (Chapter 7);
- Responds to agency and public comments received in public hearings and written comments received (Appendix K).

This Tier 1 Final EIS identifies a Preferred Alternative for the High Speed Rail Empire Corridor Program consisting of required individual capital improvements needed to achieve the program. For the program of improvements selected in this Tier 1 process, the follow-on Tier 2 NEPA documents will then explore in greater detail the component projects of the Preferred Alternative. The Tier 2 NEPA process will include detailed analyses based on refined engineering designs and operational plans. It will identify site-specific environmental consequences, and develop site-specific mitigation measures for the Preferred Alternative. Input from the public and from reviewing agencies, which had been sought during the preparation and publication of the Tier 1 Draft EIS, will continue to be solicited during the Tier 2 NEPA process.

ES-3. Alternatives Considered

ES-3.1. Initial Alternatives Considered

FRA and NYSDOT considered alternatives relative to maximum passenger train speeds, service frequencies, and physical improvement projects and selected Alternative 90B as the Preferred Alternative. Initially, alternatives were developed according to FRA's definitions of high-speed rail and intercity passenger rail service, labeled as **Emerging** (speeds up to 90 mph), **Regional** (between 90 and 125 mph), and **Core Express** (speeds between 125 and 250 mph). NYSDOT developed an initial range of possible alternatives within the framework of these categories that were grouped according to six maximum authorized speed groups. The six maximum authorized speed groups for the alternatives development consisted of:

- **79 mph,** current track standards/in cab signaling capacity–**Base, 79A, 79B, 79C Alternatives**;
- **90 mph**, next step up in track standards/in cab signaling train control–**Alternatives 90A/90B**;
- **110 mph**, another step up in track standards–**Alternative 110**;
- **125 mph**, the first speed threshold for electrically powered trains – **Alternative 125**;
- **160 mph**, the practical upper limit of electrified dynamic tilt trains, such as Acela; and
- **220 mph**, the practical upper limit of high speed rail operations.

[8] Appendix G provides more details on the Tier 1 environmental inventory and impact assessment for the Base and other Build Alternatives considered.

In addition to applying FRA's high-speed rail service levels, alternatives development also included an evaluation of service frequency, equipment requirements, and previously-identified and potential physical improvements to enhance service. The ten initial alternatives were then screened according to the program purpose and need and associated performance goals and objectives. Applying a consistent set of performance measures based on the program purpose and need and a comparative assessment of the alternatives, certain alternatives were not advanced. These included the lower-speed 79 mph maximum authorized speed alternatives, and the Very High Speed (VHS) alternatives (160 mph, 220 mph). The 79 mph alternatives were rejected as not providing enough mobility benefit – in terms of speed and travel times – compared to the similar cost 90 mph alternatives. The VHS alternatives were rejected for their extremely high cost – nearly triple the next most costly alternative – the likelihood of significant community and environmental impacts, and significant engineering design difficulties necessary to create a sufficiently straight track alignment to permit these speeds. These considerations are discussed more thoroughly in Section 3.2.2. The options retained for further evaluation are discussed in the next section.

ES-3.2. Alternatives Advanced

Five alternatives, including the Base Alternative and four Build Alternatives, were advanced for further study in the Tier 1 EIS. The Build Alternatives consist of Alternatives 90A, 90B, and 110, located along the existing Empire Corridor, and Alternative 125, which continues existing service on the existing tracks while adding a new, segregated high-speed right-of-way reserved exclusively for passenger trains and paralleling the existing alignment, as shown in Exhibit ES-2.

The following paragraphs describe the five High Speed Rail Empire Corridor Program alternatives. For each, there are a series of capital improvements aimed at improving switching and signalization to increase track capacity, straightening vertical and horizontal curves to permit higher speed, adding passing tracks and/or a fully segregated third track reserved for passenger use, and reducing the number of vehicular grade crossings to meet FRA requirements for higher-speed operation.

In each case, a suite of capital improvements identified in the *Hudson Line Railroad Corridor Transportation Plan* (2005)[9] are included for the Empire Corridor South segment, common to all four Build Alternatives. These improvements are:

- Add second track between MPs 9 to 13 (including Spuyten-Duyvil Movable Bridge);
- Add new Tarrytown pocket track to support Metro-North turnbacks without delaying Empire Corridor Service;
- Add new signal system between Croton-Harmon to Poughkeepsie Stations (MPs 32.8 to 75) for additional operating capacity;
- Add third track (MPs 53 to 63) to support Empire Corridor overtakes of Metro-North trains;
- Add new track/siding at Poughkeepsie Station Track 3 to support higher operating speeds for Empire Corridor and Metro-North service;
- Add new Poughkeepsie Yard to eliminate station congestion and crossing conflicts north and south of the station;

[9] Available at: https://www.dot.ny.gov/content/delivery/Main-Projects/S93751-Home/S93751--Repository/HudsonLineTransportationPlan_Final_Report_2005.pdf.

- Add new Control Point (CP) 82, new CP 99, new CP 136 two-track universal interlockings to support enhanced reliability during maintenance activities;
- Reconfigure Hudson Station to support simultaneous passenger boarding/alighting on both main tracks.

The Albany-Rensselaer Station Fourth-Track Capacity improvements were also included in the Hudson Line Transportation Plan and were completed. These improvements are included with the Base Alternative analysis.

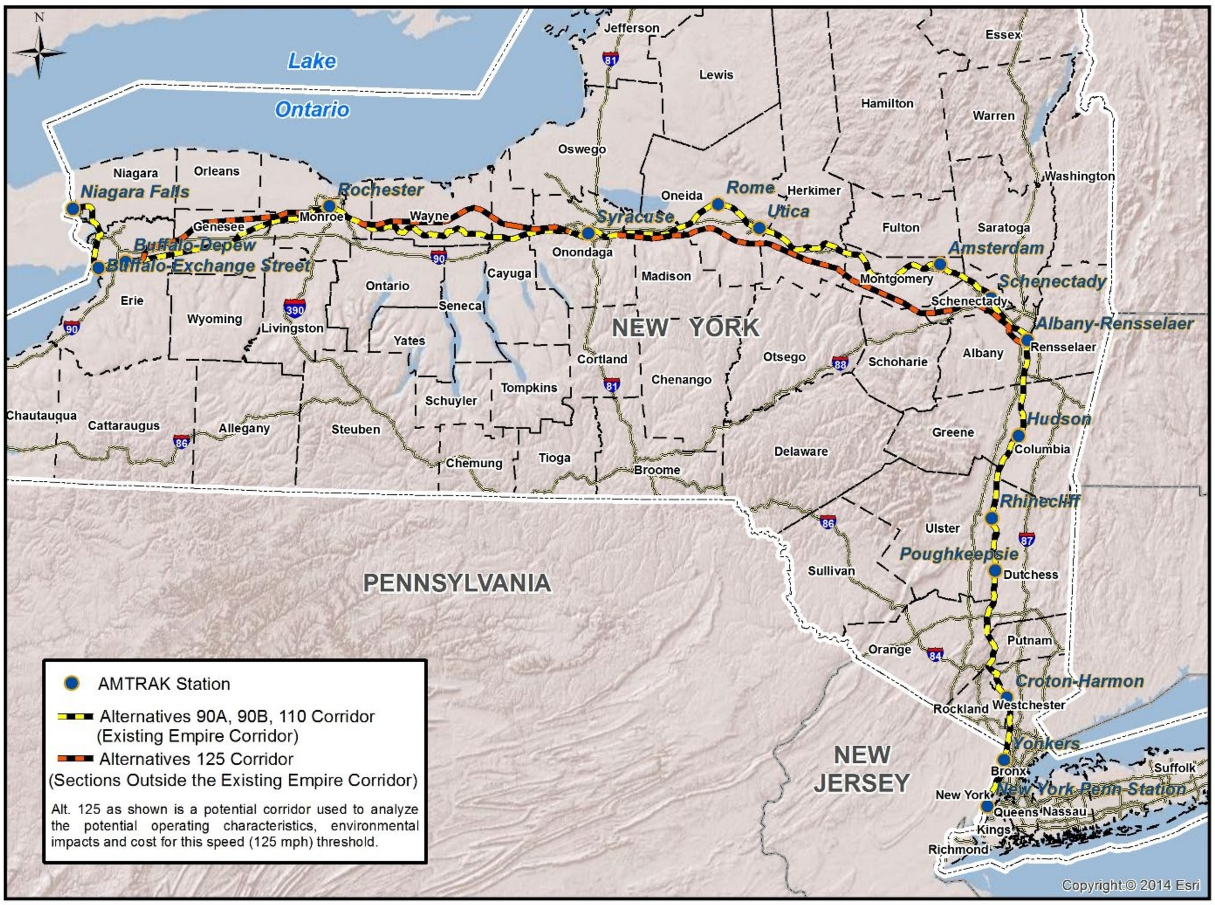


Exhibit ES-2—Corridor Map of the Build Alternatives

ES-3.2.1. Base Alternative

NEPA/SEQR regulations require analysis of the Base Alternative, often referred to as the No-Action or No-Build Alternative. This analysis is carried through the Tier 1 EIS to evaluate the cost and impacts of the program Build Alternatives in relation to the benefits gained by the public. The Base Alternative represents a continuation of existing Amtrak service with those operational and service improvements already programmed or constructed. At the time the Tier 1 Draft EIS was prepared, eight rail improvement projects that were planned and funded under FRA HSIPR and TIGER grants to address previously identified capacity constraints comprised the Base Alternative. Since publication of the Tier 1 Draft EIS, all of these projects have been completed.

Train frequency would remain unchanged from the existing frequency. The Base Alternative would maintain the existing 13 round trips per day between New York Penn Station and Albany-Rensselaer Station and the four round trips per day between Albany-Rensselaer Station and Buffalo, with three trips continuing to Niagara Falls. The majority of the work would occur within the existing right-of-way (ROW). Train trips would continue to operate at the existing maximum speed of 79 mph. The average running speed would be 51 mph. Despite projected increases in ridership, train frequency in the Base Alternative would remain unchanged from the existing frequency, and there would be no additional train sets added to the existing inventory. In 2035, 1.6 million riders are projected for the Base Alternative.

The capital cost of the Base Alternative, at the time the Tier 1 Draft EIS was prepared, was estimated to be $310 million for the eight projects proposed. The annual operations and maintenance (O&M) cost would be $106 million. With annual revenue estimated at $79 million, the annual deficit would be $27 million. The Base Alternative's estimated operating ratio, or the percent of O&M costs covered by revenue, would be 75 percent, the worst of all the alternatives. The estimated annual subsidy per rider for the Base Alternative would be approximately $17.

ES-3.2.2. Alternative 90A

Alternative 90A would add capacity and station improvements through twenty separate, capital improvement projects. Improvements for Alternative 90A would include 64 miles of new mainline track; and upgrades to 17 grade crossings/warning systems, 74 undergrade bridges, and six stations/facilities. As noted in Section ES-3.2, these improvements include elements originally proposed along Empire Corridor South as part of the Hudson Line Transportation Plan. Trains would operate at 90 mph maximum authorized speed between Schenectady and Buffalo Exchange Street, and would continue to operate at existing speeds between Penn Station, NYC and Schenectady and between Buffalo Exchange Street and Niagara Falls. The average running speed in Alternative 90A would increase to 57 mph, 12 percent faster than in the Base Alternative.

Alternative 90A would add three daily round trips between New York City and Albany, for a total of 16 round trips; and it would add four daily round trips between Albany and Niagara Falls, for a total of eight round trips to Buffalo, with seven continuing to Niagara Falls. Schedule enhancements would include express service from New York City to western New York, with station stops in Albany-Rensselaer, Syracuse, Rochester, Buffalo-Depew, Buffalo-Exchange Street, and Niagara Falls. Six train sets would be added. Alternative 90A is projected to increase annual ridership to 2.3 million passengers in 2035. This would be a gain of 700,000 passengers above the ridership projected in 2035 for the Base Alternative.

The capital cost of Alternative 90A is estimated to be $1.72 billion. The annual O&M cost would be $160 million. With annual revenue estimated at $122 million, the annual deficit would be $38 million. Alternative 90A's estimated operating cost ratio would be 76 percent, slightly higher (better) than that of the Base Alternative. The estimated annual subsidy per rider for Alternative 90A would be the highest of the Build Alternatives, but would be slightly lower than that of the Base Alternative, at approximately $17.

ES-3.2.3. Alternative 90B—Preferred Alternative

As described in Section ES-5 of this Executive Summary and in Chapter 6 of this Tier 1 Final EIS, Alternative 90B has been identified as the Preferred Alternative. The installation of approximately 370 miles of trackage, including additional third and fourth tracks, under Alternative 90B would add capacity and provide the ability to route passenger trains around freight trains even while passenger trains operate at higher speeds. Alternative 90B would include the improvement projects proposed under Alternative 90A. Alternative 90B would add a dedicated third main passenger track for approximately 273 miles between Schenectady and Buffalo-Depew stations. It would also add a fourth passenger track over a combined distance of approximately 39 miles in five separate locations. The third main passenger track would be located 15 feet from the existing mainline, and would generally occupy the portion of the existing railroad bed that historically contained two additional tracks. The fourth track would be located 15 feet north of the dedicated third track and have been designated with a maximum authorized speed of 90 mph. Alternative 90B improvements again include those Empire Corridor South Hudson Line Transportation Plan elements common among all of the Build Alternatives, as noted in Section ES-3.2 of this Executive Summary.

Additional infrastructure specific to Alternative 90B would include:

- A new signal system to support the 90 mph maximum authorized speed,
- Bridge modifications,
- Grade crossing modifications,
- Culvert extensions,
- Station improvements, and
- Three grade separated flyovers to carry passenger track passes over the existing freight tracks.

Because it would use dedicated passenger-only tracks, Alternative 90B would have fewer speed restrictions than would Alternative 90A. Under Alternative 90B, several areas along Empire Corridor West would require larger track shifts to obtain an increase in operating speeds due to the existing geometry of the track. Trains would operate at 90 mph maximum authorized speed between Albany and Buffalo and Niagara Falls. The average running speed in Alternative 90B would increase to 61 mph, 17 percent faster than the average speed of the Base Alternative, and approximately 7 percent faster than the average speed of Alternative 90A.

Like Alternative 90A, Alternative 90B would add four daily round trips between Albany and Niagara Falls for a total of eight daily round trips to Buffalo. Alternative 90B would add an additional round trip between NYC and Albany over Alternative 90A, for a total of 17 round trips along Empire Corridor South. Similar to Alternative 90A, six train sets would be added to increase the frequency of passenger rail service. Unlike Alternative 90A, there would be no express service in Alternative 90B, due to its proposed operating plan. Alternative 90B is projected to increase ridership to 2.6 million passengers in 2035. This would be a gain of approximately 300,000 passengers above projected ridership for Alternative 90A and a gain of approximately 1 million passengers above projected ridership for the Base Alternative.

The capital cost of Alternative 90B is estimated to be $5.97 billion. The annual O&M cost would be $176 million. With annual revenue estimated at $143 million, the annual deficit would be $33 million. Alternative 90B's estimated operating ratio would be 81 percent, higher (better) than both the Base Alternative and Alternative 90A. The estimated annual subsidy per rider for Alternative 90B would be approximately $13, which is about 25 percent less than that of the Base Alternative.

ES-3.2.4. Alternative 110

Alternative 110 would include the improvement projects proposed under Alternative 90A and would construct new third and fourth main tracks to support the 110 mph maximum authorized speed. Alternative 110 would add approximately 384 miles of additional trackage, but the location of the new tracks 30 feet from the existing tracks (or 15 feet further than Alternative 90B) would result in considerably greater property impacts than the Preferred Alternative. It would add a dedicated third main passenger track over 273 miles between Schenectady and Buffalo-Depew stations. It would also add a fourth passenger track over 59 miles in six locations. The third main passenger track would be located generally 30 feet from the existing mainline and occupying a portion of the existing railroad bed that historically contained two additional tracks. Due to existing physical conditions that would make it impractical to achieve the 30-foot separation, there would be sections of third main track located 15 feet from the existing track. In these instances, the maximum authorized speed would be reduced to 90mph. The fourth track would be located between the dedicated third track and the existing track using 15-foot track centers, with a designated maximum authorized speed of 90 mph. Alternative 110 improvements again include those Empire Corridor South Hudson Line Transportation Plan elements common among all of the Build Alternatives, noted in Section ES-3.2 of this Executive Summary.

Additional infrastructure specific to Alternative 110 would include:

- A new signal system to support the 110 mph maximum authorized speed,
- Bridge modifications,
- Grade crossing modifications,
- Culvert extensions,
- Station improvements, and
- Two grade separated flyovers to carry the third main passenger track over freight tracks.

Alternative 110 would provide two grade-separated flyovers. West of Rochester, the dedicated third passenger track would run over the existing Track 2 alignment, and the existing freight tracks would be relocated to the north to maintain the desired track centers. This configuration would also eliminate an expensive grade separated flyover.

The average running speed in Alternative 110 would increase to 63 mph, more than 21 percent faster than that of the Base Alternative, and approximately 3 percent faster than Alternative 90B's average speed.

Alternative 110 would add the same number of trips along the Empire Corridor as proposed for Alternative 90B. Like Alternative 90B, Alternative 110 would add four daily round trips between Albany and Niagara Falls, for a total of eight daily round trips to Buffalo, and would add four daily round trips along Empire Corridor South, for a total of 17 round trips. Due to its proposed operating plan, Alternative 110 would not offer express service. Six train sets would be added to increase the frequency of passenger rail service. Alternative 110 is projected to increase ridership to 2.8 million passengers in 2035. This would be a gain of approximately 1.2 million passengers above projected ridership for the Base Alternative and an increase of 200,000 passengers over the projected ridership for Alternative 90B.

The capital cost of Alternative 110 is estimated to be $6.69 billion. The annual O&M cost would be $178 million. With annual revenue estimated at $153 million, the annual deficit would be $25 million, the lowest of all alternatives. Alternative 110's estimated operating ratio would be 86 percent, the highest (best) of all alternatives. The estimated annual subsidy per rider for Alternative 110 would be approximately $9, which is the lowest of all alternatives, and approximately 30 percent less than Alternative 90B, the second lowest alternative. Alternative 110 also would have the lowest annualized O&M cost per rider of all the alternatives.

ES-3.2.5. Alternative 125

Alternative 125 would include improvements for Alternative 90A along Empire Corridor South and the Niagara Branch. Alternative 125 would include station improvements at Syracuse and Rochester Stations proposed under the Base Alternative. Alternative 125 would continue the current Amtrak service on the existing right-of-way ("Legacy Service").

To achieve the highest speed among the alternatives, however, Alternative 125 would also add a new electrified (with overhead catenary), two-track, grade-separated high-speed rail corridor of 283 miles between Albany/Rensselaer Station and a new Buffalo-Exchange Street Station. Within the densely-developed areas around Albany, Syracuse, Rochester, and Buffalo, the new corridor would roughly parallel the existing corridor on a combination of new and existing ROW to provide express high-speed service to existing stations in these cities. To achieve the grade separation, it is assumed that a certain amount of elevated sections would be required in these urban areas. Where Alternative 125 extends through Rensselaer and Albany counties along the New York State Thruway and through the downtown areas of Syracuse, Rochester, and Buffalo (approaching Buffalo Exchange Street Station), the tracks would be elevated and Alternative 125 would directly service the existing stations serving these cities. The remainder of the track would be largely at grade through primarily rural or undeveloped lands, and no new stations along the new alignment sections are proposed.

Required infrastructure would include roadbed, track, viaducts and bridges, cuts and embankments, access roads, railroad systems, maintenance facilities, and other support facilities. The express high-speed service would operate at an average speed of 77 mph, an increase of 51 percent over the Base Alternative and an increase of approximately 22 percent over Alternative 110. This does not account for the slower existing Amtrak service that would be retained on the existing right-of-way. The weighted average speed of both services would be 63 mph. Amsterdam, Schenectady, Rome, Utica, and Niagara Falls passengers (accounting for a small percentage of Empire Corridor passengers) would not receive high-speed dedicated service directly, but would have to transfer at either Albany, Syracuse, Rochester or a new Buffalo station to access the faster train service. For the Empire Corridor West new two-track right-of-way between Albany and Buffalo alone (without consideration of the other, slower services that augment the new 125 mph maximum authorized speed tracks), the Alternative 125 service would operate at an average speed of 108 mph.

Alternative 125 would provide a total of 19 daily round trips between Albany, Buffalo, of which six would continue on to Niagara Falls. This compares to the existing four daily round trips to Buffalo, of which three continue to Niagara Falls. Four daily round trips would be retained on the existing corridor and 15 daily high-speed express round trips would be added on the new corridor. All of the trips on the new corridor would be express service, with station stops at Albany/Rensselaer, Syracuse, Rochester, and Buffalo. Alternative 125 would add 17 dual mode locomotives to increase the frequency of passenger rail service. Alternative 125 is projected to increase ridership to 4.3 million passengers in the year 2035, more than a 50 percent increase over the projected ridership for Alternative 110 and a 169 percent increase over the Base Alternative.

The capital cost of Alternative 125 is estimated to be $15.74 billion. The annual O&M cost would be $312 million. With annual revenue estimated at $252 million, the annual deficit would be $60 million, the highest of all alternatives. Alternative 125's estimated operating ratio would be 81 percent, the same as that of Alternative 90B. The estimated annual subsidy per rider for Alternative 125 would be approximately $14, which is about 8 percent more than that of Alternative 90B, the second lowest alternative. Alternative 125 would have the highest annualized O&M cost per rider of all the alternatives.

ES-4. How do the alternatives compare?

Exhibit ES-3 presents a graphical comparison of the five alternatives. Exhibit ES-4 presents a tabular summary of service levels, ridership, and costs for the Base and Build Alternatives.

ES-5. Selection of the Preferred Alternative—Alternative 90B

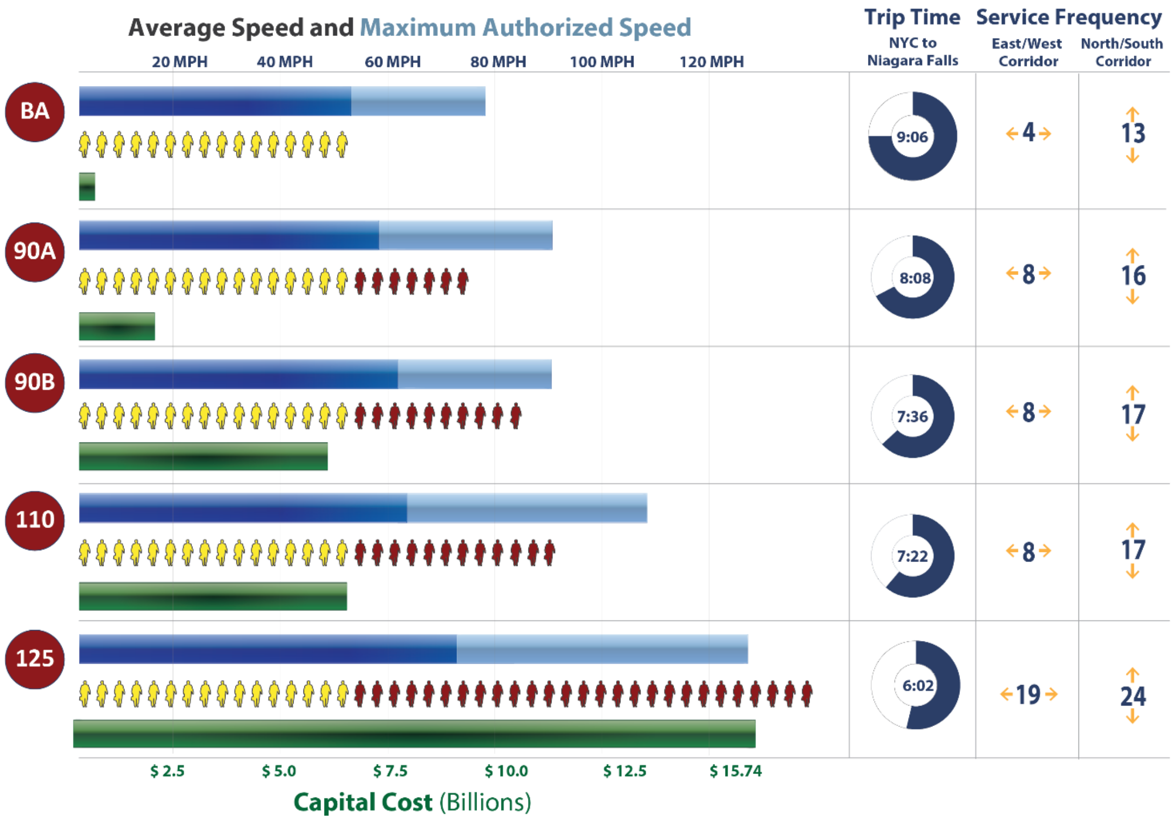
NYSDOT and FRA selected Alternative 90B as the Preferred Alternative. The installation of additional third and fourth tracks under Alternative 90B would add capacity and provide the ability to route passenger trains around freight trains even while passenger trains operate at higher speeds. Alternative 90B, would have an average speed that would be 10 mph faster than the Base Alternative between New York City and Niagara Falls and would result in a 1½ hour savings in travel time. Alternative 90B would result in the best on-time performance for Amtrak service in 2035 and, at the same time, would involve the least delay-minutes per 100 train miles operated for freight trains of the alternatives considered. Alternative 90B would also result in one of the lowest trip times for freight between Selkirk Yard, outside Albany, and Buffalo. The subsidy for the Preferred Alternative, Alternative 90B, would be $13 per rider, which would be lower than both Alternative 125's subsidy per rider of $14 and the Base and 90A Alternatives' subsidy per rider of $17 per rider.

Exhibit ES-4 presents a comparative analysis of service levels, ridership, and costs of the alternatives. Exhibit ES-5, and Exhibit ES-6 summarize the effectiveness of the alternatives in meeting the program's performance objectives using the qualitative rating system.

The selection of Alternative 90B as the Preferred Alternative considered the ability of each alternative to meet nine program performance objectives and transportation-related goals. The performance goals and transportation-related objectives were balanced against costs and environmental impacts and also considered the comments received on the Tier 1 Draft EIS, as discussed in Chapters 6 and 7.

Moreover, Alternative 90B would have fewer environmental impacts than Alternatives 110 and 125. Alternative 90B would have land use impacts in nine areas in six counties, compared to 53 areas in eight counties with Alternative 110 and two to three thousand acres of impact with Alternative 125. For reasons of safety, CSXT, the owner of the right-of-way, requires a 30-foot separation between freight and passenger tracks when passenger trains operate at 110 mph. In many places on the route, this is only possible by acquiring significant additional property. Because of the required property acquisition, Alternative 110 has significantly higher costs and greater potential for environmental impacts than Alternative 90B, while only achieving a modest improvement in overall performance.

Exhibit ES-3—Comparison of Alternatives



Note: Travel time between NYC and Niagara Falls presented in hours: minutes, based on express service, westbound scheduled times. For Alternative 125, average speed for regional service would be 53 mph, and travel time would be 8:40.

The Base Alternative and Alternative 90A, while minimizing both costs and environmental impacts, do not meet project performance goals and objectives to the extent that the other Build Alternatives do. These alternatives also have the poorest operating ratios (75%-76%) and cost-effectiveness of the alternatives considered.

Alternative 125 would attract the most passengers (4.3 million by 2035) and would perform the best in terms of travel times and frequency for the express service only (serving New York City, Albany-Rensselaer, Syracuse, Rochester, and Buffalo). However, it would be the costliest and would have much larger property and environmental impacts. It would also relegate travelers from Schenectady, Amsterdam, Utica, and Rome to the use of the existing regional train service on the existing corridor.

Exhibit ES-4—Comparative Analysis of Alternatives

Evaluation Criteria	Alternatives				
	Base	90A	90B Preferred Alternative	110	125
Service Levels (In round-trips/day)					
Frequency of Service NYC to Albany	13	16	17	17	24
Frequency of Service Albany to Buffalo	4	8	8	8	15 (express) 4 (regional)
Frequency of Service Albany to Niagara Falls	3	7	7	7	6
Average Speed NYC to Niagara Falls (mph)	51	57	61	63	77 (express) 53(regional)
Travel Time: (hrs.:min.) NYC to Niagara Falls	9:06	8:08	7:36	7:22	6:02 (express) 8:40 (regional)
Time Savings: Compared to Base Alternative (hrs.: min.)	-	0:58	1:30	1:44	3:04 (express) 0:26 (regional)
On-Time Performance	83.0%	92.4%	95.4%	94.9%	100% (express) 83.0% (regional)
Ridership (Annual One Way)					
Total (2035)	1.6 million	2.3 million	2.6 million	2.8 million	4.3 million
Increase as Compared to Base Alternative	-	0.7 million (44%)	1.0 million (63%)	1.2 million (75%)	2.7 million (169%)
Costs[1]					
Capital Costs (Billions)	$0.310	$1.72	$5.97	$6.69	$15.74
O&M Costs, Annual (Millions)	$106	$160	$176	$178	$312
Revenue, Annual (Millions)	$79	$122	$143	$153	$252
Total [Deficit]/Surplus (Millions)	[$27]	[$38]	[$33]	[$25]	[$60]
Operating Ratio (percent O&M costs covered by revenue)*	75%	76%	81%	86%	81%
Cost Effectiveness (Annualized O&M Cost per Rider)	$66.26	$69.57	$67.69	$63.57	$72.56
[Subsidy]/Surplus per Rider (rounded)	[$17]	[$17]	[$13]	[$9]	[$14]

[1] Capital Costs are in 2017 dollars

* Operating Ratio is the annual revenue as a percentage of the operating and maintenance costs. For Alternative 90B, the Preferred Alternative, this would be $143 million/$176 million = 81 %.

Exhibit ES-5—Effectiveness of Alternatives in Meeting Performance Objectives

Performance Objectives	Base	90A	90B – Preferred Alt.	110	125[1]	
Improve System-Wide On-Time Performance	X	★	★	★	★ (Express)	X (Regional)
Reduce Travel Time	–	+	+	+	★ (Express)	+ (Regional)
Increase Service Frequency	X	+	+	+	★ (Express)	+ (Regional)
Attract Ridership	–	★	★	★	★	
Reduce Automobile Trips	–	+	+	+	★	
Minimize Impact on Freight Rail Service	–	–	+	+	–	

Notes: [1] Performance on the new express service and the legacy regional service will differ, due to improvements along Empire Corridor South and the Niagara Branch.
Rating System: ★ Strongly supports program goals and objectives; + Supports program goals and objectives; - Neutral regarding program goals or objectives; X Contrary to program goals or objectives

The Alternative 125 express service would provide significant improvements in travel time (3 hours in travel time savings between New York City and Niagara Falls) over the Base Alternative in 2035, but would not directly service the stations at Schenectady, Amsterdam, Utica, and Rome or Niagara Falls. For Alternative 125, the New York-Niagara Falls legacy regional service (serving all intermediate stations, including Schenectady, Amsterdam, Utica, and Rome) would experience only modest improvements in travel time over the Base Alternative, due to improvements along Empire Corridor South and the Niagara Branch. Travelers from New York using legacy service to non-express-stop cities would experience somewhat shorter travel times (about 13 minutes faster) than those available under the Base Alternative. Moreover, because of limited train slots over Metro-North south of Poughkeepsie and schedule constraints on the Amtrak Empire Connector between Spuyten Duyvil and New York City (on which both the high-speed and regional services would operate), there would be little value in transferring between regional and high-speed services at Albany-Rensselaer, Syracuse, Rochester or Buffalo. Therefore, the benefits of Alternative 125 would not be enjoyed by Schenectady, Amsterdam, Utica, and Rome passengers (even with a transfer), while the other Build Alternatives would confer benefits on all corridor rail riders.

Alternative 125 is the costliest alternative, at $15.74 billion (in 2017 dollars), it would cost more than twice as much as the next most costly alternative (Alternative 110). Alternative 125 would also take the longest time to confer travel benefits, due to the time required to assemble, acquire, and construct a new right-of-way. Other alternatives begin conferring benefits within 2 to 5 years of the start of construction, with benefits continually increasing as additional improvements – signals, track, switches, grade crossings, and separations, bridges – are introduced in succeeding construction phases. Two to three thousand acres of land would be needed to construct a sealed high-speed rail corridor between Albany and Buffalo, affecting properties, farms, wetlands, and, potentially, tribal lands (none of the other alternatives have the potential to affect tribal lands).

While Alternative 110 would improve frequencies, travel times, and attract more passengers than Alternative 90B, the differences are relatively minor. Alternative 110 is projected to attract 2.8 million passengers in 2035, or 200,000 more passengers than Alternative 90B. This would be a gain of approximately 1.2 million passengers above projected ridership for the Base Alternative for Alternative 110. When considering cost, however, at $6.69 billion (in 2017 dollars), the capital cost of Alternative 110 would be 12 percent, or $720 million, higher than Alternative 90B. Because of the required property acquisition, Alternative 110 has significantly higher costs and greater potential for environmental impacts than Alternative 90B, while only achieving a modest improvement in overall performance.

Considering all the factors described in this chapter, Alternative 90B best meets the program purpose and need and best balances the program's benefits and effects. Therefore, Alternative 90B is selected as the Preferred Alternative. Alternative 90B would attract 2.6 million riders annually by 2035, a gain of 1 million passengers over the Base Alternative. Alternative 90B would cost $5.97 billion (in 2017 dollars).

This selection of the Preferred Alternative also considered public and agency inputs. There were 1,754 comments received from 932 commenters during the public comment period for the Tier 1 Draft EIS. There was broad support for a rail improvement program within the Empire Corridor, with the overwhelming majority of commenters (83%) voicing their support. While federal agency comments focused on technical aspects of the program, the majority of elected officials, state, regional, local agencies, and tribes supported improvements to high-speed rail within the Empire Corridor. Approximately 95 percent of businesses and organizations and 80 percent of individuals supported the program improvements. Individuals and organizations tended to favor the higher speed alternatives (Alternatives 110 and 125), over the other Build Alternatives. Comments from private railroads, including CSX Transportation, the owner/operator of portions of the right-of-way (particularly Empire Corridor West); shippers; and companies relying on freight rail expressed concerns that the program might adversely impact freight operations. The railroads, shippers, and businesses reliant on freight therefore favored the Base Alternative. The selection of Alternative 90B balances the preferences of these different constituencies.

ES-6. Potential Benefits and Environmental Impacts

This Tier 1 EIS identifies a broad, corridor-level overview of potential benefits and environmental impacts of the five program alternatives. Evaluations are based on conceptual designs and Geographic Information System (GIS) and file-based resource mapping, suitable for making corridor-wide, service-level decisions for the Empire Corridor. The quantitative extent of impacts of the Preferred Alternative, Alternative 90B, will be determined during Tier 2 evaluations and NEPA documentation, as specific projects, e.g., bridges, grade crossings, signal and track improvements, are advanced through design.

Exhibit ES-6 compares the potential impacts of the alternatives using a relative rating system to distinguish the lowest (designated L) to highest (designated H) impact potential among the alternatives. A summary of the findings for all the social, cultural and natural resource categories is discussed in Chapter 4.

Each alternative would affect the societal, cultural and natural environment differently. The Base Alternative would have the lowest potential for impact. Alternative 90A, consisting of 20 projects conducted largely within existing rights-of-way, would also be expected to have minimal impacts. Alternative 90B, the Preferred Alternative, would involve work extending outside of the right-of-way, and impacts would be even greater for Alternative 110, with track construction extending further outside of the right-of-way. Overall, Alternative 125 has the highest potential for impact of all the alternatives, with construction of a new segregated corridor and sections of elevated tracks where the railroad would extend over the existing Empire Corridor. If Alternative 125 had been selected for further consideration, design in Tier 2 would need to consider ways to further avoid and minimize impacts associated with this alternative.

A brief overview of the environmental impacts of the alternatives is provided in the following section. Chapter 4 provides an environmental overview and comparison of the alternatives and details the social, cultural, and natural resource impacts of the Preferred Alternative, Alternative 90B. Appendix G provides more details on the environmental inventory and the social, cultural, and natural resource impacts of the other Build Alternatives. Exhibit 6-13 provides a more detailed summary on impacts of each alternative on each environmental resource category.

Exhibit ES-6—Comparison of Alternatives in Selected Impact Areas

Alternative/ Impact Area	Base	90A	90B – Preferred Alt.	110	125
Socioeconomic/ Land Use	L	L	M	M	H
Community	L	L	L	M	H
Historic	L	M	H	H	M[1]
Parks	L	L	L	M	H
Visual	L	L	M	M	H
Farmland	L	L	M	M	H
Waterbodies	L	M	M	M	H
Floodplains	L	L	M	M	H
Wetlands	L	L	M	M	H
Wildlife	L	L	M	M	H
Air Quality	L	B	B	B	B
Energy/ Greenhouse Gas	L	B-L	B-L	B-M	B-H
Noise/Vibration	L	M	M	M	H

L Potential for adverse effect is lowest among the alternatives
M Potential for adverse effect is moderate among the alternatives
H Potential for adverse effect is highest among the alternatives
B Long-term beneficial impact
[1] The undeveloped nature of the 125 Study Area may contribute to the lack of documented historic resources.

- **Socioeconomic Benefits:** The introduction of high-speed rail improvements is expected to generate considerable economic benefits as a result of improved passenger rail and freight operations. Major new infrastructure investments, such as improvements to high-speed rail service, could potentially change the population and employment outlook. For example, according to a U.S. Conference of Mayor's Report, which examined the impact of high-speed rail upon the City of Albany, the introduction of high-speed rail along the corridor can contribute substantially to economic growth by driving higher-density, mixed-use development at train stations; expanding visitor markets and generating additional spending; broadening regional labor markets; and supporting the growth of technology clusters.[10] This effect would be more pronounced with Alternative 125, but substantial economic benefits would also accrue under Alternative 110 and the Preferred Alternative, Alternative 90B.

The additional tracks segregating freight and passenger service will not only accrue economic benefits from increased ridership, but will also benefit freight rail and movement of goods. Empire Corridor West represents one of CSXT's highest volume freight routes nationwide. The economic benefits associated with the project will extend to freight rail users and shipping companies, and the additional tracks will result in faster travel times and less delays for freight. This major freight corridor connects to the border crossing at Niagara Falls, an economically important gateway for international trade.

- **Land Use Impacts:** Alternative 125 would require the assembly and acquisition of public and private lands along the 280-mile Albany-to-Buffalo corridor. An estimated two to three thousand acres of land would be needed. Notwithstanding efforts to minimize adverse effects, the construction of an essentially sealed corridor with limited opportunities for crossings could be expected to have an impact on community cohesion and large-scale land uses which may be bisected by the high-speed rail corridor. By comparison, property acquisition requirements of the other alternatives that follow the existing Empire Corridor would be considerably less than that for Alternative 125. Alternative 110 would involve the next greatest property displacements, affecting approximately 53 areas in 8 counties. Property displacements with the Base and Alternative 90A are anticipated to be minimal.

  The Preferred Alternative, Alternative 90B, would affect approximately 9 areas in 6 counties. Most of the land uses affected consist of agricultural, industrial, or wooded, undeveloped property, with limited residential or building impacts. The work may require relocation of Route 5 in Montgomery County, which could involve property impacts, and the addition of maintenance service roads could also involve property takings.

  Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (e.g., growth inducing effects related to changes in the pattern of land use, and population density or growth rate). Of the alternatives evaluated, the Base and 90A Alternatives would involve the least indirect, growth-inducing impacts. Alternatives 110 and 125 would involve the greatest indirect impacts, with larger transportation benefits, and a greater degree of secondary development impacts. The Preferred Alternative would involve growth-inducing indirect impacts that would be greater than the Base and 90A Alternatives but would be more moderate than Alternatives 110 and 125.

- **Environmental Justice/Title VI Impacts:** The program of improvements under any of the alternatives is unlikely to result in disproportionately high and adverse impacts to minority and low-income communities, as well as populations protected under Title VI (Limited English Proficiency populations, disabled, and elderly).[11] Unlike the Base Alternative, all the Build Alternatives would provide increased transit options that would provide a benefit for the minority, low-income, and other disadvantaged communities. Alternative 90A and Alternative

[10] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail on Cities and their Metropolitan Areas.* Prepared for the U.S. Conference of Mayors (undated), released June 2010.

[11] Due to the size of the program area, the identification of EJ/Title VI populations was performed at the county level, as well as identifying disadvantaged communities at the city level in the largest major metropolitan areas along the program area.

90B, the Preferred Alternative, require less displacements and property impacts compared to Alternatives 110 and 125. Therefore, Alternatives 110 and 125 have a greater potential for impacts on disadvantaged populations. The Tier 2 analysis will include a more detailed and refined evaluation of the environmental justice/Title VI impacts of the Preferred Alternative (Alternative 90B).

- **Community and Public Facility Impacts:** Alternative 125 has the potential to affect 13 community/publicly used facilities (including cemeteries, privately owned golf courses/golf clubs, and a school ballfield) in 8 counties largely where it extends on new right-of-way. If Alternative 125 had been advanced, additional location analyses would need to consider ways to avoid or minimize impacts on these publicly accessible facilities. By comparison, Alternative 110 is projected to have potential effects on 4 community facilities (e.g., fire stations, post office) in 1 county.

  The Preferred Alternative, and Alternative 90A, are not expected to have any direct impacts to community facilities. Alternative 90B would not incur direct impact on community facilities, although the proposed work will adjoin several sites, including minor league baseball stadiums in Syracuse and Rochester, a college and state offices in Schenectady, and a cemetery in Schenectady County. Increased frequency of service could have the potential to incur additional visual and noise impacts from train passbys, however the additional trips represent a minimal increase over current rail traffic that includes frequent CSXT freight rail traffic. Relocations of adjoining roadways may indirectly affect community facilities (e.g., through property acquisition or changes in access), and would be better defined in Tier 2 including measures to avoid or minimize any adverse effects.

- **Historic and Archaeological Resource Impacts/Section 4(f) Uses:** As part of the Tier 1 corridor-level screening, the historic impact assessment defined Areas of Potential Effects as the area extending 100 feet from the track centerline for direct effects, to encompass all locations where project construction could occur, and 600 feet for indirect effects. The APE is defined as: "*the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties*." Based on the defined Tier 1 APEs, Alternative 90B (the Preferred Alternative) could impact a greater number of identified archaeological/historic architectural resources compared to the Base Alternative, and Alternatives 90A and 125 (including NHLs, S/NR/listed and eligible individual resources and districts). Alternative 90B (the Preferred Alternative) could involve direct effects on approximately 153 to 154 archaeological/historic architectural resources, and indirect effects on an additional approximately 149 architectural resources due to construction-related activities. Notably, there are several rail bridges located within the right-of-way, which could be adversely affected by work proposed for this alternative. There could be additional adverse impacts to architectural resources because of the property acquisitions proposed for Alternative 90B.

  Impacts for Alternative 110 would be roughly comparable to that for the Preferred Alternative, which would indirectly or directly affect 302 archaeological and architectural resources. However, Alternative 110 would likely involve greater impacts, with the location of proposed tracks 15 feet further than Alternative 90B. Alternative 90A is likely to have moderate effects, with 48 resources in the direct APE and an additional 52 resources within the indirect APE.

  Alternative 125 would largely maintain elevated tracks within the existing ROW where it overlaps with the existing Empire Corridor, potentially affecting viewsheds that contain historic properties. Alternative 125 would therefore involve greater impacts than the Base or 90A Alternatives, potentially affecting 86 resources within the direct APE and an additional 36 resources within the indirect APE, depending on the footprint for the elevated structures that would carry the grade-separated tracks over the existing tracks. Alternative 125 would be developed along new right-of-way generally away from population centers where most historic structures are found. Due to the undeveloped nature of the areas bisected by Alternative 125, historic and archaeological resources may not be fully documented for these areas. Alternative 125 would also have the greatest potential interaction with and use of tribal land.

- **Parks and Recreational Facilities Impacts/Section 4(f) Uses:** Alternative 125 has the greatest potential effect on parks and recreational facilities, with 10 such facilities in 6 counties potentially affected (including an Oneida Nation-owned golf course). If Alternative 125 had been advanced, the additional location analyses in Tier 2 would need to avoid or minimize impacts on these facilities to the extent practicable. The Base Alternative, Alternative 90A, and Alternative 90B (the Preferred Alternative) would have minimal impacts to parklands. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. With the possible exception of two crossings of the Mohawk River and Erie Canal for Alternatives 90B (the Preferred Alternative) and 110, only Alternative 110 would have any other potential effect on recreational facilities, potentially affecting one county park.

  The Preferred Alternative will involve adding tracks at two crossings over the Erie Canal. In Schenectady, trackwork would cross over the Mohawk River/Erie Canal on an existing bridge near a riverfront park and bike trail, but impacts to these recreational uses are not anticipated. The addition of additional tracks around Rochester Station will cross the Erie Canal and Erie Canalway Heritage Trail, but are not anticipated to directly affect parklands. The potential for impacts at the canal crossings will be evaluated as designs are advanced in the Tier 2 assessments.

- **Visual Impacts:** Alternative 125 would have the greatest potential for adverse visual impacts. Alternative 125 would create a new 100-foot-wide railroad right-of-way that would be electrified (with overhead catenary) in what are today largely open undeveloped and moderately developed areas. Alternative 125 would also create an elevated structure in densely populated urban centers (Syracuse, Rochester, and Buffalo), which would be more visible than the at-grade railroad. Alternative 90A would be entirely confined to the existing railroad right-of-way, and is expected to have no such effects. Both Alternative 90B (the Preferred Alternative) and Alternative 110 would involve track construction extending outside of the right-of-way, which could result in additional clearing and property displacements, but which would otherwise result in minor visual effects.

  Alternative 90B would involve minor visual changes as a result of the proposed addition of railroad tracks. This alternative would add new station buildings at Amsterdam and Buffalo-Depew stations, which could be expected to improve the appearance of these stations. Portions of Route 5, a scenic byway, would need to be relocated, but this would be relatively minor in nature. Three new flyovers would be added, which would be more visible, but these would be located at least several hundred feet from the nearest residences in either rural agricultural, lightly forested, or industrialized areas.

- **Farmlands Impacts:** Alternative 125 would have the most disruptive impact on farmland, potentially bisecting and isolating sections of prime farmlands and “farmlands of statewide significance” in 12 counties. By comparison, Alternative 110 would affect prime farmlands soils in at least 4 counties, and Alternative 90B (the Preferred Alternative) would affect prime farmland soils in at least 3 counties. Alternative 90A has only minor effects on farmland, potentially affecting agricultural districts in only 1 county. The Base Alternative would not affect prime farmland.

The Preferred Alternative, Alternative 90B, would have minimal impacts to actively-farmed areas and little or no impacts to active farms. The proposed work will include the addition of track, as well as maintenance service roads in selected areas, which may affect areas of mapped prime farmland soils and has the potential for minor encroachments on two areas within Agricultural Districts and actively farmed fields in Herkimer and Genesee counties.

- **Impacts on Waterbodies/Rivers:** Alternative 125 would have the greatest potential for impacts on waterbodies, potentially affecting 361 such resources along Empire Corridor West. The Base Alternative would have the least potential for impact on surface water resources—the Tier 1 Draft EIS documented 68 crossings[12] potentially affected by the construction of eight component projects. The other alternatives are anticipated to have moderate potential for impact relative to the other alternatives, with between 107 and 219 surface water crossings potentially affected by Alternative 90A, Alternative 90B (the Preferred Alternative), and Alternative 110, respectively. Although Alternatives 90B and 110 would cross a similar number of waterway crossings, Alternative 110 is expected to involve greater impacts due to its location 15 feet further from the existing railroad than the Preferred Alternative (for a total of 30 feet of separation).

- **Wetlands and Floodplains Impacts:** Alternative 125 would have the greatest potential for impact on wetlands, relative to the other alternatives, with 513 new wetland crossings. Alternative 90B (the Preferred Alternative) and Alternative 110 would have a moderate potential for impact, potentially affecting 454 to 473 wetland crossings. Alternative 90A would have a relatively minor potential for impact, potentially affecting 54 wetland crossings, and the Tier 1 Draft EIS documented, for the Base Alternative, proximity to 84 wetland crossings potentially impacted by the construction of eight component projects. Both the 110 and 125 Alternatives would involve greater potential for floodplain encroachments than the Preferred Alternative, which would have the potential for encroachments in 11 counties. The Base Alternative would involve minimal potential for impacts, and Alternative 90A would also have a lower potential for impacts, potentially affecting floodplains in 7 counties.

- **Coastal Resources Impacts:** The coastal zone and coastal resources with the potential to be impacted are the same for all alternatives: Hudson River, Great Lakes/Irondequoit Bay and Creek, and Lake Erie/Niagara River. All the Build Alternatives will involve bridgework in coastal areas along both Empire Corridor South and all but Alternative 90A will involve bridgework in coastal resources along Empire Corridor West.

  The Empire Corridor crosses through 11 Significant Coastal Fish and Wildlife Habitats (SCFWHs) and 6 Scenic Areas of Statewide Significance (SASSs) in this area. Proposed work for the Base Alternative, Alternative 90A, and Alternative 90B within or adjoining these SCFWHs and SASSs along this corridor would not involve substantial impacts outside of the right-of-way and would not result in appreciable changes in visual quality, and no impacts to the scenic qualities of the SASSs are anticipated. The impacts of the other Build Alternatives are comparable to that of the Preferred Alternative.

[12] The Tier 1 Draft EIS analyzed the potential impacts of the eight component projects, which have since been completed. The results of this assessment are presented to provide a basis of comparison with the Build Alternatives.

- **Ecology and Wildlife Impacts:** Alternative 125 would have the potential to impact the greatest number protected resources/species, potentially affecting 87 federally or state-listed species, 92 significant natural communities, six bird conservation areas, two National Natural Landmarks (NNLs), and Essential Fish Habitat (EFH). Alternative 90B (the Preferred Alternative) and Alternative 110 would have a moderate potential for impact, potentially affecting more than 7 and 21 locations, respectively, but substantially fewer of these resources than Alternatives 125. The 90/110 Study Area includes 72 listed species, 69 significant natural communities, six bird conservation areas, three NNLs, and EFH. Alternative 90A would have a relatively minor potential for impact, potentially impacting two locations, as well as EFH. The Base Alternative has the least potential for impact.

- **Air Quality Impacts:** Alternative 125 has the greatest potential benefit to air quality in some regions of the corridor (due to having the highest potential auto diversions), while it has the potential to adversely affect air quality in other regions of the corridor (the differences between the areas are a consequence of the distribution of on-road versus rail trips). The other alternatives would result in negligible changes in regional emissions, with the Base Alternative serving as the basis for comparison. While increased rail emissions would not adversely affect local air quality, some very minor local benefits may occur near roadways where trips are reduced. Some increases in pollutant concentrations may occur near rail stations, as rail riders access stations by auto and bus, increasing as ridership increases from Alternative 90A to 90B, 110, and 125.

  Alternative 90B (the Preferred Alternative) would result in a small net air quality benefit on a regional scale, with a reduction in all pollutants other than NOx.[13] The Preferred Alternative would result in a net reduction in 61 tons per year of carbon monoxide in the New York-Northern New Jersey-Long Island non-attainment area and 44 tons a year in the Syracuse area.

- **Energy and Greenhouse Gases Impacts**: The program would have beneficial impacts for energy use and greenhouse gas (GHG) emissions from permanently reduced annual on-road energy use and emissions as auto and bus riders switch to more energy-efficient and less polluting rail. This assessment compared these savings to energy and GHG emissions from construction. Alternative 125 is likely to require the greatest quantity of energy and materials for construction. Thus, it has the greatest potential to adversely affect net energy and greenhouse gases. Other alternatives have lesser adverse initial energy and emissions impacts in proportion to their lesser construction emissions impacts. The long-term impact of the alternatives on energy and emissions is ultimately always positive, as the on-road benefits persist year after year and eventually offset the initial construction impacts.

  Alternative 90B (the Preferred Alternative) would result in a reduction of approximately 33,000 metric tons per year of greenhouse gas emissions.

- **Noise/Vibration Impacts:** The program would increase the number of Amtrak trains by 8 trains (or 4 roundtrips) on Empire Corridor South (along which Metro-North operates 50 to 77 roundtrips daily) or 6 to 8 trains (or 3 to 4 roundtrips) on Empire Corridor West (along which CSXT operates 50 to 60 daily roundtrips). Due primarily to noise from these other sources, under all alternatives, including the Base Alternative, potential noise impacts along the Empire Corridor/Niagara Branch are expected to be moderate to severe in more urbanized areas,

[13] Even this increase in NOx would be lower than the *de minimis* levels in the conformity regulations.

between New York City and Schenectady, between Syracuse and Rochester, and between Buffalo and Niagara Falls. Alternative 125 has the potential for noise impacts in areas where no railroads currently operate. In this respect, it is the only alternative to introduce railroad noise in areas that are not already experiencing it. Noise impacts are also predicted along the three new alignment segments of Alternative 125. There is also a potential for vibration impacts along new corridor segments for Alternative 125.

The Preferred Alternative will not increase noise levels over the Base Alternative between New York City and Schenectady, and the increases west of this point would be imperceptible (0 to 2 decibels).

- **Contaminated and Hazardous Materials Impacts:** The Base Alternative and Alternative 90A would incur the least amount of potential impacts, with risks primarily associated with the presence of contamination within the existing railroad right-of-way and nearby sites. Alternative 90B (the Preferred Alternative) and Alternative 110 would have a greater potential to encounter contaminated materials than the Base and 90A Alternatives, especially where new third and fourth track subsurface work would occur within highly developed urbanized areas. However, the Preferred Alternative would involve substantially less work extending outside of the right-of-way and less property acquisitions than Alternatives 110 or Alternative 125. Alternative 125 would incur the greatest risk of impacts as work includes all the improvements considered under Alternative 90A, as well as the extension of 236 miles of new track and alignment through rural, suburban, and urban areas. The new rail alignment would require numerous property acquisitions, increasing the potential for encountering contamination.

ES-7. How will impacts be mitigated?

The final decision on the Preferred Alternative presented in this Tier 1 Final EIS will also be articulated in a Record of Decision that the FRA and NYSDOT will issue. On a broad, corridor-level basis, the Tier 1 EIS discusses strategies to mitigate potential impacts. These strategies will be further delineated during the Tier 2 analyses. The Tier 2 assessments will include thorough inventories of resources, as appropriate, to determine effects, and refinements in design of the component projects of the Preferred Alternative, Alternative 90B, to avoid and minimize environmental impacts. Impacts that cannot be avoided will be mitigated to the greatest extent practicable.

Mitigation strategies presented in Chapter 4 of this Tier 1 EIS will be further defined during Tier 2 evaluations. Tier 2 also will include ongoing discussions with federal and state authorities, regional and local governments, and the public to mitigate potential impacts. As needed, federal, state and local permits and approvals, which will require best management practices and site-specific mitigation design and post-construction monitoring, will be obtained during final design.

ES-8. How was the public involved in the Tier 1 EIS process?

ES-8.1. Tier 1 Draft EIS Publication and Public Hearings

NYSDOT and FRA selected the Preferred Alternative following extensive public involvement and agency coordination following the Tier 1 Draft EIS publication. Publication of the Tier 1 Draft EIS included mailing notifications to the project mailing list, including regulatory agencies, federal, state, local, and elected officials, stakeholders, and the public. Legal notices announcing the availability of the Tier 1 Draft EIS and advertising the public hearing schedule were published in 11 newspapers. The Tier 1 Draft EIS was made available in 24 repositories/libraries in study area counties. Public comments were also solicited through the project website (https://www.dot.ny.gov/empire-corridor), in addition to the public hearings and meetings. Opportunities for public comment included oral and written comments solicited during six public hearings held across the state during the public comment period. The public comment period, originally scheduled to close on March 24, 2014, was extended to April 30, 2014, during which time three additional public informational meetings were held.

ES-8.2. Public Outreach Program and Agency Coordination

The selection of the Preferred Alternative and the alternatives analysis performed for the Tier 1 Final EIS incorporated inputs from the public, agencies, and stakeholders. The program's multifaceted public involvement program used a variety of media to engage and inform the public and other key stakeholders. A Public Involvement Plan (PIP) was developed to identify key contacts within targeted audiences, such as government agencies and organizations, public officials, interest groups, civic and business groups, present and potential riders/users, the media, and the general public. In addition, the PIP identified NEPA cooperating and participating agencies that were invited to participate in the program.

The High Speed Rail Empire Corridor Program has solicited early and continuous feedback from the public and from federal, state, regional, and local agencies and stakeholders. The program has encouraged open discussion of program details and issues and provided opportunities for comments and questions. Public outreach has included:

- Public scoping meetings and open houses,
- Stakeholder coordination and periodic mailings,
- Newsletters and informational materials disseminated at key points during the program development process,
- Media outreach, and
- Program website.

The newsletters provided information on the project scoping and project overview, the alternatives development and screening process, and identified the alternatives being advanced for detailed evaluation. Program newsletters were uploaded to the program website at **www.dot.ny.gov/empire-corridor/** and were distributed to all contacts listed in the stakeholder mailing list. The stakeholder database is comprised of over 500 participants representing a variety of businesses, and governmental and non-governmental organizations.

At the onset of the program, appropriate federal, state, regional and local agencies were identified as having a role and/or interest in the program. NYSDOT and FRA submitted more than 34 formal letters of invitation to NEPA cooperating and/or participating agencies. The roles and responsibilities of cooperating and/or participating agencies are established under the environmental review provisions of SEQR and CEQ regulations (40 CFR 1508.5).

NYSDOT formed a project advisory committee, the Empire Project Advisory Committee (EPAC) to assist NYSDOT and FRA in progressing the environmental process. Additionally, two of the program's key partners, Amtrak and CSXT, were briefed on the status of the alternatives development phase of the program. Amtrak and CSXT have been involved in the High Speed Rail Empire Corridor Program as it proceeded through the Tier 1 EIS process and will continue to be involved in the Tier 2 evaluations. Agency coordination has also included, and will continue to include, consultations with federally recognized tribes and consulting parties pursuant to the National Historic Preservation Act.

ES-9. How will the program be financed?

Transportation infrastructure and services are typically supported by a combination of capital and operating funding from various sources. For the High Speed Rail Empire Corridor Program, capital funds would be provided primarily by FRA, the Federal Transit Administration (FTA), Federal Highway Administration (FHWA), NYSDOT and, where station upgrades are incorporated into the program, municipal governments and regional transportation authorities.

It is anticipated that FRA funding would be provided under the High-Speed Intercity Passenger Rail Program (HSIPR). For projects to be eligible for FRA funds, they must be advanced through the FRA's process. This Tier 1 Final EIS satisfies FRA's procedural requirements, including documentation required under NEPA.

During Tier 2, financial analysis will be refined for the Preferred Alternative, as cost and revenue estimates are improved and as more detailed engineering and cash flow modeling are performed. As individual projects are advanced and costs are refined, the specific projects of the Preferred Alternative will be incorporated into the state's transportation program for funding.

ES-10. What is the program schedule?

The program's Service Development Plan outlines the schedule for implementation of the Preferred Alternative. All of the projects listed under the Base Alternative have been completed, with other improvements in design and construction. The specific designs of the component projects of the Preferred Alternative will be better defined in Tier 2 design and environmental analysis. Benefits for the Preferred Alternative will accrue as individual projects are completed, and will start to be implemented within the next two to five years. The projects will be phased in over 5-year increments, with the program completed in 25 years from start of construction.

ES-11. Who can I contact for more information?

For more information on this Tier 1 EIS and the High Speed Rail Empire Corridor Program, please contact:

- Brandon Bratcher, Environmental Specialist
  Office of Program Delivery
  Federal Railroad Administration
  1200 New Jersey Avenue SE, W36-317
  Washington, DC 20590
  brandon.bratcher@dot.gov or (202) 493-0844 or

- Susan Andrews, P.E.
  Director of Rail Projects Group - Office of Design
  New York State Department of Transportation
  50 Wolf Road, POD-24
  Albany, New York 12232
  susan.andrews@dot.ny.gov or (518) 457-6685

Table of Contents

List of Exhibits

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1. Introduction and Purpose and Need

1.1. Introduction

The Council on Environmental Quality regulations that implement the National Environmental Policy Act (NEPA) of 1969 require that an Environmental Impact Statement (EIS) "*briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.*"[1] This chapter presents the Purpose and Need Statement for the High Speed Rail Empire Corridor Program (the program), including a detailed assessment of the needs that the program addresses.

The Federal Railroad Administration (FRA) and the New York State Department of Transportation (NYSDOT) prepared a tiered Environmental Impact Statement (EIS) to evaluate proposed system improvements to intercity passenger rail services along the 464-mile Empire Corridor, connecting Pennsylvania (Penn) Station in New York City with Niagara Falls Station in Niagara Falls, New York (refer to Exhibit 1-1). This Tier 1 Final EIS presents the final High Speed Rail Empire Corridor Program selected by FRA and NYSDOT from the broad range of alternatives presented in the Tier 1 Draft EIS.

Key federal legislation relevant to the development of high-speed passenger rail service on the Empire Corridor includes:

- The **Transportation Equity Act for the 21st Century (TEA-21) (PL 105-178, June 9, 1998)**, supplemented the nationwide list of five high-speed rail corridors authorized under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) (PL 102-240, December 18, 1991).[2] TEA-21 authorized the Empire Corridor, from New York City to Albany to Buffalo, New York, as a high-speed rail corridor. ISTEA defined "high-speed rail corridors" as corridors where trains operating at speeds of 90 miles per hours (mph) could be reasonably expected.
- **The Rail Passenger Service Act of 1970 (PL 91-518, October 30, 1970)** initially established a basic national rail passenger system and a rail passenger corporation – Amtrak. This Act and the **Passenger Rail Investment and Improvement Act of 2008 (PRIIA) (Division B, Title III of Public Law 110-432, October 16, 2008)**, called for significant improvements in the nation's intercity passenger rail, including the development of high-speed rail corridors. PRIIA authorized the appropriation of funds to establish several new passenger rail grant programs, including capital investment grants to support intercity passenger rail service and high-speed corridor development. FRA consolidated these and other closely related programs into the High-Speed Intercity Passenger Rail (HSIPR) Program.

[1] Council on Environmental Quality, NEPA EIS regulations, 40 CFR 1502.13.

[2] The five high-speed rail corridors authorized under ISTEA were: the Midwest, providing 3 links from Chicago, IL to Detroit, MI and St. Louis, MO and Milwaukee, WI; Florida, linking Miami with Orlando and Tampa; California, linking San Diego and Los Angeles with the San Francisco Bay Area and Sacramento via the San Joaquin Valley; Southeast, connecting Charlotte, NC, Richmond, VA and Washington, D.C.; and Pacific Northwest, linking Eugene and Portland, OR with Seattle, WA and Vancouver, British Columbia, Canada.

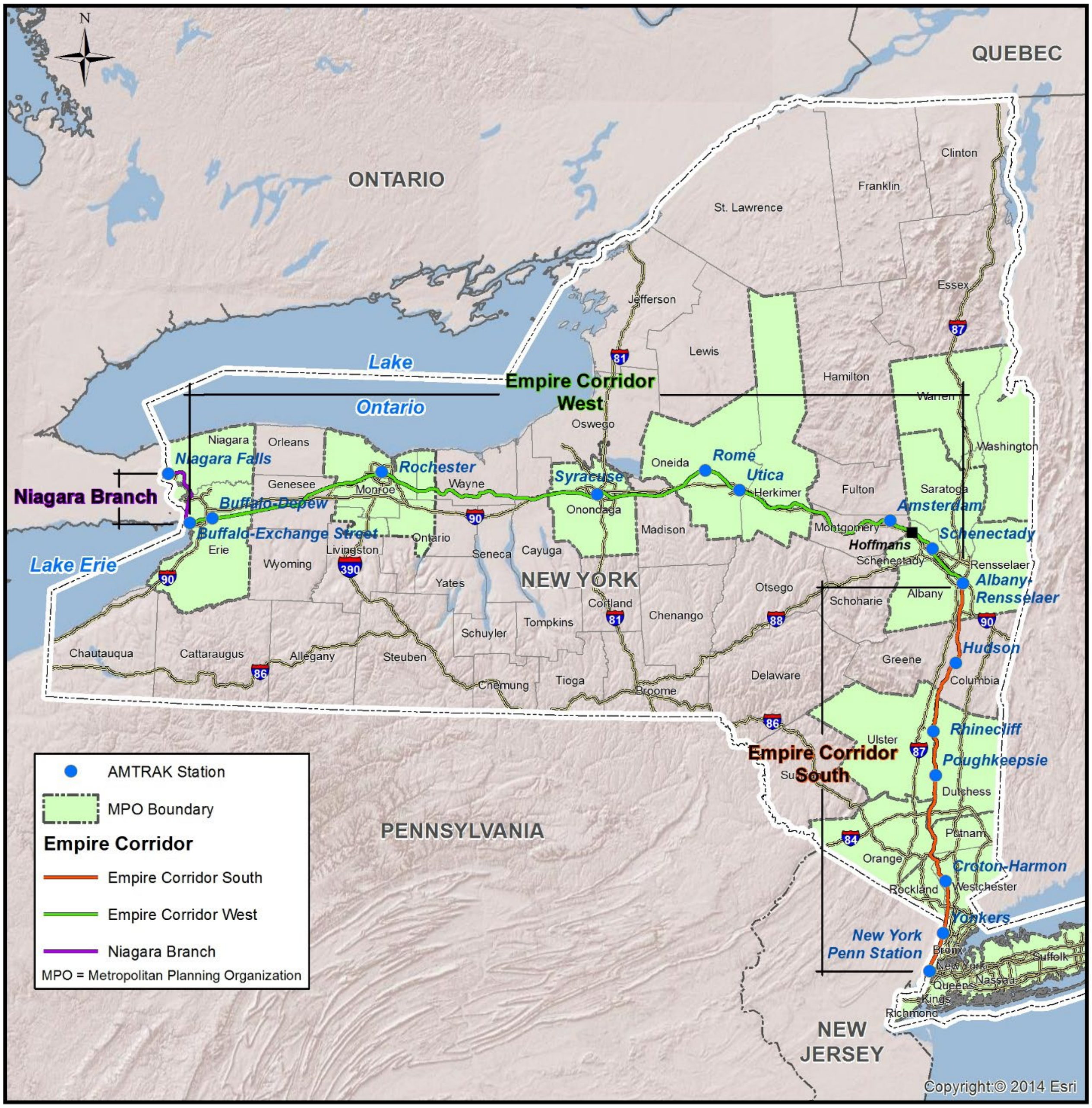

Exhibit 1-1—Program Location Map

- The **American Recovery and Reinvestment Act (ARRA) of 2009 (PL 111-5, February 17, 2009)** and the **Transportation, Housing and Urban Development and Related Agencies Appropriations Act for 2010 (Division A of the Consolidated Appropriations Act, 2010 (PL 111-117), December 16, 2009)** provided funding for the formation of the federal High-Speed Intercity Passenger Rail program (HSIPR). The Empire Corridor was one of the high-speed rail corridors to receive funding pursuant to these federal initiatives.

- The **Fixing America's Surface Transportation Act, or FAST Act (PL 1114-94, December 4, 2015)** provided funding through 2020 and marked the first time intercity passenger rail programs were included in a comprehensive, multimodal surface transportation authorization bill, authorizing more than $6.7 billion over five years for intercity passenger and freight rail grants.

The current plans for infrastructure funding by the federal government include funding for Amtrak and intercity passenger rail, to fund initiatives such as improved passenger rail service on the Empire Corridor. Under the Biden Administration, it is expected that the federal government will continue its role in supporting high speed rail projects by providing a number of funding programs. The 2021 Infrastructure Investment and Jobs Act (IIJA) includes $89.9 billion of transit funding over the next five years and an additional $66 billion for passenger rail improvements. Chapter 5 reviews in more detail the regulatory framework for intercity passenger rail improvements.

1.1.1. Tiered NEPA EIS

FRA and NYSDOT developed this Tier 1 Final EIS in accordance with the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); FRA's Procedures for Considering Environmental Impacts (64 Federal Register [FR] 28545); and the New York State Environmental Quality Review Act (SEQR) and its implementing regulations (6 New York Codes, Rules and Regulations [NYCRR] Part 617). The FRA and NYSDOT are using a tiered process, as provided for in 40 CFR 1508.28, to complete the environmental review of the program. "Tiering" is a staged environmental review process applied to environmental reviews for complex projects, such as the Empire Corridor Program.

The initial phase ("Tier 1 EIS") of this process addresses broad corridor-level issues and sets forth a package of subsequent studies, proposals, and projects. The publication of the Tier 1 Draft EIS in the Federal Register on January 31, 2014 was a major milestone in the tiered review process for this program. This Tier 1 Final EIS considers public and agency comments received during the public comment period, which closed on April 30, 2014. The number and types of comments received during the public comment period reflect the public interest in, and support for, improvements to the Empire Corridor, including the introduction of high-speed rail (refer to Chapter 7).

The Tier 1 EIS evaluates a range of alternatives to meet the program needs of reducing infrastructure constraints and accommodating existing and projected demand. It establishes specific performance objectives for:

- Increasing train frequency and on-time performance (OTP),
- Reducing train travel time and automobile trips along the corridor,
- Attracting additional passengers, and
- Minimizing interference with freight rail operations.

This Tier 1 EIS identifies broad-based operational changes and investments in infrastructure and rolling stock (locomotives and passenger coaches) necessary to achieve those performance objectives. This document outlines the following in defining the program and evaluating five program alternatives:

- Defines the purpose and need for the proposed action including goals and objectives;
- Develops criteria and screens alternatives to eliminate those that do not meet the purpose and

need of the proposed action;

- Identifies the range of reasonable alternatives to be considered, consistent with the current and planned use of the corridor, existing services within and adjacent to the program area, and other planned improvements;
- Identifies the general alignment(s) and general right-of-way requirements of the reasonable alternatives;
- Identifies the infrastructure and equipment investment requirements for each reasonable alternative;
- Identifies the travel times, service schedule, frequencies, and stations serviced for the reasonable alternative(s);
- Identifies environmental constraints and considerations and performs high-level environmental review and evaluation of the reasonable alternatives under consideration.

In this Tier 1 Final EIS, FRA and NYSDOT identify a Preferred Alternative for the High Speed Rail Empire Corridor Program, consisting of required individual capital improvements needed to achieve program goals and objectives. A companion document for the High Speed Rail Empire Corridor Program, the Service Development Plan prepared for the Preferred Alternative, identifies the timing and sequencing for implementation of the improvements. The Tier 1 process will conclude with publication of the Record of Decision (ROD), presenting the decision on the Preferred Alternative for the Empire Corridor High Speed Rail Empire Corridor Program.

Tier 2 NEPA document(s) will evaluate in greater detail the component projects of the Empire Corridor Program selected in this Tier 1 process. The Tier 2 process will include detailed analyses based on refined engineering designs and operational plans and will identify site-specific environmental consequences. Site-specific mitigation measures for the Preferred Alternative will be developed where avoidance and minimization of impacts cannot be achieved. NYSDOT will continue to solicit input from the public and from reviewing agencies during the Tier 2 NEPA process.

1.1.2. Corridor and Program History

The Empire Corridor connects New York City with the largest cities in New York State, extending north through Yonkers, Poughkeepsie, and Hudson, and turning west at Albany to extend through Schenectady, Utica, Syracuse, Rochester, Buffalo, and terminating at Niagara Falls. The Empire Corridor, as defined in this Tier 1 Final EIS, consists of three main segments:

- **Empire Corridor South**, extending 142 miles north from Penn Station to just north of Albany-Rensselaer Station;
- **Empire Corridor West**, extending 294 miles west from approximately one mile north of the Albany-Rensselaer Station to just east of the Buffalo-Exchange Street Station; and the
- **Niagara Branch**, extending 28 miles north from a point located just east of Buffalo-Exchange Street Station to Niagara Falls.

The Empire Corridor is one of eleven designated high-speed rail corridors nationwide.

The Empire Corridor has been a vital rail transportation route of national significance for almost 200 years. This transportation route extends north from New York City through the Hudson Valley region and west through the Mohawk Valley region, south of the Adirondacks and north of the Catskills, to

Buffalo and Niagara Falls. The corridor developed along the historic "Water Level Route" that followed the canal system connecting Lake Erie and the Hudson River to transport goods and services to and from New York City. For many decades, the New York Central Railroad operated the route as a four-track high-speed mainline between Albany and Buffalo, carrying passenger and freight trains along express and local tracks. The Niagara Branch operated as a two-track shared use corridor, extending north from Buffalo along Lake Erie, the Niagara River, and into Canada at Niagara Falls. The transportation afforded by the canals and railroads connecting to the Great Lakes helped to establish New York City as an international trade center and the Atlantic port for the Midwest, and to transform Buffalo into the state's second largest city. This network also enabled growth and development of the other major metropolitan areas (including the five other largest cities in the state) along this route.

Use of highways and airports constructed over the last generation has eclipsed rail use in the Empire Corridor for longer distance trips between upstate and western New York to New York City. The construction of the New York State Thruway (Thruway), consisting of Interstate 90 from Buffalo to Albany and Interstate 87 from Albany to New York City located roughly parallel to the Empire Corridor, has increased the reliance on automotive travel. The area is also serviced by regional airports, providing service from Buffalo, Rochester, Syracuse, and Albany to New York City. Through the second half of the 20th century, multiple factors, including competition from highways and airports, contributed to the decline of the railroads that led to bankruptcy of most of the railroad companies in New York and the Northeast by the early 1970s.

As part of cost-saving measures that started in the late 1950s, the New York Central Railroad (later Penn Central and Conrail) removed track infrastructure located along the Empire Corridor to reduce maintenance, operating and real estate property tax costs; creating a two-track system between Albany-Rensselaer Station and Buffalo, and a single-track line on portions of the Niagara Branch.

In 1970, the Rail Passenger Service Act established the National Railroad Passenger Corporation (Amtrak) to provide intercity rail service in 46 states and the District of Columbia. Prior to the establishment of Amtrak, private railroad freight companies provided intercity passenger rail service. Amtrak is currently the operator of intercity passenger rail service on the Empire Corridor. Amtrak assumed the common carrier obligations of private railroads in exchange for a right to priority access of their tracks for incremental cost.

The possibility of instituting high-speed rail service along the Empire Corridor has been the focus of studies dating back twenty years. Developments in recent years have advanced rail planning and funding at both the federal and state levels culminating in this Tier 1 EIS program to evaluate high-speed passenger rail service along the Empire Corridor. Exhibit 1-2 presents a timeline of the recent program planning and development milestones for high-speed rail in the Empire Corridor.

1.1.3. CSXT Agreements

CSX Transportation, Inc. (CSXT), a private freight railroad company, owns more than half of the Empire Corridor (Exhibit 2-1 in Chapter 2). While recognizing the federal NEPA and New York State SEQR legal framework upon which the environmental review process must be based, this Tier 1 EIS has been developed in consideration of two agreements between NYSDOT and CSXT (dated May 28, 2010), both crafted to preserve the independence and integrity of the EIS process: "Framework Agreement Concerning Certain Rights and Responsibilities with Respect to New York High Speed Rail" and "Agreement for Progressing a Tier 1 Environmental Impact Statement" ("Agreements") (attached as Appendix J).

CSXT has agreed to work with NYSDOT as the Tier 1 EIS is being developed by providing assistance and technical guidance, as well as documents and access to its property, as outlined in the

Exhibit 1-2—High Speed Rail Empire Corridor Planning Timeline

2023	Publish Notice of Availability of Tier I Final EIS.
2021	The eighth Base Alternative was completed in 2021.
2017	Seven of the eight projects designed to improve the base alternative for comparison against other alternatives are completed. Improvements include three new station buildings, new track signaling and communications, interlockings, and warning devices at grade crossings.
2014	Publication of the Notice of Availability of the Tier 1 Draft EIS in the Federal Register, marking the start of the public comment period.
2010	FRA and NYSDOT initiate scoping of Tier 1 EIS.
2010	Northeast Corridor Infrastructure Master Plan: Recommends capital investment programs between New York City and Schenectady, including Positive Train Control and station improvements.
2009	FRA and NYSDOT initiate Tier 1 EIS to evaluate Empire Corridor high-speed rail intercity passenger service.
2009	New York State Rail Plan: Identifies the Empire Corridor High-Speed Intercity Passenger Rail (HSIPR) Program as a necessary investment to address critical capacity and bottleneck constraints.
2009	Empire Corridor receives ARRA funding as one of eleven high-speed rail corridors nationwide.
2006	High-Speed Rail Task Force Report: Focuses on the need for both short-range and long-range incremental improvements and development of an operating plan in the Empire Corridor.
2005	Hudson Line Railroad Corridor Transportation Plan: Analyzes freight and passenger operations on the Hudson Line through 2020, and identifies infrastructure improvements to increase passenger train speeds to 125 mph.
2004	High-Speed Rail Pre-Feasibility Study: New York City to Montreal: Part of the I-87 Multimodal Corridor Study; evaluates the feasibility of high-speed rail using Empire Corridor tracks from New York City to Albany.
2000	Intercity Passenger Rail Plan: Travel into the 21st Century on the Empire Service: Defines NYSDOT's vision for high-speed passenger rail service.
1998	Empire Corridor receives TEA-21 authorization as a high-speed rail corridor.
1989	NYSDOT commissions first passenger demand forecasting project for Empire Corridor high-speed rail.

Agreements. CSXT has also agreed to take into consideration the results of the Tier 1 EIS, as well as the views of the FRA, State of New York, Amtrak, the Port of New York/New Jersey and its customers. At the same time, CSXT has stated that it has the obligation to preserve and grow its freight rail capacity and will maintain sole discretion to decide the safety and use of its property.

The position taken by CSXT and agreed to by NYSDOT in the Agreements must be considered in the implementation of the Preferred Alternative chosen by NYSDOT and FRA on property owned by

CSXT. One principle set forth in the Agreements is that CSXT is entitled to compensation for the use, acquisition, or diminishment in value of its property resulting from any project advanced as a result of the Tier 1 EIS. While the development of the cost of alternatives must and will include the recognition of this principle, the negotiation of the actual value of any compensation to CSXT is not part of this Tier 1 EIS, and will be developed if and when necessary as part of Tier 2 program advancement.

For these reasons, independent analysis by CSXT of the impacts to CSXT property will be extremely important and valuable to NYSDOT and FRA as the NEPA process continues. This Tier 1 Final EIS considers, to the extent appropriate, CSXT comments and the other comments received and public hearings on the Tier 1 Draft EIS.

1.2. Existing Transportation Deficiencies

The existing Empire Corridor passenger rail service is negatively impacted by inadequate service levels, operational constraints (track conditions, alignment, and obsolete or inadequate track and signal systems), and delays resulting from pervasive conflicts with freight traffic. As a result, passenger rail service is not viewed by travelers as a viable, attractive transportation option, particularly to and from points west of Albany-Rensselaer Station.

Existing inadequate infrastructure to support rail operations limit Empire Corridor service. For Amtrak's current rating of reliability on its routes, 80 percent on-time performance (OTP) is considered to be a "passing" grade. In 2019,[3] Amtrak rated the Empire Service between New York and Albany as having 91 percent of on-time customers (where customers arrive within 15 minutes), but the full Empire Service operating between New York to Niagara Falls only operated with 66 percent of on-time customers (considered by Amtrak to be a failing grade). Of the other routes operating on Empire Corridor in 2019, only the Ethan Allen Express received a passing OTP (85 percent). The Adirondack had a 2019 customer OTP of 73 percent, and the Maple Leaf had an OTP of 67 percent.

Furthermore, although maximum authorized speeds along portions of the Empire Corridor are 79 mph on the Buffalo to Hoffmans (west of Albany-Rensselaer) segment and 110 mph on the Hoffmans to New York City segment (refer to Exhibit 1-1), actual operating speeds along the majority of the Empire Corridor are considerably lower due to track conditions, alignment, and obsolete or inadequate track and signal systems which constrain capacity and speed.

Existing passenger rail service is infrequent relative to other available modes of transportation. For example, in 2019, there was a strong travel market between New York City and Albany, and passenger rail captured only 11 percent of that market. In 2019, the Empire Corridor offered thirteen weekday trips, with the earliest Albany-Rensselaer arrival time of approximately 9:50 a.m. This limited service does not accommodate business weekday schedules. Additionally, travel by rail between New York City and Buffalo is not a viable option for a business traveler, given the existing frequency of service and travel time. There were only four weekday trips between New York City and Buffalo. Furthermore, the trip from Buffalo to New York City can be made in less than two hours by air and under seven hours by car, compared to approximately eight hours by the existing Empire Corridor passenger service provided by Amtrak.

Despite these constraints and service limitations, ridership had historically been growing. Ridership

[3] This Tier 1 Final EIS describes 2019 rail ridership, OTP, and schedule as the latest available pre-pandemic condition. Ridership reported for the corridor excludes the ridership on the Lake Shore Limited, Adirondack, and Ethan Allen Express services.

on the Empire Corridor increased by 54 percent (561,881 passengers) over 17 years to total more than 1.6 million passengers in 2019. Since 2001, ridership on the Buffalo to Albany-Rensselaer portion of the corridor has more than doubled, at the same time freight and commuter rail volumes have grown. Projections through 2035 indicate that freight traffic will continue to increase. Ridership on the Metro-North Railroad's Hudson Line has increased 26 percent (3.6 million additional passengers) over 18 years from 2001 through 2019. Congestion is expected to worsen as demand for passenger, commuter, and freight rail grows.

Existing and forecasted socioeconomic and transportation market conditions in the Empire Corridor indicate an opportunity for an improved Empire Corridor passenger rail service to grow further, offering a viable alternative mode of intercity travel in the Empire Corridor.

1.3. Purpose and Need

The purpose of the program is to improve service so that the Empire Corridor continues to serve as a critical link connecting the national, regional, and local transportation network. Currently, the train speeds, number of trains servicing the corridor, and reliability of services are insufficient to accommodate the demand in present and future railroad services. Despite these constraints and service problems, ridership on the Amtrak Empire Service, the Metro-North, as well as freight traffic have grown. Since 2001, ridership on the Buffalo to Albany portion of the Empire Corridor has more than doubled, at the same time competing rail services for Empire Corridor trackage for freight and commuter rail volumes have also grown. Projections through 2035 indicate that Amtrak passenger service, Metro-North commuter rail, and freight traffic will continue to increase. Congestion is expected to only worsen as demand for intercity passenger, commuter, and freight rail services all continue to grow on these shared-track systems. The sections below provide more information on the purpose and need for the program.

1.3.1. Program Purpose

The purpose of the High Speed Rail Empire Corridor Program is to introduce higher passenger train speeds on the Empire Corridor and improve reliability, travel times, service frequency, and passenger amenities. The High Speed Rail Empire Corridor Program will improve passenger rail service along the corridor and, in so doing, attract additional passengers, increase travel choices, and contribute to a balanced, multi-modal transportation system.

Improved service along the Empire Corridor will better connect the principal population centers of western New York State with Albany and New York City, further enhancing connections to Northeast Corridor (NEC) passenger rail service (Philadelphia and Washington) and other markets (Midwest and New England), and facilitating international travel to Canada. Its location within one of the most populated regions in the country, as well as its importance to national and international freight traffic, underscores the importance of the Empire Corridor to regional development. Providing time-sensitive and efficient service will, in turn, promote economic vitality, improve quality of life for residents, and reduce automotive travel and emissions.

1.3.2. Program Needs

This program is being undertaken to meet the following needs: reduce infrastructure constraints and accommodate existing and projected demand.

Reduce Infrastructure Constraints

The Empire Corridor is distinguished by its diversity of private and public ownership and mix of passenger and freight usage (refer to Exhibit 2-1 in Chapter 2). Empire Corridor West is the most important and heavily used freight route in the state, carrying one of the highest volumes on the CSXT system nationwide. It is the major gateway to Canada; the Midwest; and the Port of New York/New Jersey, the third largest container port in the United States.[4] Metropolitan Transportation Authority's (MTA's) Metro-North Railroad (Metro-North), operating the Hudson Line commuter rail service on the southern half of Empire Corridor South, is the second busiest commuter railroad in the country.

Outside of the Northeast Corridor, Amtrak intercity passenger services run almost exclusively on railroads owned and controlled by private freight and commuter railroads. This can create delays due to freight and commuter train interferences, track work and slow orders, as well as other factors largely beyond the control of Amtrak. Freight trains generally operate at speeds slower than passenger trains, in accordance with FRA track class operating restrictions (refer to Appendix E). Slower-moving freight trains have to move to sidings (sections of low-speed track separate from mainline or branch tracks) to let passenger trains pass or the faster-moving passenger train has to slow down behind the slower freight train. This does not allow for optimal usage of tracks. Overall, these problems in the Empire Corridor result in over 161,000 minutes of annual delay, according to analysis of data provided to NYSDOT by Amtrak.[5] This represents more than seven hours per day of total train delay to Amtrak trains in the corridor.

Speed restrictions caused by the competing uses of the rail system are one of the most common causes of delay along Empire Corridor South between Albany-Rensselaer and Penn Stations. Particularly on the Hudson Line, users with different operating requirements (mix of speeds, loads, and types of equipment) can cause congestion that trickles throughout the system. The Hudson Line has the greatest variety of types of users, and a delay in Albany can cause a train further south to miss its window, creating cascading delays that affect other operators.

Passenger rail service in Empire Corridor West is also frequently delayed as a result of the volume of freight and passenger service that shares the corridor's constrained infrastructure west of Albany-Rensselaer Station. While demand for service on the Empire Corridor has grown, the system is operating as a two-track system west of Schenectady, and is reduced to single-track in two places on the 27-mile section of track between CP169 at Hoffmans, New York and CP142 at Albany-Rensselaer; a passing siding is available between CP156 at Carman and CP160 at Schenectady. The single-track section requires that a train may have to wait at Schenectady Station or Albany-Rensselaer Station for up to 18 minutes if a train is

Exhibit 1-3—Livingston Avenue Bridge

[4] In 2011, the Port of New York and New Jersey had the third highest cargo volume in the United States, following the Port of Los Angeles, with the highest cargo volume; and the Port of Long Beach, with the second highest cargo volume.
[5] Amtrak Conductor Delay Report, July 1, 2009 to June 30, 2010.

traveling in the opposing direction.[6]

Deferred infrastructure maintenance has resulted in areas of speed restrictions that further reduce capacity, including the Livingston Avenue Bridge[7] between Albany-Rensselaer and Schenectady Stations, where speed is presently restricted to 15 mph. There are several yards and industrial lead tracks that also contribute to congestion and negatively affect travel times and reliability for both freight and passenger rail services. Infrastructure constraints on the Empire Corridor have been extensively documented in a number of planning studies. Key findings are noted as follows:

- The NEC FUTURE program is being undertaken to create a comprehensive plan for the Northeast Corridor. In July of 2017, the FRA published a Record of Decision (ROD) on the program. The ROD identifies "*Empire Corridor Planning*" for "*engineering and environmental analysis to support improved passenger rail on the Empire Corridor*" as related improvements. The ROD also identifies as related improvements other ongoing specific projects along the Empire Corridor that are part of the overall program of improvements.

- *Northeast Corridor Infrastructure Master Plan* (2010) identifies major challenges to the reliability and convenience of both existing and proposed intercity passenger rail service in the Empire Corridor between New York City and Schenectady.[8] Identified challenges include numerous chokepoints caused by obsolete or inadequate track and signal systems, which constrain capacity and speed. The Master Plan identifies the single-track sections of the segments between Albany and Schenectady as among the greatest points of conflict for intercity trains operating over the Empire Corridor. Currently NYSDOT and Amtrak are completing the installation of double-track between CP143 at Albany-Rensselaer and CP156 at Carman; this will provide for a double track railroad between Schenectady and Albany-Rensselaer. In addition, it indicates the need for a new Livingston Avenue Bridge and additional track and extended platform and yard facilities in the Albany-Rensselaer Station to alleviate current congestion and accommodate increased service. NYSDOT and Amtrak have completed the installation of a new 4th track in Albany-Rensselaer and upgrading of interlockings at both ends of the station. The 2010 Master Plan also cites the need for improvements on freight-only infrastructure in this area to minimize conflicts between freight and intercity service. It identifies capital investment programs by segment along the Empire Corridor from New York City to Schenectady to reduce or eliminate freight/passenger train conflicts, thus improving reliability and convenience of intercity passenger rail service. These improvements were based on specific projects identified in the *Hudson Line Railroad Corridor Transportation Plan* and the *New York State Rail Plan*.[9] The programs identified included the following segments:
  - Empire Connection Improvements
  - Hudson Line Commuter and Intercity Improvements
  - Empire Corridor Improvements
  - Albany-Rensselaer Station and Yard Capacity Improvements
  - Positive Train Control (PTC)
  - Station Improvements

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[6] High Speed Rail Task Force. Final Report: Connecting New York's Future. January 2006.

[7] A separate NEPA study is ongoing for the Livingston Avenue Bridge. Project website is accessible at: https://www.dot.ny.gov/display/projects/livingstonavebridge.

[8] The NEC Master Plan Working Group. *The Northeast Corridor Infrastructure Master Plan*. May 2010.

[9] NYSDOT. *New York State Rail Plan – Strategies for a New Age*. 2009.

The Northeast Corridor (NEC) website identifies, as a project on a connecting corridor, the Empire Corridor Hudson Line Improvements.

- The *Hudson Line Railroad Corridor Transportation Plan* (2005)[10] analyzes freight and passenger operations through 2020, and identifies infrastructure improvements to increase passenger train speeds to 125 mph. The plan analyzes the capacity of the system, identifies individual choke points, and cites specific improvements, such as track crossover switches, high-level platforms, and additional areas of track and yard capacity upgrades to improve the flow of rail traffic.

- The New York State Senate High Speed Rail Task Force Action Program identifies the existing operational constraints on Empire Corridor West in its final report, *Connecting New York's Future* (2006): "*In the Albany to Buffalo Corridor, increasing freight traffic, greater distances and variable operating and track conditions are the major constraints. Over the long term, freight service and a quality passenger service cannot coexist on the same tracks at speeds over 90 mph. Empire Corridor service will not compete successfully with air travel for trips between Buffalo and New York City without a new dedicated passenger rail guideway*."[11]

Accommodate Existing and Projected Demand

As shown in Exhibit 1-4, Empire Corridor ridership steadily increased over the past eighteen years. Ridership increased an average of approximately 3.7 percent a year from 2002 to 2011, and an average annual increase of approximately 1.4 percent from 2011 to 2019.[12] Rail ridership was approximately 1.4 million person-trips in 2011, increasing to 1.6 million person trips in 2019.

The *New York State Rail Plan* identifies the need to address capacity for projected increases in both the freight and passenger rail markets. The *New York State Rail Plan* notes: "*Amtrak is seeing some of its largest percentage ridership increases along the Buffalo-Albany rail corridor despite the level of freight-related delay. With high gas prices, ridership is expected to keep growing; this increase will create pressure for more reliable service and, eventually, more frequency of passenger trains. At the same time, CSXT is expecting increases in freight rail business.*"[13]

The Vision for 2020 in the *New York State Rail Plan* calls for an intercity passenger rail system to transport double the ridership on the rail corridor between New York City and Albany, Albany and Buffalo, and between Albany and Montreal.

Studies forecast growth in both passenger and freight traffic. The *Hudson Line Rail Corridor Transportation Plan* (2005) anticipates that total rail traffic along the Hudson Line commuter rail line will increase substantially by 2022.[14] The Hudson Line ridership increased a total of 35 percent in the 15 years prior to 2010, and ridership has steadily increased 11 percent since then. Commuter rail ridership increased approximately 2.3 percent annually in the 10 years prior to 2010. Since 2010, commuter rail ridership has increased an average of 1.2 percent a year to 2019.

[10] Systra Engineering. *Hudson Line Railroad Corridor Transportation Plan Final Report (Document No. M40801-11/9518/STU-137).* Prepared for New York State Department of Transportation, November 2005.

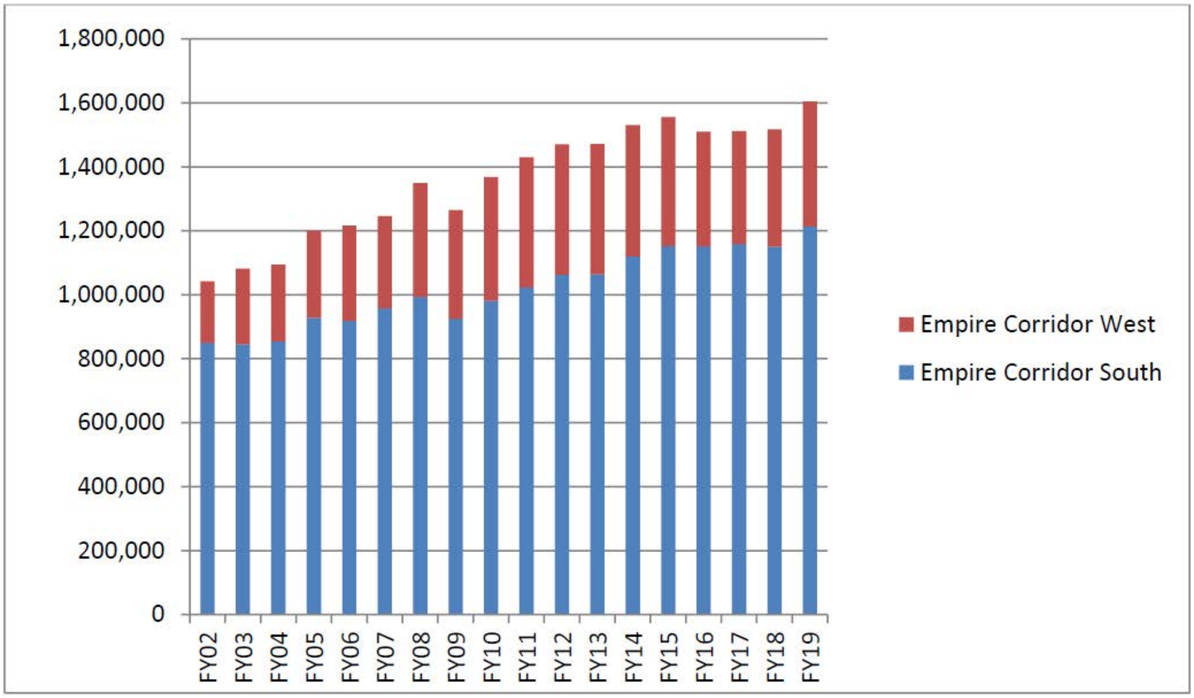
[11] High Speed Rail Task Force. *Final Report: Connecting New York's Future*. January 2006.

[12] 2019 was used for ridership as it represents the latest available pre-pandemic condition.

[13] NYSDOT. *New York State Rail Plan – Strategies for a New Age*. 2009.

[14] Systra Engineering. *Hudson Line Rail Corridor Transportation Plan Final Report (Document No. M40801-11/95 18/STU-137).* Prepared for Amtrak, Canadian Pacific Railway, CSXT, MTA Metro-North Railroad, NYSDOT. November 2005.

Exhibit 1-4—Empire Corridor Ridership FY02 to FY19



Source: Amtrak, 2011-2019. Note that Amtrak's fiscal year operates from October 1 to September 30.

The United States Department of Transportation (U.S. DOT) forecasts that rail freight traffic will grow 88 percent by 2035,[15] and cross border rail shipments will triple by 2035.[16] The Niagara Frontier Urban Area Freight Transportation Study estimates a major increase in rail freight shipments, from 47 million tons in 2004 to 93 million tons by 2035.[17] The Association of American Railroads forecasts freight traffic on the Empire Corridor will increase by 50 to 100 percent by 2035.[18] A study of rail freight traffic by the Greater Buffalo-Niagara Regional Transportation Council (GBNRTC) forecasts almost 100 percent (96.7%) growth in rail carload and intermodal traffic between 2004 and 2035.[19] The growth in cross-border rail traffic was estimated by the Niagara Frontier Urban Area Freight Transportation Study to be 183.2 percent between 2006 and 2035.[20] Projections of freight use by the New York City Economic Development Corporation[21] anticipated freight volumes increasing by 58 percent from 198 million tons in 2016 to 312 million tons in 2045. Of the current freight reaching New York City, only 2 percent travels by rail. The goals of the "Freight NYC" plan include expanding movement of freight by rail.

[15] *U.S. DOT Freight Analysis Framework,* as cited by *New York State Rail Plan* (2009).

[16] *Niagara Frontier Urban Area Freight Transportation Study*, as cited by *New York State Rail Plan* (2009).

[17] Wilbur Smith Associates. Niagara Frontier Urban Area Freight Transportation Study Final Report, Project No. 06 Freight. Prepared for the GBNRTC, August 2010.

[18] Association of American Railroads. *National Rail Freight Infrastructure Capacity and Investment Study* (2007).

[19] GBNRTC. *2035 Long-Range Transportation Plan Update.* May 2010. Accessed September 27, 2011.

[20] Wilbur Smith Associates. *Niagara Frontier Urban Area Freight Transportation Study, Technical Memorandum No. 3: Freight Transportation Market Profiles, Project No6 Freight.* March 6, 2009.

[21] NYC EDC, "Freight NYC: Goods for the Good of the City," 2016.

1.4. Performance Objectives

NYSDOT identified performance objectives for the High Speed Rail Empire Corridor Program as measurable objectives that directly relate to the program purpose and need to reduce infrastructure constraints to accommodate existing and projected demand. These performance objectives are:

- Improve system-wide on-time performance (OTP) to at least 90 percent;
- Reduce travel time along all segments of the Empire Corridor;
- Increase the frequency of service (number of daily round trips) along Empire Corridor West beyond the existing four daily round trips;
- Attract additional passengers;
- Reduce automobile trips, thereby reducing highway congestion;
- Minimize interference with freight rail operations.

These six performance objectives are used to evaluate and rank the high-speed rail alternatives developed for the High Speed Rail Empire Corridor Program. The environmental impacts of these alternatives are also considered, as presented in this Tier 1 Final EIS, and were an important factor in selecting the Preferred Alternative to be advanced in Tier 2.

1.5. Transportation-Related Goals

In addition to the measurable performance objectives outlined above, NYSDOT has identified the following broad-based transportation-related goals of the High Speed Rail Empire Corridor Program. NYSDOT anticipates that the program will have positive impacts on the local and regional economy and will reduce greenhouse gas emissions.

- **Increase travel choices by providing additional commuting and travel options for residents and workers.** The program will provide increased intercity passenger rail access to major metropolitan areas and will provide additional commuting and other travel options for residents and workers. This improved transportation access will potentially boost both the number of jobs available and the ability of workers (particularly those without alternative means of transportation) to access work locations, thereby expanding available labor markets. The program's proposed rail passenger amenities, including improved station operations, accessibility, and parking, will help to attract additional passengers and will contribute toward expanding travel choices in the Empire Corridor. A U.S. Conference of Mayors' report indicates that the potential travel efficiency gains through high-speed rail can lead to business productivity increases: car and truck travelers will benefit from reduced road congestion; airport users will benefit from reduced airport congestion; and travelers without car access will benefit by traveling to places that were previously unavailable to them.[22] Providing options for travelers and connecting the major metropolitan areas will improve the quality of life for Empire Corridor residents and workers.
- **Contribute to economic revitalization by accommodating forecasted growth in population and employment and corridor rail freight operations and by accommodating and attracting additional tourists**. New York City is the nation's largest economic center, and

[22] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail on Cities and their Metropolitan Areas.* Prepared by the U.S. Conference of Mayors (undated), released June 2010.

is one of the three largest economic centers in the world, along with London and Tokyo. Population growth, particularly growth in the New York metropolitan area, has brought corresponding growth in freight movement and commuter rail service levels. The U.S. Conference of Mayors' report projects that economic benefits of New York City to Albany high-speed rail service to the Albany metropolitan area alone would range from $358 million (with 79/90 mph service) to $523 million (with 110 mph service) in business sales for incremental-medium service, and would reach nearly $2.5 billion with 220 mph service.[23] Improving freight rail access in the corridor has national trade and economic implications as well, given the importance of the Buffalo and Niagara crossings, connections to the Port of New Jersey/New York and the Midwest, and freight movement on the line connecting to these markets. The Empire Corridor also connects the state's major tourism destinations, including New York City, Niagara Falls, the Finger Lakes Region, and the Hudson Valley. In 2019, and for the 19th consecutive year, New York was the most visited state by overseas travelers (over 10 million visitors or 26 percent of all overseas visitors in the U.S.), according to the U.S. Department of Commerce's National Travel and Tourism Office.[24] The proposed high-speed rail program would support increased travel and tourism, a substantial and growing component of the of New York State economy.

- **Improve environmental quality by facilitating rail use and reducing reliance on automobile travel, thereby reducing fuel use and greenhouse gas (GHG) emissions.** Reducing reliance on automotive travel will provide benefits to air quality and will reduce greenhouse gas emissions. A 2006 study, *High Speed Rail and Greenhouse Gas Emissions,*[25] calculated emissions saved and generated through institution of high-speed rail nationwide. The study estimated the net reduction in greenhouse gas emissions due to high-speed rail service along the Empire Corridor to be almost half a billion pounds of annual carbon dioxide emission. Benefits would accrue from not only diverting passenger trips from other modes, but also by facilitating freight rail use and future growth in rail. For each one percent increase in long-haul freight that changes from truck to rail, fuel savings would be approximately 111 million gallons per year and annual greenhouse gas emissions would fall by 1.2 million tons.

[23] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail on Cities and their Metropolitan Areas.* Prepared for the U.S. Conference of Mayors (undated), released June 2010.

[24] U.S Department of Commerce, National Travel and Tourism Office. "2019 U.S. Travel and Tourism Statistics (Inbound): 2019 Overseas Visitation Estimates to the States, Cities, and Regions Visited." 2019. Accessed April 2, 2021.

[25] Center for Clean Air Policy, Center for Neighborhood Technology. *High Speed Rail and Greenhouse Gas Emissions.* January 2006. Accessed July 8, 2011. < http://www.cnt.org/repository/HighSpeedRailEmissions.pdf>

2. Existing Transportation Conditions and Major Markets

Chapter 2 describes the Empire Corridor's existing transportation conditions and major markets. Section 2.1 presents an overview and route description of the existing Empire Corridor rail system. Section 2.2 describes the importance of the Empire Corridor to major markets, including the existing regional transportation market. Sections 2.3 through 2.5 present the existing conditions of the Empire Corridor freight, commuter rail, and intercity passenger rail service, and Section 2.6 addresses safety considerations. Appendix E contains additional information on the ridership study of major markets (automobile, bus, air, rail), other rail linkages and routes, and rail infrastructure (including signals, track classifications and speeds, rail yards, bridges, tunnels, and rolling stock). Appendices B and D present additional detailed information on the ridership analysis and rail simulations.

2.1. Empire Corridor Rail System

2.1.1. Railroad Ownership

Exhibit 2-1 illustrates track ownership on the Empire Corridor. Amtrak owns, maintains, and dispatches the southernmost 11 miles of track on Empire Corridor South (west side line of former New York Central Railroad), from Penn Station to the Spuyten Duyvil Bridge that spans the Harlem River at the northern tip of Manhattan.

Metro-North owns the track along the east side of the Hudson River, from the Spuyten Duyvil Bridge to Poughkeepsie, for its Hudson Line service with responsibility for maintenance and dispatching.

With the exception of one short (6.8-mile) segment owned by Amtrak west of the Schenectady Station, between the station and Hoffmans, CSXT is the owner of the Empire Corridor rail infrastructure from Poughkeepsie to Niagara Falls. This CSXT corridor comprises the:

- Hudson Subdivision (Poughkeepsie north to Albany-Rensselaer and west to Hoffmans);
- Selkirk Subdivision (Hoffmans to Amsterdam);
- Mohawk Subdivision (Amsterdam to Syracuse);
- Rochester Subdivision (Syracuse to Buffalo);
- Buffalo Terminal Subdivision in Buffalo; and
- Niagara Subdivision (Buffalo to Niagara Falls).

In 2012, NYSDOT facilitated a lease agreement between CSXT and Amtrak for portions of the Empire Corridor between Poughkeepsie, Albany-Rensselaer, and Hoffmans, NY. When combined with previous lease agreements for portions of the corridor within this 94-mile segment, Amtrak assumed full responsibility for dispatching and maintenance from the northern boundary of Metro-North control through Albany to Control Point (CP)[26] 169 at Hoffmans, where CSXT's freight-only Selkirk Branch joins the Empire Corridor. The 2012 lease agreement marks the first time in the corridor's history that passenger-only carriers have controlled the entire Empire Corridor from New York to Albany and beyond to Hoffmans. CSXT retains responsibility for the operation of freight trains within the territory leased by Amtrak as well as on the Metro-North Hudson Line. West of Hoffmans, CSXT remains responsible for maintenance and dispatching of the Empire Corridor.

[26] A control point is an interlocking, or the location of a track signal or other marker, the indications of which dispatchers can specify when controlling trains.

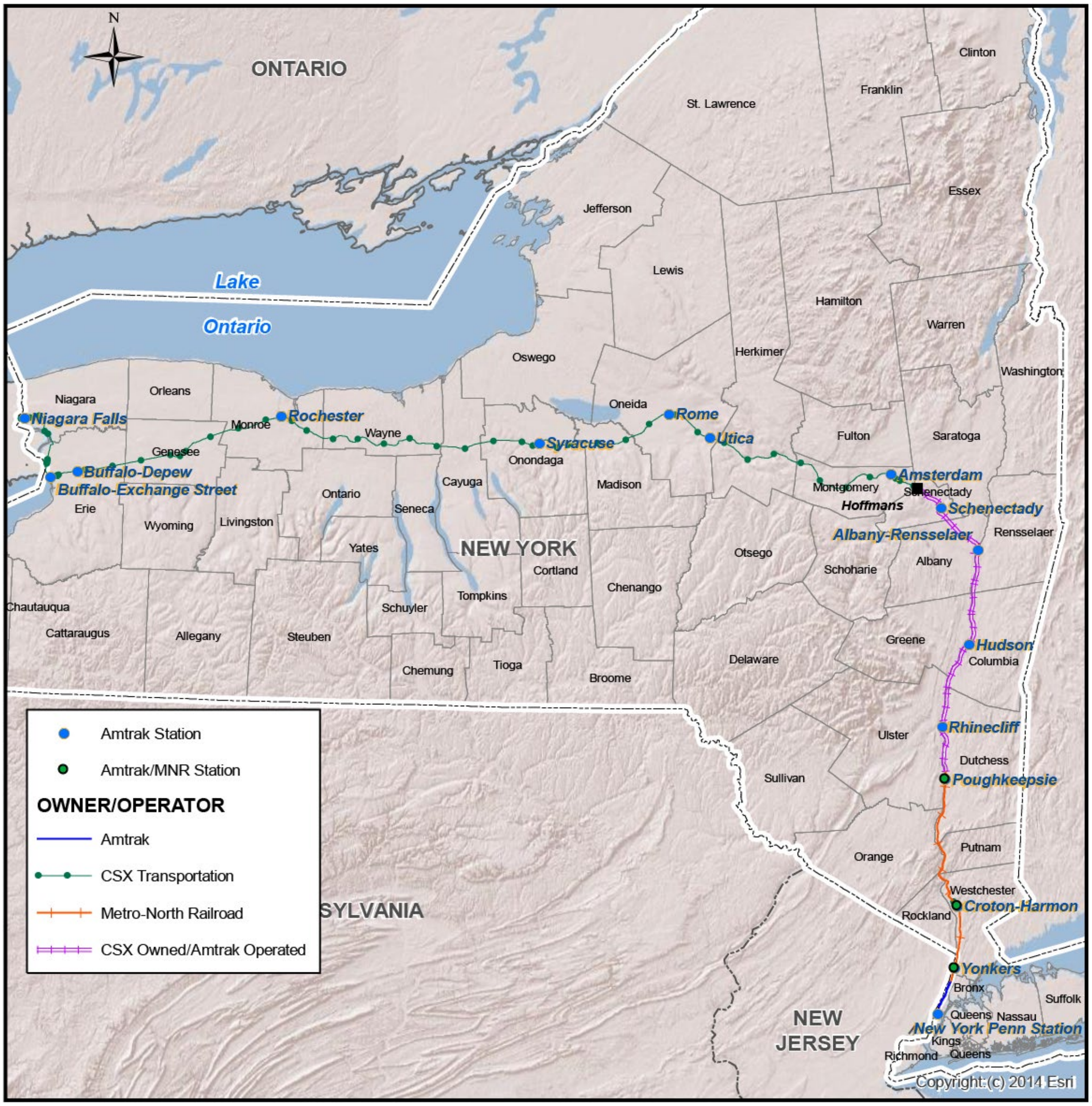


Exhibit 2-1—Empire Corridor Ownership

North of the Buffalo Terminal Subdivision, CSXT owns most of the Niagara Subdivision as far as CP 28. In December 2012, Amtrak assumed ownership, control, and maintenance of approximately 0.37 mile of former CSXT and Canadian National Railway track from immediately west of CP-28 to the U.S.-Canada international border on the Whirlpool Bridge. The Whirlpool Bridge, a railroad and vehicular passenger bridge located at the international border crossing, is owned and maintained by the Niagara Falls Bridge Commission.

2.1.2. Route Description

Empire Corridor South (New York City to Albany)

The Empire Corridor South extends 142 miles (Milepost [MP] 0 to 143[27]) north from Penn Station to approximately one mile north of Albany-Rensselaer Station in Rensselaer County (refer to Exhibit 2-3). This route continues from Manhattan through the Bronx (Bronx County), Yonkers and Croton-Harmon (Westchester County), Poughkeepsie (Dutchess County), extending to approximately one mile north of Albany-Rensselaer Station (Rensselaer County). The line runs through the Hudson Valley north to the Capital District.

Metropolitan Transportation Authority's (MTA's) Metro-North Railroad (Metro-North) operates Hudson Line commuter rail service (formerly Hudson River Line and New York Central Railroad) between Poughkeepsie and Grand Central Terminal (GCT) (MP 0 to 73.5). Empire Corridor South consists of the Empire Connection and the Metro-North/CSXT Hudson Line. The Empire Connection runs from Penn Station, northward along the west side of Manhattan, across the Harlem Ship Canal at Spuyten Duyvil Bridge (refer to Exhibit 2-2), and then joins with Metro-North's Hudson Line, a distance of 10.8 miles.

Exhibit 2-3 shows the two segments of the Metro-North Hudson Line. The Hudson Line is double-tracked north of the Croton-Harmon Station at Croton-on-Hudson (Milepost 33.2), with some three-track sections. To the south of Croton-Harmon Station, the line is mostly four tracks (two express and two local) and includes an electrified third rail. This configuration, generally speaking, does not affect train speeds. The southern portion of the Hudson Line begins at interlocking Control Point (CP) 12 on the Hudson Line, where the Empire Connection from Penn Station joins Metro-North's Hudson Line from GCT. The length of the segment is 21.4 miles, ending at Croton-Harmon, MP 33.2.

Exhibit 2-2—Spuyten Duyvil Bridge over Harlem River

Portions of the Hudson Line have 110 mph passenger train operation and limited freight activity (approximately four trains a day). The Empire Corridor South has a capability of accommodating the second highest rail car weight limit class (286,000 pounds) for freight. In 2019, Metro-North operated approximately 59 (weekend) and 85 (weekday) daily passenger roundtrips along the Hudson Line, of which roughly one third are express trains servicing Poughkeepsie and most of the remaining trips are local trains to Croton-Harmon Station or points south. In 2019, Amtrak operated thirteen daily roundtrips (weekdays) along the Empire Corridor South between Albany-Rensselaer and New York City, with eleven daily roundtrips on the weekends.

[27] Mileposts referenced in this Tier 1 EIS are measured south to north using Hudson Line mileposts from Grand Central Terminal. Mileposts referenced extend north to Albany-Rensselaer, then east to west on Empire Corridor West. Although Empire Corridor South extends to MP 143, the mileage from Penn Station to MP 143 totals to 142 miles. This is because the mileposts, as designated by the railroads, skip a mile where the Hudson line merges with the Empire Corridor at the Manhattan-Bronx county line near the Spuyten Duyvil Station.

In addition to Empire Service to Buffalo and points beyond, this section of track also accommodates Amtrak service that extends north of Schenectady Station on the Canadian Pacific Railway to Montreal (Adirondack—one daily roundtrip) and Vermont (Ethan Allen Express—one daily roundtrip). There is also one daily connecting service from Albany-Rensselaer to Boston, Massachusetts. These regional routes extending beyond the Empire Corridor are shown in Exhibit 2-4, which shows the regional linkages including to the Northeast Corridor and international routes in Canada.

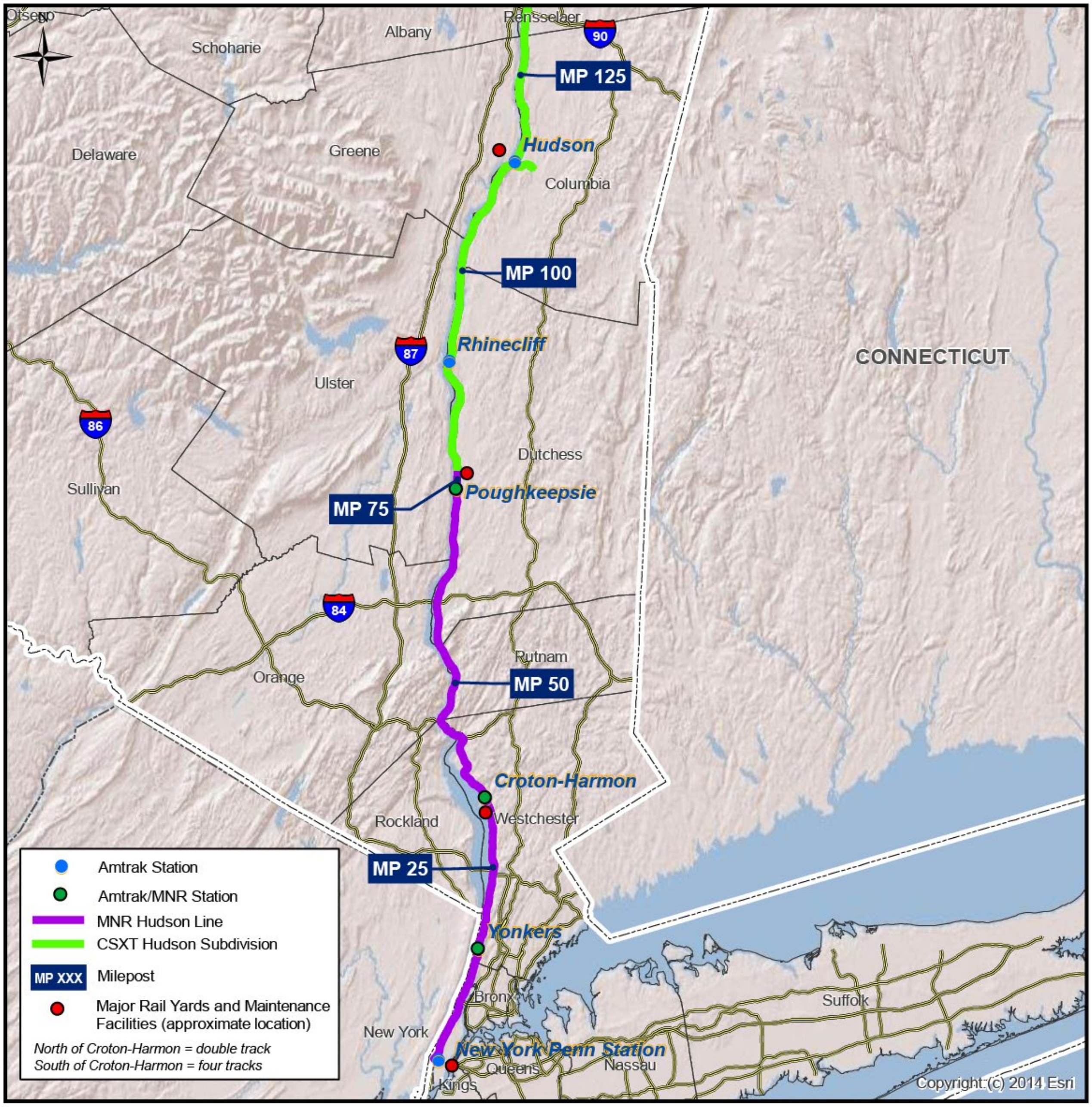


Exhibit 2-3—Empire Corridor South

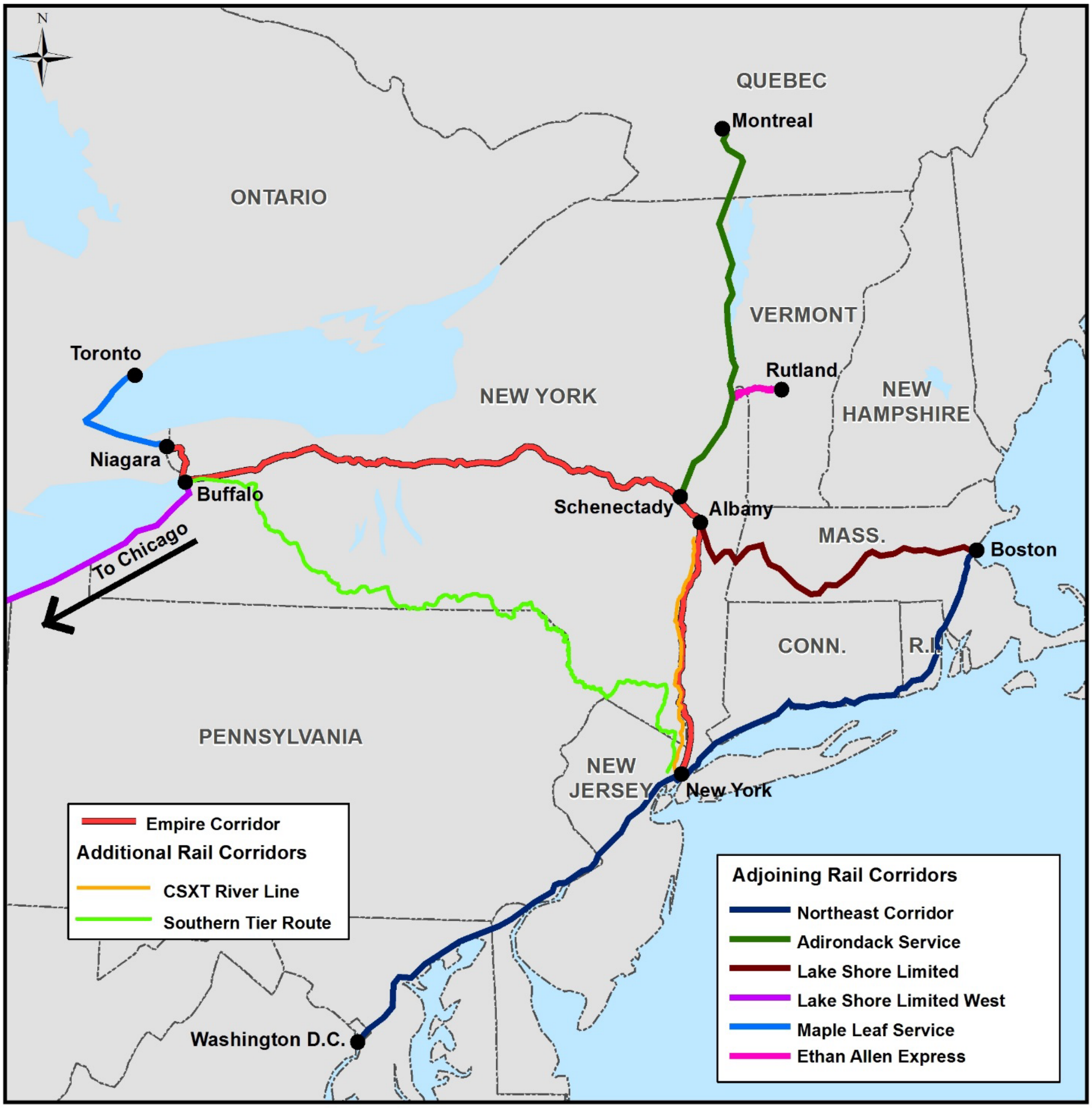


Exhibit 2-4—Additional and Adjoining Rail Corridors

With few exceptions, the tracks generally follow the east shoreline of the Hudson River. The northern portion of the Metro-North Hudson Line begins at MP 33.2 at Croton-Harmon Station and ends at MP 73.5 at Poughkeepsie Station. The under running third rail electrification ends at Croton-Harmon Station and all trains north of that point are operated with conventional diesel electric locomotives. Parts of this segment have sharper curvature than do segments to the south. These curves limit maximum speed to 45 to 55 mph; otherwise, 80 mph is the predominant speed.

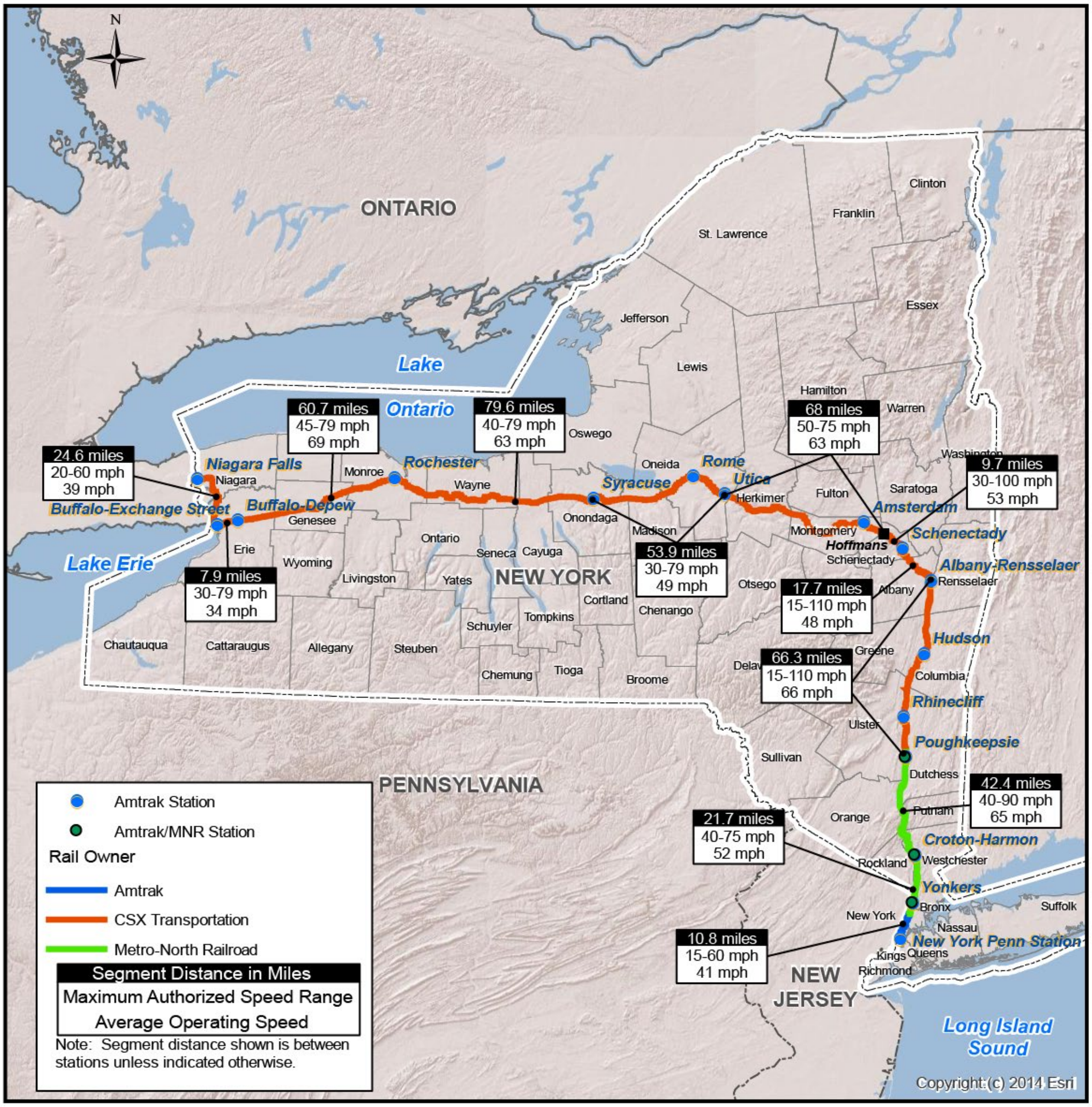


Exhibit 2-5—Empire Corridor Maximum Authorized Speed Ranges and Average Operating Speeds[28]

Exhibit 2-5 shows Maximum Authorized Speeds and average operating speeds along Empire Corridor. The northern section above the Hudson Highlands, where the Hudson River and the railroad are significantly straighter, allows for 90 mph operation of passenger trains. Leaving Croton-Harmon Station to the north, Amtrak intercity trains stop only at Poughkeepsie.

28 Exhibit displays MASs and average speeds as reported in the Tier 1 Draft EIS.

The Amtrak Hudson Line begins at Poughkeepsie Station, MP 73.5, and ends at CP 169 MP 169.7 at Hoffmans, New York. This segment has the highest maximum authorized speeds (MAS) on the Empire Corridor, with speeds of up to 110 mph. The higher speeds are, in large measure, due to generally following the Hudson River, which is comparatively straight relative to segments to the south. The higher speeds also reflect extensive investment by New York State since the 1970s.

Empire Corridor West (Albany to Buffalo)

Empire Corridor West extends 294 miles west (MP 143 to 437) from approximately one mile north of Albany-Rensselaer Station to just east of the Buffalo-Exchange Street Station (refer to Exhibit 2-6). This section of track passes through the Mohawk Valley from the Capital District cities of Albany and Schenectady, passing through the central-western New York cities of Utica, Syracuse, and Rochester in the Finger Lakes Region, and Buffalo on Lake Erie. Outside of these metropolitan areas, the railroad also passes through the more rural counties of Montgomery, Herkimer, Madison, Cayuga, Wayne, Monroe, and Genesee.

This section of track is a two-track line that is the busiest freight track in the state, carrying one of the highest volumes on the CSXT system nationwide. This is the only railroad line in upstate/western New York that can accommodate the maximum freight rail car weight (315,000 pounds). The entire line west of Hoffmans (west of Schenectady) also has adequate clearance for trains with double-stack intermodal containers. CSXT operates this as a high-volume railroad that is heavily-used by 50 to 60 freight trains daily. Intermodal transportation uses standardized cargo containers to allow ease of transport by, and transfer between, different modes (freight trains, cargo ships, and freight trucks) without double handling the freight itself. The Albany to Hoffmans segment has very light freight traffic due to freight traffic diverting to Selkirk Yard to the south. The existing corridor, at the time the Tier 1 Draft EIS was published, included a single-track segment between Albany and Schenectady, but has since been doubletracked. There are speed restrictions/slow orders due to track conditions, such as the Livingston Avenue Bridge over the Hudson River, where speed is restricted to 15 mph. Speed restrictions also remain due to grades on West Albany Hill and on the approach to Schenectady. Current operating speeds of up to 79 miles per hour are permitted by the signal system for this shared use corridor, although actual speeds are considerably lower. Speeds are reduced to 30 mph through the downtown Buffalo area.

In 2019, Amtrak operated a total of four daily roundtrips along the Empire Corridor West. Of these four trips, one daily service trip continues from Buffalo-Depew Station to Chicago (Lake Shore Limited). Amtrak operates three daily round trips to Niagara Falls (Empire Service), with one continuing on to Toronto (Maple Leaf Service) (see Exhibit 2-4). In addition to these four trips, two trips offer service to Schenectady, one on the Adirondack Service continuing to Montreal and one on the Ethan Allen Express continuing to Rutland, Vermont.

Leaving Albany-Rensselaer Station, the Empire Corridor curves sharply west to cross the Hudson River on the Livingston Avenue drawbridge, MP 142.9. The line then skirts the northern edge of downtown Albany, and begins the steepest grade on the Empire Corridor, Albany Hill. The grade reaches a maximum of approximately 1.6 percent for about 1.7 miles, climbing from about 30 feet above sea level at the Hudson River to about 200 feet above sea level.

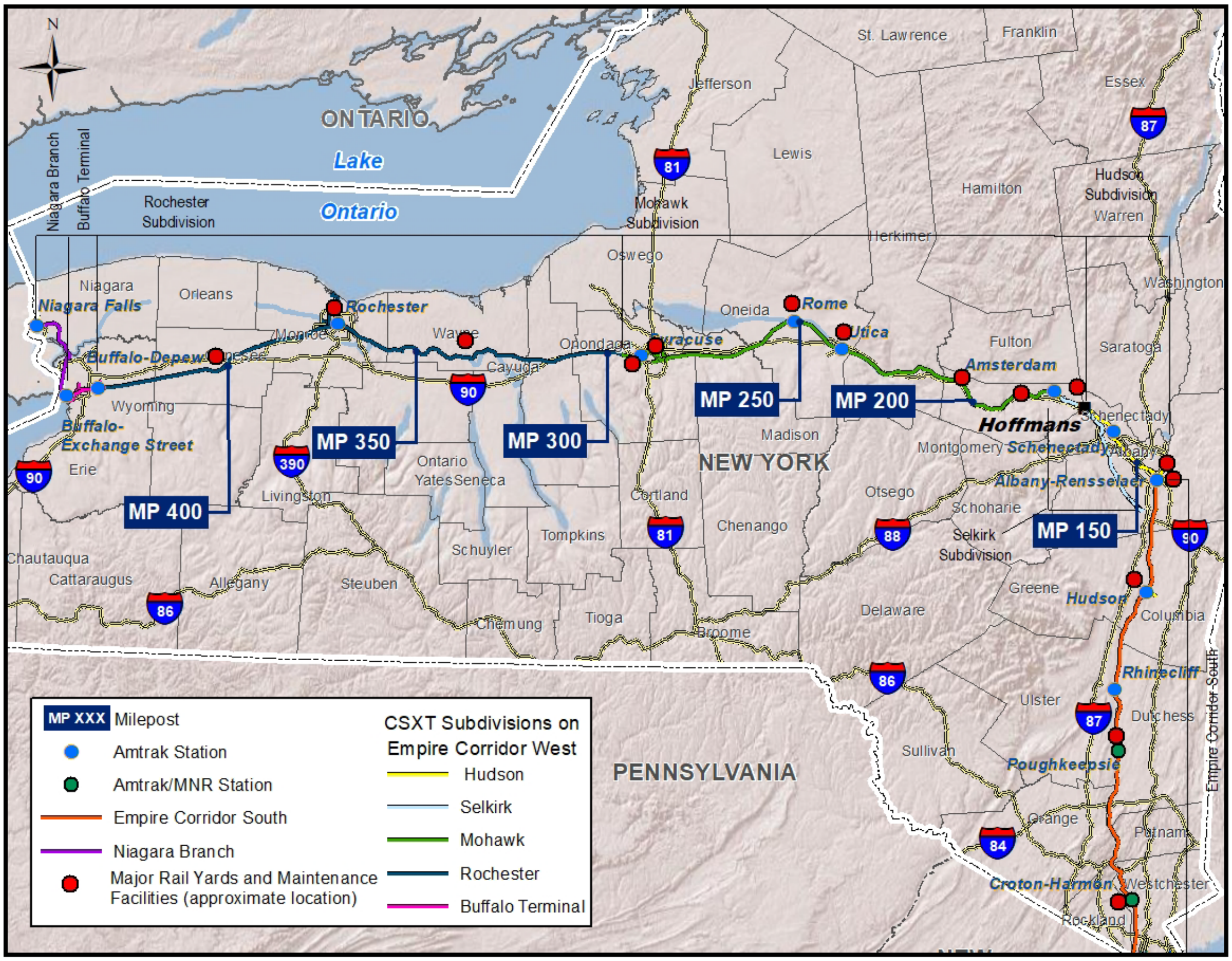


Exhibit 2-6—Empire Corridor West

The segment then passes through the Town of Colonie and approaches the outskirts of Schenectady. CSXT's Carman Branch (freight only) begins at MP 156.5 (CP 156) and provides a connection between the Amtrak – Hudson Line and the CSXT – Selkirk Sub-Division in South Schenectady. The Carman Branch provides access for CSXT to their yard in West Albany, along with the ability to divert passenger trains around Schenectady; if necessary. The branch diverges from the Amtrak – Hudson Line on the south side of the alignment and crosses over the Empire Corridor on an overhead bridge.

Leaving Schenectady Station, the Empire Corridor curves west and crosses the Mohawk River on a 725-foot-long double-track bridge. The line skirts the northern edge of Scotia and, at MP 168.3, passes under CSXT's Selkirk Subdivision, which curves west after the bridge to parallel the Empire Corridor between the Mohawk River to the south and the Selkirk Division to the north. The Empire Corridor joins CSXT's Selkirk Subdivision at CP 169 (Hoffmans).

The **CSXT Selkirk and Mohawk Subdivisions** extend 127.1 miles from Hoffmans, MP 169.7, to the end of CSXT's Mohawk Subdivision, west of Syracuse at MP 296.8. Empire Corridor West includes all of the Mohawk Subdivision and a short section of the westerly end of the Selkirk Subdivision. The Selkirk/Mohawk Subdivision dividing line is located at MP 175.5 (CP 175 in Amsterdam), 5.8 miles west of Hoffmans.

The eastern half of this segment closely follows the Mohawk River to Herkimer, where the river turns north to drain part of the Adirondack highlands, resulting in a number of curves that reduces maximum operating speed. West of Herkimer, the railroad follows the New York State Canal System. The landscape becomes less hilly approaching Utica and on to Syracuse. The Mohawk Subdivision ends, and the Rochester Subdivision begins, at MP 296.8, about five miles west of Syracuse Station.

The **CSXT Rochester Subdivision** extends 133 miles from the boundary with the Mohawk Subdivisions, west of Syracuse, and west to the **Buffalo Terminal Subdivision** at MP 429.8. The short, 7.9-mile Buffalo Terminal Subdivision extends to MP 437.7, at which point the **Niagara Subdivision** diverges north.

Leaving Syracuse, the railroad alignment heads almost due west, following a broad, level valley generally drained by the Seneca River. This section has minimal curvature and supports a 79 mph maximum speed for passenger trains. Approaching Savannah, the alignment crosses the Erie Canal at MP 319.30, and the extensive Montezuma Marsh, a wide floodplain of the now narrow Seneca River. All trains are limited to 40 mph due to continual differential settlement of the Seneca River bridge structure at MP 319.7 to 320.1.

Approaching Clyde at MP 328, the railroad encounters a region of hills. With the alignment designed to avoid some of the pronounced ridges, maximum passenger train speed is reduced to as low as 55 mph at Lock Berlin Curve,[29] MP 332.6, to 334.0. Sustained 79 mph passenger train operation is not possible until Walworth at MP 361. At Walworth, sustained 79 mph passenger train operation is possible for 7.5 miles to the eastern approaches to Rochester.

Similar to the segment through Syracuse, but shorter in overall length, the rail segment through Rochester features significant freight activity, complex track work, junctions, and reduced speeds (as low as 45 mph for passenger trains). West of Rochester at MP 372.2, the Rochester Subdivision continues west with a straight alignment and fairly level topography, which permits 79 mph for passenger trains operating from MP 372.2 to MP 435.4 (within the Buffalo Terminal Subdivision). The eastern limits of Frontier Yard are accessed at CP 434, which also permits movement to the Belt Subdivision, the primary freight train bypass around the City of Buffalo and the route to the International Railroad Bridge connecting to Ontario, Canada. Passenger train operating speeds, west of MP 435.4 on the Buffalo Terminal Subdivision, are limited to a speed of 60 mph near Frontier Yard and then to 30 mph at MP 436.8. At CP 437, approaching the Niagara Subdivision, passenger trains increase their maximum operating speed to 60 mph, once they clear the interlocking at CP 437, and then follow the governing speed restrictions for this subdivision.

<u>Niagara Branch (Buffalo to Niagara Falls)</u>

The Niagara Branch (CSXT Niagara Subdivision) extends 28 miles north MP 437 (CP 437) and proceeds generally north to Niagara Falls (refer to Exhibit 2-7). This section of track passes through Erie and Niagara counties.

The Niagara Branch is primarily a passenger railroad; since there is a freight bypass route used by CSXT that provides modern clearances for freight service to Niagara Falls (refer to Section 2.3). Maximum passenger speeds over this single- and double-track (formerly all double-tracked), shared

[29] Lock Berlin Curve is actually two curves; a reverse curve with some tangent between them. The initial curve outlines an almost a ninety degree angle.

use corridor range from 40 to 60 mph. Impediments to freight movements include a tunnel with a vertical clearance slightly more than 16 feet, which is inadequate for a number of modern railcars, including double-stack containers. The northernmost section of track crosses into Niagara Falls, Canada at the Whirlpool Bridge. The Whirlpool Bridge accommodates the railroad on the upper level and carries highway traffic on the lower level. This bridge is used only for the Maple Leaf service to Toronto, Canada operated by Amtrak and VIA rail (one daily roundtrip), and the freight use that formerly operated on the bridge has been abandoned.

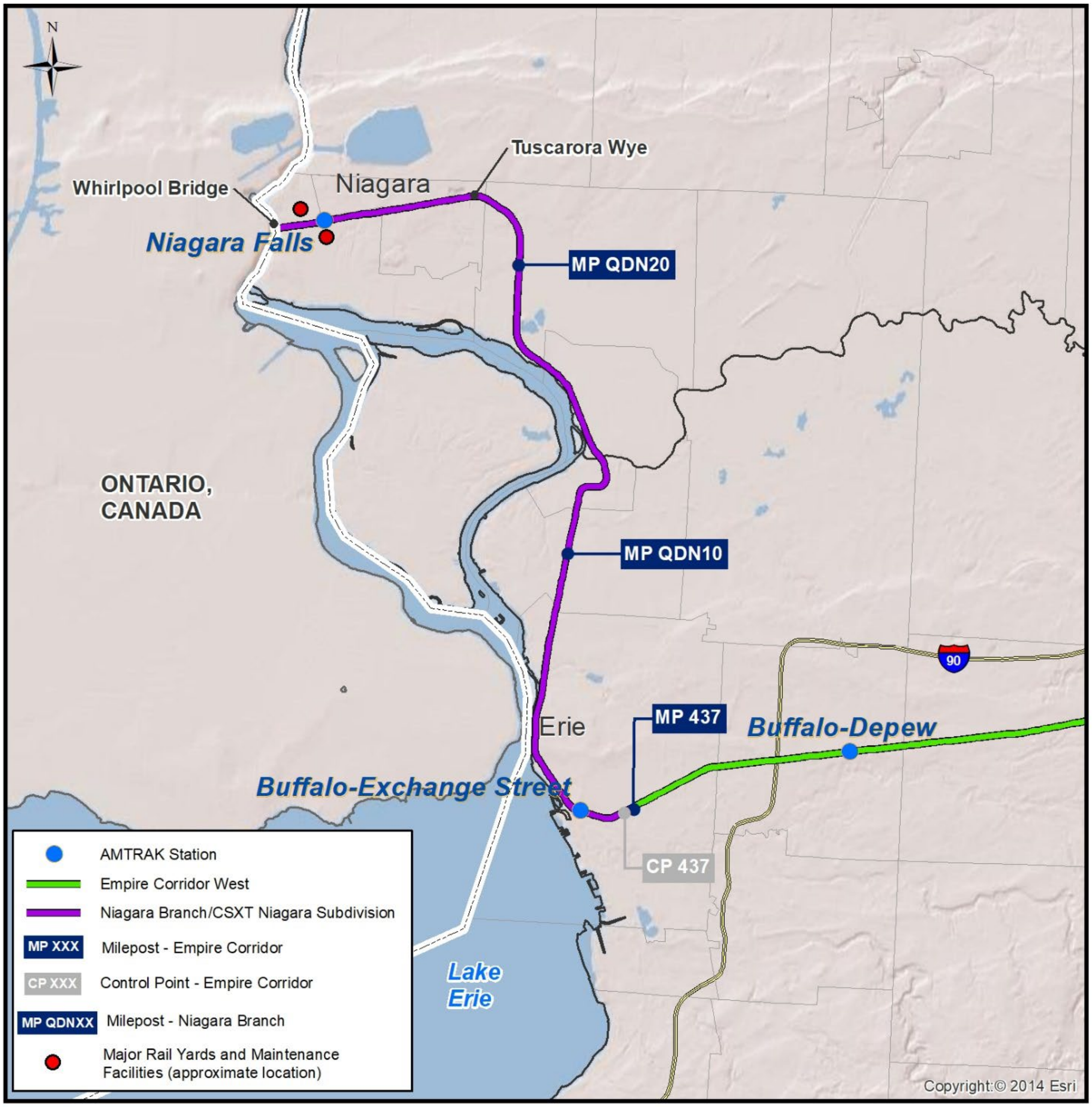


Exhibit 2-7—Niagara Branch

CP 437 is the dividing point of CSXT's Buffalo Terminal Subdivision, CSXT's Niagara Subdivision, the Lake Shore Subdivision, and the Belt Subdivision. CSXT's Belt Subdivision joins from the north and provides a high clearance bypass of downtown Buffalo. The Niagara Branch continues straight toward the shore of Lake Erie, curving to the right and continuing 1.9 miles to Amtrak's Buffalo-Exchange Street Station, which is very close to Buffalo's main business district. It proceeds generally north, through Tonawanda, North Tonawanda to Niagara Falls. Leaving Exchange Street, the Niagara Branch closely parallels Route I-190 along the Niagara River. The right-of-way (ROW) passes through a short tunnel under overhead roadways and is generally confined by many ramps, parallel roadways and I-190 itself. Six miles from its beginning, the track exits the confines of parallel highways at the I-190 and the Scajaquada Expressway (Route 198) interchange. At this location, the Niagara Branch passes junctions with the freight-only Belt Subdivision; most freight trains destined for Niagara Falls rejoin the Empire Corridor at this location.

The Tuscarora Wye (refer to Exhibit 2-7) connects with the Niagara Branch about 5½ miles south of Niagara Falls. Northbound Amtrak trains terminating in Niagara Falls access the wye to pull forward, then reverse (using the other leg of the wye) to back into Niagara Falls Station. This allows the terminating Amtrak trains to be "turned" without the expense of a yard crew. Southbound Amtrak trains do not use the Tuscarora Wye.

2.2. Major Markets Served by the Empire Corridor

The Empire Corridor runs through the population and economic spine of New York State, connecting many of its metropolitan areas. Eighty percent of New York State's 19.4 million residents live within 30 miles of the Empire Corridor. According to the 2019 U.S. Census, New York's six largest metropolitan areas (in order, New York City, Buffalo, Rochester, Yonkers, Syracuse, Albany) lie along this corridor. The Empire Corridor includes nine of the top fourteen most populous cities (Schenectady, 9th largest city; Utica, 10th largest city; and Niagara Falls, 14th largest city). The convenience of efficient rail travel will contribute to the accessibility of these communities, enhancing their economic and cultural vitality and supporting local and regional economic development efforts.

There are eight metropolitan statistical areas (MSAs)[30] located along the route, defined around the eight major metropolitan areas extending into New Jersey and Pennsylvania. The total population of the MSAs exceeds the population of the State of New York. The following is a description of the eight MSAs, which are served by nine Metropolitan Planning Organizations (MPOs).

- **New York-Newark-Jersey City, NY-NJ-PA MSA** (also referred to as the **New York-Northern New Jersey-Long Island, NY-NJ-PA MSA**), served by the **New York Metropolitan Transportation Council (NYMTC).** NYMTC is the state-designated MPO for New York City, Long Island and the lower Hudson Valley and is comprised of the following ten counties: New York, Kings, Bronx, Richmond, Queens, Nassau, Suffolk, Putnam, Rockland, and Westchester.
- **Poughkeepsie-Newburgh-Middletown, NY MSA** served by the **Orange County Transportation Council (OCTC)** and the **Poughkeepsie-Dutchess County Transportation Council (PDCTC).** The OCTC is the MPO for Orange County, while the PDCTC is the MPO for

[30] The general concept of a metropolitan statistical area is that of an area containing a large population nucleus (based on urbanized areas of 50,000 or more population), and adjacent communities that have a high degree of integration with that nucleus. The Metropolitan Statistical Area comprises the central county or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the core as measured through commuting. MSAs serve to group urban areas (and can group together several cities) for population censuses and compilations of related statistical data.

Dutchess County.

- **Kingston, NY MSA**, served by the **Ulster County Transportation Council (UCTC)**. UCTC is the designated MPO for Ulster County.
- **Albany-Schenectady-Troy, NY MSA**, served by the **Capital District Transportation Committee (CDTC)**. CDTC is the designated MPO for the Albany-Schenectady-Troy metropolitan area and is responsible for Albany County, Rensselaer County, Schenectady County, and Saratoga County.
- **Utica-Rome, NY MSA**, served by the **Herkimer-Oneida Counties Transportation Study (HOCTS)**. HOCTS is responsible for the transportation planning in Herkimer and Oneida Counties.
- **Syracuse, NY MSA**, served by the **Syracuse Metropolitan Transportation Council (SMTC)**. SMTC is the state-designated MPO for Onondaga County and small portions of Madison and Oswego Counties.
- **Rochester, NY MSA**, served by the **Genesee Transportation Council (GTC)**. GTC is the MPO responsible for the transportation planning of the Genesee-Finger Lakes Region which includes the following nine counties: Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming and Yates Counties.
- **Buffalo-Cheektowaga-Niagara Falls, NY MSA**, served by the **Greater Buffalo-Niagara Regional Transportation Council (GBNRTC)**. GBNRTC is **t**he MPO for Niagara and Erie Counties.

The southern terminus of the Empire Corridor, the New York City metropolitan area, is the nation's largest MSA with an estimated population of over 19 million. New York City's labor market totaled 6,193,192 in 2019, comprising 48.1 percent of New York State's employment. In 2019, the gross metropolitan product of the New York metropolitan area (New York-Newark-Jersey City, New York-New Jersey-Pennsylvania MSA) was $1.861 trillion, larger than the combined gross domestic product of Pennsylvania and New Jersey, and larger than all but one state (California).[31] This gross metropolitan product represents the largest consumer market in the United States.

The nine MPOs along the route account for approximately 90 percent of the state's total population and employment and form the bulk of the high-speed rail ridership market. The population of the nine MPOs is forecast to be 19,403,664 by 2035. In 2019, the state population totaled 19,453,561. Although population between 2010 and 2019 remained largely the same, the employment for these MPOs increased almost 19 percent. The employment in these MPOs is forecasted to increase 1 percent by 2035 to 11,847,283, thereby continuing to constitute roughly 89 percent of the state's total 2035 projected employment of 13,286,923[32].

The regional population and employment projections for the Empire Corridor indicate a strong population and employment base, and a correspondingly strong high-speed rail travel market. These projections do not account for major new infrastructure investments, such as improvements to high-speed rail service described in Chapter 3, which could potentially change the population and employment outlook. For example, according to a U.S. Conference of Mayor's Report, which

[31] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail on Cities and their Metropolitan Areas.* Prepared for the U.S. Conference of Mayors (undated), released June 2010; U.S. Bureau of Economic Analysis, GDP/MSA-states, 2016.

[32] U.S. Census, 2010 and 2019 were the sources for county population. U.S. Bureau of Economic Analysis was the source for 2010 and 2019 employment, for all MPOs except for the Syracuse Metropolitan Transportation Council. Woods and Poole Economics, Inc. was used for 2035 county population and employment forecasts.

examined the impact of high-speed rail upon the City of Albany, the introduction of high-speed rail along the corridor can contribute substantially to economic growth by driving higher-density, mixed-use development at train stations; expanding visitor markets and generating additional spending; broadening regional labor markets; and supporting the growth of technology clusters.[33]

The Buffalo-Niagara region is an important gateway for international trade. According to the U.S. Bureau of Transportation Statistics, the Buffalo-Niagara region was the third busiest international trade crossing by land in the nation in 2000, behind Texas and Michigan.[34] The four highway bridges and two rail bridges across the Niagara River comprised the second busiest commercial border crossing of the entire Canada-U.S. border.[35] Of the four international highway bridges across the Niagara River, only two are used for commercial traffic. Currently, one rail bridge crosses the river with freight trains using the International Rail Bridge between Black Rock, New York and Fort Erie, Ontario. The Whirlpool Bridge carries the Amtrak New York City to Toronto train and connects to VIA RAIL Canada. In the past, a third crossing via the suspension bridge traversed the Niagara River between the United States and Canada. It was removed from service as part of a grade elimination project in Niagara Falls, Canada. According to the New York State Rail Plan (2009), the Buffalo and Niagara crossings into Canada (including highway freight) accounted for 60 percent of imports from Canada through the New York State border crossings (worth an estimated $37.9 billion) and 73.4 percent of U.S. exports (worth an estimated $32.5 billion) in 2005. Of this, rail accounted for 16.6 percent (or $6.3 billion) of imports and 4.7 percent (or $1.5 billion) of exports through the Buffalo and Niagara crossings.[36] A Greater Buffalo-Niagara Regional Transportation Council study of freight estimated that in 2006, $7.1 billion (or 5.1 million tons) of Canadian imports traveled via rail through the Port of Buffalo-Niagara Falls into the U.S., and $1.8 billion of goods were exported in the same year.[37] Approximately one-fourth of the international trade with Canada occurs at the highway border crossings located along the Niagara River. In 2010, the Port of Buffalo-Niagara Falls had the third highest ranking for trade value of rail crossing ports into Canada in the U.S., accounting for $7.2 billion of imports and $2.8 billion of exports.[38]

2.3. Freight Operations

Empire Corridor West (from Hoffmans) carries 50 to 60 daily freight trains (refer to Exhibit 2-8), one of the highest volumes on the entire CSXT system. CSXT operates upwards of 80 local freight trains per week and close to 450 through freight trains per week along this segment.[39]

This section of track is the only railroad line in upstate/western New York that can accommodate the maximum freight rail car weight (315,000 pounds). There is a wide range of freight trains, with the single largest category being intermodal trains that carry double-stack containers to and from East Coast ports (refer to definition of intermodal transportation in Section 2.1.2). Some intermodal trains

[33] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail and Cities on their Metropolitan Areas.* Prepared for the U.S. Conference of Mayors (undated), released June 2010.

[34] U.S. Bureau of Transportation Statistics, North American Transborder Freight Data, "Top 104 Ports/Districts by Trade Value (U.S. Dollars) (Ranked by Total Trade) for U.S.-Canada Partner Trade by Rail: Buffalo-Niagara Falls, New York." Accessed October 12, 2011.

[35] Ontario Ministry of Transportation and NYSDOT, *Bi-National Transportation Strategy for the Niagara Frontier*, December 2005.

[36] NYSDOT, *New York State Rail Plan – Strategies for a New Age*, 2009.

[37] Wilbur Smith Associates, *Niagara Frontier Urban Area Freight Transportation Study, Technical Memorandum No. 5: Economic Impact Analysis, Project No. 06 Freight.* Prepared for the GBNRTC, Updated June 2010.

[38] U.S. Bureau of Transportation Statistics, North American Transborder Freight Data, "Top 104 Ports/Districts by Trade Value (U.S. Dollars) (Ranked by Total Trade) for U.S.-Canada Partner Trade by Rail: Buffalo-Niagara Falls, New York." Accessed October 12, 2011. <**http://www.bts.gov/programs/international/transborder/TBDR_QuickSearch.html**>

[39] LTK Engineering Services. Rail Network Operations Simulation Results. Prepared for NYSDOT. June 2012.

also carry "piggyback" highway trailers on flat cars. Other train types include enclosed automobile "racks" from final assembly plants; coal trains for electric generating plants; garbage trains from New York City and other locations; and general merchandise trains carrying lumber, chemicals, grain, fertilizer, plastics, propane, and other commodities.

The busiest segment of the CSXT freight operations (Buffalo-Rochester) handled about 85 million gross tons (mgt) of freight per year in 1997, increasing to about 110 mgt in 2007. This reflects an annual growth of about 2.5 percent. CSXT's Niagara Branch handles approximately 10 to 20 mgt of freight per year. Although corridor-specific figures are not available, the recession severely affected freight traffic. For the CSXT system, as a whole, volume tonnage declined by about 17 percent from 2008 to 2009, rebounding by about 9 percent from 2009 to 2010.

Most freight trains on the Empire Corridor continue west from Buffalo on the CSXT Lake Shore Subdivision/Chicago Line that passes along the south shore of Lake Erie. CSXT interchanges freight with Canadian National Railway and Canadian Pacific Railway in the Buffalo area.

Exhibit 2-8—2019 Weekday Train Frequencies on Empire Corridor

Service	Empire Corridor South South of Albany-Rensselaer		Empire Corridor West West of Albany-Rensselaer	
	Outbound (to Albany)	Inbound (to New York City)	Outbound (to Buffalo-Depew)	Inbound (to Albany)
Passenger Rail (Amtrak)	To Albany	From Albany	From Albany	To Albany
	13	13	4 (6 from Schenectady)	4 (6 to Schenectady)
Commuter (Metro-North)	To Poughkeepsie*	From Poughkeepsie	N/A	
	32	32		
	Terminating at Croton-Harmon or Points South	Originating at Croton-Harmon or Points South		
	55	52		
	Total Outbound 87	Total Inbound 84		
Freight (CSXT)	4		50 – 60 (west of Hoffmans)	

* One of the 32 trains terminates at Beacon, just south of Poughkeepsie.
Source: Amtrak Empire Service: New York, Albany, and Buffalo, NRPC Form W8, June 30, 2019; Metro-North Railroad Hudson Line Timetable, effective June 30 through September 28, 2019.

Local CSXT freight trains operate to Niagara Falls, serving industries and power plants in that area. Although the CSXT and Canadian National freight networks formerly connected via the Whirlpool Bridge in Niagara Falls, freight trains do not regularly use this routing. On the east, CSXT freight trains diverge from the Empire Corridor at Hoffmans, operating to the large classification (sorting) yard at Selkirk, south of Albany.

From Selkirk Yard, the majority of the freight trains operate south via the CSXT River Line (former West Shore Railroad) to New Jersey, while others operate east to connect with the Boston & Albany Line to Springfield, Worcester, and Boston, Massachusetts. Two freight trains cross the Hudson River, then access Empire Corridor South at Stuyvesant to travel to Poughkeepsie and the New York City area, where connections are made with the Long Island rail freight network.

The CSXT Buffalo Terminal area, located at the western end of the Empire Corridor, is a major hub for international rail movements and is used by all four major Class I railroads[40] in the eastern U.S. (CSXT, Norfolk Southern, Canadian National, and Canadian Pacific), each with its respective terminal facilities, classification yards, interchange, and mainline tracks. The Empire Corridor only accommodates one of these Class I railroads (CSXT), although the Mohawk, Adirondack & Northern Railroad holds trackage rights to operate between Utica and Rome on CSXT tracks.

CSXT has a freight bypass around Rochester to the south, the 23.5-mile-long single-track West Shore Subdivision. This bidirectionally-signaled line diverges east of Rochester at MP 359.2 and rejoins the Rochester Subdivision at MP 382.6, west of Rochester. Freight trains that do not stop at Rochester, such as intermodal, automotive, unit coal, and grain trains, use this slightly shorter, uncongested route on an as-needed basis.

The CSXT River Line, which parallels the Empire Corridor, operates as a north-south freight line along the west side of the Hudson River with connections to Albany. The River Line, a single-track freight line, is used as CSXT's principal intermodal route, along with the Chicago Line (Empire Corridor West), between the Port Authority of New York & New Jersey and Chicago. The "Castleton Cut-off" route that connects the River Line at Selkirk Yard with the Empire Corridor at Stuyvesant and the Boston & Albany Line is the closest freight rail crossing of the Hudson River to New York City, and, at 125 miles north of the city, the closest connection to points west of the river.

CSXT recently changed Selkirk Yard from a hump classification yard to a flat switch facility. Selkirk remains as the focal point for rail freight service through the Albany-Schenectady area, as well as the operational control point for all CSXT operations in the corridor. Appendix E provides additional descriptions of other service yards.

Empire Corridor South has a capability of accommodating the second highest rail car weight limit class (286,000 pounds) for freight. CSXT freight traffic on Empire Corridor South is considerably lighter than freight traffic west of Hoffmans. Freight service on the Hudson Line consists of through freight limited to a nighttime window, as per agreement between Metro-North and CSXT, and several locals (four) per day. Within the southern portion of the line within Metro-North territory, there are some moves during the day, but they are minor and performed within scheduled time slots. Freight service on the Hudson Line is constrained by the high volume of Metro-North commuter rail traffic and nonstandard clearances at bridges over the rail line. As previously noted, much of the freight traffic is routed down CSXT's West Shore Line to northern New Jersey, rather than into New York City, where congestion and a lack of modern freight rail yards hamper deliveries (with the exception of shippers with their own sidings).

2.4. Commuter Rail Operations

The Empire Corridor South is heavily used for commuter rail by Metro-North Railroad, the second busiest commuter railroad in the nation (refer to Exhibit 2-8). South of Poughkeepsie Station, Metro-North operates Hudson Line commuter service into Grand Central Terminal. Key ridership and on-time performance (OTP) statistics are summarized in Exhibit 2-9.

The growing ridership base on the Hudson Line increased 35 percent over the 15 years prior to 2010,

[40] Class I railroads are defined by the Surface Transportation Board as having annual operating revenues of $250 million or more in 1991 dollars.

an average of 2.3 percent a year.[41] Over these 15 years, Hudson Line commuter rail ridership had increased by roughly 4 million, to 15.7 million annually in 2010. Since 2010, commuter rail ridership has increased 11 percent, an average annual increase of 1.2 percent, to reach 17.4 million annually in 2019.

Poughkeepsie (MP 73.5) marks the northernmost extent of the Metro-North territory along Empire Corridor South (MPs 0 to 142) for the Hudson Line service, and the Croton-Harmon Station demarcates the other major service stop midway along the line (MP 33.2). South of Croton-Harmon Station, only three of the four lines are electrified with third rail, so the non-electrified track serves Amtrak, freight service, and Metro-North diesel service (which is different than express service). Four tracks typically carry two express and two local tracks in each direction that service closely spaced suburban stations.

The Metro-North Hudson Line runs as a double-track line to Poughkeepsie, with some three-track sections. Three track sections extend between Croton-Harmon to Peekskill (CP 35 to CP 39), at Beacon (CP 58 to CP 61), and at Poughkeepsie (CP 72 to CP 75).

Exhibit 2-9—Metro-North Ridership and OTP, 2010 and 2019

	2010	2015	2019
On-time Performance System-wide	97.5%	93.5%	95%
Hudson Line Ridership	15.7 million	16.4 million	17.4 million

In 2019, Metro-North Hudson Line commuter rail service consisted of:

- On weekdays, 87 revenue trains originated from and 84 terminated at New York City Grand Central Terminal (GCT), for a total of 171 trips each weekday.
- On weekends, Metro-North operated 53 trips to and from GCT (with 6 additional trips on Saturdays each way), for a total of 106 to 118 trips to and from GCT each day.
- Roughly half of the trips were express or limited express trains to Poughkeepsie (29 outbound and 30 inbound on weekdays and 22 inbound and outbound on weekends).

Most of the trains are express, or limited express trains, with other trains operating as local shuttle trains to Croton-Harmon only. On weekdays, three late night/early morning inbound trains and one outbound train operate as shuttle trains making all stops between New York City and Poughkeepsie. On the weekends, two late-night shuttles operate inbound from Poughkeepsie making almost all stops, with one outbound late-night shuttle.

[41] Anders, Marjorie, MTA, "RE: New York State High Speed Rail Project-Metro-North Hudson Line Ridership Information," email/personal communication with HNTB Corporation, October 28, 2011, updated with annual 2011-2019 MNR ridership reports .

2.5. Intercity Passenger Rail Operations

This section describes reliability/on-time-performance (OTP), travel times, schedule frequency, and ridership for Amtrak's intercity passenger rail service on the Empire Corridor.

2.5.1. Reliability

Reliability, or OTP, is the consistency of service in terms of both travel times and adherence to published schedules. Inadequate reliability adds to total travel time because passengers are forced to select earlier departure times to allow sufficient time for potential delays.

Poor OTP and long travel time can result in a negative impact on ridership for Empire Corridor passenger rail service. A train that is 10-minutes late is reported the same as a train that is three hours late, yet the latter has a much more severe impact because it is likely to result in passengers selecting other modes for future travel. The program objectives for Empire Service include improving system-wide OTP to at least 90 percent.

The metrics Amtrak uses for OTP have evolved over time. The customer on-time performance (OTP) is the percentage of all customers on an intercity passenger rail train who arrive at their detraining point no later than 15 minutes after their published scheduled arrival time, reported by train and by route. The "All Stations OTP" accounts for timeliness at all station arrivals (rather than just end points). A more detailed review of endpoint OTPs (2017) for Empire Corridor service and routes by schedule is presented in Appendix E.

For Amtrak's current rating of its routes, 80 percent is considered to be a "passing" grade. In 2019, Amtrak rated the OTP for Empire Service between New York to Albany as 91 percent of on-time customers (where customers arrive within 15 minutes) and the OTP for the full Empire Service operating between New York to Niagara Falls OTP was only 66 percent of on-time customers (a failing grade). Of the other routes operating on Empire Corridor, only the Ethan Allen Express received a passing OTP of 85 percent. The Adirondack had a 2019 customer OTP of 73 percent, the Maple Leaf had an OTP of 67 percent.

Exhibit 2-10—2019 OTPs for Empire Service between Niagara Falls and NYC and Other Routes

Train	All-Stations OTP		Customer OTP		Ave. Minutes late per late Rider	
	Current Month	Most Recent 12 Months	Current Month	Most Recent 12 Months	Current Month	Most Recent 12 Months
Empire	78.4%	80%	76.8%	80.3%	45	41
New York-Albany	94.3%	94.3%	89.6%	91.1%	42	35
New York-Niagara Falls	65.7%	68.9%	61.8%	66.4%	42	42
Adirondack	71.2%	73.2%	68.3%	73.1%	54	46
Ethan Allen Express	84.6%	89.6%	79.2%	84.9%	32	34
Maple Leaf	68.3%	67.9%	59.5%	66.8%	57	47

Source: Host Railroad Report, Amtrak Train Performance on Host Railroads, preliminary released for informational purposes, December 2019.

As shown in Exhibit 2-10, only the New York to Albany service operates at optimal OTPs of approximately 90 percent or better. Overall OTPs for a year period on Empire Service was approximately 80 percent, but the Niagara Falls service from and to New York experienced OTPs between 62 to 69 percent.

Amtrak routinely collects information on the causes of train delays, which are frequently due to host/owner railroad issues. Exhibit 2-11 summarizes the common causes of delays and minutes of host-responsible delay on the Empire Corridor. The threshold for Amtrak's 80 percent OTP goals correlates to 900 host-responsible delay minutes per 10,000 train miles. These thresholds are shown in bold in this exhibit. The delays shown are normalized by train mile so that the delays for each operator are divided by the train miles operated by that operator, then multiplied by 10,000 train miles. Delays associated with CSXT operation on Empire Corridor West and Metro-North operations on Empire Corridor South exceed the Amtrak target on an annual basis. On the New York to Niagara Falls Empire Service, the average delays per late rider in 2019 attributed to CSXT totaled 1,043 minutes, or 17.4 hours (per 10,000 train miles). On the New York to Albany Service, the average minutes late per late rider in 2019 attributed to Metro-North totaled 947 minutes, or 15.8 hours (per 10,000 train miles).

Exhibit 2-11—2019 Minutes of Delay per 10,000 Train Miles by Host for Empire Service

Train	Host	Total Host Responsible Delays		Largest Two Delay Categories				Route Miles
		Current Month	Most Recent 12 Months	#1		#2		
Empire								
New York-Albany	Amtrak	237	231	DCS	93	PTI	78	81
	MNRR	844	**947**	CTI	570	RTE	123	64
New York-Niagara Falls	CSX	**1035**	**1043**	FTI	402	RTE	311	296
	Amtrak	242	329	DCS	118	PTI	71	109
	MNRR	822	**1364**	CTI	503	DMW	119	64
Adirondack	CN	**3523**	**4021**	DSR	2254	RTE	744	49
	CP	687	767	PTI	466	FTI	94	178
	Amtrak	154	329	PTI	81	DCS	32	100
	MNRR	820	**921**	CTI	499	RTE	137	64
Ethan Allen Express	CP	507	675	PTI	359	DCS	35	60
	Amtrak	507	430	PTI	301	DCS	85	100
	MNRR	**1061**	**1316**	CTI	496	DMW	279	64
	VTR	0	274		0		0	24
Maple Leaf	CSX	**1284**	**1261**	FTI	649	RTE	341	298
	Amtrak	263	304	PTI	167	DCS	41	109
	MNRR	743	**966**	CTI	468	RTE	148	64

Note: DCS=delay signals, CTI=commuter train interference, FTI=freight train interference, PTI=passenger train interference, RTE=routing, DMW=maintenance of way.
Source: Host Railroad Report, Amtrak Train Performance on Host Railroads, preliminary released for informational purposes, December 2019.

2.5.2. Travel Times

Travel time is a component of a total trip between origin and destination and is often another determining factor in mode choice. A number of factors affect total trip time, including distance, wait time for a train, OTP, and average delay, as well as access and egress.

Rail travel from New York City to Albany-Rensselaer Station has a scheduled run time of 2 hours 30 minutes (2:30). The total trip time, which includes access time, wait time, haul time, and egress time, is estimated to be 3 hours 10 minutes (3:10). When considering total travel times, rail trip times are competitive with automobile, bus, and air travel between New York City and Albany.

Rail trip times are considerably slower in the Penn Station to Niagara Falls segment, and, as a result, rail travel is not competitive with other travel modes. Passenger rail travel time from New York City to Buffalo-Exchange Street is 8 hours and 18 minutes (8:18), with a total trip time (access/egress, wait, and haul time) of approximately 9:50. The long trip-time is a contributing factor in discouraging the use of the rail corridor to travel between key cities such as Buffalo and New York City.

2.5.3. Schedule Frequency

Schedule frequency represents the range and uniformity of departure times offered in train schedules, and it is a critical determinant of mode utilization. With automobile trips essentially offering unlimited frequency, an attractive rail service must offer a range of departure times throughout the day to provide passengers with multiple choices. It is preferable that rail services operate on “clockface” schedules which offer near-uniform intervals between departures, such as at 10 minutes after each hour. Passengers find these clockface schedules easier to remember and particularly attractive.

In 2019, Empire Corridor Service between New York and Albany-Rensselaer consisted of thirteen (13) daily weekday roundtrips (with 11 weekend roundtrips), while service between Albany-Rensselaer and Buffalo-Depew had a frequency of just four (4) roundtrips per day (refer to Exhibit 2-8). Of the four daily trains, three of the westbound trains provided service to Niagara Falls, and three of the four eastbound trains provided service from Niagara Falls.

Overall, service is modest, particularly for Empire Corridor West. The lack of service directly limits the market potential for rail relative to the other transportation modes serving this corridor. Use of rail service between New York City and Buffalo, as well as other cities along Empire Corridor West, is predominantly limited to leisure travel or multi-day business trips.

Despite rail’s competitive travel time from New York City to Albany, the first daily train does not arrive in Albany until 9:50 a.m., slightly later than ideal for business travelers. A one-way trip between Albany-Rensselaer Station and Buffalo had a scheduled travel time of approximately five hours or greater. As shown in Exhibit 2-12 and Exhibit 2-13, it is not possible to travel by passenger train from Albany-Rensselaer to Buffalo for a day trip. The earliest daily westbound train arriving in Buffalo-Depew Station from Albany-Rensselaer arrives at 3:01 p.m., while the latest daily eastbound train departed from Buffalo (Exchange Street) departs at 12:55 p.m. (daily) or 3:37 p.m. (Sundays). The service also does not serve peak direction trips between cities, as there are no scheduled eastbound trains between Buffalo and Albany-Rensselaer that arrive in Albany-Rensselaer before 9 a.m. The limited service between Albany-Rensselaer and Buffalo is insufficient to attract travelers who have other transportation options, such as auto, bus or air, that provide them with greater flexibility in scheduling their travel.

Exhibit 2-12—2019 Daily Westbound Train Schedule: Albany-Rensselaer to Buffalo-Depew

Service Trains	Departure Albany-Rensselaer, NY	Arrival Buffalo-Depew, NY	Scheduled Trip Time (hours: minutes)
63 Maple Leaf	10:00 a.m.	3:01 p.m.	5:01
281 Empire Service	1:00 p.m.	6:03 p.m.	5:03
283 Empire Service	4:00 p.m.	9:02 p.m.	5:02
49 Lake Shore Limited	7:05 p.m.	11:59 p.m.	4:54

Source: Amtrak Empire Service: New York, Albany, and Buffalo, NRPC Form W08, 11/11/201911

Exhibit 2-13—2019 Daily Eastbound Train Schedule: Buffalo-Depew to Albany-Rensselaer

Service Trains	Departure Buffalo-Depew, NY	Arrival Albany-Rensselaer, NY	Scheduled Trip Time (hours: minutes)
280 Empire Service	4:46 a.m.	9:41 a.m.	4:55
284 Empire Service	7:41 a.m.	12:37 p.m.	4:56
48 Lake Shore Limited	8:51 a.m.	2:25 p.m.	5:34
64 Maple Leaf	1:09 p.m.	6:39 p.m.	5:30
Notes: Train 280 does not operate on Sunday, but other trains offer service at or around the same times.			

Source: Amtrak Empire Service: New York, Albany, and Buffalo, NRPC Form W08, 11/11/2019

2.5.4. Ridership

From 2011 to 2019, ridership along the Empire Corridor (excluding Lake Shore Limited, Adirondack, and Ethan Allen Express services) increased from 1.4 million to 1.6 million, which represents an average increase of 1.4 percent per year over this time period. From 2002 to 2011, ridership increased more sharply from 1.04 million at an average rate of approximately 3.7 percent a year. Most significantly, the increase along Empire Corridor West accounted for a greater proportion of this rise, with ridership increasing 111 percent from 2002 to 2011. Intercity passenger rail ridership increased 23 percent between Albany-Rensselaer and Niagara Falls from 2007 to 2008, and increased 50 percent from 2003 to 2008.[42] These percentage increases represent an average over these time periods, but ridership changes have not been linear. The largest total annual increases in the Empire Corridor ridership (more than an additional 100,000 passenger trips per year), occurred in the years 2005, 2008, 2010, and the second largest annual increases in ridership occurred in 2011 (62,313), 2014 (58,531), and 2019 (87,367). In some years, increases were relatively small in 2013 (1,328), 2017 (1,715), and 2018 (5,194), and annual ridership decreased in 2009 (-83,605) and 2016 (-46,236).

Exhibit 2-14 presents a summary of rail ridership among the 15 major market pairs in 2009. NYSDOT

[42] NYSDOT. *New York State Rail Plan.* 2009.

obtained rail ridership data by analyzing the origin-destination data obtained from Amtrak. The data were sorted by station pairs, which provided the ridership between the discreet station pairs and the total boardings at each station. The major travel markets at stations along Empire Corridor appear to remain unchanged over time. Comparison of boardings and alightings from Empire Corridor Amtrak stations (see Exhibit 2-15) indicates that the proportion of station passenger use remained essentially unchanged between fiscal years 2010 and 2019 (less than 1% change at each station over this time period).

The greatest number of boardings, 45 percent, involved travel to and from New York City. Albany was the second most popular origin/destination city, with 37 percent of the total market share. The major market share of any one city then declined substantially, with the Buffalo market comprising 6 percent, the next largest major market share. The most frequent market pair, the New York City-Albany market, constituted 34 percent of the entire 2009 rail market. Although the New York City-Buffalo market had the second greatest number of boardings, it totaled only 3 percent of the entire Empire Corridor rail market, as did the New York City to Syracuse market. Along Empire Corridor West, the Albany-Buffalo market comprised only 1 percent of the rail market.

Exhibit 2-14—2009 Major Market to Market Boardings

Trip Origins	Trips Destinations						
	NYC	Albany	Utica	Syracuse	Rochester	Buffalo	Total
NYC	-	320,155	19,858	29,787	23,427	29,881	423,108
Albany	320,155	-	2,082	7,013	8,224	11,133	348,607
Utica	19,858	2,082	-	819	1,421	2,480	26,659
Syracuse	29,787	7,013	819	-	1,794	6,466	45,878
Rochester	23,427	8,224	1,421	1,794	-	1,862	36,728
Buffalo	29,881	11,133	2,480	6,466	1,862	-	51,821
Total	423,108	348,607	26,659	45,878	36,728	51,821	932,801

Source: Amtrak

The 15 major travel market pairs are: New York City (NYC)-Albany; NYC-Utica, NYC-Syracuse, NYC-Rochester, NYC-Buffalo; Albany-Utica; Albany-Syracuse; Albany-Rochester; Albany-Buffalo; Utica-Syracuse; Utica-Rochester; Utica-Buffalo; Syracuse-Rochester; Syracuse-Buffalo, Rochester-Buffalo.

While trip time and cost are perhaps the most important characteristics when evaluating ridership levels among travel modes, frequency of service and OTP are also critical determinants. For example, service between city pairs along Empire Corridor West have similar distances and travel times, and competitive fares among rail, bus and auto. Between Syracuse and Rochester, where air travel is not available, rail service has a superior travel time and cost as compared to bus service.

Rail represents a fraction of travel between Rochester and Syracuse, however (approximately 1,800 rail trips versus more than 92,000 bus trips in 2009). Service frequency and OTP are the major determinants for this city pair; rail service offers only 4 roundtrips between the two cities and an OTP of less than 60 percent, whereas bus service offers 24 trips between Syracuse and Rochester with an approximate 85 percent OTP.

Currently, rail does not capture a significant share of any city pair market along Empire Corridor West due to its significantly less frequent service and its poor OTP. Poor OTP effectively adds to travel time and eliminates business travel, as travelers cannot take a chance on the mode of travel not arriving at their destination around their scheduled time. Empire Corridor West has historically low OTP and extended average delay times, particularly during peak travel hours.

2.5.5. Stations and Parking

There are 16 existing stations with Amtrak service located in metropolitan areas along the Empire Corridor, in addition to 24 other stations serviced by Metro-North along the route segment south of Poughkeepsie. Exhibit 2-15 presents the Amtrak stations, and the boardings and alightings occurring at each station, in FYs 2010 and 2019. Empire Corridor stations comprised 98.6 percent of total New York State station usage in FY 2010, which totaled 10,276,419 passengers. In FY 2019, Empire Corridor stations comprised 99.2 percent of total New York State station usage, which totaled 13,023,212 passengers. (Note that more than 80 percent of passengers in FY 2010 and 84 percent of passengers in FY 2019 used Penn Station, but not necessarily for Empire Corridor service.) Empire Corridor station boardings and alightings increased by 2,799,525 between 2010 and 2019, an increase of 27.4 percent.

Exhibit 2-15—2010 and 2019 Empire Corridor Amtrak Station Boardings and Alightings

Station	Boardings & Alightings FY 2010	Boardings & Alightings FY 2019	Distance between Stops (mi)
Pennsylvania (Penn)	8,377,944	10,811,323	-
Yonkers	20,433	32,109	14
Croton-Harmon	41,570	46,403	18
Poughkeepsie	75,775	109,877	41
Rhinecliff	158,534	211,139	15
Hudson	150,197	237,268	25
Albany-Rensselaer	737,259	806,960	28
Schenectady	56,125	62,180	18
Amsterdam	9,174	11,183	17
Boehlert Transportation Center at Union Station (Utica)	61,108	63,968	60
Rome	9,100	6,924	14
William F. Walsh Regional Transportation Center (Syracuse)	139,175	131,515	40
Rochester	128,935	132,434	80
Buffalo-Depew	111,513	107,780	60
Buffalo-Exchange Street	30,171	43,384	8
Niagara Falls International Railway Station and Transportation Center	27,270	34,965	27

Sources: New York State Rail Plan, 2009, page 94; Amtrak Government Affairs, "Amtrak Fact Sheet: Fiscal Year 2010, State of New York." November 2010; "Amtrak Fact Sheet: Fiscal Year 2019, State of New York."

Several of the passenger stations, including those in Amsterdam and Buffalo-Exchange Street, are physically obsolete and have experienced deferred maintenance, contributing to the overall perception that passenger rail service along Empire Corridor West is not an attractive, convenient, or reliable travel option. The following is a description of the stations along the Empire Corridor. Parking at each station was estimated based on information provided by the owner, if available, or Amtrak and/or review of aerial photography (for surface parking). Separate NEPA environmental reviews have been performed for station work using federal funding discussed below. Each station project has independent utility from the Empire Corridor program and would/will improve passengers experience using the system with or without eventual corridor improvements.

Pennsylvania (Penn) Station in New York City (Exhibit 2-16) is the busiest station in the nation, and is owned by Amtrak. The station features 21 station tracks, 11 platforms, four interlockings, and two passenger concourse levels. In 2019, approximately 600,000 passengers a day passed through Penn Station. In addition to Amtrak operations, the station is used by the commuter rail operations of the Long Island Rail Road and the New Jersey Transit Corporation (NJ TRANSIT), both of which share tracks with Amtrak. Together, these three carriers operated over 1,300 weekday trains at Penn Station in 2019.

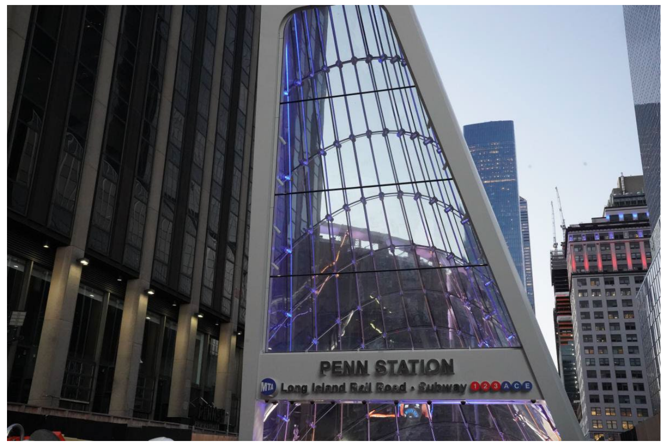


Exhibit 2-16—Pennsylvania Station

The current station site has been in place since 1910, originally designed in the iconic Beaux-Arts style by McKim, Mead, and White. With station demolition in 1963, a reconstruction of the station's public areas was completed in 1968, resulting in the current underground station facility. Prior to a series of major track and switch renewal projects in 2017 and 2018, the track level of the station remained substantially as it was constructed in 1910, though some track and platform reconfiguration had also taken place since then to accommodate longer commuter rail trains. The station has no public parking facilities, though numerous Manhattan parking facilities are located nearby.

Moynihan Station expands the Penn Station rail functions across 8th Avenue into the historic James A. Farley Post Office Building, part of a mixed-use redevelopment of the entire block. The Moynihan Station Project was reconstructed in two phases. A groundbreaking for Phase I of the Moynihan Station, located across Eighth Avenue from Penn Station in midtown Manhattan, was held on October 18, 2010. Phase 1 included expansion and enhancement of the 33rd Street Connector between Penn Station and Moynihan Lower (West End) Concourse. This included extension and widening of this concourse to serve nine of Penn Station's eleven platforms, new vertical access points and circulation space, new entrances into the new concourse at the 31st and 33rd Street corners of the Farley Building, and an emergency ventilation system. The U.S. Department of Transportation provided $83 million in Transportation Investment Generating Economic Recovery Grants (TIGER) funded through ARRA to increase passenger access, streamline rail operations, and implement other building improvements. In 2012, FRA also awarded Moynihan Station a $30 million High Speed Rail Grant for the underground connecting corridor construction and the first portion of the new emergency ventilation system. Subsequent phases included a new recently completed $1.6 billion Moynihan Train Hall (above the connector) in the historic Farley Post Office Building and the recently opened East End Gateway to Penn Station at 33rd Street and 7th Avenue (opened to the public December 31, 2020 and January 1, 2021). The project improves passenger connections between Penn Station and Moynihan Station and ultimately will renovate Penn Station itself. Demolition of the post office building prepared the site for the new 255,000 square foot train hall. The overall redevelopment will include 700,000 square feet of mixed use development featuring commercial, retail, and dining venues. When completed, the $2.5 billion program includes this redevelopment in the main building and its annex (between Eighth and Ninth Avenues bordered by 31st and 33rd Streets), as well as the renovation of the Seventh and Eighth Avenue subway stations.

Yonkers Station, built in 1911, serves the downtown area of Yonkers via the Metro-North Hudson Line. It is an express station that, in addition to Amtrak Empire Corridor service, serves Metro-North passengers from GCT in Manhattan. It has two high-level island platforms and four tracks. The facility is owned by Metro-North, and parking is owned by the Yonkers Parking Authority. The Beaux-Arts style terminal building was renovated by Metro-North in 2004. The parking garage accommodates 610 spaces that are shared with Metro-North commuters. Yonkers is an inner-ring suburb of New York City, and the station connects the high density inner-ring suburbs to the Empire Corridor, allowing patrons to access Amtrak without having to travel to New York City.

Croton-Harmon Station, also part of the Metro-North Hudson Line, is the main transfer point for local and express commuter rail service. The station is served by most Amtrak Empire Corridor trains, with only a few express trains skipping the station. There are three center island platforms at the station. In 2016, a $3.6 million project for station renovations streamlining the station layout and improving the customer waiting area was completed. The parking facility accommodates 2,503 spaces, which are shared with Metro-North commuters. The station marks the end of the electrified territory from GCT and is the site of major shop facilities for Metro-North. Uses around the station include a rail layover facility on the west side of the tracks, as well as a Westchester County Park. Croton Harmon Station serves a similar purpose as Yonkers Station, except that it is a catchment area for a larger region of outer-ring rural and small town markets.

Poughkeepsie Station, modeled after GCT, is a Beaux-Arts style terminal with an overhead walkway connecting to a parking garage. Poughkeepsie Station and the parking garage are owned by Metro-North. Improvements to this historic station, built in 1918, were made in 2002 and included enhanced connectivity to the city's Main Street and a large commuter parking garage. The station is equipped with a high-level center island and side platforms, accessing three tracks. Parking spaces at Poughkeepsie Station total 1,123. These spaces are shared with commuters, so that only a portion may be available for Amtrak patrons, dependent on time of day.

Rhinecliff Station, constructed in 1914 in the hamlet of Rhinebeck, serves northern Dutchess County and the Kingston area across the Hudson River. The station experienced the third highest Amtrak boardings/alightings in the state in FY 2017 and is frequented by longer distance commuters using Amtrak service. The station is owned by Amtrak, with parking owned and leased by Amtrak, the station has one center island, low-level platform that serves both tracks. A new high-level platform, accessible bathrooms, repairs to the station and upgrades to the ticket counter, and two new elevators are among the improvements planned at the Rhinecliff rail station. Work recently completed for ADA compliance in 2020 included improvements to the stairs. There are 183 parking spaces available.

Hudson Station, built in 1874, is the oldest operating passenger rail station in the state of New York. Owned by Amtrak, with parking owned by Amtrak/City of Hudson, the Hudson Station has two short, low-level platforms, with access to the normally southbound platform requiring passengers to cross the normally northbound track at grade. A "one train at a time" rule [43] is enforced at the station because of the necessity for passengers to cross the track closest to the station building to board trains on the outside track. Even though there are two physically separate tracks at Hudson Station, there is only one common platform for passengers to use to board trains on both tracks. In the late 1990s, parking demand led to opening a new lot across the street, and in 2009, the city created metered parking on Front Street. There are 185 parking spaces at the station. Improvements completed in 2016 to 2017 include parking lot lighting, new fencing, brick paving, paving of the employee parking lot, and striping. This work included ADA improvements (interior and exterior) and bathroom remodeling.

Albany-Rensselaer Station, with the second highest boardings/alightings in the state, was the ninth busiest station in the Amtrak system nationally in FY 2018. The station is located in Rensselaer, 1.5 miles from downtown Albany (Exhibit 2-17). Prior to the 1971 advent of Amtrak, intercity passenger trains operated out of the historic Union Station in downtown Albany; however, the use of Union Station was abandoned in 1968 as a cost-cutting move by Penn Central Railroad and the facilities were moved to Rensselaer.

Exhibit 2-17—Albany-Rensselaer Station

The station is a large, newer intermodal facility owned and constructed by the Capital District Transportation Authority (CDTA) in 2002, replacing two terminal buildings constructed in 1968 and 1980. The station has three tracks and two mostly high-level center island platforms. The easterly platform services only one track on the west. The track bay on the east, between platform and station, is currently vacant but was designed to accommodate a planned fourth station track. The station accommodates 1,400 spaces in a parking garage and surface parking immediately adjacent to the station.

Amtrak and NYSDOT completed demolition of the previous terminal facilities in February 2011 to accommodate construction of a fourth track at Albany-Rensselaer Station. The fourth track is now in service, and the project includes platform extensions. The track project will increase station capacity and improve operating flexibility, leading to more efficient passenger boarding and better OTP.

Schenectady Station, constructed in 1979, is located adjacent to (and at a lower level than) the existing rail platform between the two tracks in downtown Schenectady. All Amtrak services stop at this station, including the Adirondack and Ethan Allen trains that diverge onto the adjacent Canadian Pacific main line to the north. The station platform is a single, low island platform about 745 feet long. Amtrak owns the station building and the Schenectady Metroplex Development Authority owns the southern parking lot. There are approximately 50 parking spaces available for Amtrak use. NYSDOT received federal High Speed Intercity Passenger Rail (HSIPR) funding toward the construction of a replacement intermodal station. The platform and related track improvements

[43] NORAC (Northeast Operating Rules Advisory Committee) Rule 121, Intervening Tracks at Station Platforms, a. General Requirements: When a passenger train is receiving or discharging passengers across an intervening track, trains and track cars must not pass between that train and the station platform.

were included in the double track project. The first phase included demolition of the existing station, platform concrete work, and repairs to the elevated viaduct for the railroad work for $5.5 million. The station component for approximately $20 million of federal grants and state monies included station demolition in 2017 and was completed in 2018.

Amsterdam Station, constructed in 1973, is a small, brick station building owned by Amtrak. The station has a single, low-level side platform located on the Track 1 side and 16 parking spaces. Generally, passenger trains are routed in both directions to Track 1 for boarding. When passenger trains must use Track 2, approaching trains on Track 1 must hold outside of the station because boarding passengers cross Track 1 at grade to access Track 2. In 2015 to 2016, improvements made included ADA improvements (interior and exterior), and station building improvements, including new HVAC system, bathroom remodeling, roofing, and insulation/doors.

The Boehlert Transportation Center at Union Station in Utica accommodates Amtrak and the Adirondack Scenic Railroad. All eight daily Amtrak passenger trains stop at Utica. Originally built in 1914, the historic station was renovated in 1978, with several phases of improvements ongoing. The station has two low-level platforms: a side platform to Track 2, and a center island platform serving Track 1 and a track used by the Adirondack Scenic Railroad excursion trains. There are approximately 200 parking spaces. Phased improvements on the station area include roof and station improvements (Phases 2 through 5), completed between 1997 and 2005. These improvements included interior renovations, renovation of overhead office space, and restoration of interior lobby, floor, and storefronts. Union Station and the parking area are owned by Oneida County. The station is located in the Central Business District near tourist, institutional and business attractions. Union Station includes a large building that houses county offices, retail establishments, and a farmers market. This area of Utica is slated for revitalization and redevelopment, including recent proposals to renovate the buildings housing office space within and around the station.

Rome Station was constructed in 1914 and renovated in 2004. The station is located in proximity to the canal waterfront, and neighboring commercial districts in downtown Rome. Rome Station, owned by the City of Rome, has a low-level, center island platform, as well as a platform on the side of the station house itself, and 32 parking spaces.

The William F. Walsh Regional Transportation Center in Downtown Syracuse is considered a long–distance multi-modal terminal, providing bus connections to intercity operators and the city's CENTRO buses. All eight daily Amtrak trains stop at Syracuse. The station opened in 1999, replacing the Amtrak station previously located in East Syracuse. Syracuse Station has a single, high-level center island platform and 266 parking spaces. There is presently only one track adjacent to the center platform with provision made for a second track between the platform and the station building. The facility, platforms, and parking are owned by Intermodal Transportation Center, Inc. A HSIPR grant of $18.5 million and NYSDOT grant of $4.6 million will cover final design and construction to provide congestion relief in the vicinity of Syracuse Station and CSXT's DeWitt freight yard to improve Amtrak and freight service on the Empire Corridor. Work funded under this grant reflects a multi-phase approach to provide congestion relief improvements in the project area. In the past, some of the tracks were only signaled in one direction, but bidirectional upgrades are being performed as part of Phase 1 of the Syracuse Track Configuration and Signal Improvements project, which will allow all the tracks to be operated in either direction, facilitating freight movements to DeWitt Yard. Construction of the congestion relief project is underway, with completion of Phase 1 in 2021.

Rochester Station, originally constructed in 1978, was reconstructed as an intermodal station using

$15 million in federal TIGER funds, which was completed in October 2017. All eight daily Amtrak trains stop at Rochester. The station is in the densest portion of downtown Rochester, near educational, tourist, institutional and business uses and attractions. Rochester Station and north parking lot are owned by Amtrak. NYSDOT owns the southern parking lot. The station currently has a single, low-level side platform located on the Track 2 (south) side. There are a total of 40 parking spaces.

Buffalo-Depew Station, located in Depew, is a relatively small suburban facility constructed in 1979 (Exhibit 2-18). All eight Amtrak intercity passenger trains stop at Buffalo Depew. Buffalo-Depew Station and parking lots are owned by NYSDOT. The station has one low-level side platform located on Track 2 side (south). There are 80 parking spaces in both east and west lots. The station is located outside of the Central Business District and is surrounded by several large industrial and commercial operations. The station is close to the Buffalo Niagara International Airport.

Exhibit 2-18—Buffalo-Depew Station

In 2013, Buffalo-Depew Station completed state-of-good-repair and accessibility improvements funded via a $770,000 HSIPR grant.

Buffalo-Exchange Street Station is located close to of central business district destinations and is served by municipal bus. The station was constructed in 1952 and is a small brick structure with a single low-level platform. The City of Buffalo owns the station building and parking lot, with parking for 20 cars. The station is served by the Amtrak Maple Leaf and four daily Niagara Falls trains. The station is not served by the Lake Shore Limited because the station is located on the Niagara Branch, just north of the track split between routes to Chicago and to Toronto. In the spring of 2017, a station siting committee jointly commissioned by the state and city endorsed potential sites for relocation of the station in the immediate downtown area adjoining the existing Buffalo-Exchange Street Station, as part of planned station improvements. In 2019, construction of a new $27.7 million station on the existing station grounds began, at a location closer to Exchange Street, allowing construction of a taller station building structure, outside the shadow of the I-190 viaduct, and high-level platform. A pedestrian walkway under I-190 connects the station to Metro Rail on Main Street. Space is also reserved for 14 canopied parking spaces for the future addition of buses. A planned second phase will expand the station further to accommodate bus service and additional train routes, which would create an intermodal transit center.

Niagara Falls International Railway Station and Transportation Center formerly occupied a one- and two-story brick building, near Highway 61, which was formerly a freight house built for the Lehigh Valley Railroad in 1959. With completion of construction on a new intermodal transportation center that incorporates the U.S. Customhouse, the Amtrak station has been relocated 1 mile to the west. The new station incorporates the U.S. Customs and Border Protection in a complex consisting of the old customhouse and modern additions. Construction on the project, with $16.5 million in funding from the US Department of Transportation's TIGER program, was completed in 2016. The new station is closer to the major Niagara Falls tourism destinations. There are 60 parking spaces available. Crews still perform train cleaning and minor maintenance at the former station location, which includes layover yards, and trains are turned around in the yard tracks after stopping at the new station. NYSDOT owns the former station facility, currently leased by Owasco River Railway, Inc., which also includes facilities for Amtrak operating crews and personnel.

2.6. Safety Considerations

The safety of Empire Corridor passengers is of the utmost importance. Ten years of safety data made available from the FRA Office of Safety Analysis, from January 2008 through December 2017, were analyzed for counties located along the Empire Corridor. The FRA Office of Safety Analysis provided data on injuries and fatalities for train accidents, highway-rail incidents, and other accidents/incidents.[44] The FRA defines accidents/incidents as collisions, derailments, and other events involving the operation of on-track equipment and causing reportable damage above an established threshold; impacts between railroad on-track equipment and highway users at crossings; and all other incidents or exposures that cause a fatality of injury to any person, or an occupational illness to a railroad employee. Accidents and incidents are divided into Train Accidents, Highway-Rail Incidents, and Other, as follows:

- Train accidents are safety-related events involving on-track rail equipment (both standing and moving) that cause monetary damage to the rail equipment and track above a prescribed amount (threshold for 2008 is $8,500);
- Highway-rail grade crossing incidents are any impacts between a rail and highway user (both motor vehicles and other users of the crossing at a designated crossing site, including walkways, sidewalks, etc., associated with the crossing);
- Other incidents are any death, injury, or occupational illness of a railroad employee that are not the result of a "train accident" or "highway-rail incident."

From 2008 to 2017, as shown in Exhibit 2-19, there have been 26 fatalities and 1,389 injuries in counties along the Empire Corridor. Ninety-six percent of all accidents/injuries were classified as "Other," or cases in which monetary damage was less than $8,500 or was not classified as a highway-rail incident.

Along the Empire Corridor, there were 19 train accidents in this 10-year period. Across the U.S. in 2017, 575 people were killed and 505 were injured while trespassing on railroad ROWs and property. A majority of all fatalities and injuries along the Empire Corridor was due to other incidents, including incidents at public crossings and trespassing. New York County accounted for nearly 68 percent of all injuries, 15 percent of fatalities, and a majority of incidents occurred in this densely-populated county.

From 2008 to 2017, there were ten incidents at public grade crossings along the Empire Corridor; three of these incidents resulted in fatalities (1 fatality per incident). Comparatively, in the U.S. in 2016 alone, there were 2,041 incidents at public highway-rail crossings, resulting in 255 deaths and 843 injuries.

According to data published by the National Safety Council, highway travel is 12 to 20 times more

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[44] FRA Office of Safety Analysis. "1.12 Ten Year Accident/Incident Overview by Railroad/Region/State/County." Accessed February 27, 2018, <**http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/TenYearAccidentIncidentOverview.aspx**>

likely to result in a fatality than rail travel. To further increase the safety of rail transportation and especially high-speed rail, the FRA prepared a High Speed Passenger Rail Safety Strategy in 2012.

Addressing grade crossings, a top priority, the Safety Strategy reinforces current FRA regulations that require the protection of rail movements with full width barriers capable of absorbing the impact of maximum weight highway vehicles where train-operating speeds are between 111 and 125 mph and that require elimination or grade-separation of all crossings where trains travel at speeds above 125 mph (49 CFR 213.347).[45]

Exhibit 2-19—Ten Year Safety Data in Counties along Empire Corridor, 2008-2017

County (SE to NW)	Total			Train	Highway-Rail Grade Crossing		Other			Public Crossing
	Accidents/ Incidents	Fatalities	Injuries	Accident Injuries	Accidents/ Incidents	Fatalities/ Injuries	Accidents/ Incidents	Fatalities	Injuries	Incidents
New York	915	4	937	6			886	4	931	
Bronx	16	1	15	1			15	1	15	
Westchester	48	3	43	3			45	3	43	
Putnam										
Dutchess	49	3	46	1			48	3	46	
Columbia	26	3	25		1		24	3	25	1
Rensselaer	94	0	91	3			91		91	
Albany	69	1	71	1			68	1	71	
Schenectady	22	2	20	1			21	2	20	
Montgomery	4		3	1	1		2		2	
Herkimer										
Oneida	22		25	1	1	1	20		20	1
Madison										
Onondaga	32		33				32		33	
Cayuga	1	1	1		1	2				
Wayne	5		2	1	2		2		2	2
Monroe	34	4	30		1	1	33	3	30	1
Genesee	2	1	1		1	1	1		1	1
Erie	37	3	34				37	3	34	
Niagara	16		12		4		12		12	4
Total	**1392**	**26**	**1389**	**19**	**12**	**5**	**1337**	**23**	**1376**	**10**
Note: No data were available for Putnam, Herkimer, or Madison counties.										

Source: FRA Office of Safety Analysis

The FRA Safety Strategy also addresses the following elements for high speed passenger rail operations:

- Eliminate all redundant or unnecessary crossings, together with any crossings that cannot be made safe due to crossing geometry or proximity of complex highway intersections.
- Install the most sophisticated traffic control/warning devices compatible with the location (e.g., median barriers, special signage [possible active advanced warning], four-quadrant gates), where train-operating speeds are between 80 and 110 mph.

45 FRA. "High Speed Passenger Rail Safety Strategy". Accessed May 22, 2012, <http://www.fra.dot.gov/downloads/safety/HSRSafetyStrategy110609.pdf>

There are nearly 365 at-grade crossings on the current Empire Corridor centerline. When the Preferred Alternative is advanced in Tier 2 assessments, these at-grade crossings would be either enhanced or eliminated, depending on the final design speed, consistent with the FRA's regulations and guidance.

According to the Rail Safety Improvement Act of 2008 (RSIA), positive train control (PTC), a system designed to prevent collisions between trains, overspeed derailments, incursions into established work zone, and the movement of a train through an improperly positioned switch, was required on certain lines of Class 1 freight and passenger rail carriers, including the Empire Corridor trackage of Amtrak, CSXT, and Metro-North, by the end of 2015. Federal legislation by Congress deferred implementation to 2018. Under the revised mandate, rail operators can also be granted an additional two years to complete final testing of their systems, provided they meet certain baseline standards for infrastructure installation by 2018. CSXT has implemented PTC west of Hoffmans, and Metro-North has implemented PTC south of Poughkeepsie. The FRA has issued a $33 million grant for installation of PTC technology on 97 miles of Amtrak-leased tracks between Hoffmans and Poughkeepsie, in territory between CSXT and Metro-North. The FRA implemented the legislative PTC requirements, including application to dedicated (passenger train only) high-speed rail lines; the RSIA language currently applies only to certain lines of Class 1 carriers and regularly scheduled intercity or commuter passenger operations.

Prior to the federally mandated deadline (December 2020), Metro-North completed full implementation of PTC on its entire system, including the 74.8 miles of the Hudson Line. Similarly, Amtrak and CSXT have completed PTC installation as well.

ROW safety measures include prevention of vandalism, launching of objects from overhead bridges or structures into the path of trains, and/or the intrusion of vehicles from adjacent ROW. While these are always important issues, protecting the HSR's ROW from overhead bridges or structures is especially important where at-grade crossings are eliminated by grade-separated crossings, as objects or even vehicles could fall from the overpasses and land on the tracks. European HSR uses intrusion detection nets (e.g., infrared, microwave, video technology) to communicate any hazards that may be on the tracks at overpass intersections.

3. Alternatives

This chapter describes the High Speed Rail Empire Corridor Program alternatives and the alternatives screening and selection process, and identifies the Preferred Alternative. This chapter reviews how NYSDOT developed the program alternatives, and examines the engineering aspects of all feasible alternatives to address the program purpose, needs, and objectives described in Chapter 1. This chapter also describes considered alternatives that were not advanced for further study, along with the reasons for not advancing them.

There are several aspects to each alternative including operational changes, investments in infrastructure, and equipment. Chapter 6 includes a comparison of the reasonable alternatives advanced for further study, and identifies the reasons for selection of the Preferred Alternative.

The specific **operational and physical elements used to define the alternatives** consist of:

- Maximum authorized speed (MAS);
- Frequency of service;
- Schedule enhancements, including express service;
- Track, bridge, signal and grade crossing improvements;
- Station and facility improvements;
- Equipment (locomotives and coaches);
- Capital costs at a program level; and
- Operations and maintenance costs.

This program is being undertaken to meet ***the following needs***:

- Reduce infrastructure constraints, and
- Accommodate existing and projected demand.

The following **performance objectives** have been identified for the High Speed Rail Empire Corridor Program as measurable objectives that directly relate to the program purpose and need to reduce infrastructure constraints to accommodate existing and projected demand:

- Improve system-wide on-time performance (OTP) to at least 90 percent;
- Reduce travel time along all segments of the Empire Corridor;
- Increase the frequency of service (number of daily round trips) along Empire Corridor West beyond the existing four daily round trips;
- Attract additional passengers;
- Reduce automobile trips, thereby reducing highway congestion; and
- Minimize interference with freight rail operations.

These six performance objectives were used to evaluate and rank how the high-speed rail alternatives meet the goals and objectives for the High Speed Rail Empire Corridor Program. The evaluation criteria for screening and selection of the Preferred Alternative included performance measures such as trip time, on-time performance, ridership, and revenue.

The environmental impacts of these alternatives were also considered, as presented in the Tier 1 Draft EIS (see Appendix G), and were an important factor in selecting the Preferred Alternative advanced in this Tier 1 Final EIS.

3.1. Alternatives Development and Screening

The Federal Railroad Administration (FRA) has established three levels of high-speed rail service along with planning guidelines for each: Emerging, Regional and Core Express as shown in Exhibit 3-1.

FRA uses the **"Emerging"** category to describe relatively frequent service used to connect smaller communities, and having speeds up to 90 miles per hour (mph), on tracks shared by freight, commuter, and intercity passenger rail.

The **"Regional"** category is used to describe relatively frequent service used to connect mid-sized urban areas, and having speeds between 90 and 125 mph, on tracks that may be shared by freight, commuter, and intercity passenger rail or on tracks dedicated for passenger rail.

The **"Core Express"** category is used to describe frequent service used to connect large urban areas, and having speeds between 125 and 250 mph or more, on tracks dedicated for intercity passenger rail.

Alternative development for this program initially began with categorizing possible alternatives according to the FRA's levels of high-speed rail service. Using this information, NYSDOT developed an initial range of possible alternatives within the framework of these categories to satisfy the program purpose (refer to Section 1.3). Each service level achieves different goals, provides different top speeds, and requires different kinds and levels of investments. The initial range of possible alternatives developed for this program included six groups organized by the maximum authorized speed (MAS) associated with each group. NYSDOT based the naming convention of the alternatives on these groupings according to the MAS (79 mph, 90 mph, 110 mph, 125 mph, 160 mph, and 220 mph) with variations of the speed-based alternative designated by the letters A, B, and C.

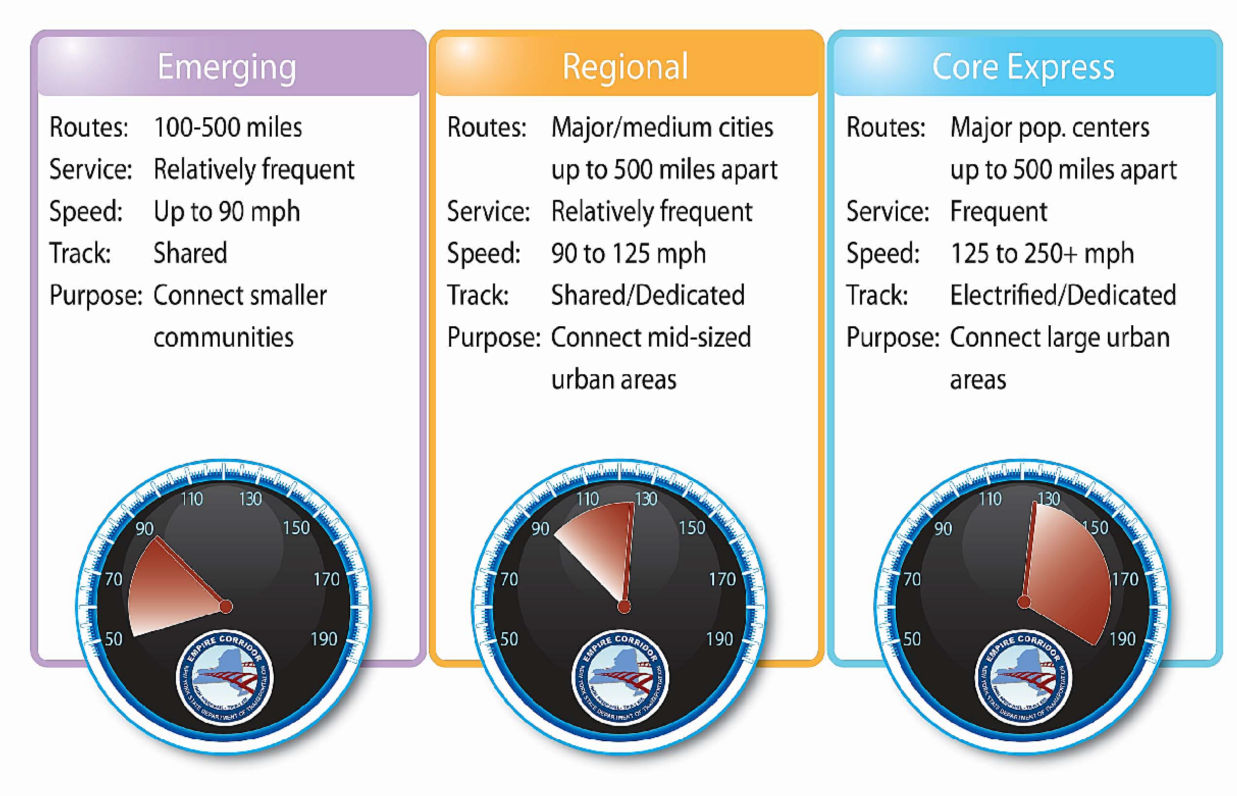
- Using **79 miles per hour** as the maximum authorized speed represents what can be done with current track standards and in-cab signaling capacity. Alternatives in this category would use current vehicle technology with the possibility of integrated trainsets. They include several variations on the 79 mph alternative (Base, 79A, 79B, 79C) and would fall into the FRA's "**Emerging**" category.

- Using **90 miles per hour** as the maximum authorized speed represents the next step up in track standards and in-cab signaling train control. Alternatives in this category would use current vehicle technology with the possibility of integrated trainsets. They include several variations on the 90 mph alternative (90A and 90B) and would fall into the FRA's "**Regional**" category.

- Using **110 miles per hour** as the maximum authorized speed represents another step up in track standards. Described as the "110 Alternative," this alternative would also use current vehicle technology with the possibility of integrated trainsets and would fall into FRA's "**Regional**" category.

- A **125 miles per hour** alternative would be the first speed threshold for electrically powered

Exhibit 3-1—FRA Levels of High-Speed Rail Service



Source: FRA. *Vision for High-Speed Rail in America: High-Speed Rail Strategic Plan.* April 2009.

trains and represents another step up in track standards and advanced train control. This alternative would fall into FRA's "**Core Express**" category.

- A **160 miles per hour** alternative would represent the practical upper limit of electrified dynamic tilt trains, such as the Amtrak Acela, which provide faster operating speeds on curves. This alternative represents another step up in track standards and advanced train control and would fall into FRA's "**Core Express**" category.

- A **220 miles per hour** alternative represents the practical upper limit of high-speed rail operations seen in France, Germany, Spain, Japan and China and would fall within FRA's "**Core Express**" category.

In addition to maximum authorized speed, alternatives are further described in terms of service schedules, station stops, equipment, and physical improvements.

3.1.1. Service Schedules and Station Stops

Service frequency was a key consideration in developing and defining alternatives. Three service levels were considered:

- The existing four round trips per day between Albany-Rensselaer and Buffalo;

- Increasing the service to 12 round trips per day between Albany-Rensselaer, Buffalo, and Niagara Falls; and
- Increasing the service to eight round trips per day between Albany-Rensselaer, Buffalo, and Niagara Falls with express service.

An initial group of alternatives was defined that focused on improving the reliability (on-time performance [OTP]) of the existing four round trips per day service. This approach focused on identifying capital improvements to support an 85 percent to 90 percent OTP level between Albany-Rensselaer, Buffalo, and Niagara Falls, while maintaining the existing four daily round trips service.

A second group of alternatives was defined that increased service levels to 12 round trips per day as well as improved reliability. Preliminary Empire Corridor ridership was estimated in an iterative process based on varied levels of service frequency. Initial ridership forecasts were based on service frequencies between Albany-Rensselaer, Buffalo, and Niagara Falls of 12 round trips per day. This would be a substantial service expansion with estimated gains in ridership of about 65 percent. The ridership gains would be significantly less than the percentage increase in service levels (300%). Therefore, daily service levels of 12 round trips were determined to be very high when compared to the relatively low increase in ridership gained for the projected service increase.

NYSDOT determined that a third group of alternatives with service levels of eight round trips per day as well as improved reliability was a reasonable initial balance between service attractiveness and operating subsidy affordability. This doubling of the existing service would result in ridership gains of 38 percent to 74 percent over the Base Alternative depending on the alternative. The Base, or "No Action," Alternative represented future conditions assuming planned and approved projects (see Exhibit 3-8) would be built, but without implementation of any of the "Build" Alternatives of this High Speed Rail Empire Corridor Program. The Base Alternative is used for comparison to all Build Alternatives.

In addition to determining the appropriate service level (eight round trips per day), the concept of providing express service was also evaluated along the Empire Corridor West during development of the alternatives. Two of the alternatives, Alternatives 90A and 125, would offer some form of express service between New York City and Niagara Falls.

3.1.2. Equipment

The number of new train sets, consisting of locomotive and passenger coaches, which would be required for each alternative, are indicated in the description of each alternative. The Empire Corridor does not support electric propulsion trains north of Croton-Harmon Station. At the same time, trains are required to operate with electric propulsion at Penn Station New York and through the East River Tunnels to the layover/servicing facilities at Sunnyside Yard in Long Island City, Queens. Therefore, the existing Empire Corridor is operated with specialized "dual mode" locomotives that can switch from electric to diesel operation (the present switchover occurs at about 40th Street in Manhattan, just north of Penn Station). The present Amtrak electric operation uses 700 volts (DC) third rail as an energy source at Penn Station and in the East River Tunnels. This third rail configuration is different than that of Metro-North, so Empire Corridor trains are unable to take advantage of the third rail between Spuyten Duyvil and Croton-Harmon.

In addition to dual mode locomotives, longer-distance Empire Corridor trains (those to/from Montreal, Toronto, and Chicago) utilize conventional diesel locomotives west of Albany. Both the dual mode and conventional diesel locomotives are capable of 110 mph operation, and regularly achieve this speed on portions of the corridor between Hudson and Schenectady, but a long period of acceleration is required. Empire Corridor passenger coaches are single level unpowered coaches of the "Amfleet" type that date from the 1970s. These coaches, including some similar food service/business class cars, are approaching the end of their service life, but funding is not yet in place for their replacement.

3.1.3. Physical Improvements

Each alternative consists of a program of improvements needed to implement the characteristics of the alternative (increased speed, improved reliability, increased capacity to support additional service, and passenger amenities). The types of physical improvements include new sidings, new dedicated passenger track, grade crossing improvements or elimination, advanced train control systems, and station improvements. The specific improvements included in the alternatives are based on an evaluation of potential capital projects developed for each segment of the corridor. Between New York City and Albany-Rensselaer, the section known as Empire Corridor South, improvements were identified in the Hudson Line Railroad Corridor Transportation Plan.[46] A series of improvements were identified in this plan along with a likely year of implementation, based on operational need, capital cost, available funding, and permitting/design status.

In each case, a suite of capital improvements identified in the Hudson Line Transportation Plan are included for the Empire Corridor South segment, common to all Build Alternatives. These improvements are:

- Add second track between MPs 9 to 13 (including Spuyten Duyvil Movable Bridge);
- Add new Tarrytown pocket track to support Metro-North turnbacks without delaying Empire Corridor Service;
- Add new signal system between Croton-Harmon and Poughkeepsie Stations (MPs 32.8 to 75) for additional operating capacity;
- Add third track (MP 53 to 63) to support Empire Corridor overtakes of Metro-North trains;
- Add new track/siding at Poughkeepsie Station Track 3 to support higher operating speeds for Empire Corridor and Metro-North service;
- Add new Poughkeepsie yard to eliminate station congestion and crossing conflicts north and south of the station;
- Add New Control Point (CP) 82, New CP 99, New CP 136 – two-track universal interlockings to support enhanced reliability during maintenance activities;
- Reconfigure Hudson Station to support simultaneous passenger boarding/alighting on both main tracks.

Within the Base Alternative, the completed Albany-Rensselaer Station fourth-track capacity improvements were included in the Hudson Line Railroad Corridor Transportation Plan. In addition, NYSDOT identified improvement projects not already included in the Base Alternative. These include projects from:

- NYSDOT HSIPR grant and TIGER grant applications to the FRA,

[46] SYSTRA Engineering. *Hudson Line Railroad Corridor Transportation Plan: Final Report*, (Document No. M40801-11/95 18/STU-137). Prepared for Amtrak, Canadian Pacific Railway, CSXT, MTA Metro-North Railroad, NYSDOT. November 2005.

- The New York State Rail Plan, and
- Additional improvements identified during development of this Tier 1 Final EIS to improve speed and reliability and enhance service.

As with New York City to Albany-Rensselaer projects, NYSDOT designated these improvements with a likely year of implementation, based on operational need, capital cost, available funding and permitting/design status. NYSDOT gave priority to projects that provide relief to current delays experienced by passenger and/or freight trains. These delays were identified from the 2008 Empire Corridor baseline simulation model, which has been calibrated against actual operations. NYSDOT used 2008 as the analysis year because it reflects realistic trends in rail congestion, prior to the economic downturn (and concomitant decline in freight shipping) in 2009. Review of 2019 (pre-pandemic) available information shows that Amtrak schedules and freight traffic are essentially the same, therefore new rail simulation would not show substantial changes.

The general elements of each alternative are summarized in Exhibit 3-2. All alternatives would include projects planned under the Base Alternative (designated BA in Exhibit 3-2).

3.2. Alternatives Considered and Eliminated From Further Study

Once NYSDOT developed the initial full range of possible alternatives, NYSDOT subsequently screened alternatives according to the program purpose and need and associated objectives. NYSDOT applied a consistent set of performance measures (i.e., trip time, reliability, ridership, cost and revenue) to evaluate the range of possible alternatives.

NYSDOT did not advance certain alternatives based on an evaluation of these performance measures and comparative costs and environmental impacts. In addition, the performance of alternatives was compared against each other in the screening, and those that were not as effective in meeting the performance objectives were eliminated from further consideration.

The following describes the alternatives considered and eliminated from further study.

3.2.1. 79 mph MAS Alternatives

Two 79 mph Maximum Authorized Speed (MAS) infrastructure alternatives were considered, incorporating various infrastructure improvements and operational enhancements, as alternatives that would maintain the existing FRA class of track/maintenance tolerances in the corridor and constrain associated infrastructure improvements to the existing right-of-way. These two alternatives upgrade existing tracks and provide two different service levels—maintaining existing frequency of service and an approximate doubling of Albany-Rensselaer to Buffalo service—to form Alternatives 79A and 79B, respectively. Infrastructure improvements would include passing sidings and signal and station improvements.

A third 79 mph MAS alternative, designated Alternative 79C, included a new dedicated single main track with some new dedicated double main track segments for train passing adjacent to the existing Empire Corridor alignment. The principal attribute of all three of the 79 mph alternatives is to provide greater reliability and fewer conflicts with existing and future CSXT freight movements along the Empire Corridor West (service characteristics along the Empire Corridor South between Albany-Rensselaer and New York Penn Station would remain unchanged).

Exhibit 3-2—General Elements of the Alternatives

Alternative Components	BA	79A	79B	79C	90A	90B	110	125	160	220
Maximum Authorized Speed	79	79	79	79	90	90	110	125	160	220
Base Alternative Projects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
New Sidings		✓	✓	✓	✓	✓	✓			
Station Improvements		✓	✓	✓	✓	✓	✓	✓	✓	✓
New Service			✓	✓	✓	✓	✓	✓	✓	✓
New Dedicated Main Track				✓		✓	✓			
Grade Crossing Improvements				✓	✓	✓	✓			
Advanced Train Control System					✓	✓	✓	✓	✓	✓
Additional Right-of-Way within Existing Corridor						✓	✓			
New Corridor & Right-of-Way/ Electrified								✓	✓	✓
Eliminate Grade Crossings								✓	✓	✓

None of the 79 mph alternatives provide a significant operational or cost advantage over the 90 mph alternatives, which are distinguished primarily by track structure improvements to support higher passenger train speeds where feasible within the existing corridor alignment.

Simulations show that the New York to Niagara Falls trip time of Alternatives 79A/B is within 10 minutes (out of a scheduled trip time of over 8 hours) of that of Alternative 90A. Service levels are identical. As a result, ridership projections are essentially the same between these alternatives.

Similarly, Alternative 79C is characterized by essentially similar infrastructure as Alternative 90B, each with a dedicated third track over most of the corridor between Schenectady and Buffalo. Travel time differences between the two alternatives, based on detailed single train simulation, are less than 25 minutes (out of a trip time of more than 7 hours). Ridership projections for these two alternatives show less than 10 percent difference, reflecting identical service delivery and very similar trip times between the two alternatives.

Because there was no substantive and positive differentiator of the 79 mph alternatives, they were not advanced for further consideration. In each case, the comparable 90 mph alternative showed slightly superior trip time and ridership, resulting in it being retained over its slightly inferior 79 mph counterpart.

3.2.2. Very High Speed (VHS) Alternatives

During the program scoping process in 2010, considerable interest was expressed by the public and other program stakeholders in the potential for higher speed alternatives. These included a 160 mph alternative representing the practical upper limit of electrified dynamic tilt trains, such as the Amtrak Acela; and a 220 mph alternative representing the practical upper limit of high-speed rail operations seen in France, Germany, Spain, Japan, and China. In response to this, a range of higher speed alternatives was carefully examined according to the same metrics as the other alternatives.

The very high speed (VHS) alternatives would require a dedicated right of way but would result in significant travel time savings (5:17 and 4:23 respectively for 160 mph MAS and 220 mph MAS), and commensurately higher estimated ridership (4.06 and 5.12 million respectively for 160 mph MAS and 220 mph MAS).

These gains would come with significant service and economic costs and possible environmental impacts. Attaining average speeds commensurate with the proposed investment would result in the likely diversion of the VHS service from all but four of the existing Empire Corridor West stations (i.e., Albany-Rensselaer, Syracuse, Rochester, and Buffalo Exchange would serve both the VHS and any continued "Legacy" Empire Corridor passenger service). Between Albany-Rensselaer and New York City, there would be an entirely new station and market configuration, with construction of new right-of-way on a viaduct structure aligned with existing highways (assumed to be I-87/NY State Thruway). Physical and environmental characteristics of the existing Empire Corridor South would result in either extraordinary encroachments and impacts or a diversion so far to the east as to fall outside the Empire Corridor as defined. As such, synergies between existing commuter rail and high-speed rail services in the corridor would be lost under these alternatives. It would not be possible to utilize Metro-North to originate at a suburban station and connect to a high-speed rail train.

At a corridor level, alternatives that are on alignments beyond the existing railroad corridor would be expected to have greater impacts to the natural and human environment than alternatives that follow the existing railroad corridor.

Although these alternatives would meet performance objectives, these improvements would come at a cost that is, by any current measure, infeasible at $27 billion (160 mph MAS) and $39 billion (220 mph MAS), calling into question the viability of improvements to the Empire Corridor that would go well above and beyond the current financial constraints. The projected capital cost of these alternatives is 30 to 43 times greater than the Amtrak intercity rail capital program for the entire United States for FY 2011, for example.

For all of these reasons, NYSDOT eliminated the VHS alternatives from further study. More prudent and feasible alternatives exist which confer transportation benefits and do not have substantial negative cost, property-taking, community, and environmental impacts.

3.2.3. 125 mph MAS Alternative on Existing Empire Corridor

A higher speed alternative, 125 mph MAS, was evaluated west of Schenectady, and consideration was given of running this service on the existing Empire Corridor West. The differences in costs and benefits, between Alternative 125 on the existing Empire Corridor and Alternative 125 on a new corridor, favor the new-corridor alternative. Use of the existing corridor for Alternative 125 would require additional infrastructure over and above the 110 Alternative: dual mode locomotives in electric mode would be operated along an electrified, completely grade-separated corridor that also includes (where possible) additional curve modifications.

Today, portions of the existing corridor geometry can support 125 mph MAS. However, just like the 110 and 90 mph Alternatives, there are portions of the corridor that could not be realigned to support 125 mph, so trains would have to slow down and speed up at each civil speed restriction. For instance, west of Syracuse, from Mileposts 328 to 351, a number of consecutive curves limit speeds from 70 to 100 mph, with many at 80 mph. Although it may be possible to remedy a few of these curves, the fact that it takes so long for a train to recover speeds in the range of 80 to 110 mph, there is little to nothing to be gained in modifying the few curves that may be able to be eased, unless most all of the curves can be modified. That is, the trip time (or average speed) for the new corridor 125 Alternative will be better than the trip time (or average speed) for an existing-corridor 125 Alternative. The rail simulation (presented in Appendix D) did not quantitatively evaluate existing 125 mph MAS on the existing Empire Corridor. However, it did evaluate regional legacy service that would continue to operate on existing Empire Corridor for 125, making all train stops, and this service was considerably slower than the express service (by approximately 2 hours and 40 minutes). Appendix D addresses the rail simulation for Alternative 125 on a new exclusive alignment (express service) and states: "*When the data is presented solely for Albany to Buffalo (Exhibit D-41), the range of scheduled train speeds becomes more pronounced because the alternatives' capital improvements are focused in this area. The current scheduled speed across Empire Corridor West is 57 MPH. Each of the alternatives, including the Base Alternative, provides higher average speeds. The 125 Alternative provides the highest average speed – 108 MPH for Express service*."

NYSDOT has concluded that the incremental costs associated with upgrading the existing corridor from 110 mph MAS to 125 mph MAS are not justified by incremental improvement in trip time. The incremental approach will never achieve trip times close to a new corridor, although this does not include the purported acceleration improvements of electric traction equipment. Grade separating on the existing corridor adjacent to the existing freight tracks would be costly and complicated compared to constructing a new corridor.

3.3. Alternatives Advanced for Further Study

Five alternatives were advanced for further study:

- **Base Alternative:** consists of eight capital improvement projects that have been funded under FRA HSIPR and TIGER grants, in addition to normal maintenance.
- **Alternative 90A:** consists of 20 additional capital improvement projects previously identified for potential FRA HSIPR and TIGER grant funding. This alternative would provide a MAS of 90 mph with limited express service and also includes the Base Alternative projects.
- **Alternative 90B:** consists of additional areas of third track and fourth track and station improvements to accommodate a MAS of 90 mph. This alternative also incorporates the 20 Alternative 90A improvements, in addition to the eight Base Alternative projects.
- **Alternative 110:** consists of additional areas of third track and fourth track and station improvements to accommodate a MAS of 110 mph. This alternative also incorporates the 20 Alternative 90A improvements, in addition to the eight Base Alternative projects.
- **Alternative 125:** maintains existing Amtrak Empire Service and incorporates express service along a new, electrified, grade-separated corridor, providing a MAS of 125 mph between Albany-Rensselaer and Buffalo Exchange Street. The route overlaps with and serves station tracks at Syracuse and Rochester, incorporating Base Alternative improvements and those Alternative 90A improvements along the Hudson Line and Niagara Branch and the portions of Empire Corridor West that overlap with the new route.

Exhibit 3-3 presents a corridor map of the Build Alternatives, and Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6 summarize the characteristics and improvements for each alternative. Chapter 6 presents the comparison of alternatives and rationale for selection of the Preferred Alternative.

These alternatives incorporate most of the improvements along Empire Corridor South outlined in the Hudson Line Railroad Corridor Transportation Plan, with the exception of the Base Alternative (which only incorporates improvements identified at Albany-Rensselaer Station).

Track centers described in this Tier 1 Final EIS are based on conceptual-level design. These conceptual-level track centers represent prudent estimates of proposed conditions and have been used to establish this program's potential impacts to adjacent property and environmental resources for each feasible Build Alternative. Specific track center design criteria and actual track centers proposed will be established during detailed design. Specific individual project track center design criteria, including any proposed design exceptions, will be developed considering factors including: the policies of the FRA, design guidelines and criteria of the railroad owners, and avoidance and minimization of impacts to adjacent property and environmental resources.

For the 90 mph and 110 mph Alternatives, the new higher speed tracks for passenger trains would be installed on the north side of the existing railroad alignment. This would avoid conflicts with the existing train movements on the route while the new tracks for the higher speed were being installed, and would minimize construction impacts on rail traffic.

The line historically operated as a four-track system, and, as part of cost-saving measures that started in the late 1950s, the two tracks that formerly existed on the north side were either removed or converted to sidings to save on maintenance. The new passenger tracks would be added in the former locations of these two tracks. The primary factors for installing tracks on the north side include the ability to upgrade existing sidings in place to become the third and fourth tracks. The current tracks in operation are on the south side of the right-of-way, and there is availability of right-of-way on the north where this area previously had tracks in operation. Installation on the south side would also require property acquisition in places. In many cases, infringement on waterways, roadways, or other obstacles, such as bridge columns, would occur. Sections of the Erie Canal system or Mohawk River closely adjoin the existing railroad in several different locations.

However, an additional cost of placing the new passenger tracks to the north is the need to construct additional crossovers, flyovers, and interlockings to allow freight trains running on the south side to crossover the new passenger mains to reach freight facilities on the north side. This cost may offset some of the cost savings of locating the new passenger tracks to the north, but the resulting interconnectivity between the passenger and freight mains has the benefit of facilitating future maintenance operations for both modes and provides bypasses for each in the event of a service interruption such as equipment failure, derailment, etc.

Alternative 125 achieves a MAS of 125 mph by developing a new conceptual corridor alignment that minimizes horizontal curvature and elevation changes. The location of the new corridor was determined based on topography and avoidance of geographic information system (GIS)-mapped constraints, while remaining near the existing railroad corridor and providing connections with the existing Albany-Rensselaer, Syracuse, Rochester, and Buffalo-Exchange Street Stations.

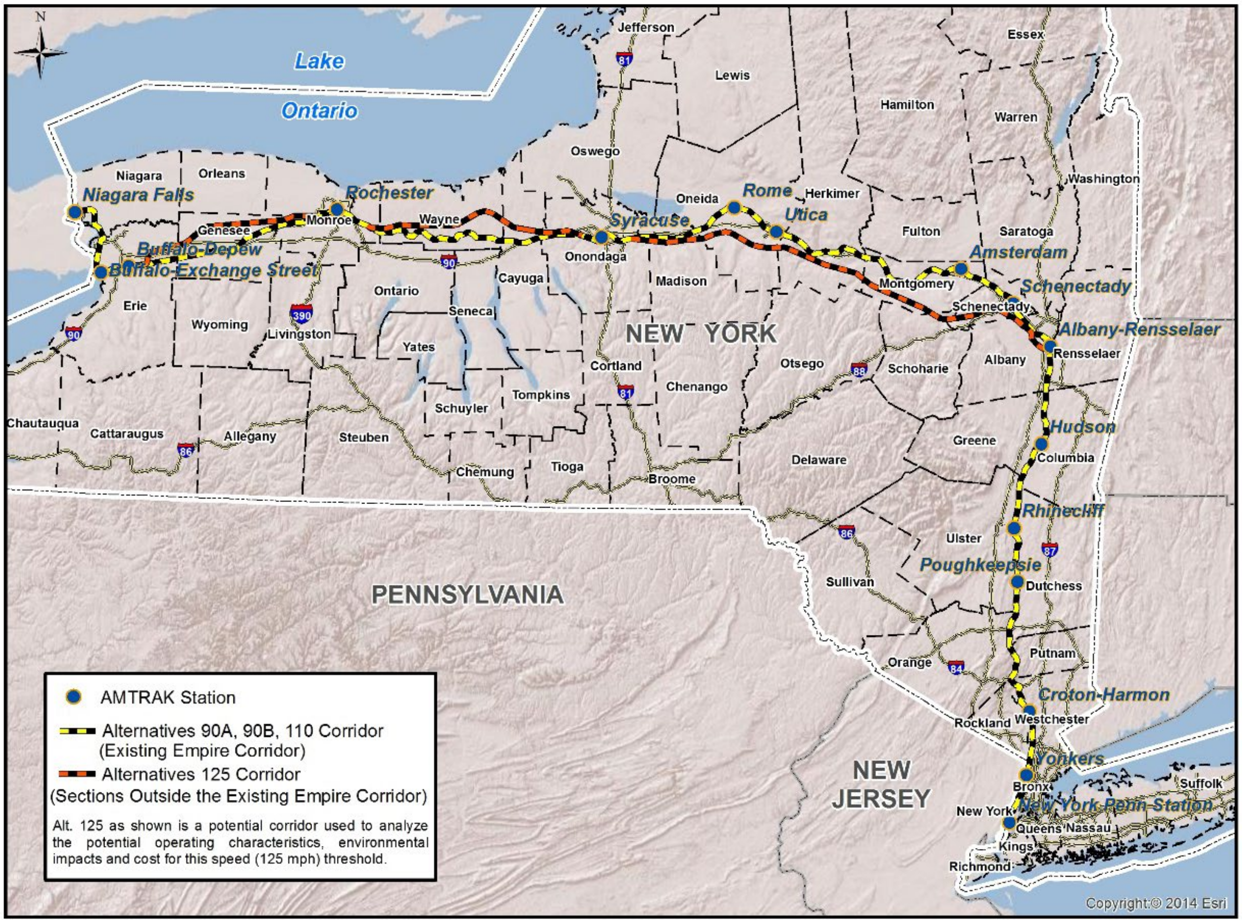


Exhibit 3-3—Corridor Map of the Build Alternatives

Exhibit 3-4—Summary New/Improved Infrastructure needed for Alternatives

Improvement/Addition	Alternative				
	Base	90A	90B	110	125
Miles of new mainline track	36	54			243 double track
Miles of dedicated third track		10	283	283	10
Miles of dedicated fourth track			39	59	
Miles of elevated track					56
Flyovers			3	2	
Bridges (undergrade)	34	74	284(*)	284(*)	74(*)
Station Buildings	2	6	5	5	4
Station Facilities and Trackwork	4	6	11	11	9
Bridges (overhead)			90	90	
Grade crossings	25	17	103	102	17

(*) Totals are for Empire Corridor West only.

Exhibit 3-5—Summary of Track Improvements for Alternatives

Description	Milepost	Base	90A	90B	110	125
Add 4 miles of second track (Spuyten Duyvil and movable bridge)	9 – 13		X	X	X	X
Add 1 mile of new track (Tarrytown Pocket Track)	23.8 - 25		X	X	X	X
Add 10 miles of new third track (Metro-North)	53 - 63.5		X	X	X	X
Replace Livingston Avenue Bridge	143		X	X	X	X
Construct/rehab. 17 miles of second main track (Rensselaer to Schenectady Stations)	143.2 - 160.3	X	X	X	X	X
Add 8 miles of second main track	161-169			X	X	
Add 10 miles of new main track (Selkirk/Mohawk Subdivisions)	169 - 178.5		X	X	X	
Add 273 miles of new third track	159 - 432			X	X	
Add 9 miles of new fourth track (Selkirk/Mohawk Subdivisions)	170 - 179			X		
Add 10 miles of new fourth track (Mohawk Subdivision)	174 - 184				X	
Add 10 miles of new fourth track (Mohawk Subdivision)	204 - 214			X		
Add 11 miles of new fourth track (Mohawk Subdivision)	218 - 229				X	
Add 4 miles of new fourth track (Mohawk Subdivision)	235 - 239			X	X	
Add 13 miles of new fourth track (Mohawk Subdivision)	246 - 259				X	
Add 8 miles of new fourth track (Rochester Subdivision)	301 - 309			X		
Add 10 miles of new fourth track (Rochester Subdivision)	310 - 320				X	
Add 1 mile of new fourth track (Rochester Subdivision)	373 - 374.3			X	X	
Add 9 miles of new third track & signal system (Rochester Subdivision)	373 - 382		X	X	X	
Add 11 miles of new third track & signal system (Rochester Subdivision)	382 - 393		X	X	X	
Add 8 miles of new fourth track (Rochester Subdivision)	375 - 383			X		
Add 11 miles of new fourth track (Rochester Subdivision)	388 - 399				X	
Grade Separated Flyover (Mohawk Subdivision)	279			X	X	
Grade Separated Flyover (Rochester Subdivision)	366			X	X	
Grade Separated Flyover (Rochester Subdivision)	427			X		
Double Track - Add 5 miles of second track (Niagara Subdivision)	QDN2 to QDN7			X		
Double track - Add 6 miles of second track (Niagara Subdivision)	QDN17 - QDN22.8		X	X	X	X
Upgrade 3 miles of existing track (Niagara Subdivision)	QDN25 - QDN28		X	X	X	X
20 miles of elevated Corridor between Albany and Schenectady	QH142 - QH162					X
106 miles of double track on new alignment	QH162 - QH268					X
15 miles of elevated corridor through and outside of Syracuse	QH268 - QH283					X
62 miles of double track on new alignment	QH283 – QH345					X
16 miles of elevated corridor through and outside of Rochester	QH345 - QH361					X
48 miles of double track on new alignment	QH361 – QH409					X
11 miles of track improvements at grade on existing alignment	QH409 – QH420					X
5 miles of elevated corridor in and east of Buffalo	QH420 - QH425					X

Exhibit 3-6—Summary of Station Improvements for Alternatives

Station & Improvements		MP	Alternative				
			Base	90A	90B	110	125
Rhinecliff	New high-level platform & canopy	89.2		X	X	X	X
Hudson	Reconfigure for simultaneous train stops on Tracks 1 and 2	114.5		X	X	X	X
	New Ferry Street Bridge/platform improvements			X	X	X	X
Albany-Rensselaer	New center island platform	142.1					X
	Extension of platform & canopy		X	X	X	X	X
	New 4th track		X	X	X	X	X
	New connecting tracks						X
Schenectady	New station building	159.8	X	X	X	X	X
	New stairs & elevators to platforms		X	X	X	X	X
	ADA compliant platforms		X	X	X	X	X
	Weather protected connector corridor		X	X	X	X	X
	New 3rd track				X	X	
Amsterdam	New station building	177.6		X	X	X	
	ADA compliant counter, restrooms, ramps, elevators			X	X	X	
	New high-level platform			X	X	X	
	Overhead pedestrian bridge				X	X	
	New 3rd track			X	X	X	
	New 4th track				X	X	
Utica	New center island platform	237.5			X	X	
	Overhead pedestrian bridge				X	X	
	New 3rd & 4th tracks				X	X	
Rome	New side platform	251.3			X		
	New center island platform					X	
	Overhead pedestrian bridge					X	
	New 3rd track				X	X	
	New 4th track					X	
Syracuse	New center island platform	291.4					X
	Modify existing side platform				X	X	
	Overhead pedestrian bridge						X
	New 2nd track			X	X	X	X
	New 3rd track			X	X	X	X
	Modify interlockings & one new interlocking			X	X	X	
	Upgrade existing 3rd track and signalization		X				
	Upgrade existing 3rd track as fourth track			X	X	X	
	Add crossovers & reconfigure signals			X	X	X	
	Rehab/replace Park Street Bridge			X	X	X	X
Rochester	New station building	371	X	X	X	X	X
	New high-level, center island platform		X	X	X	X	X
	Overhead pedestrian bridge		X	X	X	X	X
	New 3rd & 4th tracks		X	X	X	X	X
	New interlockings		X	X	X	X	
Buffalo-Depew	New station building	431.7		X	X	X	
	New high-level center island platform with canopy			X	X	X	
	ADA compliant platform, ticket counter, restrooms, ramps, railings			X	X	X	
	New 3rd track			X	X	X	X
	New 4th track				X	X	X
Buffalo Exchange Street	Relocated, new station building	QDN 1.9					X
	ADA compliant connections to existing facilities						X
	New center island platform at new location						X
	New 3rd & 4th tracks at new location and connecting tracks						X
Niagara Falls	Relocated, new station building	QDN 28.2	X	X	X	X	X
	US Customs Border Protection (CBP) inspection facilities		X	X	X	X	X
	Covered high-level platform		X	X	X	X	X
	Upgrade existing track		X	X	X	X	X

3.3.1. Base Alternative

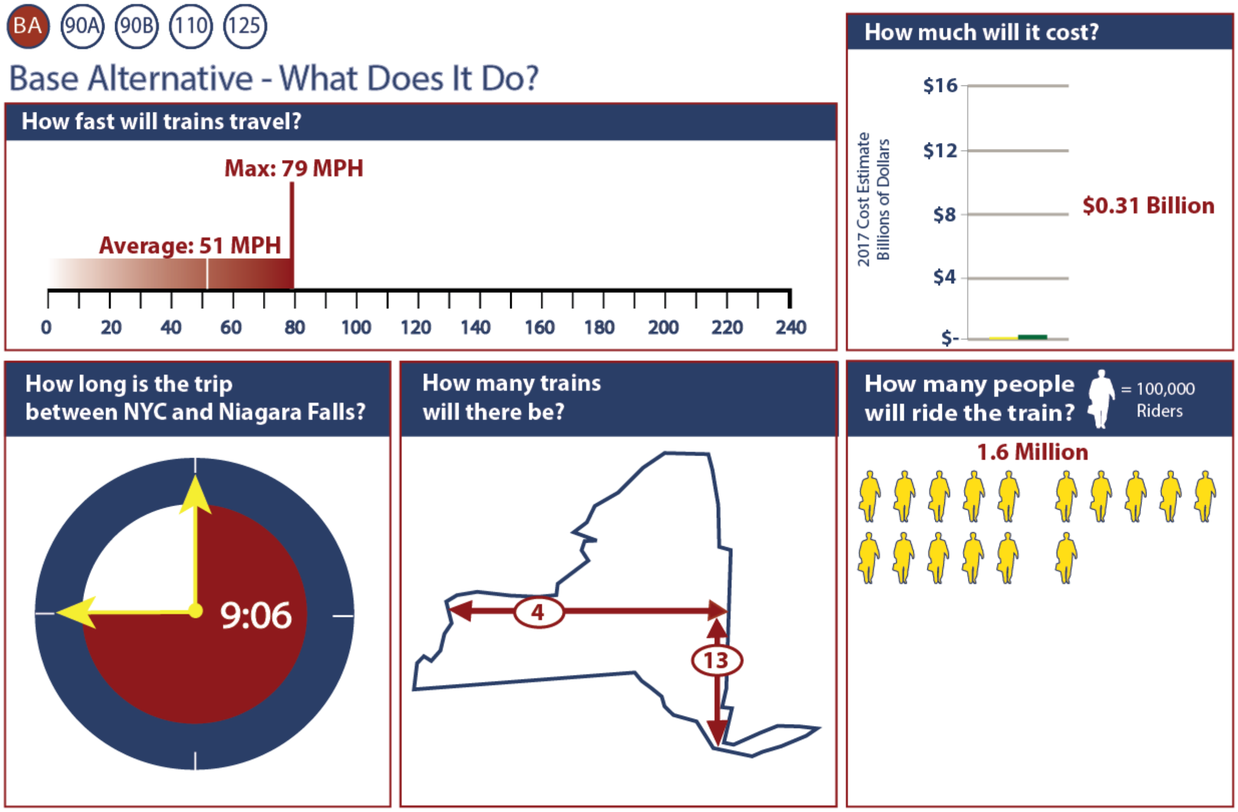
The Base Alternative is carried through the Tier 1 EIS as the basis to evaluate the cost and impacts of the program's Build Alternatives in relation to the benefits gained by the public. The Base Alternative consists of eight limited rail improvement projects that, at the time the Tier 1 Draft EIS was prepared, were planned and funded to address previously identified capacity constraints. Train frequency will remain unchanged from the existing frequency. The key features of the Base Alternative are illustrated in Exhibit 3-7.

The Base Alternative represents the future condition of the transportation network given committed rail, highway, bus, and airport improvement projects that have been built or are planned and are within the intercity travel market study area; i.e., the general geographic area served by the Empire Corridor.

Sources of information used to develop the year 2035 Base Alternative include the following:

- New York State Department of Transportation, Statewide Transportation Improvement Program (STIP);
- Metropolitan Planning Organization (MPO), financially constrained Long Range Transportation Improvement Plans (LRTPs) and Transportation Improvement Plans (TIPs);

Exhibit 3-7—Base Alternative – Key Features



Note: Travel time between NYC and Niagara Falls presented in hours: minutes, based on westbound scheduled times.

- Federal Aviation Administration (FAA) Terminal Area Forecast Summary, Fiscal Years 2010 – 2030;
- Various Airport Master Plans; and
- Various Bus Routing/Planning Documents.

Planned improvements to the highway infrastructure (automobile and bus modes), airport infrastructure, and rail infrastructure were accounted for in forecasts of market demand and ridership as part of the Base Alternative (see Appendix E). A description of alternative transportation modes (automobile, bus, air) is provided in Appendix E, Section 2, and Appendix B presents the transportation market analysis for these alternative modes compared to rail. The following is a description of planned improvements for passenger rail and freight rail service.

Physical Improvements

The Base Alternative represents a continuation of existing Amtrak service with those operational and service improvements already programmed. Such improvements consist of maintenance, rehabilitation and improvement to track capacity, signal work, highway-rail crossings, and passenger stations. Despite increasing ridership, the Base Alternative makes no provision for any improvement of rail service beyond what is already being operated and programmed by Amtrak, Metro-North, and/or NYSDOT. It assumes the continued operation of four daily round-trips of conventional speed Amtrak passenger service between Penn Station, New York City, and Niagara Falls on the Metro-North and CSXT owned alignment. Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6 summarize the characteristics and improvements proposed or recently completed for the Base Alternative.

NYSDOT, Amtrak, Metro-North, and others had planned improvements to the New York State Empire Service to improve freight and Amtrak operations at several locations. Eight projects comprised the Base Alternative passenger rail improvements as presented in the Tier 1 Draft EIS, of which eight have since been completed, as described in Exhibit 3-8 and shown in Exhibit 3-9. These projects were all advanced independently, having received environmental clearances under NEPA. In addition, there are over 15 new projects proposed in the study area. These proposed projects do not substantially change the condition of the Base Alternative and the analysis presented in this Tier 1 Final EIS. Collectively, the completed and proposed projects will not change the environmental analysis and alternatives rankings because these projects do not add substantial main line track capacity and are located within the existing railroad rights-of-way. Together, these projects have and will continue to increase train speeds in the most heavily traveled sections of the Empire Corridor, increase capacity to enable more trains to operate without conflicts, and substantially improve schedule (On-Time Performance (OTP) reliability along with upgrade passengers' experience and increase ridership.

FRA had awarded NYSDOT High-Speed Intercity Passenger Rail grants in the corridor, in addition to TIGER grants. The HSIPR grants awarded for Empire Service include partial funding towards this Tier 1 EIS and these projects that comprise the Base Alternative. These eight interrelated projects provide for the following improvements:

- Enhancements to stations in Albany-Rensselaer, Schenectady, Syracuse, Rochester, and Niagara Falls;
- New tracks signaling, and communications;
- Interlockings; and

Exhibit 3-8—Base Alternative Passenger Rail Improvement Projects

Project Name (Milepost)	ARRA Grant Application	Project Description	Project Status
Hudson Subdivision Signal Reliability (MP 75.8 to 140)	ES-3	Replace old signal poles (for electric power to signals and communication lines) with underground cable between Poughkeepsie and Rensselaer Station.	Completed
Highway-Rail Grade Crossings Safety Improvements CSXT Hudson Line (MP 75.8 to 140)	ES-1	Design and install grade crossing active warning device, roadway approach and/or pedestrian improvements to accommodate improved passenger rail operations between Poughkeepsie and Albany-Rensselaer.	Completed
Albany-Rensselaer Station Fourth Track Capacity Improvements (MP 141 to 143)	ES-9	Add fourth track and extend platform to increase station capacity, operating speeds, train frequency, routing, and reduce delays.	Completed
Albany-Schenectady Double Track (MP 143.2 to 160.3)	ES-10	Design, construct, and rehabilitate a second main track between the Rensselaer and Schenectady stations to increase capacity, reduce bottleneck, and improve operations in congested single track segment.	Completed
Schenectady Station Renovation/Platform Improvements (MP 159.8)	EW-01	Complete station reconstruction, ADA-compliant platform and station access, viaduct repairs, and parking improvements.	Completed
Syracuse Track Configuration and Signal Improvements (MP 287 to 291)	EW-6	Upgrade main line tracks and third and fourth tracks to reduce congestion, delays, and interference between passenger and freight trains.	Completed[47]
Rochester Station Redevelopment / Operating Improvements (MP 368 to 373)	EW-19	New station building New high-level center island platforms, tracks/siding/interlocking to improve train operation efficiency, reduce congestion, and improve passenger safety.	Completed
Niagara Falls Station – New Intermodal Transportation Center (MP QDN28.2)	EW-13	New station with improved location in downtown Niagara Falls, function, operation, connectivity, border security, less delays.	Completed

Source: NYSDOT ARRA Grant Applications: ES = Empire Corridor South; EW = Empire Corridor West
NOTE: Section 2.5.5, Stations and Parking provides an update of status of improvements at station sites. The majority of these recently completed or proposed projects are ancillary improvements (e.g., parking or ADA improvements) that do not substantially affect track capacity on the order of magnitude as the proposed Build Alternatives.

[47] Phase 1 of the Syracuse Track Configuration and Signal Improvements (including installation of third track) was completed in 2021.

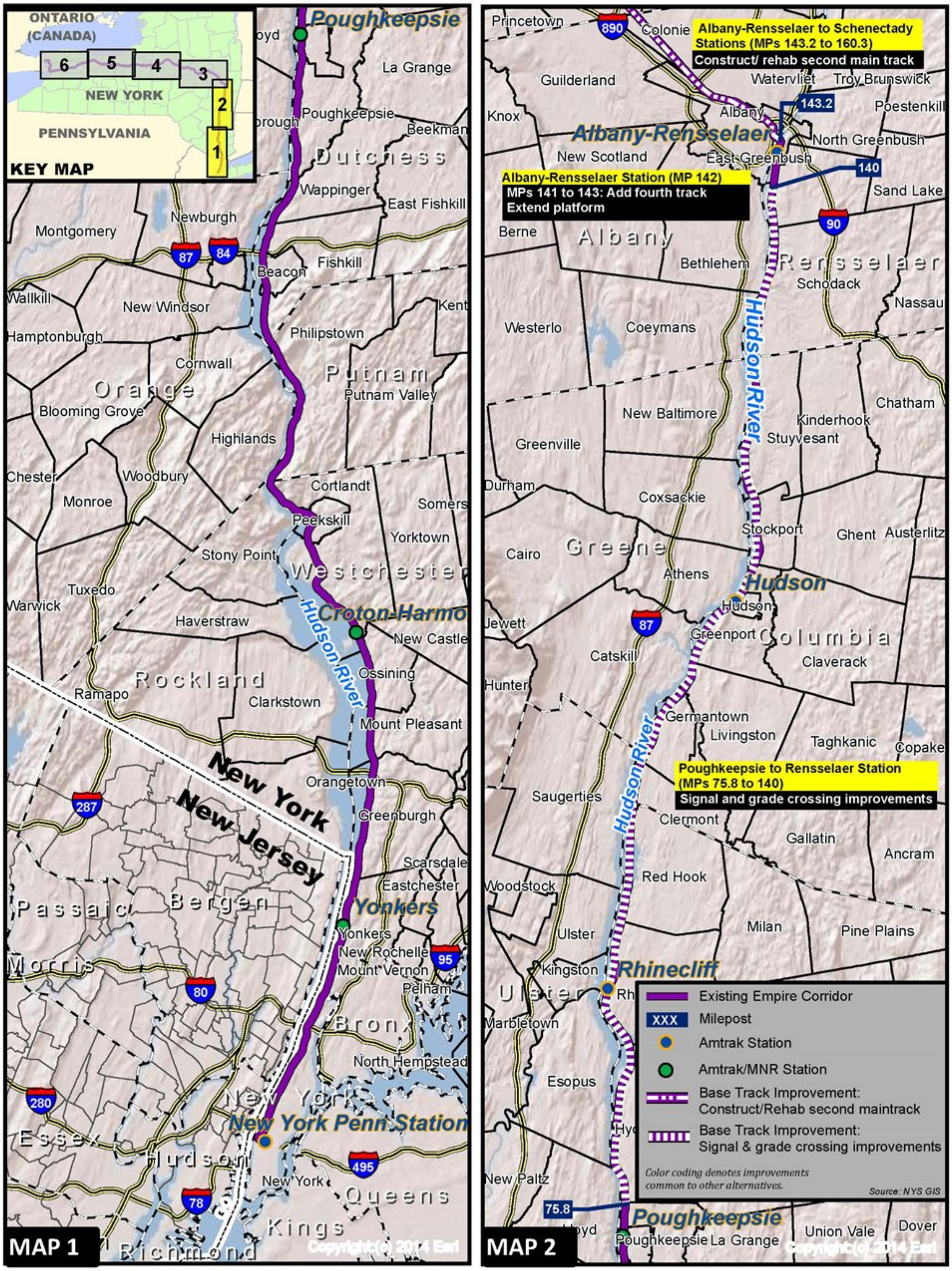


Exhibit 3-9—Base Alternative

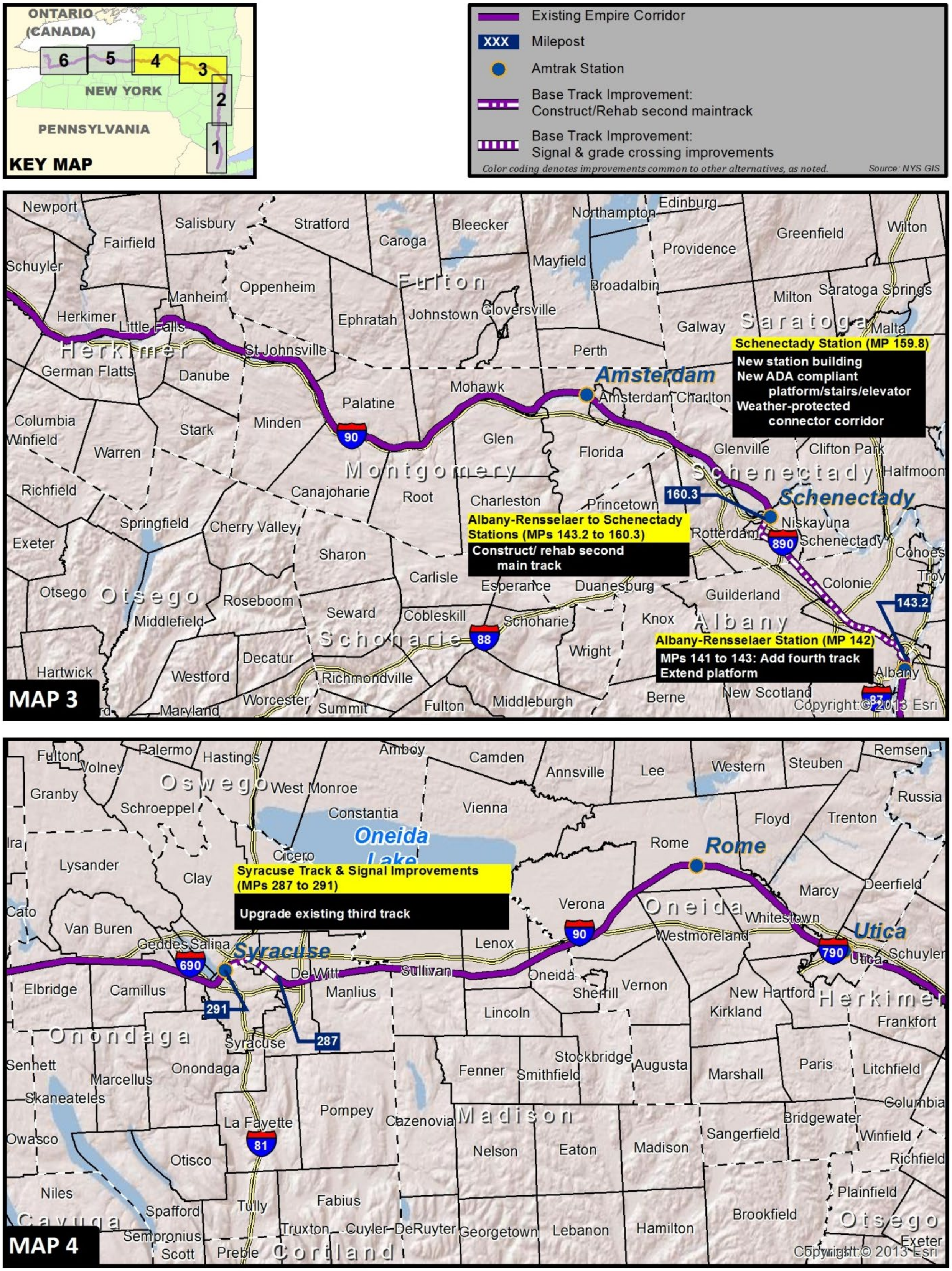
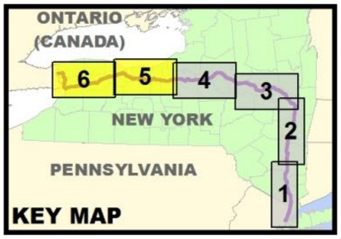
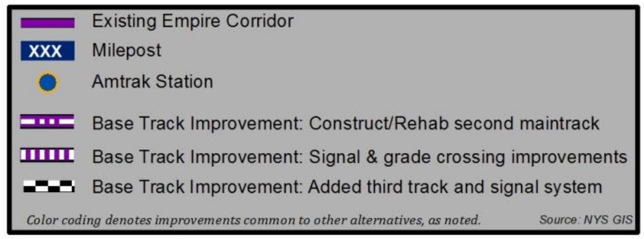


Exhibit 3-9—Base Alternative (Maps 3 and 4)





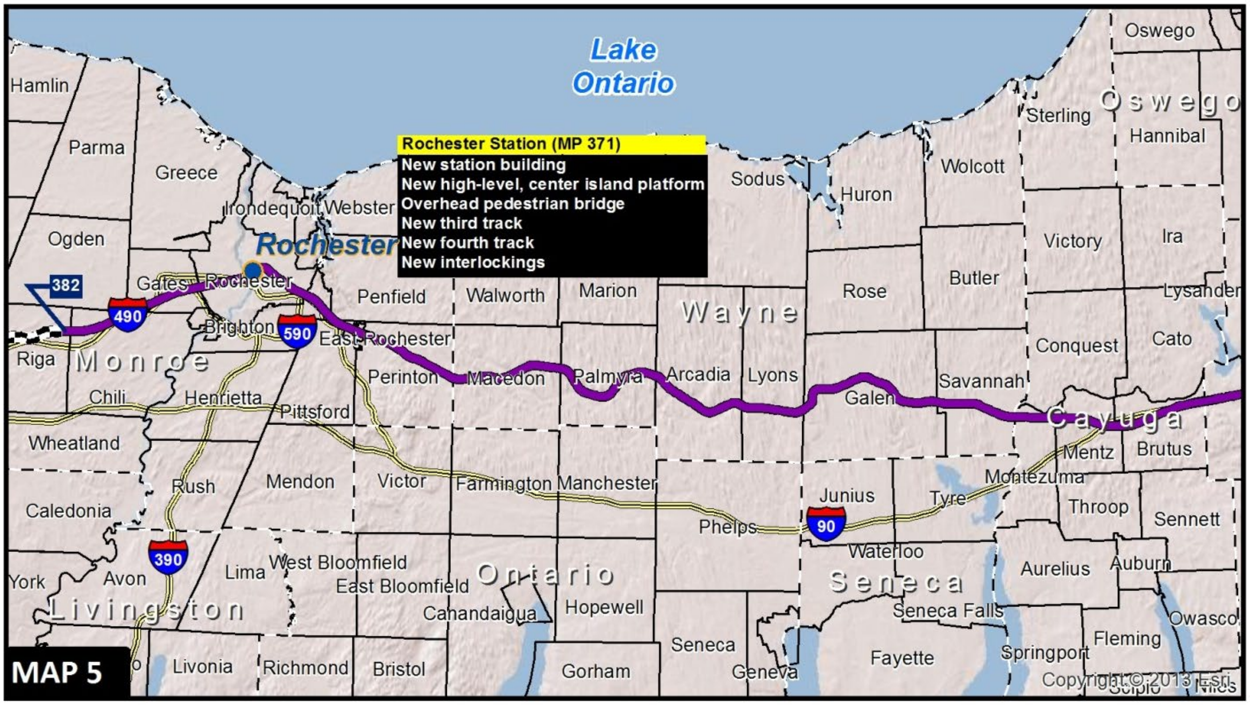


Exhibit 3-9—Base Alternative (Maps 5 and 6)

- Warning devices at grade crossings.

Under the Base Alternative, maintenance and rehabilitation of the existing freight rail system will continue. Rehabilitation will consist of improvements to track capacity, signalization, and highway-rail crossing improvements. Variations in times of departure and arrival, as well as train sizes and performance, are much greater in freight services than in passenger services.

Freight service schedules and train sizes/performance for the program area are generally kept confidential by the operators, due to the competitive nature of freight railroading. Therefore, the unpredictable nature of freight service and the projections of increased freight traffic support the projections of decreasing efficiency in the existing program area. Increasing this efficiency may be accomplished by reestablishing track in the program area where the track has been removed or by building new alignment track and by coordinating the schedules of both freight and passenger trains diverted to the reestablished and/or new alignment tracks.

Service Frequency Enhancement

The Base Alternative will maintain the existing 13 round trips per day between New York Penn Station and Albany-Rensselaer Station and the four round trips per day between Albany-Rensselaer Station and Buffalo, with three trips continuing to Niagara Falls.

Schedule Enhancement: Express Service and Station Stops

The Base Alternative will not add express service nor change the existing station stops made.

Equipment

The Base Alternative will not add new equipment.

Capital Costs

The estimated capital cost of the Base Alternative is $310 million.

Trip Time

With the Base Alternative, trip time between New York Penn Station and Niagara Falls, based on westbound scheduled times, will be 9 hours and 6 minutes (9:06).

On-Time Performance

The OTP for the Base Alternative along the Empire Corridor West will be 83 percent in the year 2035.

Ridership

Ridership for the Base Alternative is projected to be 1.6 million passengers in the year 2035.

Revenue

Annual revenue to the Base Alternative is projected to be $79 million.

Operations & Maintenance Costs

Operations and maintenance costs for the Base Alternative are estimated at approximately $106 million per year.

Safety

The improvements included in the Base Alternative will result in an overall increase in safety for the traveling public due to the safety-enhancing projects proposed with this alternative. The increase in train ridership over existing conditions could translate to a decrease in highway traffic volumes. With fewer cars on the road this will, in turn, naturally result in fewer traffic accidents and other safety gains. Although there will be additional rail tracks built at some grade crossings, no new grade crossings will be added. Since the frequency of accidents, injuries, and deaths involving trains, especially with modern safety features at railroad grade crossings, is much lower than the frequency of accidents on highways, the overall number of accidents, injuries, and deaths will decrease due to the shift in travel from passenger cars to rail. Federal funding announced in 2017 for positive train control will improve safety for the route between Schenectady and Poughkeepsie, and Metro-North and the State of New York have advanced initiatives for PTC along the Hudson Line south of Poughkeepsie. Positive train control has also been implemented by CSXT west of Schenectady.

Freight Operations

The improvements are limited in scope, and no significant changes with respect to freight operations would occur under the Base Alternative. There would be no direct impacts on freight operations, and the freight trip times from Selkirk Yard in the Albany area to Buffalo are expected to remain relatively constant (projected to be 8 hours and 14 minutes).

3.3.2. Alternative 90A

Alternative 90A, one of the two 90 mph alternatives, would use 90 miles per hour as the maximum authorized speed. Alternative 90A would include constructing new track in designated locations to meet higher track standards than those currently in use on the Empire Corridor, with in-cab signaling train control. This alternative would use current vehicle technology with the possibility of integrated trainsets. Alternative 90A would fall into the FRA's "Regional" category.[48] Alternative 90A would add capacity and station improvements that consist of 20 separate, identified capital improvement projects, which are listed in Exhibit 3-11 in the "Physical Improvements" section. Alternative 90A improves service with the purchase of new train sets that would be used to increase the Empire Service to 16 daily round trip trains operating between New York City and Albany-Rensselaer Station and to eight daily round trips between Albany-Rensselaer Station and Buffalo, with seven continuing on to Niagara Falls. The key features of Alternative 90A are illustrated in Exhibit 3-10.

Physical Improvements

Alternative 90A would consist of 20 additional capacity and station improvement projects, in addition to the eight projects proposed under the Base Alternative. The assumption in this Tier 1 Final EIS is that the new train sets and equipment added in Alternative 90A would be staged and maintained at existing locations and/or facilities along the corridor and/or at spaces gained with the addition of these 20 projects comprising Alternative 90A. Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6 summarize the characteristics and improvements proposed for Alternative 90A.

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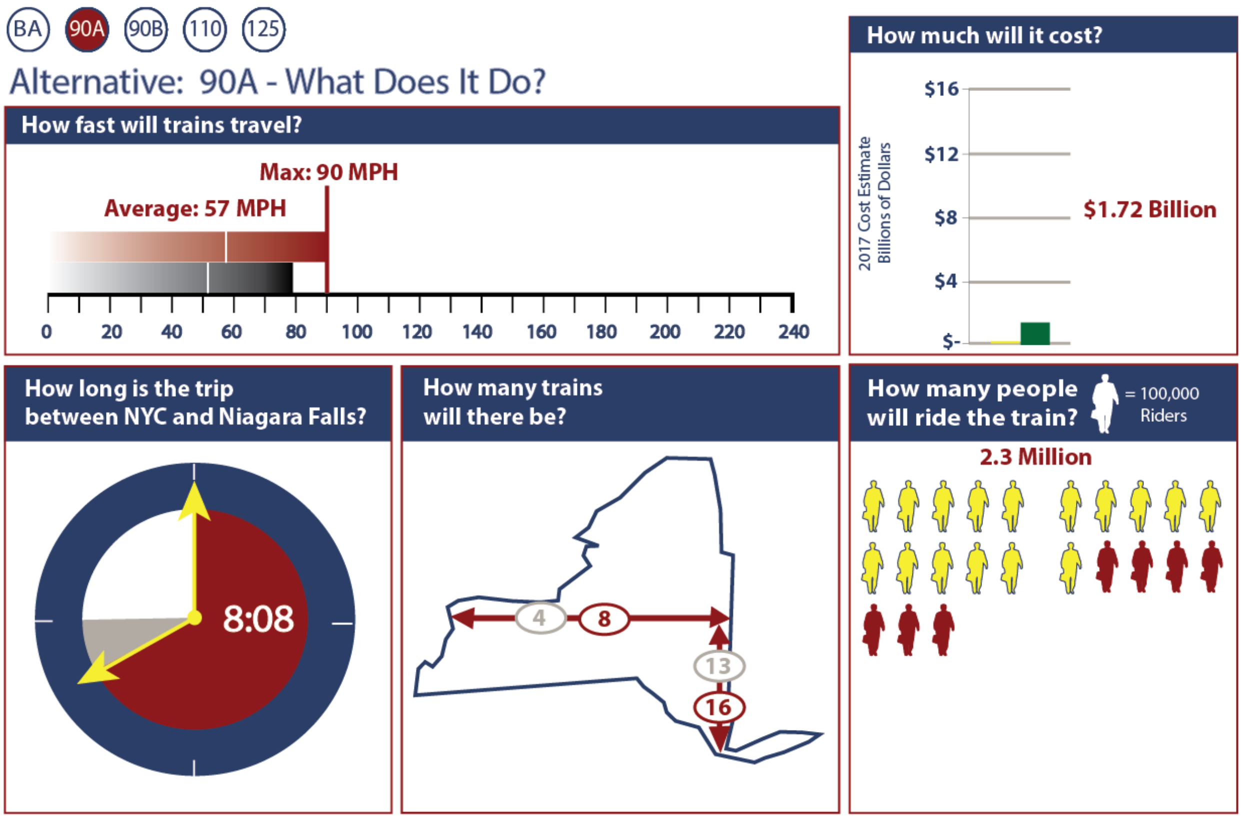
[48] FRA. *Vision for High-Speed Rail in America: High-Speed Rail Strategic Plan.* April 2009.

The 20 capital improvement projects included in Alternative 90A are summarized in Exhibit 3-11 and are shown in Exhibit 3-12.

Exhibit 3-10—Alternative 90A – Key Features



Note: Travel time between NYC and Niagara Falls presented in hours: minutes, based on westbound scheduled times.

Physical improvements would range from:

- Constructing new trackwork;
- Reconfiguring, realigning, and/or removing trackwork;
- Shifting track to improve clearances;
- Rehabilitating trackwork;
- Improving signalization;
- Installing new interlockings;
- Reconfiguring, removing, or relocating interlockings;
- Upgrading to higher speed turnouts;
- Widening and/or rehabilitating the roadbed and bridges;
- Improving stations and station platforms;
- Improving at yards and maintenance facilities;
- Installing pocket track;

- Eliminating or improving grade crossings; and
- Constructing civil support projects such as rock slope and right-of-way stabilization.

Exhibit 3-11—Alternative 90A Rail Improvement Projects

Project Name (Milepost)	Project ID	Project Description
Amtrak West Side Connection Spuyten Duyvil Second Track (MPs 9 to 13)	SRP-1	Increase capacity by adding a second track.
Metro-North – Tarrytown Pocket Track / Interlocking (MPs 23.8 to 25.0)	SRP-2	Increase capacity by adding a new track to improve speed, travel time, OTP, safety and reduce delay. Allows for increased future frequency.
Metro-North New Signal System (CP 33 to CP 75) (MPs 32.8 to 75.8)	ES-12	Signal system improvements to provide operating benefits in capacity, reliability and schedule recovery.
Metro-North – New Third Track (CP 53 to CP 63) (MPs 53 to 63.5)	SRP-3	Increase capacity, reduce delay and improve schedule and operational reliability by providing the capability for freight trains to meet/pass.
Metro-North Poughkeepsie Yard / Storage Facility Track / Signals (CP 71 to CP 75) (MPs 71 to 75.8)	ES-13	New track/siding and yard will help improve speed, travel time, OTP and safety and reduce delay. Allows for increased future frequency.
Rhinecliff Station Improvements (MP 89.2)	SRP-11	Improve reliability by adding high-level platforms to cut station dwell time in half.
Hudson Line Reliability Improvements New Control Points (CP 82, CP 99, CP 136) (MPs 82 to 136)	ES-05	Improve reliability by reducing spacing of interlockings, improving dispatching options to meet or pass trains, which will decrease delays.
Hudson Line Reliability Improvements Rock Slope Stabilization (10) (MPs 105.3 to 130)	ES-04	Improve reliability by removing / stabilizing rock slopes at 10 locations (5 locations between, MPs 105.3-106, one location at MP 119.5, and 4 locations at MPs 128.1-130), upgrading slide detector fences to improve safety, and reduce delays.
Hudson Station / Track Geometry Improvements (MPs 114.5 to 115)	ES-14	Improve reliability through track realignment / new Ferry St. bridge, which will improve speed and safety for station access, ADA-compliant platform; eliminate delays by supporting two trains serving the station at the same time.
Livingston Avenue Bridge (LAB) Replacement Project (MPs 143)	ES-15	Replace deficient moveable bridge to improve safety / reliability, travel time, remove speed / weight restrictions, increase capacity.
Mohawk Subdivision – New Main Track (CP 169 to CP 179) (MPs 169 to 178.5)	EW-14a	Increase capacity by adding a dedicated passenger track to increase frequencies and provide additional capacity / reliability.
Mohawk Subdivision Congestion Relief (CP 175, CP 239 & CP248) (MPs175 to 294)	EW-05	Improve travel times, operational capacity and safety by upgrading automatic block signals, control points and interlockings.
Amsterdam Station Improvements (MP 177.6)	EIS-1	Improve reliability by constructing a new station with high level / double edge platform. Improve train operations and reduce dwell time.

Exhibit 3-11—Alternative 90A Rail Improvement Projects

Project Name (Milepost)	Project ID	Project Description
Belle Isle Capacity Improvements (CP 290 to CP 293) Syracuse Station - Track Improvements (MPs 290 to 294)	EIS-6	Increase capacity by providing additional freight train queuing capability and ability for freight trains to operate between DeWitt and Belle Isle Pocket Yard without occupying existing main line. Add second station track at Syracuse Station and reconfigure signals at the station including one new interlocking.
Rochester Subdivision Reliability Third Main Track (CP 373 to CP 382) (MPs 373 to 382)	EW-16	Increase capacity with third main track and signal system to improve speed, frequency, safety and reliability.
Rochester Subdivision Third Main Track (MP 382 to 393)	EW-20	New third main track and signal system to improve speed, frequency, and reliability.
Buffalo Depew Station Improvements (MPs 429.5 to 432.5)	EIS-10	Improve reliability by constructing new station with high level / double edge platform. Improve train operations and reduce dwell time.
Niagara Subdivision Double Track (CP 17 to CP 22) (MPs QDN17 to QDN23.8)	EW-17	Improve capacity by adding a second track.
Niagara Falls Maintenance Facility / Yard Improvements (MP QDN27)	EW-18	Improve reliability by adding storage tracks and a maintenance building to provide shore power, potable water, inspection, cleaning and light repair capabilities. Decreases time to prepare for AM departures and eliminates delays from frozen equipment. Increases layover capacity.
Niagara Falls Track Improvements (MPs QDN25 to QDN28)	EIS-12	Improve capacity and reliability by upgrading an existing track

ES = Empire Corridor South; EW = Empire Corridor West; SRP = State Rail Plan; EIS – Tier 1 Environmental Impact Statement

All physical improvements would be constructed within the existing ROW. No curves would be physically changed to increase speeds within the corridor. All improvements would be evaluated in greater detail as part of any future Tier 2 NEPA documentation.

With Alternative 90A, Amtrak service would continue to operate within the existing railroad right-of-way, primarily along the same tracks on which it presently operates and in a few limited segments on new alignments. Based on the conceptual-level design, new mainline tracks would be spaced at 15-foot centers on tangent alignments and increased for curvature. Since some existing multiple track segments where the alternative would add a track or two are at less than 15 feet (at 13 or 14 feet centers), increasing the distance between track centers to 15 feet or more may necessitate track shifts and/or isolated minor widening.

On the Hudson Line, number 32.7 turnouts would be used, where possible, to allow passenger trains to operate up to 80 mph through the diverging side of a turnout and through crossovers. This would improve run times by allowing the trains to remain at 79 mph MAS without having to decelerate and accelerate, approaching and leaving, slower speed turnouts (i.e., to 45 mph through a number 20, or to 60 mph through a number 26.5).

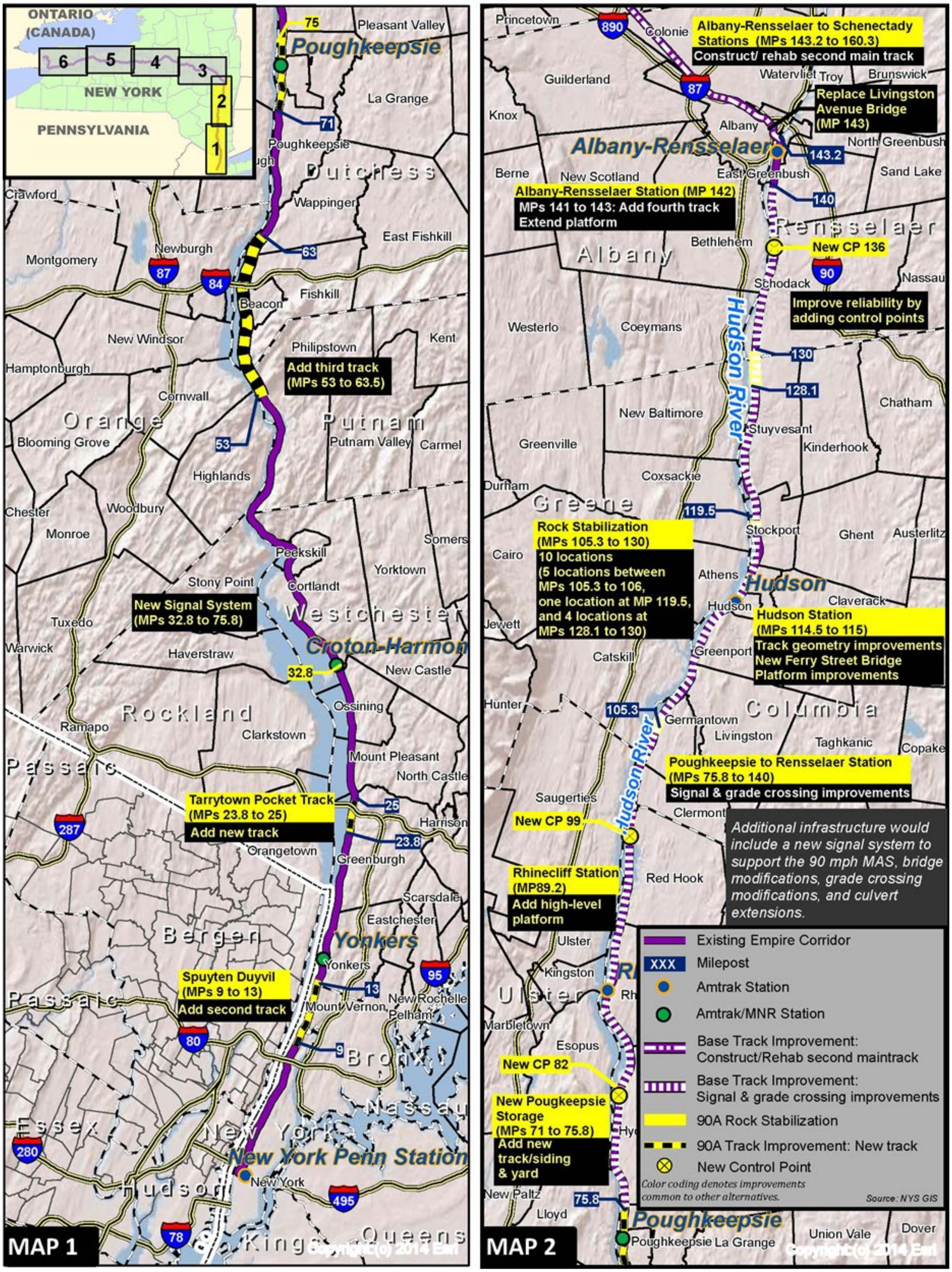


Exhibit 3-12—Alternative 90A

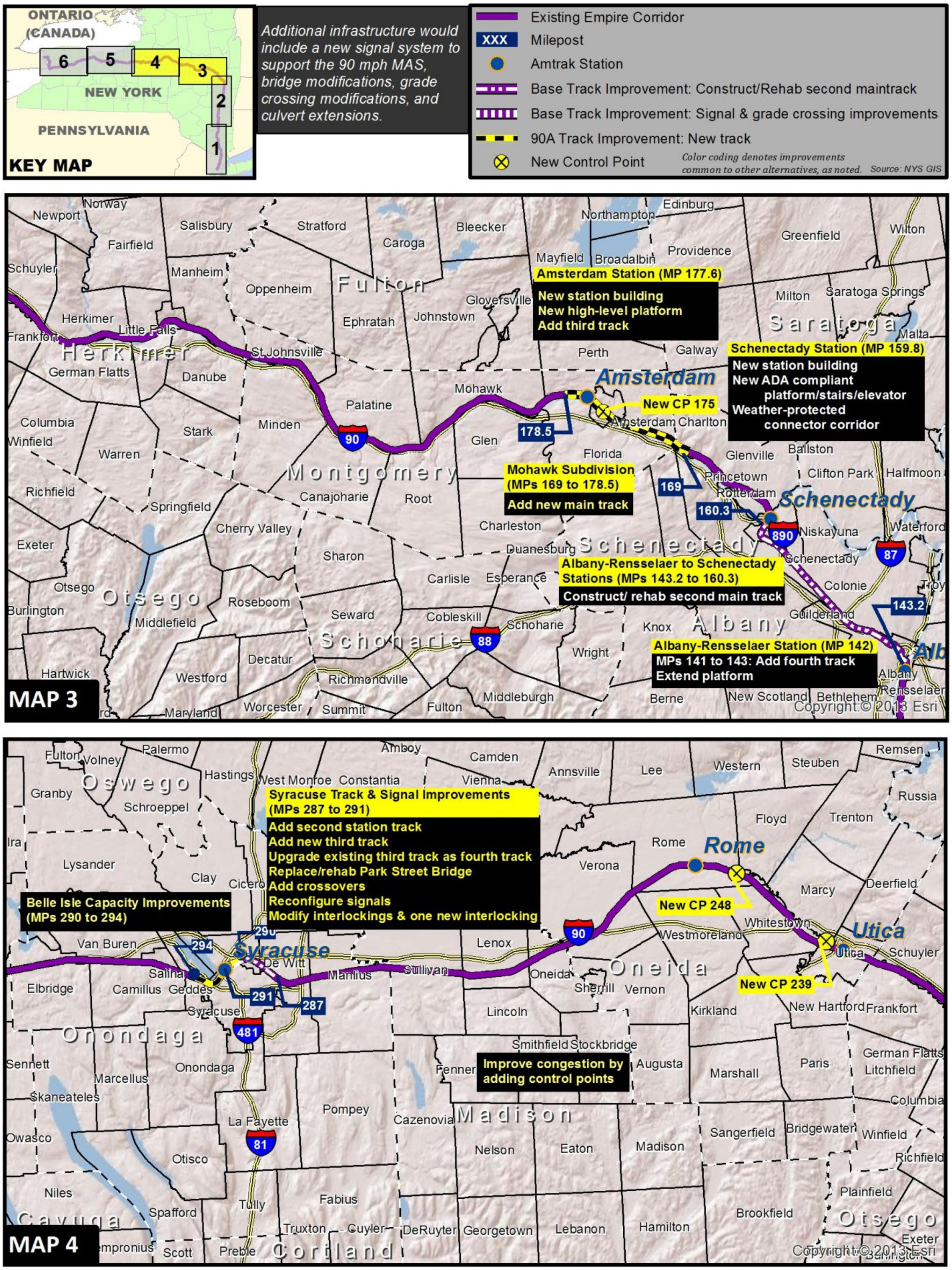


Exhibit 3-12—Alternative 90A (Maps 3 and 4)

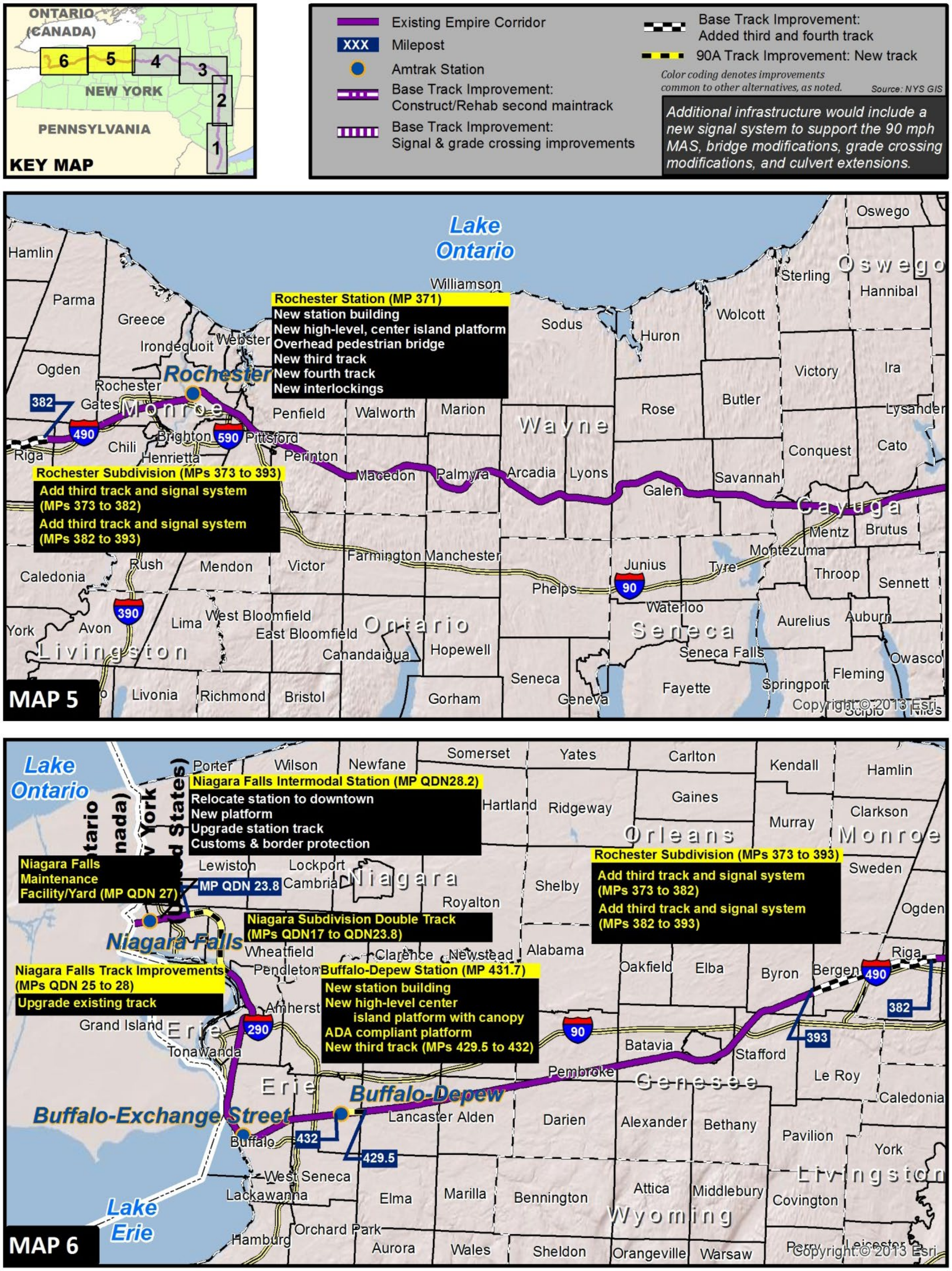


Exhibit 3-12—Alternative 90A (Maps 5 and 6)

Empire Corridor South

On the Empire Corridor South between New York City and Albany-Rensselaer, Alternative 90A includes the majority of the projects that were identified in the Hudson Line study. The Hudson Line projects are included because they provide benefits to reduce delay or improve reliability within the Hudson Subdivision. Those projects from the Hudson Line study not included in Alternative 90A either do not provide significant benefits or would be deferred to be constructed in later years. Only one project from the Hudson Line study is not included in either the Base Alternative or Alternative 90A:

- Stuyvesant Third Track and Interlocking Improvements (Project ES-06; Hudson Subdivision Reliability Third Main Track).

Alternative 90A improvements on the Empire Corridor South would include Project SRP-1 to reestablish a second track between CP 10 and CP 12 (across the Spuyten Duyvil). Alternative 90A would add a third main track at the following two locations:

- **CP 53 to CP 63** – Project SRP-3 would add a new third main track from CP 53 (north of Cold Spring Station) to CP 63 (north of New Hamburg Station) incorporating existing third track between, and modifying, CP 58 and CP 61 (at, and north of, Beacon Station); and

- **CP 71 to CP 75** – Project ES-13 would reconfigure three mainline tracks, north of Poughkeepsie Station to CP 75 (to expand the yard) and extend a third track a mile south to CP 71.

Alternative 90A would provide various other capacity improvements, reconfiguring the mainline and expanding yards to accommodate train operations and facilities at the following locations:

- **CP 24 to CP 25** – Project SRP-2 (mainline and yard improvements south of Tarrytown Station),
- **CP 33 to CP 75** – Project ES-12 (signal system improvements from Croton-Harmon Station to Poughkeepsie Station),
- **CP 71 to CP 75** – Project ES-13 (mainline and yard improvements at Poughkeepsie Station), and
- **CP 114 to CP 115** – Project ES-14 (mainline and other improvements at Hudson Station).

Facility enhancements such as track reconfigurations and platform additions would be provided at Rhinecliff, Hudson, Amsterdam, Syracuse, and Buffalo-Depew Stations, in addition to improvements from the Base Alternative at Albany-Rensselaer, Schenectady, Rochester, and Niagara Falls Stations (see Exhibit 3-6).

Empire Corridor West

On the Empire Corridor West, Alternative 90A would add significant features that include extending a new mainline third track at the following four locations:

- **CP 169 to CP 179** – Project EW-14a, capacity improvements west of Schenectady at "Hoffmans", just east of the junction with the Selkirk Branch in Glenville, to just west of Amsterdam Station; and, along the way, incorporating the existing siding at Kellogg IT (CP 173 to CP 175);

- **CP 290 to CP 293** – Project EIS-6, Belle Isle capacity improvements at Syracuse Station;

- **CP 373 to CP 382** – Project EW-16, capacity improvements from just east of the Buffalo Wye to east of Route 259 (CP 373 to CP 380); incorporating existing track east of Route 259 to the West Shore connection (CP 380 to CP 382); and

- **CP 382 to CP 393** – Project EW-20 of Alternative 90A from the West Shore connection to eight miles east of Batavia Yard (CP 382 to CP 393).

These extensions would incorporate several Base Alternative and new capital projects within Alternative 90A, including upgrades of several segments of existing track for continuity along the way.

On the Niagara Branch, Alternative 90A would provide a second main track at the following location:

- **CP 17 to CP 22** – Project EW-17 would extend a second track between CP 17 (MP QDN17) and CP 22 (to MP QDN 23.8 at Tuscarora Road), connecting both leads of the "Lockport Subdivision Tuscarora Wye."

Alternative 90A would provide new station buildings and/or station facility enhancements at five station locations, where items such as new track, crossovers and grade crossings, and ADA safety improvements, high-level platforms, and in some cases, a completely new station would be constructed.

New station buildings would be constructed at Amsterdam and Buffalo-Depew in addition to the new station buildings at Schenectady, Rochester and Niagara Falls from the Base Alternative.

Maximum Authorized Speed (MAS)

The MAS for Alternative 90A would be 90 mph (Empire Corridor West). The average running speed with Alternative 90A would increase to 57 mph, six miles per hour faster than in the Base Alternative. Amtrak passenger train speeds, both slower and faster, and limited locations along the corridor would remain unchanged in Alternative 90A. The MAS along the entire Empire Corridor is indicated on the "Alternative 90A Track Schematics," Drawings 90A-1 to 90A-17 (refer to Appendix A).

With Alternative 90A along the Empire Corridor South, the MAS for Amtrak trains traveling north of Poughkeepsie (MP 74) to Hoffmans (at CP 169 near MP 170) would remain mostly at 75 to 95 mph with some exceptions. Relatively long stretches having higher MAS of 100 mph and 110 mph would remain at the following locations:

- 110 mph would remain along two segments: between the Stuyvesant IT (MP 125), just east of the Shodack SD connection, and Albany-Rensselaer (MP 142);

- 110 mph east of Schenectady between MP 149, west of the West Albany Yard, and the Carman IT at CP 156 (MP 156); and

- 100 mph would remain for most of the way west of Schenectady Station between MP 161 and Hoffmans at CP 169 (near MP 170).

Slower MAS would remain at the following locations along the Empire Corridor South:

- 50 mph at Hudson (MP 114),

- 30 to 75 mph approaching Albany-Rensselaer Station and the West Albany Yard (MP 141 to MP 145), and
- 30 to 70 mph at Schenectady Station (MP 159 to MP 161).

With Alternative 90A along the Empire Corridor West, the MAS for passenger trains traveling west of Hoffmans at CP 169 (near MP 170) to west of Frontier Yard (MP 435), west of Buffalo-Depew Station would remain mostly at 70 and 79 mph with many short segments having slower speeds. Slower MAS would remain at the locations on the Empire Corridor West listed in Exhibit 3-13.

Exhibit 3-13—Alternative 90A – Slower MAS

MP	Location	Description
193	Fonda	50 mph west of Amsterdam at for a mile at MP 183, just east of Fonda Yard, and at "Big Nose" curve
199	Canajoharie	60 mph at CP 198, just west of Route 10
217	Little Falls	55 mph at Borroughs Team Track (between CP 215 and CP 218)
237	Utica	60 mph at Utica Station
285 - 287	Dewitt	40 mph at DeWitt Yard
287 - 294	Syracuse	55 and 60 mph passing Syracuse Station (CP 293)
320	Savannah	40 mph at the "Floating Bridge" over the Seneca River
333 – 340	Lyons	55 to 70 mph passing Lyons Yard and approaching the Ontario Midland Railroad connection west of the yard
350 – 360	Macedon	65 mph for mile-long segments west of CP 349, and just west of the West Shore connection at CP 359
369 – 372	Rochester	55 to 45 mph passing Rochester Yard and Rochester Station
375	Rochester	45 mph at CP 375, just west of the Buffalo Wye
435 - QDN28	Buffalo Exchange Street & Niagara Falls	40 and 60 mph west of Frontier Yard to Niagara Falls on the Niagara Branch

Service Frequency Enhancement

Alternative 90A would increase the frequency of Amtrak Empire Service. Amtrak service between New York City and Albany-Rensselaer Station would increase to 16 daily round trips, adding three trains, a 23 percent gain above the current 13 trips in the Base Alternative. Service between Albany-Rensselaer Station and Buffalo would increase to eight daily round trips, with seven continuing on to Niagara Falls, roughly doubling the current four-trip service to Buffalo in the Base Alternative.

Schedule Enhancement: Express Service and Station Stops

The improvements in Alternative 90A would add express service to the Amtrak Empire Service. Four new round trips would operate as an express service with station stops in Niagara Falls, Buffalo-Exchange Street, Buffalo-Depew, Rochester, Syracuse, Albany-Rensselaer and New York City (Penn Station).

Equipment

Alternative 90A would add six train sets to increase the frequency of Amtrak service.

Capital Costs

The estimated capital cost of Alternative 90A is $1.72 billion (in 2017 dollars). The major cost components in Alternative 90A are the 20 additional capital improvement projects. The cost includes costs for Positive Train Control (PTC) and for additional train sets and equipment to increase the frequency of Amtrak rail service.

Trip Time

In Alternative 90A, the trip time between New York City and Niagara Falls, based on westbound scheduled times, would be 8 hours and 8 minutes (8:08). This would be 58 minutes shorter than the 9 hour and 6 minute (9:06) trip in the Base Alternative.

On-Time Performance

The OTP for Alternative 90A along the Empire Corridor West would be 92.4 percent in the year 2035.

Ridership

Alternative 90A is projected to increase annual ridership to 2.3 million passengers in the year 2035. This would be a gain of 700,000 above the 1.6 million passengers projected in 2035 for the Base Alternative.

Revenue

Annual revenue for Alternative 90A is projected to be $122 million.

Operations & Maintenance Costs

Operations and maintenance costs for Alternative 90A are estimated at approximately $160 million per year.

Safety

The improvements included in Alternative 90A would result in an overall increase in safety for the traveling public. The increase in train ridership would translate to a decrease in highway traffic volume. With fewer cars on the road this would, in turn, naturally result in fewer traffic accidents and other safety gains. Although there would be additional rail tracks built at some grade crossings, no new grade crossings would be added. Existing grade crossing warning/ protection will be upgraded as needed with crossing gates, signs, crossbucks, flashers, etc. Private crossings will be protected by fence gates and signs, not active warning systems. Perimeter fencing has been accounted for in the cost estimate on both sides of the right-of-way. Since the frequency of accidents, injuries, and deaths involving trains, especially with modern safety features at railroad grade crossings, is much lower than the frequency of accidents on highways, the overall number of accidents, injuries, and deaths would decrease due to the shift in travel from passenger cars to rail.

Passenger and freight trains are currently comingled on CSXT's right-of-way. CSXT has expressed concerns about comingling of passenger rail and freight on Empire Corridor.

Alternative 90A will provide additional trackage to better segregate passenger rail and freight rail, thereby improving safety of rail transportation on the Empire Corridor. Alternative 90A would not increase the risk of an accident due to the proposed capital improvement projects. Alternative 90A would include improvements to the signalizing system and Positive Train Control system, which would increase safety over existing conditions.

Implementation of safety measures, such as Positive Train Control (PTC), will be included in the design and construction of each of the alternatives. It is also anticipated that crash energy management measurements will be included in the design criteria for each concept alignment. CSXT's comments, including concerns regarding safety, are responded to in Appendix K, Comments and Responses for Railroads. During the Tier 2 assessments, additional coordination with CSXT will be performed to obtain input into the development of design plans.

The proposed track improvements would be designed to comply with American Railway Engineering and Maintenance-of-Way Association, Amtrak, and CSXT design criteria. Federal funding announced in 2017 for positive train control will improve safety for the route between Schenectady and Poughkeepsie, and Metro-North and the State of New York have advanced initiatives for PTC along the Hudson Line south of Poughkeepsie. Positive train control has also been implemented by CSXT west of Schenectady.

Freight Operations

Alternative 90A would provide additional sections of track, with sections of third main track added in at least five locations and second track added in at least two locations. For Alternative 90A, the new passenger tracks along Empire Corridor West would generally be located on the north side. The line historically operated as a four-track system, and, as part of cost-saving measures that started in the late 1950s, the two tracks that formerly existed on the north side were either removed or converted to sidings to save on maintenance. The new passenger tracks would be added in the former locations of these two tracks. The simulation of rail operations and the analysis of the potential impact of the program alternatives on freight operations demonstrate that Alternative 90A will likely have a positive effect on freight movements (or will at least be comparable to the Base Alternative) (see Exhibit 6-8 and Appendix D). Service is demonstrated to improve for both passenger and freight train operations as passenger interference is minimized. The Rail Network Operations Simulation (Appendix D) used information provided by CSXT for both current and future train movements.

The primary factors for installing tracks on the north side include the ability to upgrade existing sidings in place to become the third and fourth tracks. The current tracks in operation are on the south side of the right-of-way, and there is availability of right-of-way on the north where this area previously had tracks in operation. Installation on the south side would also require property acquisition in places. In many cases, infringement on waterways, roadways, or other obstacles, such as bridge columns, would occur. Sections of the Erie Canal system or Mohawk River closely adjoin the existing railroad in several different locations.

During final design there will be a detailed evaluation of the need to construct additional crossovers, flyovers, and interlockings to allow freight trains running on the south side to crossover the new passenger mains to reach freight facilities on the north side.

3.3.3. Alternative 90B (Preferred Alternative)

NYSDOT has identified Alternative 90B in this Tier 1 Final EIS as the Preferred Alternative, for reasons described in Chapter 6. The selection of the Preferred Alternative considered the comments received from the public and agencies during the public comment period for the Tier 1 Draft EIS. This Tier 1 Final EIS presents the comparison with the Base and all other Build Alternatives considering the program purpose and need, engineering and operational characteristics, costs, and socioeconomic and environmental impacts, which were all factors in the selection of the Preferred Alternative.

Alternative 90B, one of the two 90 mph alternatives, uses 90 miles per hour as the maximum authorized speed, and consists of constructing new third and fourth mainline track and a new signal system to support the 90 mph speed. This alternative would use current vehicle technology with the possibility of integrated trainsets. Alternative 90B would fall into the FRA's "Regional" category. Alternative 90B would improve service with the purchase of new train sets that would be used to increase the Empire Service to 17 daily round trip trains operating between New York City and Albany-Rensselaer and to eight daily round trips between Albany-Rensselaer and Buffalo, of which seven continue on to Niagara Falls. The key features of Alternative 90B are illustrated in Exhibit 3-14.

Physical Improvements

Alternative 90B would add a total of approximately 370 miles of additional trackage to better segregate passenger rail and freight trains. Alternative 90B would add dedicated third main passenger track for approximately 273 miles between Schenectady (MP 159) and Buffalo-Depew (MP 432) (see Exhibit 3-15). It would also add a fourth passenger track over a combined distance of approximately 39 miles in five separate locations (MP 170-179, MP 204-214, MP 235-239, MP 301-309, MP 375-383). Based on the conceptual-level design, the third main passenger track would be located on the north side of the existing tracks, 15 feet from the existing mainline, and would generally occupy the portion of the existing railroad bed that historically contained two tracks. The fourth tracks would be located 15 feet further north of the dedicated third track and have been designated with a MAS of 90 mph. Alternative 90B would also add double track to the Niagara Branch between MPs QDN 2 and 7, west and north of the Buffalo Exchange Street Station.

Additional infrastructure would include:

- A new signal system to support the 90 mph MAS;
- Bridge modifications;
- Grade crossing modifications;
- Culvert extensions;
- Station improvements; and
- Three grade separated flyovers (MP 279, MP 366, and MP 427) where the third main passenger track passes over the existing freight tracks on an elevated structure, eliminating any potential conflicts with freight train movements.

The proposed flyovers are capital intensive, but would serve as an effective infrastructure improvement that could be designed to reduce passenger/freight interference. The concepts for the three flyovers presented in this Tier 1 Final EIS would be developed further in Tier 2 design. Other alternatives could be explored by developing a series of joint improvements both for station access and layouts and track/signal systems and alignment.

Grade crossing modifications would be required to accommodate new tracks. Upgrades to existing grade crossing warning devices would be determined in subsequent design phases and in any Tier 2 documents.

Locations for potential maintenance service roads have been identified along the entire corridor between MP 159 and MP 432. Service roads provide necessary access to the railroad infrastructure for routine inspections, regular maintenance, and emergency situations. The specific need, size, and location of the service roads will be determined in subsequent design phases and Tier 2 studies. Some level of property acquisition would be required over substantial portions of Alternative 90B, not only for service road construction, but to accommodate the geometry and track centers of the third and fourth main tracks.

Empire Corridor South

The improvements proposed with Alternative 90A on the Empire Corridor South also would be included in Alternative 90B. The additional improvements provided with Alternative 90B would all be located on the Empire Corridor West.

Empire Corridor West

Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6 summarize the characteristics and improvements proposed for Alternative 90B, which also include improvements proposed for Alternative 90A. For descriptive purposes, the major physical improvement features of Alternative 90B are presented in two segments along the Empire Corridor West. The first segment is between Schenectady and Syracuse (MPs 159-292), and the second is between Syracuse and Buffalo-Depew (MPs 292-432). Syracuse Station is the approximate center of the third track segment (133 miles from Schenectady to Syracuse and 140 miles from Syracuse to Buffalo-Depew).

Schenectady to Syracuse (MP 159-292)

Within this segment, Alternative 90B would provide the major improvements shown in Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6, based on the conceptual design developed for this Tier 1 Final EIS.

Several areas would require larger track shifts to obtain an increase in operating speeds due to the existing geometry of the track: MP 168.3, MP 192.6, MP 198.5, MP 199.4, and MP 205.6.

Station improvements would be made at the following existing stations:

- **Schenectady Station** – As proposed for the Base Alternative, new station building, stairs and elevators to platforms, ADA compliant platform, and weather-protected corridor would be provided, and a new third track would be added with Alternative 90B.

- **Amsterdam Station** – As proposed for Alternative 90A, a new station building, ADA compliant counter, restrooms, ramps, elevators would be provided, with a new high-level platform and new third track, but Alternative 90B would also add an overhead pedestrian bridge and new fourth track.

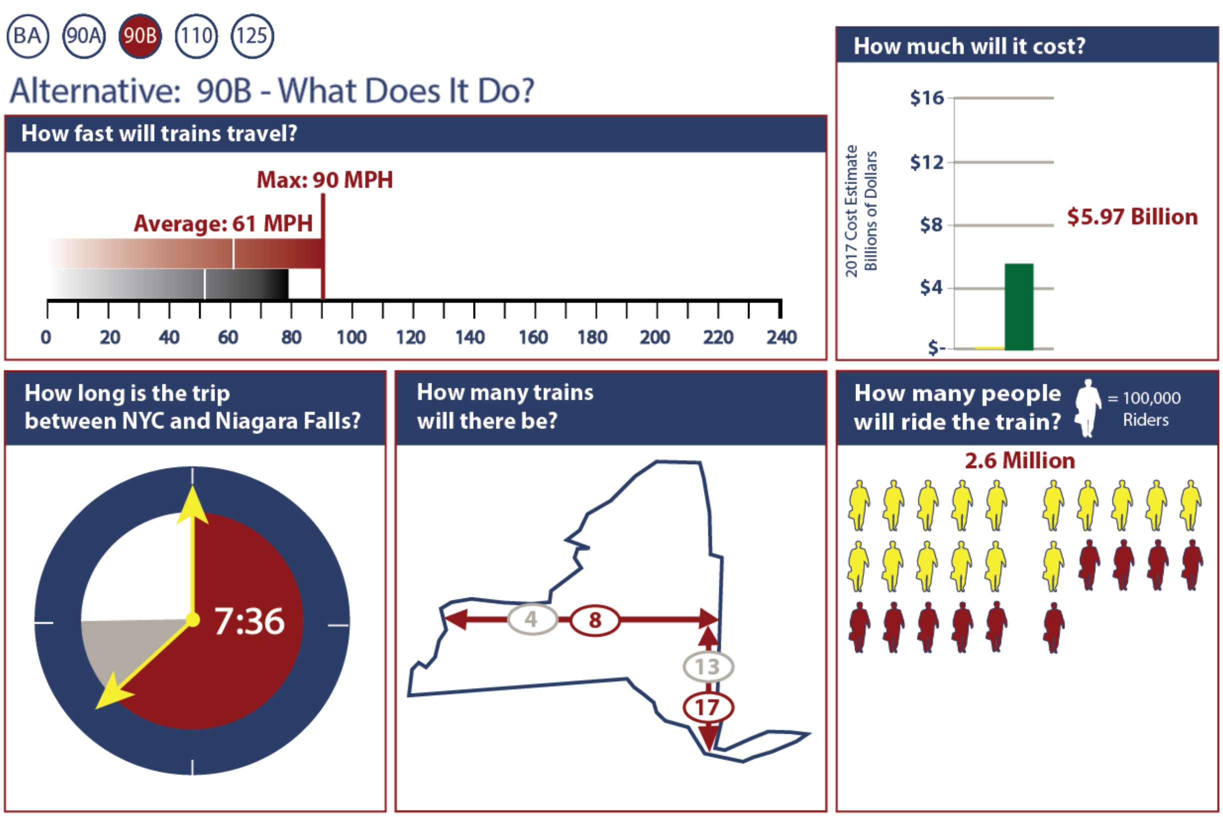
- **Utica Station -** New center island platform, overhead pedestrian bridge, and new third and fourth track would be provided.

- **Rome Station** – New side platform and new third track would be provided.

- **Syracuse Station** – As proposed for the Base Alternative, upgrades to the existing third track would be provided. As proposed for Alternative 90A, new second and third tracks, modified and one new interlocking, and added crossovers and reconfigured signals would be provided, in addition to rehabilitation/replacement of the Park Street Bridge. Alternative 90B would also modify the existing side platform.

Alternative 90B also would require realignment of several existing roadways that are adjacent to the railroad right-of-way over a total length of approximately four miles. Roadway realignments would be required along approximately 3.5 miles of Route 5 and other roadways that closely parallel the railroad between Schenectady County and Onondaga County. Most of these realignments would be minor and as little as approximately ten feet horizontally. Other roadway realignments would be more substantial, could range in excess of 50 feet horizontally, and could potentially involve property acquisition for the roadway relocation. Coordination with local authorities and FHWA, as appropriate, will occur in individual project planning and Tier 2 efforts.

Exhibit 3-14—Alternative 90B (Preferred Alternative) – Key Features



Note: Travel time between NYC and Niagara Falls presented in hours: minutes, based on westbound scheduled times.

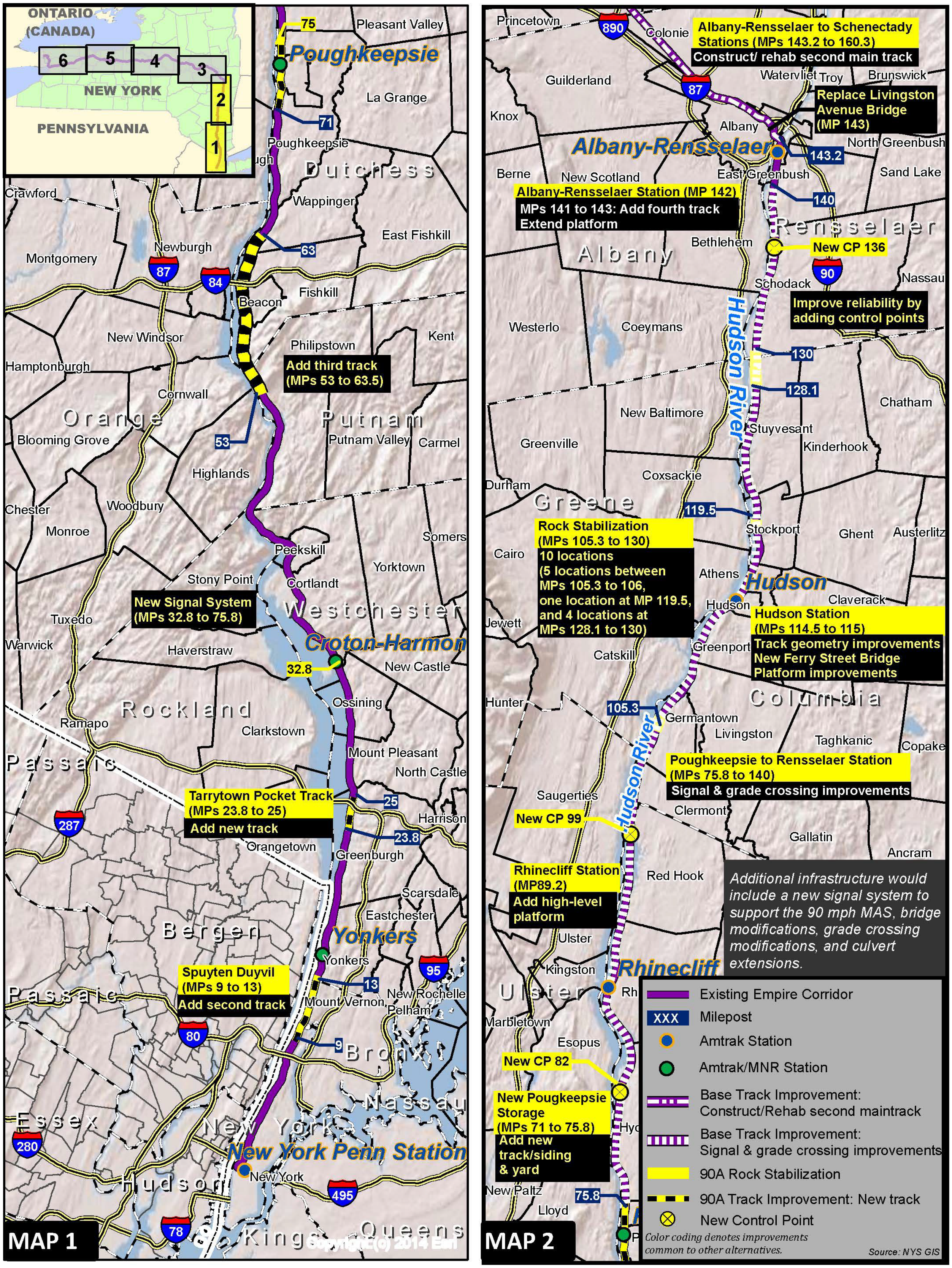


Exhibit 3-15—Alternative 90B (Preferred Alternative)

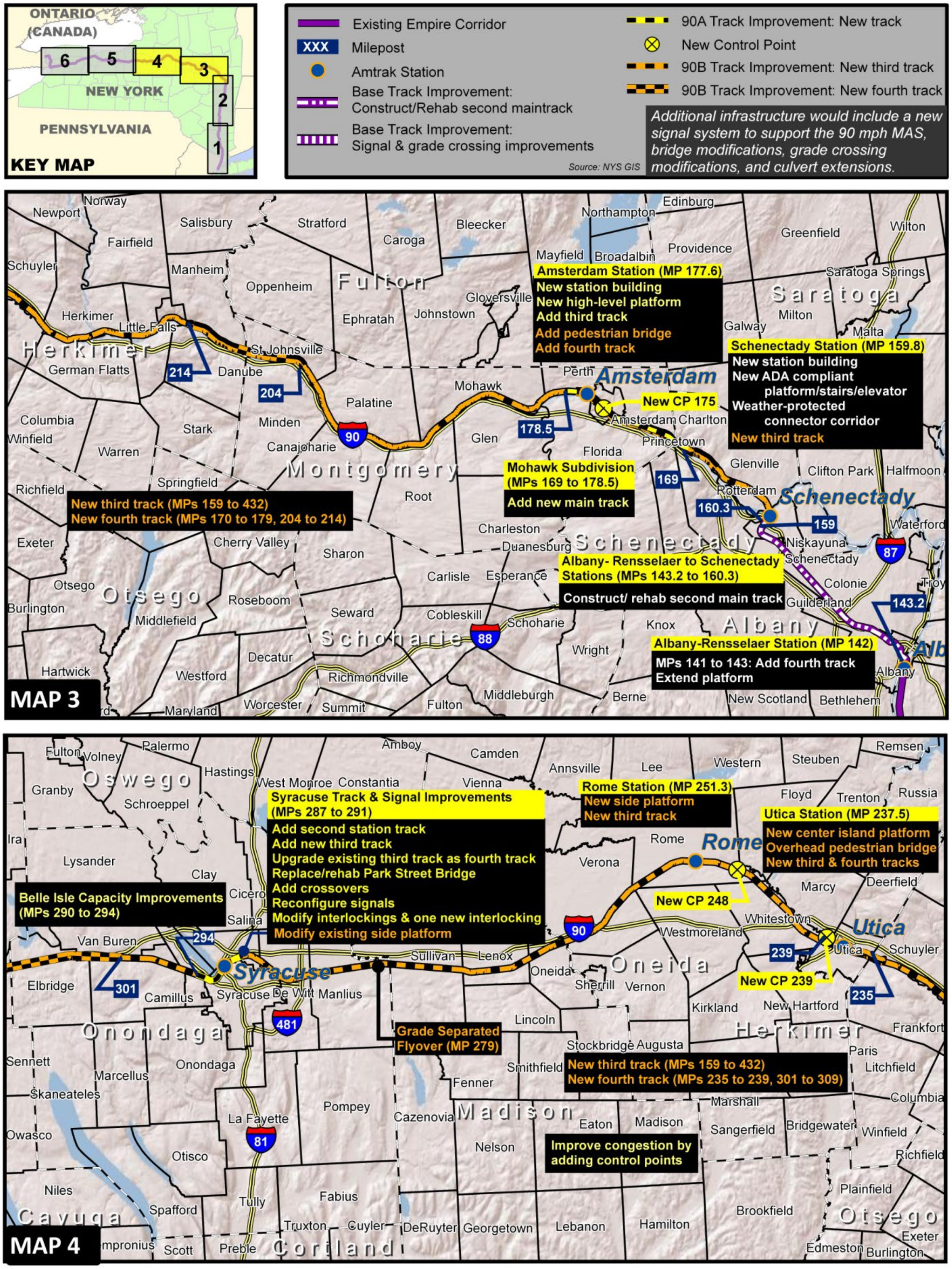


Exhibit 3-15—Alternative 90B, Preferred Alternative (Maps 3 and 4)

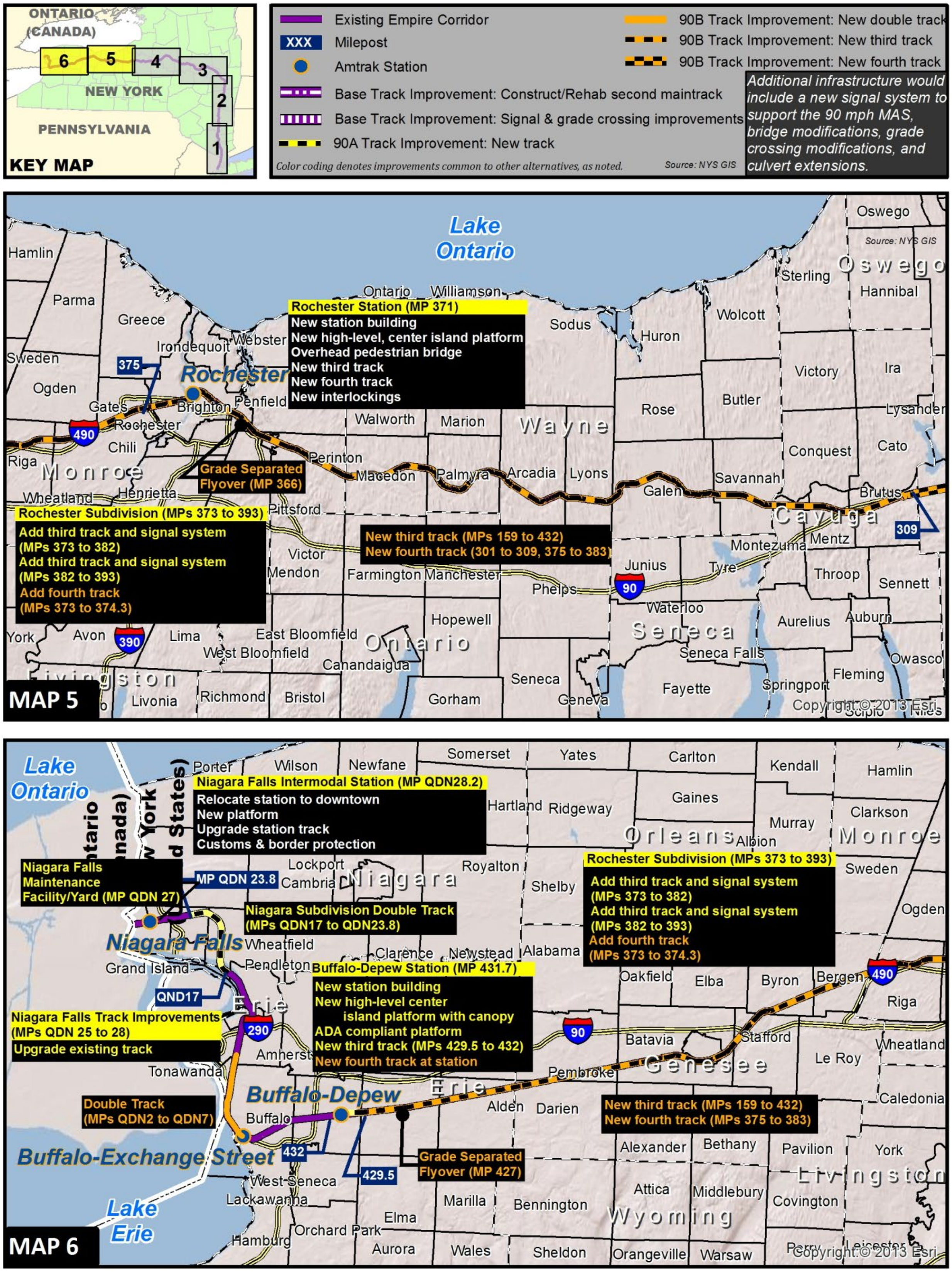


Exhibit 3-15—Alternative 90B, Preferred Alternative (Maps 5 and 6)

Potential property acquisitions that could require acquisition of a structure in addition to open land include: MP 168.33 (Glenville, Schenectady County), MP 210.8 (Manheim, Herkimer County), MP 215.6 (Little Falls, Herkimer County), MP 237.7 (Utica, Oneida County), and MP 286.4 (De Witt, Onondaga County).

Syracuse to Buffalo-Depew (MP 292-432)

Within this segment, Alternative 90B would provide the major improvements shown in Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6, based on the conceptual design developed for this Tier 1 Final EIS.

No major track realignment areas would be needed to obtain an increase in operating speed.

Station improvement would be made at the following existing stations:

- **Rochester Station (completed in 2017)** – As proposed with the Base Alternative and Alternative 90A, new third and fourth tracks and interlockings will be provided, along with a new station building, new high-level center island platform, and overhead pedestrian bridge.

- **Buffalo-Depew Station** – As proposed with Alternative 90A, a new station building, high level center island platform and ADA compliant platform, ticket counter, restrooms, ramps, and railings, along with a new third track would be provided. Alternative 90B would also add a new fourth track.

Realignment of several existing roadways that are adjacent to the railroad right-of-way would be required over a total length of approximately four tenths of one mile in Onondaga and Cayuga counties. These realignments would be minor and as little as approximately ten feet horizontally.

Potential property acquisitions that could require acquisition of a structure in addition to open land include: MP 341.1 (Arcadia, Wayne County) and MP 377.6 (Gates, Monroe County).

Maximum Authorized Speed

Alternative 90B would provide for a MAS of 90 mph between Albany, Buffalo and Niagara Falls.

Service Frequency Enhancement

Alternative 90B would increase the frequency of Amtrak Empire Service. Amtrak service between New York City, and Albany-Rensselaer would increase to 17 daily round trips, adding four trains, a 30 percent gain above the current 13 trips in the Base Alternative. Service between Albany and Buffalo would increase to eight daily round trips, seven of which continue on to Niagara Falls, doubling the current four-trip service to Buffalo in the Base Alternative.

Schedule Enhancement: Express Service and Station Stops

No express service is proposed for Alternative 90B.

Equipment

Alternative 90B would add six train sets to increase the frequency of Amtrak service.

Capital Costs

The estimated capital cost of Alternative 90B, the Preferred Alternative, is $5.97 billion.

Trip Time

With Alternative 90B, the trip time between New York City and Niagara Falls, based on westbound scheduled times, would be 7 hours and 36 minutes (7:36). This would be 32 minutes less than Alternative 90A's trip time and one hour and 30 minutes (1:30) less than the Base Alternative's trip time.

On-Time Performance

The OTP for Alternative 90B along the Empire Corridor West would be 95.4 percent in the year 2035.

Ridership

Alternative 90B is projected to increase ridership to 2.6 million passengers in the year 2035. This would be a gain of approximately 300,000 passengers above projected ridership for Alternative 90A and a gain of approximately one million passengers above projected ridership for the Base Alternative in 2035.

Revenue

Annual revenue for Alternative 90B is projected to be $143 million.

Operations & Maintenance Costs

Operations and maintenance costs for Alternative 90B are estimated at approximately $176 million per year.

Safety

The improvements included in Alternative 90B would result in an overall increase in safety for the traveling public. The increase in train ridership would translate to a decrease in highway traffic volume. With fewer cars on the road this would, in turn, naturally result in fewer traffic accidents and other safety gains. Moreover, Alternative 90B will add approximately 370 miles of additional trackage, including third and fourth track, which will provide better segregation of passenger rail and freight trains. This should reduce conflicts between passenger rail and freight trains and provide improvements in safety. Although there would be additional rail tracks built at some grade crossings, no new grade crossings would be added. Grade crossing warning system upgrades will be installed at all existing grade crossings to accommodate operations at the higher speeds. Safety system upgrades that could be considered include CCTV installations at grade crossings. All of the existing crossings will be converted to automatic systems for improved safety. The warning system at grade crossings will be integrated with the rail signal system. Costs for fencing for portions of the corridor on both sides of the right-of-way have been incorporated, which will provide improved safety by preventing trespassing within the right-of-way. Since the frequency of accidents, injuries, and deaths involving trains, especially with modern safety features at railroad grade crossings, is much lower than the frequency of accidents on highways, the overall number of accidents, injuries, and deaths would decrease due to the shift in travel from passenger cars to rail.

Passenger and freight trains are currently comingled on CSXT's right-of-way. CSXT has expressed concerns about comingling of passenger rail and freight on Empire Corridor.

The Preferred Alternative, Alternative 90B, will provide additional trackage to better segregate passenger rail and freight rail, thereby improving safety of rail transportation on the Empire Corridor. Approximately 370 miles of new track will consist largely of third track in the Mohawk Valley, where CSXT freight operates west of Albany. Alternative 90B would not increase the risk of an accident due to the proposed capital improvement projects. Alternative 90B would include improvements to the signalizing system and Positive Train Control system, which would increase safety over existing conditions.

Implementation of safety measures, such as Positive Train Control (PTC), will be included in the design and construction of each of the alternatives. It is also anticipated that crash energy management measurements will be included in the design criteria for each concept alignment. CSXT's comments, including concerns regarding safety, are responded to in Appendix K, Comments and Responses for Railroads. During the Tier 2 assessments, additional coordination with CSXT will be performed to obtain input into the development of design plans.

The proposed track improvements would be designed to comply with American Railway Engineering and Maintenance-of-Way Association, Amtrak, and CSXT design criteria. Federal funding announced in 2017 for positive train control will improve safety for the route between Schenectady and Poughkeepsie, and Metro-North and the State of New York have advanced initiatives for PTC along the Hudson Line south of Poughkeepsie. Positive train control has also been implemented by CSXT west of Schenectady. A System Safety Plan will be prepared for approval for FRA prior to the start of system operation, in compliance with federal guidelines.

Freight Operations

Alternative 90B would include the Alternative 90A additional sections of track (with sections of third main track added in at least five locations and second track added in at least two locations) plus would add an additional 273 miles of third track and 39 miles of fourth track at five separate locations. These third and fourth main tracks would be placed at least 15 feet from the existing mainline, in the existing railbed that historically contained two tracks. These improvements are anticipated to improve freight trip times between Selkirk Yard in Albany and Buffalo by at least 5 minutes and up to 14 minutes. It is anticipated that this will increase freight capacity, as the rail simulation shows a decrease in freight delays, even with future anticipated freight increases. Future coordination with CSXT on professional dispatching and operations to reduce freight conflicts to maximize freight capacity will be performed.

The simulation of rail operations and the analysis of the potential impact of the program on freight operations demonstrate that the Preferred Alternative will have a positive effect on freight movements (see Exhibit 6-8). The additional capacity of increased mainline track in Alternatives 90B along with professional dispatching will result in positive benefits to freight traffic by decreasing delays and uncertainty. Service is demonstrated to improve for both passenger and freight train operations as passenger interference is minimized. The Rail Network Operations Simulation (Appendix D) used information provided by CSXT for both current and future train movements. With Alternative 90B, freight train delay-minutes would decrease the most among all alternatives, improving 10 percent over the Base Alternative and 6 percent over Alternative 110, the second best Build Alternative.

For Alternative 90B, the new passenger tracks along Empire Corridor West would generally be located on the north side. The line historically operated as a four-track system, and, as part of cost-saving measures that started in the late 1950s, the two tracks that formerly existed on the north side were either removed or converted to sidings to save on maintenance. The new passenger tracks would be added in the former locations of these two tracks.

The primary factors for installing tracks on the north side include the ability to upgrade existing sidings in place to become the third and fourth tracks. The current tracks in operation are on the south side of the right-of-way, and there is availability of right-of-way on the north where this area previously had tracks in operation. Installation on the south side would also require property acquisition in places. In many cases, infringement on waterways, roadways, or other obstacles, such as bridge columns, would occur. Sections of the Erie Canal system or Mohawk River closely adjoin the existing railroad in several different locations.

During final design there will be a detailed evaluation of the need to construct additional crossovers, flyovers, and interlockings to allow freight trains running on the south side to crossover the new passenger mains to reach freight facilities on the north side.

3.3.4. Alternative 110

Alternative 110 uses 110 miles per hour as the maximum authorized speed and would construct new third and fourth main track and a new signal system to support the 110 mph speed. This alternative would use current vehicle technology with the possibility of integrated trainsets. Alternative 110 would fall into the FRA's "Regional" category.

Alternative 110 would improve service with the purchase of new train sets that would be used to increase the Empire Service to 17 daily round trip trains operating between New York City and Albany-Rensselaer. Eight daily round trips would be made between Albany and Buffalo, of which seven continue on to Niagara Falls. The key features of Alternative 110 are illustrated in Exhibit 3-16.

Physical Improvements

Alternative 110 would add approximately 384 miles of additional trackage to better segregate passenger rail and freight trains. Alternative 110 would add a dedicated third main passenger track between Schenectady (MP 159) and Buffalo-Depew (MP 432) (see Exhibit 3-17). It would also add a fourth passenger track in six locations (MP 174-184, MP 218-229, MP 235-239, MP 246-259, MP 310-320, and MP 388-399). Based on the conceptual-level design, the third main passenger track would be located on the north side of the existing tracks between MPs 159 and 366 and on the south side from MPs 366 to 432, generally 30 feet from the existing mainline and occupying a portion of the existing railroad bed that historically contained two tracks. Due to existing physical conditions that would make it impractical to achieve the 30-foot separation (between track centers), there would be sections of third main track located 15 feet from the existing track. In these instances, the MAS would be reduced to 90mph. The fourth tracks would be located between the dedicated third track and the existing track using 15-foot track centers, with a designated MAS of 90 mph.

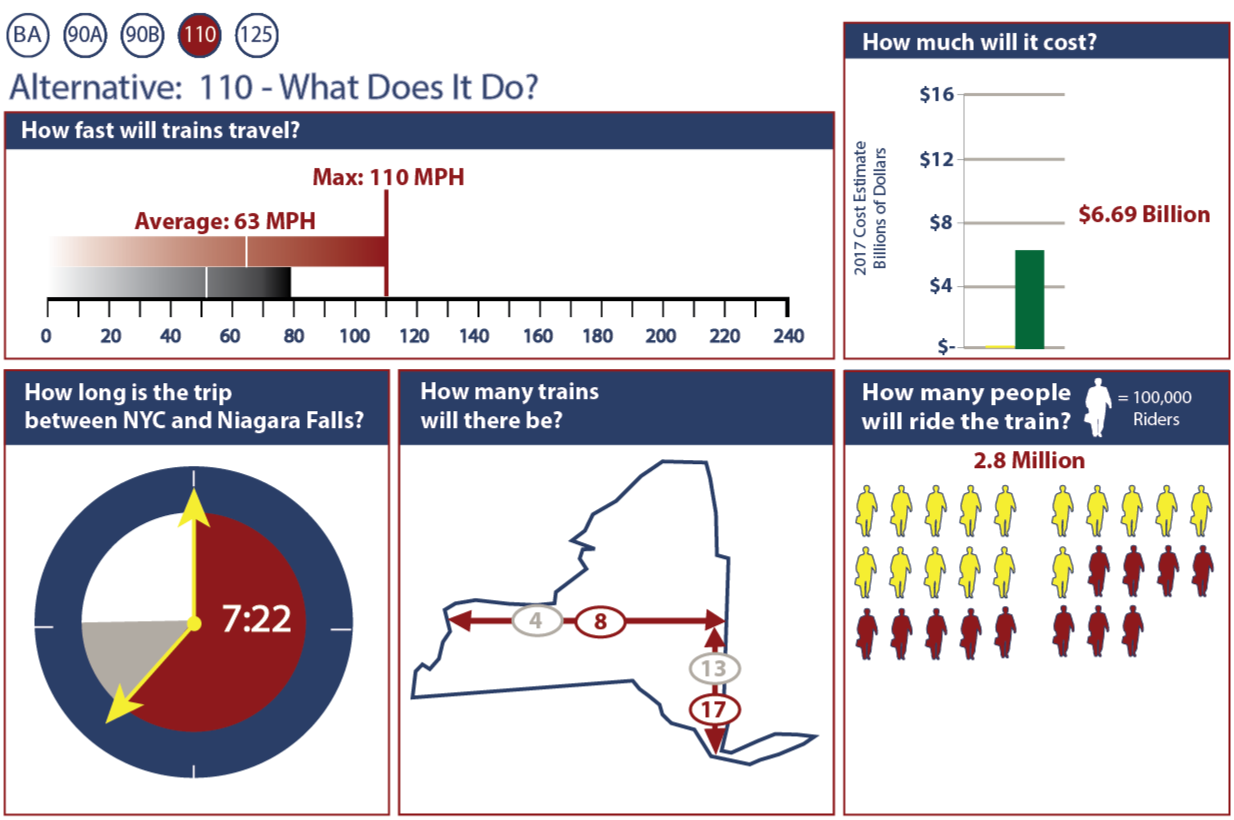
Additional infrastructure would include:

- A new signal system to support the 110 mph MAS;
- Bridge modifications;
- Grade crossing modifications;
- Culvert extensions;

- Station improvements; and
- Two grade separated flyovers (MPs 279 and MP 366) where the third main passenger track passes over the existing freight tracks on an elevated structure, eliminating any potential conflicts with freight train movements.

The proposed flyovers are capital intensive, but would serve as an effective infrastructure improvement that could be designed to reduce passenger/freight interference. The concepts for the two flyovers presented in this Tier 1 Final EIS would be developed further in Tier 2 design. Other alternatives could be explored by developing a series of joint improvements both for station access and layouts and track/signal systems and alignment.

Exhibit 3-16—Alternative 110 – Key Features



Note: Travel time between NYC and Niagara Falls presented in hours: minutes, based on westbound scheduled times.

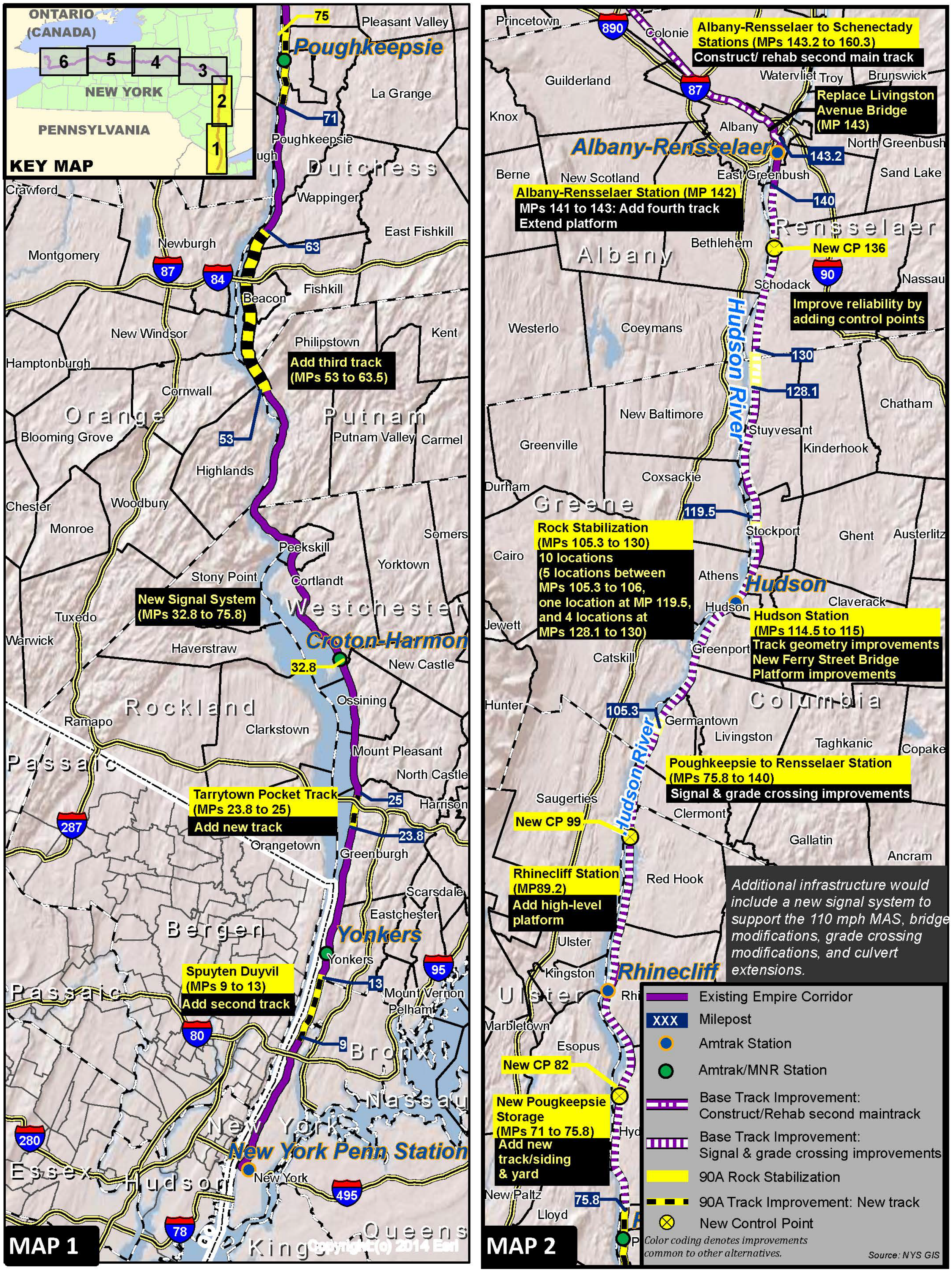


Exhibit 3-17—Alternative 110

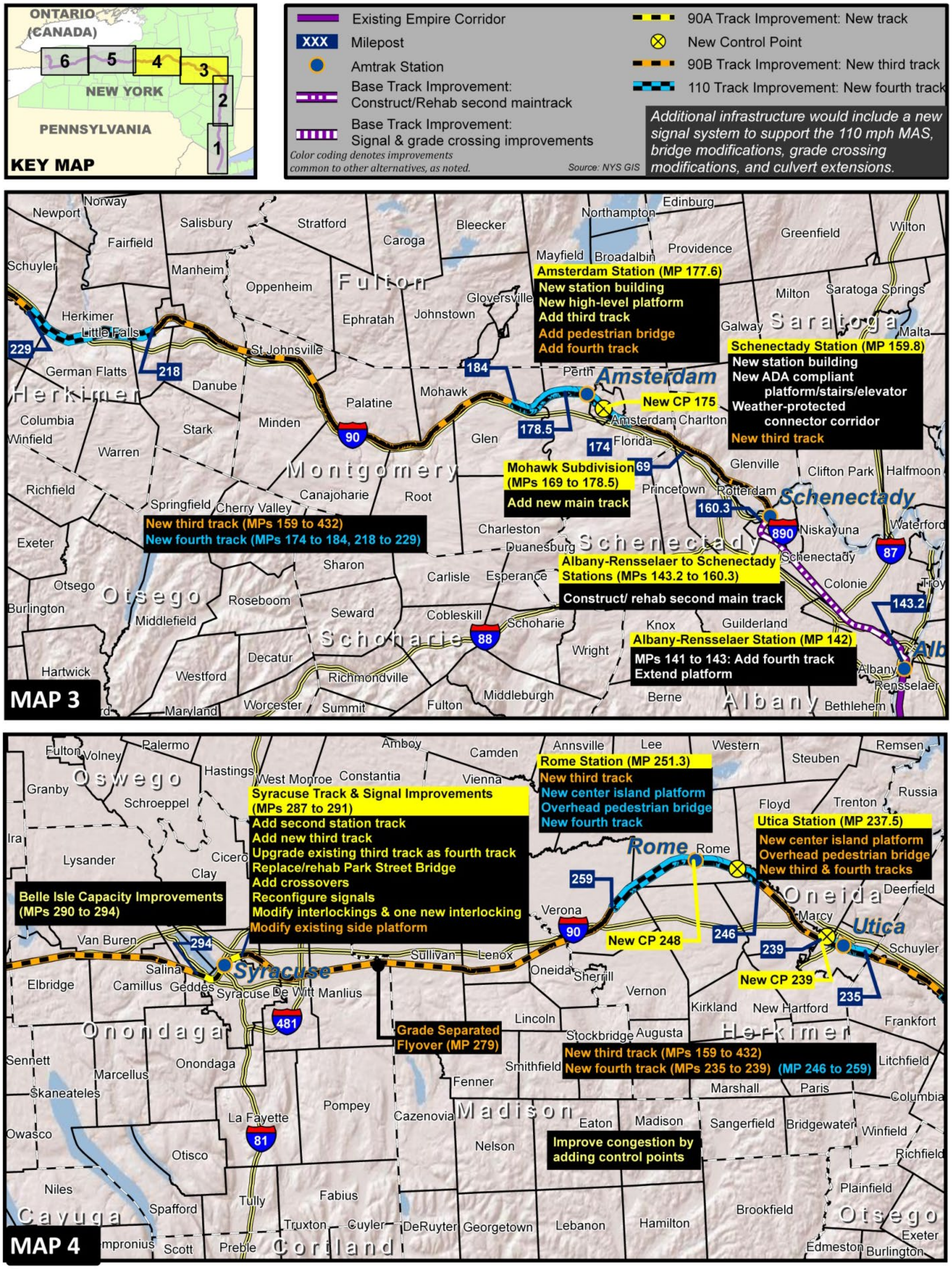


Exhibit 3-17—Alternative 110 (Maps 3 and 4)

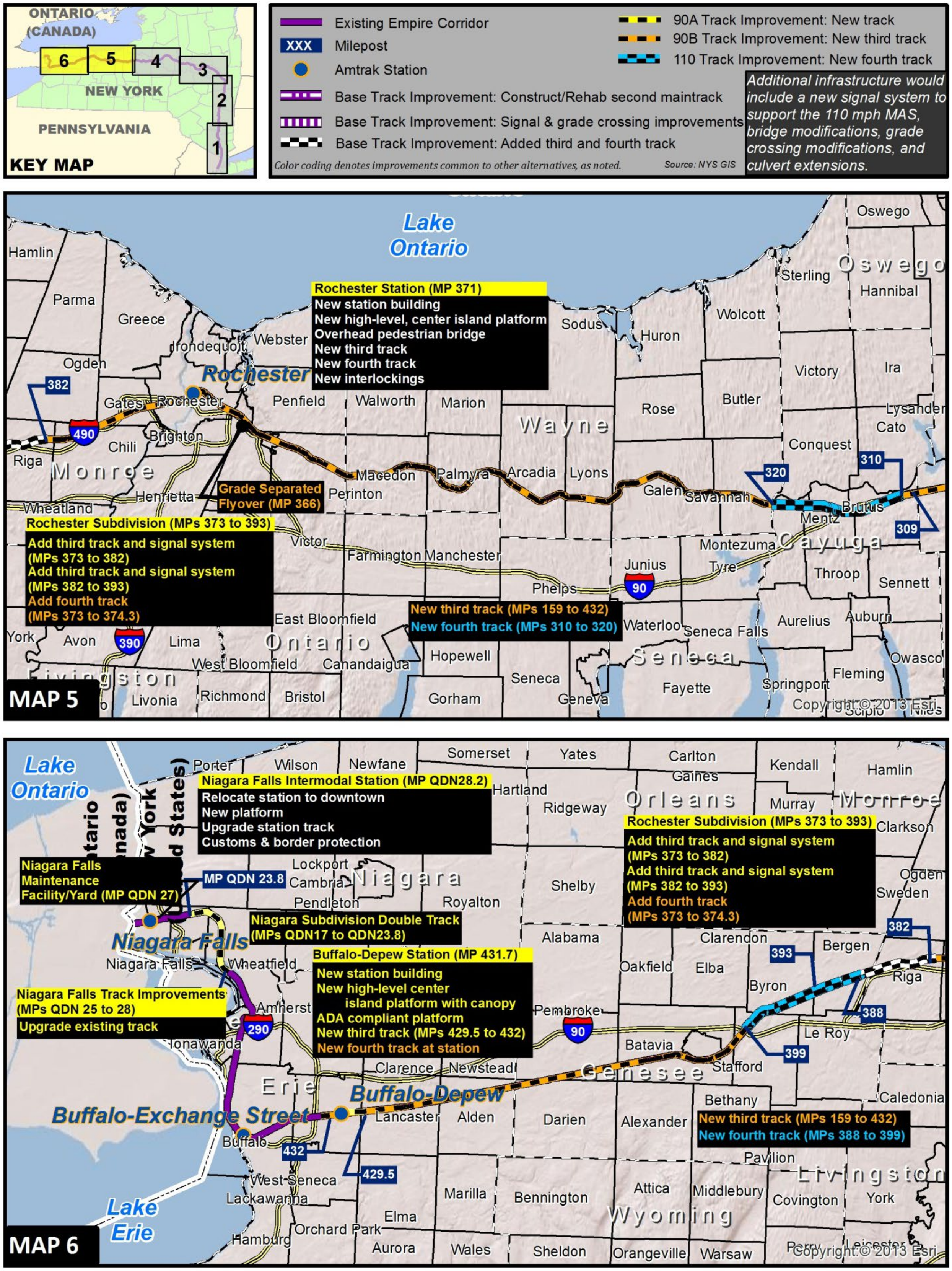


Exhibit 3-17—Alternative 110 (Maps 5 and 6)

Grade crossing modifications would be required to accommodate new tracks. Upgrades to existing grade crossing warning devices would be determined in subsequent design phases and in any Tier 2 documents.

Alternative 110 would be considerably different than Alternative 90B west of the Rochester Station. West of Rochester, Alternative 110 alignment would continue on the south side of the corridor. The dedicated third passenger track would run over the existing Track 2 alignment, and the existing freight tracks would be relocated to the north to maintain the desired track centers. This configuration would also eliminate an expensive grade separated flyover.

Locations for potential maintenance service roads have been identified along the entire corridor between MP 159 and MP 432. The specific need, size, and location of the service roads would be determined in subsequent design phases and Tier 2 studies. Some level of property acquisition would be required over substantial portions of Alternative 110, not only for service road construction, but to accommodate the geometry and track centers of the third and fourth main tracks.

Empire Corridor South

The improvements proposed with Alternative 90A on the Empire Corridor South also would be included in Alternative 110. The additional improvements provided with Alternative 110 would all be located on the Empire Corridor West.

Empire Corridor West

Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6 summarize the characteristics and improvements proposed for Alternative 110, which also include improvements proposed for Alternative 90A. For descriptive purposes, the major physical improvement features of Alternative 110 are presented in two segments along the corridor. The first segment is between Schenectady and Syracuse (MPs 159-292), and the second is between Syracuse and Buffalo-Depew (MPs 292-432). Syracuse Station is the approximate center of the third track segment (133 miles from Schenectady to Syracuse and 140 miles from Syracuse to Buffalo-Depew).

Schenectady to Syracuse (MP 159-292)

Several areas would require larger track shifts to obtain an increase in operating speeds due to the existing geometry of the track: MP 168.4, MP 182.0, MP 192.7, MP 198.3, MP 199.3, MP 205.5, MP 211.6, and MP 221.8.

Station improvements would be made at the following existing stations:

- **Schenectady Station** – As proposed for the Base Alternative, new station building at the existing station, stairs and elevators to platforms, ADA compliant platform, and weather-protected corridor would be provided, and a new third track would be added as with Alternative 90B.

- **Amsterdam Station** – As proposed for Alternative 90A, a new station building at or near the existing Amtrak station, ADA compliant counter, restrooms, ramps, elevators would be provided, with a new high-level platform and new third track, and as with Alternative 90B an overhead pedestrian bridge and new fourth track would be added.

- **Utica Station** – As proposed for Alternative 90B, a new center island platform, overhead pedestrian bridge, and new third and fourth track would be provided.

- **Rome Station** – As proposed for Alternative 90B, a new third track would be provided, and a new fourth track, new center island platform, and overhead pedestrian bridge would be added under Alternative 110.

- **Syracuse Station** – As proposed for the Base Alternative, upgrades to the existing third track would be provided. As proposed for Alternative 90A, new second and third tracks, modified and one new interlocking, and added crossovers and reconfigured signals would be provided, in addition to rehabilitation/replacement of the Park Street Bridge. As proposed for Alternative 90B, a modified existing side platform would be provided.

Alternative 110 also would require realignment of several existing roadways that are adjacent to the railroad right-of-way over a total length of approximately seven miles. The roadway realignments would be required where Route 5 and other roadways closely adjoin the railroad in the section between Schenectady and Onondaga counties. Most of these realignments would be minor and as little as approximately ten feet horizontally. Other roadway realignments would be more substantial, could range in excess of 50 feet horizontally, and could potentially involve property acquisition for the roadway relocation. Coordination with local authorities and FHWA, as appropriate, will occur in individual project planning and Tier 2 efforts.

Potential property acquisitions that could require acquisition of a structure in addition to open land include the following locations: MP 168.3 (Glenville, Schenectady County), MP 184.6 (Mohawk, Montgomery County), MP 186.3 (Mohawk, Montgomery County), MP 191.7 (Mohawk, Montgomery County), MP 198.1 (Palatine, Montgomery County), MP 200.6 (Palatine, Montgomery County), MP 207.5 (St. Johnsville, Montgomery County), MP 210.8 (Manheim, Herkimer County), MP 215.1 (Manheim, Herkimer County), MP 226.9 (Herkimer, Herkimer County), MP 228.0 (Schuyler, Herkimer County), MP 230.8 (Schuyler, Herkimer County), MP 237.2 (Utica, Oneida County), and MP 286.4 (De Witt, Onondaga County).

Syracuse to Buffalo-Depew (MP 292-432)

One area would require larger track shifts to obtain an increase in operating speeds due to the existing geometry of the track, MP 355.2.

Station improvements would be made at the following existing stations:

- **Rochester Station (completed in 2017)** – As proposed with the Base Alternative, new third and fourth tracks and interlockings will be provided, along with a new station building, new high-level center island platform, and overhead pedestrian bridge.

- **Buffalo-Depew Station** – As proposed with Alternative 90A, a new station building, high level center island platform and ADA compliant platform, ticket counter, restrooms, ramps, and railings, along with new third track, would be provided. As proposed with Alternative 90B, a new fourth track would be provided.

Alternative 110 also would require realignment of several existing roadways in Onondaga and Cayuga counties that are adjacent to the railroad right-of-way over a total length of approximately four tenths of one mile. These realignments would be minor and as little as approximately ten feet horizontally.

Potential property acquisitions that could require acquisition of a structure in addition to open land include: MP 341.1 (Arcadia, Wayne County), MP 361.4 (Perinton, Monroe County), MP 377.7 (Gates, Monroe County), and MP 389.1 (Bergen, Genesee County).

Maximum Authorized Speed

Alternative 110 would provide for a MAS of 110 mph between Albany, Buffalo and Niagara Falls.

Service Frequency Enhancement

Alternative 110 would increase the frequency of Amtrak Empire Service. Amtrak service between New York City and Albany would increase to 17 daily round trips, adding four trains, a 30 percent gain above the current 13 trips in the Base Alternative. Service between Albany and Buffalo would increase to eight daily round trips, of which seven would continue on to Niagara Falls, doubling the current four-trip service to Buffalo in the Base Alternative.

Schedule Enhancement: Express Service and Station Stops

No express service is proposed for Alternative 110.

Equipment

Alternative 110 would add six train sets to increase the frequency of passenger rail service.

Capital Costs

The estimated capital cost of Alternative 110 is $6.69 billion.

Trip Time

With Alternative 110, the trip time between New York City and Niagara Falls, based on westbound scheduled times, would be 7 hours and 22 minutes (7:22). This would be one hour and 44 minutes (1:44) less than the Base Alternative's trip time.

On-Time Performance

The OTP for Alternative 110 along the Empire Corridor West would be 94.9 percent in the year 2035.

Ridership

Alternative 110 is projected to increase ridership to 2.8 million passengers in the year 2035. This would be a gain of approximately 1.2 million passengers above projected ridership for the Base Alternative in 2035.

Revenue

Annual revenue for Alternative 110 is projected to be $153 million.

Operation & Maintenance Costs

Operations and maintenance costs for Alternative 110 are estimated at approximately $178 million per year.

Safety

The improvements included in Alternative 110 would result in an overall increase in safety for the traveling public. The increase in train ridership would translate to a decrease in highway traffic volume. With fewer cars on the road this would, in turn, naturally result in fewer traffic accidents and other safety gains. Moreover, Alternative 110 will add approximately 384 miles of additional trackage, including third and fourth track, which will provide better segregation of passenger rail and freight trains. This should reduce conflicts between passenger rail and freight trains and provide improvements in safety. These tracks will be spaced 15 feet further from the existing tracks than Alternative 90B (for a 30-foot separation) to accommodate trains operating at higher speeds. Although there would be additional rail tracks built at some grade crossings, no new grade crossings would be added. Grade crossing warning system upgrades will be installed at all existing grade crossings to accommodate operations at the higher speeds. Safety system upgrades that could be considered include CCTV installations at grade crossings. All of the existing crossings will be converted to automatic systems for improved safety. The warning system at grade crossings will be integrated with the rail signal system. Costs for fencing for portions of the corridor on both sides of the right-of-way have been incorporated, which will provide improved safety by preventing trespassing within the right-of-way. Since the frequency of accidents, injuries, and deaths involving trains, especially with modern safety features at railroad grade crossings, is much lower than the frequency of accidents on highways, the overall number of accidents, injuries, and deaths would decrease due to the shift in travel from passenger cars to rail.

Passenger and freight trains are currently comingled on CSXT's right-of-way. CSXT has expressed concerns about comingling of passenger rail and freight on Empire Corridor.

Alternative 110 will provide additional trackage to better segregate passenger rail and freight rail, thereby improving safety of rail transportation on the Empire Corridor. Approximately 384 miles of new track will consist largely of third track in the Mohawk Valley, where CSXT freight operates west of Albany. Alternative 110 would not increase the risk of an accident due to the proposed capital improvement projects. Alternative 110 would include improvements to the signalizing system and Positive Train Control system, which would increase safety over existing conditions.

Implementation of safety measures, such as Positive Train Control (PTC), will be included in the design and construction of each of the alternatives. It is also anticipated that crash energy management measurements will be included in the design criteria for each concept alignment. CSXT's comments, including concerns regarding safety, are responded to in Appendix K, Comments and Responses for Railroads. During the Tier 2 assessments, additional coordination with CSXT will be performed to obtain input into the development of design plans.

The proposed track improvements would be designed to comply with American Railway Engineering and Maintenance-of-Way Association, Amtrak, and CSXT design criteria. Federal funding announced in 2017 for positive train control will improve safety for the route between Schenectady and Poughkeepsie, and Metro-North and the State of New York have advanced initiatives for PTC along the Hudson Line south of Poughkeepsie. Positive train control has also been implemented by CSXT west of Schenectady. A System Safety Plan will be prepared for approval for FRA prior to the start of system operation, in compliance with federal guidelines.

Freight Operations

Alternative 110 would include the Alternative 90A additional sections of track (with sections of third main track added in at least five locations and second track added in at least two locations) plus would add an additional 273 miles of third track and 59 miles of fourth track. These third and fourth main tracks would generally be placed at least 30 feet from the existing mainline, where there is available right-of-way, in the existing railbed that historically contained two tracks. These improvements are anticipated to improve freight trip times between Selkirk Yard in Albany and Buffalo by at least 10 minutes and up to 20 minutes. It is anticipated that this will increase freight capacity, as the rail simulation shows a decrease in freight delays, even with future anticipated freight increases. Future coordination with CSXT on professional dispatching and operations to reduce freight conflicts to maximize freight capacity will be performed.

The simulation of rail operations and the analysis of the potential impact of the program on freight operations demonstrate that Alternative 110 will have a positive effect on freight movements (see Exhibit 6-8). The additional capacity of increased mainline track in Alternatives 110 along with professional dispatching will result in positive benefits to freight traffic by decreasing delays and uncertainty. Service is demonstrated to improve for both passenger and freight train operations as passenger interference is minimized. The Rail Network Operations Simulation (Appendix D) used information provided by CSXT for both current and future train movements.

For Alternative 110, the new passenger tracks along Empire Corridor West would generally be located on the north side. The line historically operated as a four-track system, and, as part of cost-saving measures that started in the late 1950s, the two tracks that formerly existed on the north side were either removed or converted to sidings to save on maintenance. The new passenger tracks would be added in the former locations of these two tracks.

The primary factors for installing tracks on the north side include the ability to upgrade existing sidings in place to become the third and fourth tracks. The current tracks in operation are on the south side of the right-of-way, and there is availability of right-of-way on the north where this area previously had tracks in operation. Installation on the south side would also require property acquisition in places. In many cases, infringement on waterways, roadways, or other obstacles, such as bridge columns, would occur. Sections of the Erie Canal system or Mohawk River closely adjoin the existing railroad in several different locations.

During final design there will be a detailed evaluation of the need to construct additional crossovers, flyovers, and interlockings to allow freight trains running on the south side to crossover the new passenger mains to reach freight facilities on the north side.

3.3.5. Alternative 125

Alternative 125 uses 125 miles per hour as the maximum authorized speed and would be the first speed threshold for electrically powered trains. Alternative 125 would construct an entirely new two-track grade-separated electrified corridor (with overhead catenary wire for power delivery to the trains) between Albany and Buffalo dedicated to high-speed passenger rail service and would fall into FRA's "Core Express" category. The route corridor is approximately 283 miles in length from Albany/Rensselaer Station to Buffalo Exchange Street Station.

The current Empire Corridor use of dual mode (electric and diesel) locomotives would continue in Alternative 125, although the electric propulsion type (AC) would differ from that used at present

(DC) on the tracks surrounding Penn Station New York. Trains would operate in diesel mode on the existing Hudson Line Corridor between Albany/Rensselaer Station and a point just north of Penn Station New York, where they would switch over to the existing AC-powered overhead catenary for operation to the station and servicing facility.

Within the densely-developed areas around Albany, Syracuse, Rochester, and Buffalo, the new corridor would roughly parallel the existing corridor on a combination of new and existing right-of-way to provide express service (15 round trips) to existing stations in these cities. The existing four daily round trips to Buffalo (of which three continue on to Niagara Falls) would be maintained on the existing right-of-way. Between Albany and Buffalo, the new corridor would follow an alignment designed to balance the competing demands of operating speed, cost and environmental impacts.

The key features of Alternative 125 are illustrated in Exhibit 3-18. The travel times assume that one station in a new central location would be provided in Buffalo. For the purposes of this Tier 1 Final EIS, the existing Buffalo-Depew and Exchange Street stations are assumed to be in place. Station sites would be further defined in Tier 2. The average speeds reflect the 125 mph express service speeds (including Hudson Line/Empire Corridor South) and do not include speeds for the existing Amtrak service that would also be maintained. The weighted average speed of both services would be 63 mph, but only Schenectady, Amsterdam, Rome, and Utica passengers (a small percentage of Empire Corridor passengers) will not experience high-speed dedicated service. Required infrastructure includes roadbed, track, viaducts and bridges, cuts and embankments, access roads, railroad systems, maintenance facilities, and other support facilities. Exhibit 3-4, Exhibit 3-5, and Exhibit 3-6 summarize the characteristics and improvements proposed for Alternative 125, which also include improvements proposed for Alternative 90A that extend along the Hudson Line or Niagara Branch.

Physical Improvements

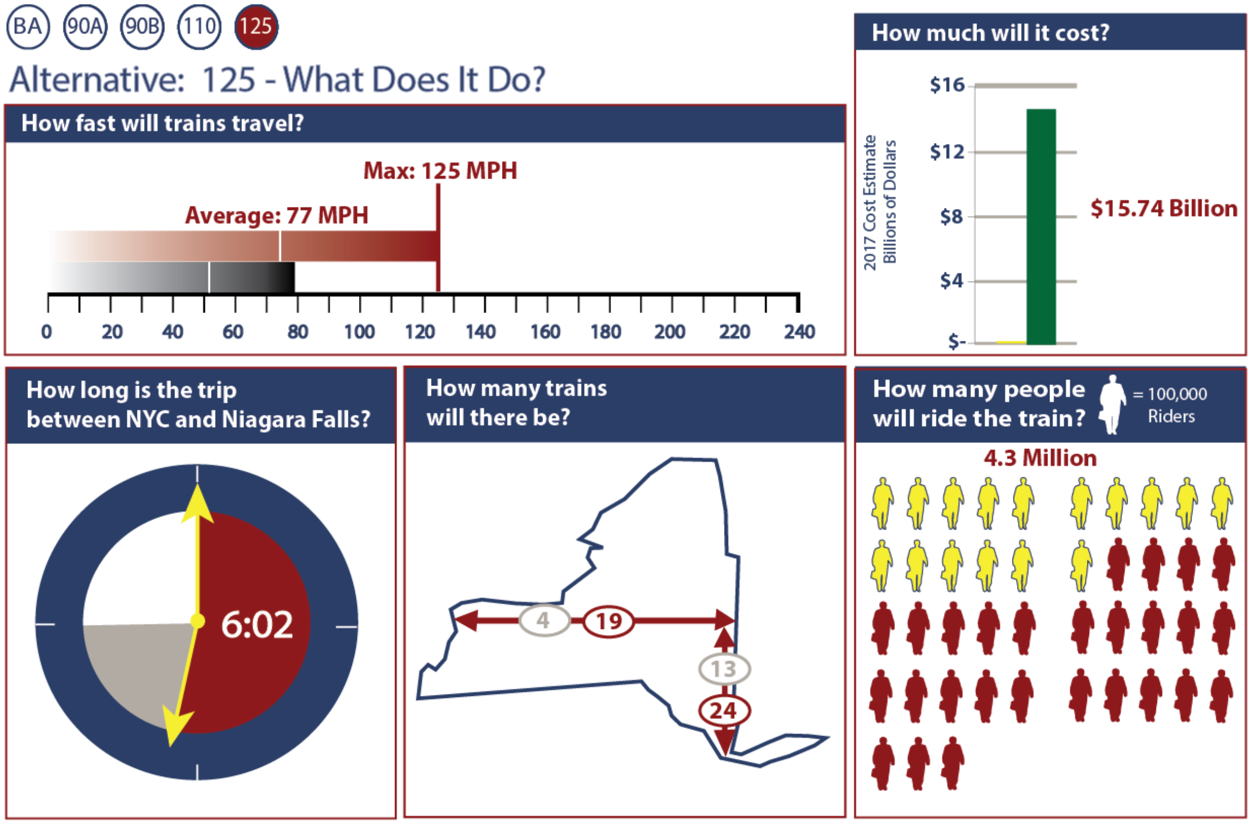
Empire Corridor South

The improvements proposed with Alternative 90A on the Empire Corridor South also would be included in Alternative 125. Due to the developed nature of the corridor along the Hudson Line, it is assumed that the maximum speeds along this section would be 110 mph and that the improvements proposed are the same as for Alternatives 90A, 90B, and 110. The additional improvements provided with Alternative 125 would all be in the Empire Corridor West segment.

Empire Corridor West

Approximately 83 percent of Alternative 125 would be along new electrified corridor (with overhead catenary) between Buffalo and Albany (see Exhibit 3-19). Exhibit 3-20 summarizes the existing and new corridor lengths for Alternative 125. Alternative 125 extends north to Albany-Rensselaer Station, then doubles back to a new river crossing across the Hudson River, following the New York State Thruway (I-87/I-90) and largely bypassing the cities of Albany and Schenectady. Alternative 125 would also include new right-of-way on a more direct route between Rensselaer County and a

Exhibit 3-18—Alternative 125 – Key Features

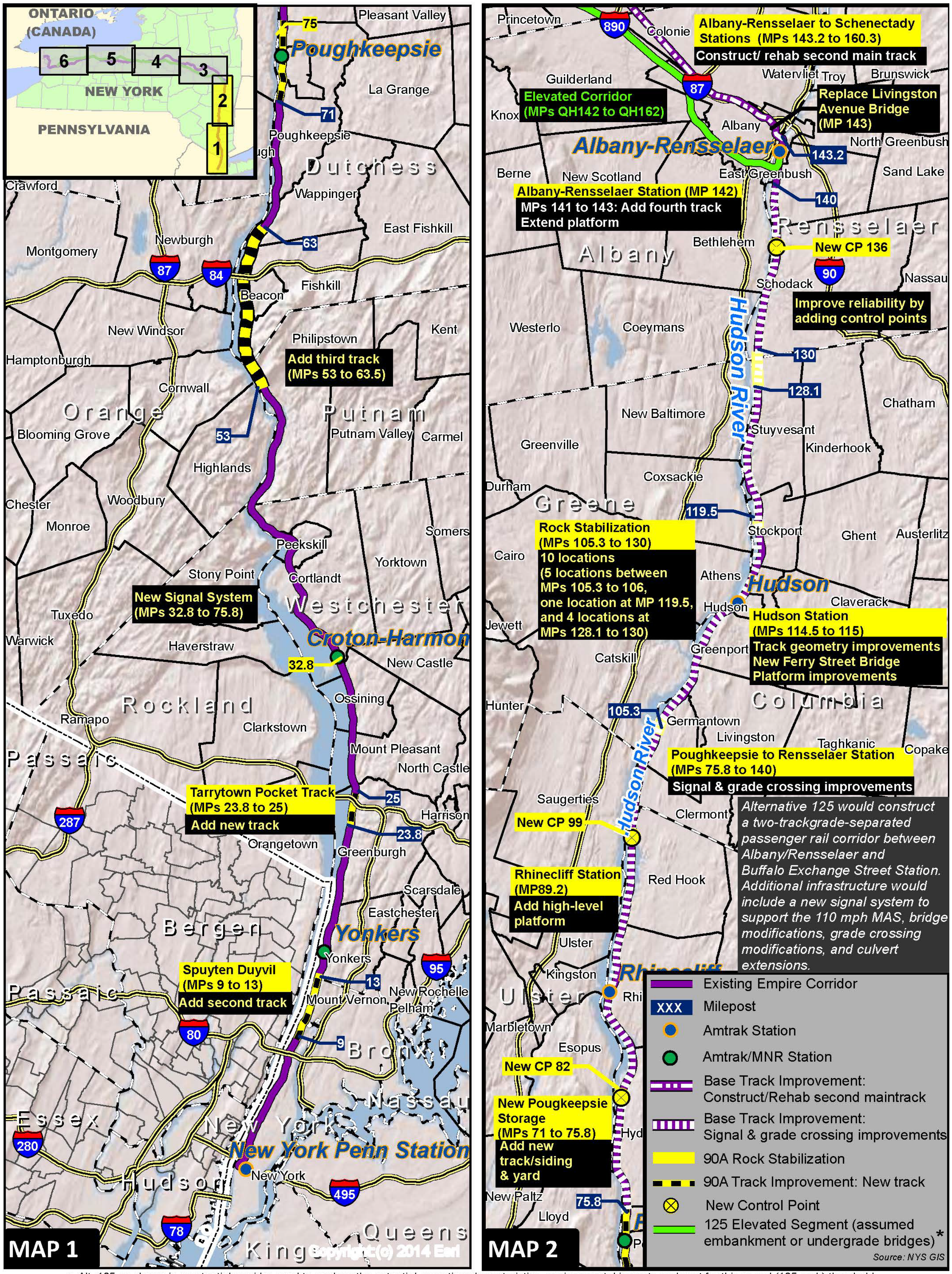


Note: Travel time between NYC and Niagara Falls presented in hours: minutes, based on express service, westbound scheduled times. The average speed for the "Regional Service" (or existing Amtrak service) that would be maintained on the existing Empire Corridor would be 53 mph, with a weighted average of 63 mph for both services. Travel time for regional service would be 8:40.

point five miles east of the Buffalo-Depew Station, merging back with the Empire Corridor over two 15-mile and 16-mile segments centered on Syracuse and Rochester, respectively. Alternative 125 would involve construction of a total of 236 miles of double track on new corridor alignment along three different segments: Rensselaer to Syracuse, Syracuse to Rochester, and Rochester to Buffalo. The alignment would be located within the existing Empire Corridor right-of-way through the cities of Syracuse, Rochester, and Buffalo.

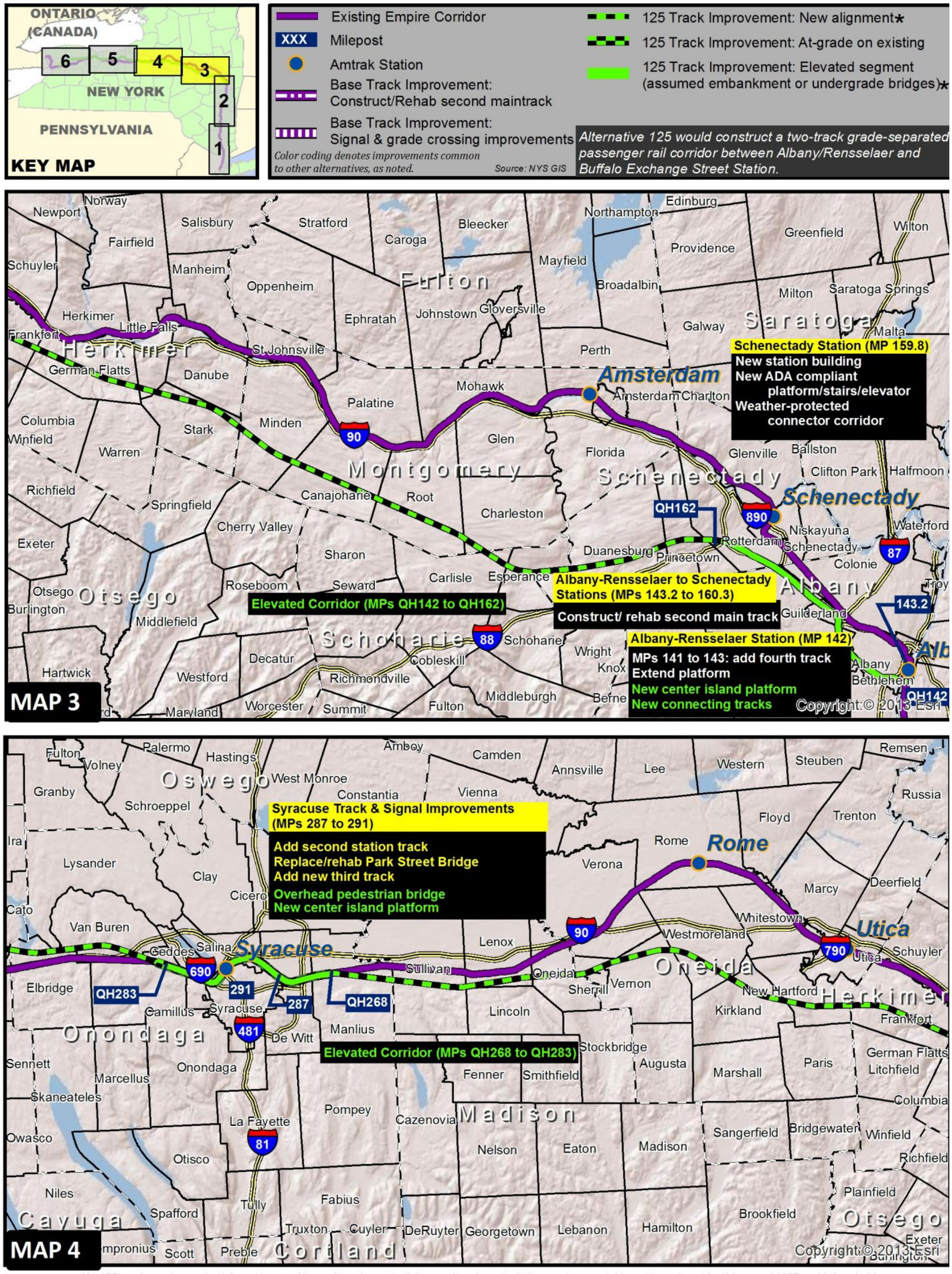
Alternative 125 concept is a new grade separated (from highway and other railroads) corridor for the exclusive use of high-speed passenger trains. To achieve the grade separation, it is assumed that a certain amount of viaduct is required in the urban areas.

Where Alternative 125 extends through Rensselaer and Albany Counties along the New York State Thruway and through the downtown areas of Syracuse, Rochester, and Buffalo (approaching Buffalo Exchange Street Station), the tracks would be elevated, and Alternative 125 would directly service the existing stations serving these cities. The remainder of the track would be largely at grade through primarily rural or undeveloped lands, and no new stations along the new alignment sections are proposed.



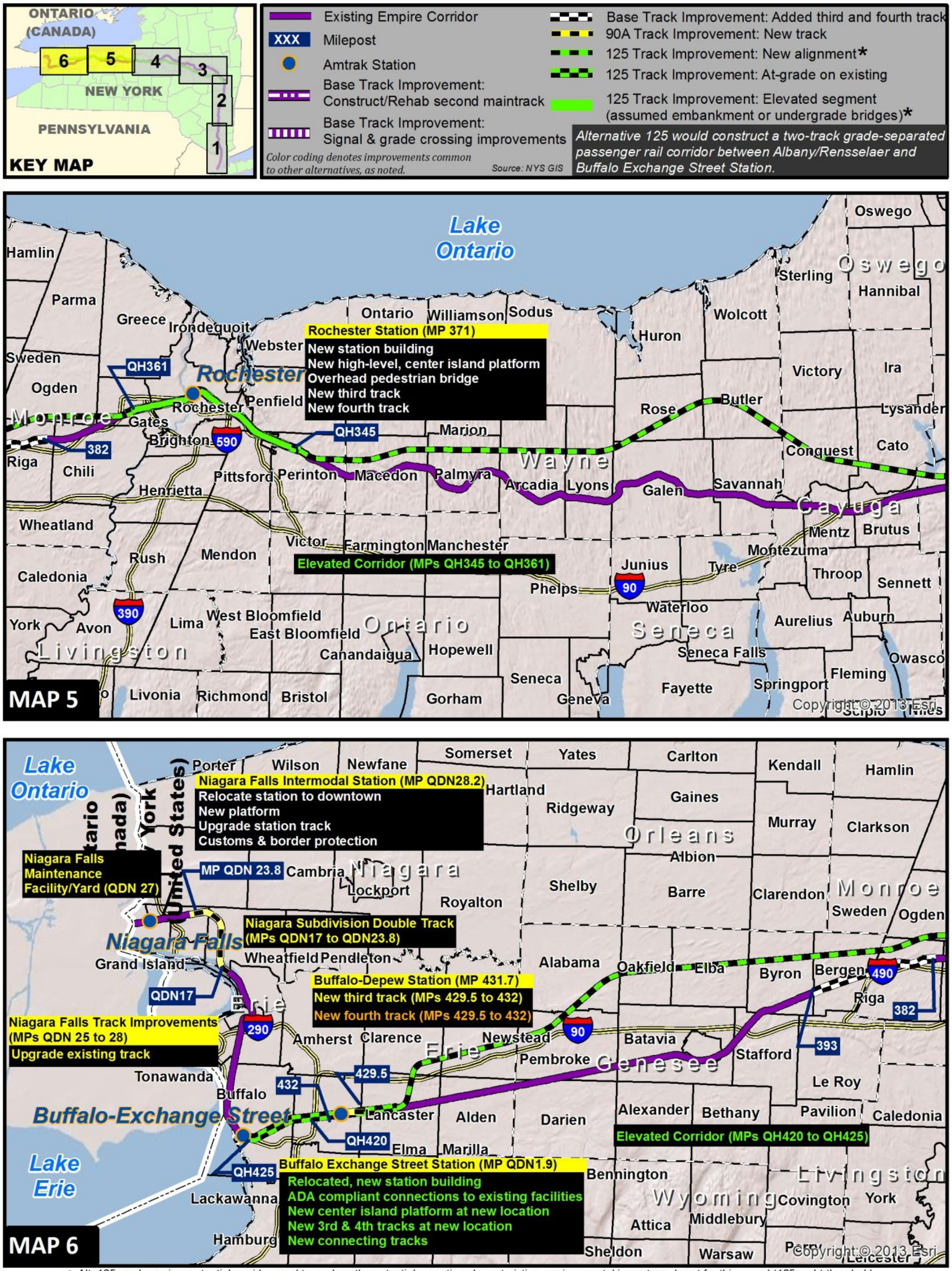
* Alt. 125 as shown is a potential corridor used to analyze the potential operating characteristics, environmental impacts and cost for this speed (125 mph) threshold.

Exhibit 3-19—Alternative 125



* Alt. 125 as shown is a potential corridor used to analyze the potential operating characteristics, environmental impacts and cost for this speed (125 mph) threshold.

Exhibit 3-19—Alternative 125 (Maps 3 and 4)



* Alt. 125 as shown is a potential corridor used to analyze the potential operating characteristics, environmental impacts and cost for this speed (125 mph) threshold.

Exhibit 3-19—Alternative 125 (Maps 5 and 6)

Exhibit 3-20—Alternative 125 – Existing and New Corridor Mileage and Elevated Tracks

	Total Route Length (Miles)	Along "New" Corridor (Miles)	Along Existing Empire Corridor (Miles)
Buffalo to Albany:	**283**	**236**	**47**
Buffalo to Rochester	70	48	22
Elevated Track	11		11
Rochester to Syracuse	77	62	15
Elevated Track	15		15
Syracuse to Albany	136	126	10
Elevated Track	30		30

It is assumed that grade separation will be achieved by elevating the tracks above the existing grade on a combination embankment and elevated structures. The structurally elevated structures are assumed to be supported by columns or viaduct. It is assumed that a total of 57 miles of elevated track will be required based on Tier 1 analysis, although further design and definition would be part of Tier 2 assessments.

For the purposes of evaluating potential impacts, operating characteristics, and costs of Alternative 125, a potential corridor on new right-of-way was identified between the sections of the route where it would follow the existing Empire Corridor to connect with existing stations at Albany-Rensselaer, Syracuse, Rochester, and Buffalo. This corridor was located using available Geographic Information System (GIS) mapping of environmental constraints, topography, and aerial photography. If Alternative 125 had been selected for further consideration in Tier 2, this corridor location would have been further refined to avoid community and environmental resources to a greater extent.

Alternative 125 extends north to Albany-Rensselaer Station, then doubles back to a new river crossing across the Hudson River, following the New York State Thruway (I-87/I-90) and largely bypassing the cities of Albany and Schenectady. Alternative 125 would involve construction of a total of 236 miles of double-track on new alignment along three different segments: Rensselaer to Syracuse, Syracuse to Rochester, and Rochester to Buffalo. The alignment would be located within the existing Empire Corridor right-of-way through the cities of Syracuse, Rochester, and Buffalo.

Alternative 125 incorporates the improvements proposed for Alternative 90A, 90B, and 110 along Empire Corridor South. However, along Empire Corridor West, existing Empire Service to all existing stations will be maintained, but express service along Alternative 125 would only service Albany-Rensselaer, Syracuse, Rochester, and Buffalo Exchange Street stations. Alternative 125 would not include those station improvements proposed for Alternatives 90B and 110 that would be bypassed by the express service. The station improvements that would be provided along Empire Corridor West for Alternative 125 are described below, and Exhibit 3-21 shows the Alternative 90A improvements that would be included in Alternative 125.

- **Schenectady Station** – This station would be bypassed by Alternative 125 express service, although existing service would be maintained. As proposed for the Base, new station building, stairs and elevators to platforms, ADA compliant platform, and weather-protected corridor would be provided.

- **Amsterdam Station** – This station would be bypassed by Alternative 125 express service, although existing service would be maintained. No improvements are proposed for Amsterdam Station, which would be reconstructed under Alternatives 90A, 90B, and 110.

- **Utica and Rome Stations** – These stations would be bypassed by Alternative 125 express service, although existing service would be maintained. No improvements are proposed for Alternative 125 at Utica and Rome stations, which would be provided with new platform, tracks, and overhead pedestrian bridge for Alternatives 90A, 90B, and 110.

- **Syracuse Station** – As proposed for Alternative 90A, new second and third tracks would be provided, in addition to rehabilitation/replacement of the Park Street Bridge. Alternative 125 would add a new center island platform and an overhead pedestrian bridge.

- **Rochester Station (under construction)** – As proposed with the Base Alternative, new third and fourth tracks, new station building, new high-level center island platform, and an overhead pedestrian bridge would also be provided under Alternative 125.

- **Buffalo-Depew Station** – This station would be bypassed by Alternative 125 express service, although existing service would be maintained. As proposed with Alternative 90A, new third track would be provided and as proposed with Alternative 90B, new fourth track would be provided.

- **Buffalo Exchange Street Station** – Buffalo Exchange Street station will be relocated and a new station building provided for Alternative 125. In addition, ADA compliant connections to existing facilities, a new center island platform at a new location, and new third and fourth tracks and connecting tracks would be provided.

<u>Maximum Authorized Speed</u>

Alternative 125 would provide for a MAS of 125 mph between Albany/Rensselaer and Buffalo.

<u>Service Frequency Enhancements</u>

Alternative 125 would provide for a total of 19 daily round trips between Albany-Rensselaer Station and Buffalo, compared to the existing four daily round trips to Buffalo, of which six would continue to Niagara Falls. Four daily round trips would be retained on the existing corridor (of which three continue to Niagara Falls) and 15 daily round trips that will run express between major cities (Albany-Rensselaer, Syracuse, Rochester, and Buffalo) would be added on the new corridor.

Exhibit 3-21—Alternative 90A Rail Improvements included in Alternative 125

Project Name (Milepost)	Project ID	Project Description	"Necessary" for 125 Project
Amtrak West Side Connection Spuyten Duyvil Second Track (MPs 9 to 13)	SRP-1	Increase capacity by adding a second track.	Yes
Metro-North – Tarrytown Pocket Track / Interlocking (MPs 23.8 to 25.0)	SRP-2	Increase capacity by adding a new track to improve speed, travel time, OTP, safety and reduce delay. Allows for increased future frequency.	Yes
Metro-North New Signal System (CP 33 to CP 75) (MPs 32.8 to 75.8)	ES-12	Signal system improvements to provide operating benefits in capacity, reliability and schedule recovery.	Yes
Metro-North – New Third Track (CP 53 to CP 63) (MPs 53 to 63.5)	SRP-3	Increase capacity, reduce delay and improve schedule and operational reliability by providing the capability for freight trains to meet/pass.	Yes
Metro-North Poughkeepsie Yard / Storage Facility Track / Signals (CP 71 to CP 75) (MPs 71 to 75.8)	ES-13	New track/siding and yard will help improve speed, travel time, OTP and safety and reduce delay. Allows for increased future frequency.	Yes
Rhinecliff Station Improvements (MP 89.2)	SRP-11	Improve reliability by adding high-level platforms to cut station dwell time in half.	Yes
Hudson Line Reliability Improvements New Control Points (CP 82, CP 99, CP 136) (MPs 82 to 136)	ES-05	Improve reliability by reducing spacing of interlockings, improving dispatching options to meet or pass trains, which will decrease delays.	Yes
Hudson Line Reliability Improvements Rock Slope Stabilization (10) (MPs 105.3 to 130)	ES-04	Improve reliability by removing / stabilizing rock slopes at 10 locations (5 locations between, MPs 105.3-106, one location at MP 119.5, and 4 locations at MPs 128.1-130), upgrading slide detector fences to improve safety, and reduce delays.	Yes
Hudson Station / Track Geometry Improvements (MPs 114.5 to 115)	ES-14	Improve reliability through track realignment / new Ferry St. bridge, which will improve speed and safety for station access, ADA-compliant platform; eliminate delays by supporting two trains serving the station at the same time.	Yes
Livingston Avenue Bridge (LAB) Replacement Project (MPs 143)	ES-15	Replace deficient moveable bridge to improve safety / reliability, travel time, remove speed / weight restrictions, increase capacity.	Yes
Mohawk Subdivision – New Main Track (CP 169 to CP 179) (MPs 169 to 178.5)	EW-14a	Increase capacity by adding a dedicated 110 mph passenger track to increase frequencies and provide additional capacity / reliability.	No

Exhibit 3-21—Alternative 90A Rail Improvements included in Alternative 125

Project Name (Milepost)	Project ID	Project Description	"Necessary" for 125 Project
Mohawk Subdivision Congestion Relief (CP 175, CP 239 & CP248) (MPs175 to 294)	EW-05	Improve travel times, operational capacity and safety by upgrading automatic block signals, control points and interlocking.	No
Amsterdam Station Improvements (MP 177.6)	EIS-1	Improve reliability by constructing a new station with high level / double edge platform. Improve train operations and reduce dwell time.	No
Belle Isle Capacity Improvements (CP 290 to CP 293) Syracuse Station - Track Improvements (MPs 290 to 294)	EIS-6	Increase capacity by providing additional freight train queuing capability and ability for freight trains to operate between DeWitt and Belle Isle Pocket Yard without occupying existing main line. Add second station track at Syracuse Station and reconfigure signals at the station including one new interlocking.	Station work is required for 125 but would be different work than described here
Rochester Subdivision Reliability Third Main Track (CP 373 to CP 382) (MPs 373 to 382)	EW-16	Increase capacity with third main track and signal system to improve speed, frequency, safety and reliability.	Station work is required for 125 but would be different work than described here
Rochester Subdivision Third Main Track (MP 382 to 393)	EW-20	New third main track and signal system to improve speed, frequency, and reliability.	No
Buffalo Depew Station Improvements (MPs 429.5 to 432.5)	EIS-10	Improve reliability by constructing new station with high level / double edge platform. Improve train operations and reduce dwell time.	No
Niagara Subdivision Double Track (CP 17 to CP 22) (MPs QDN17 to QDN23.8)	EW-17	Improve capacity by adding a second track.	Yes
Niagara Falls Maintenance Facility / Yard Improvements (MP QDN27)	EW-18	Improve reliability by adding storage tracks and a maintenance building to provide shore power, potable water, inspection, cleaning and light repair capabilities. Decreases time to prepare for AM departures and eliminates delays from frozen equipment. Increases layover capacity.	Yes
Niagara Falls Track Improvements (MPs QDN25 to QDN28)	EIS-12	Improve capacity and reliability by upgrading an existing track	Yes

ES = Empire Corridor South; EW = Empire Corridor West; SRP = State Rail Plan; EIS – Tier 1 Environmental Impact Statement

Service Enhancements

The Alternative 125 corridor includes two intermediate stops between Albany-Rensselaer and Buffalo at Syracuse and Rochester. Distances between stops would range from 135 miles between Albany/Rensselaer and Syracuse, to 70 miles between Syracuse and Rochester, and between Rochester and Buffalo.

Equipment

Alternative 125 would add 17 dual mode locomotive-powered trainsets to increase the frequency of passenger rail service. All Empire Corridor Alternatives require continued use of dual mode locomotives. Alternative 125 will use a different type of dual mode locomotive, similar to those recently introduced on the NJ TRANSIT and AMT (Montreal) commuter rail networks. Rather than 700 volts (DC) third rail power, Alternative 125 will use a diesel/AC overhead contact wire dual mode capability. The overhead wire is presently energized at 25 hertz (Hz) 11 kilovolts (kV) within the Penn Station/East River Tunnel area and assumed to be energized at the more modern standard of 60 Hz 25 kV in the proposed electrified segment of the alternative. As with the NJ TRANSIT operation, the Alternative 125 dual mode locomotives would be capable of operating with either of the AC frequency/voltage combinations.

Capital Costs

The estimated capital cost of Alternative 125 is $15.74 billion.

Trip Time

With Alternative 125, the trip time between New York City and Niagara Falls, based on westbound scheduled times, would be 6 hours and 2 minutes (6:02). This would be 3 hours and 4 minutes (3:04) less than the Base Alternative's trip time.

On-Time Performance

In 2035, the OTP for Alternative 125 along the Empire Corridor West would be virtually 100 percent on the new Alternative 125 corridor and an 83 percent OTP on the existing (regional) corridor.

Ridership

Alternative 125 is projected to increase ridership to 4.3 million passengers in the year 2035. This would be almost 169 percent more than the projected ridership for the Base Alternative.

Revenue

Annual revenue to Alternative 125 is projected to be $252 million.

Operations & Maintenance Costs

Operations and maintenance costs for Alternative 125 are estimated at approximately $312 million per year.

Safety

As a sealed corridor with all grade-separated crossings, travel safety would be maximized with Alternative 125. The high-speed service will not encounter grade crossings, which will reduce the potential for conflicts between automobile traffic and high-speed passenger trains. Costs for fencing for portions of the corridor on both sides of the right-of-way have been incorporated, which will provide improved safety by preventing trespassing within the right-of-way. The increase in train ridership could translate to a decrease in highway traffic volume. With fewer cars on the road this would, in turn, naturally result in fewer traffic accidents and other safety gains. Although there would be additional train frequency, the frequency of accidents, injuries, and deaths involving trains, is much lower than the frequency of accidents on highways, therefore the overall number of accidents, injuries, and deaths would decrease due to the shift in travel from passenger cars to rail.

Passenger and freight trains are currently comingled on CSXT's right-of-way. CSXT has expressed concerns about comingling of passenger rail and freight on Empire Corridor. CSXT's comments, including concerns regarding safety, are responded to in Appendix K, Comments and Responses for Railroads. Alternative 125 would provide an exclusive right-of-way for express traffic; however, regional trains would still share trackage with CSXT freight trains.

The proposed track improvements would be designed to comply with American Railway Engineering and Maintenance-of-Way Association, Amtrak, and CSXT design criteria. Federal funding announced in 2017 for positive train control will improve safety for the route between Schenectady and Poughkeepsie, and Metro-North and the State of New York have advanced initiatives for PTC along the Hudson Line south of Poughkeepsie. Positive train control has also been implemented by CSXT west of Schenectady on the existing rail corridor. A System Safety Plan will be prepared for approval for FRA prior to the start of system operation, in compliance with federal guidelines.

Freight Operations

The freight operating characteristics for Alternative 125 are anticipated to be similar to that of the Base Alternative. Alternative 125 would include the Alternative 90A additional sections of track (with sections of third main track added in at least five locations and second track added in at least two locations). West of Albany-Rensselaer Station, new mainline passenger trains would operate on exclusive right-of-way for 243 miles, minimizing interference with freight operations. However, unlike Alternatives 90B and 110, Alternative 125 will not add additional third and fourth main tracks along Empire Corridor West, and will not reduce conflicts between freight traffic and regional Amtrak Empire Corridor service serving all passenger stations.

The simulation of rail operations and the analysis of the potential impact of the program on freight operations demonstrate that Alternative 125 will have a similar effect on freight movements as the Base Alternative (see Exhibit 6-8). The reason that service is comparable is that the regional legacy service of four daily round trips will continue to operate on the existing Empire Corridor, in addition to the express service. The Rail Network Operations Simulation (Appendix D) used information provided by CSXT for both current and future train movements.

4. Social, Economic, and Environmental Considerations

4.1. Introduction

This chapter describes existing social, economic, and environmental conditions in the study area and describes the potential for impacts of the Preferred Alternative (Alternative 90B) for the Empire Corridor Program. This chapter presents a comparison of the direct, long-term, and/or operational impacts of Alternative 90B with the other alternatives considered and dismissed (the Base Alternative,[49] Alternative 90A, and Alternatives 110 and 125). Further details on existing environmental conditions and the impact assessments for 90A, 110, and 125 (as presented in the Tier 1 Draft EIS) can be found in Appendix G. Indirect and cumulative impacts are addressed in Section 4.24 while construction and/or short-term impacts are addressed in Section 4.25.

The impacts assessment performed is largely a qualitative assessment based on the Tier 1 concepts developed. The Tier 1 EIS has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); FRA's NEPA procedures (64 Federal Register [FR] 28545 and 78 FR Part 2713); and the New York State Environmental Quality Review Act (SEQR). NYSDOT, as the SEQR lead agency, has determined that the variance procedures under SEQR (17 NYCRR Part 15) apply. NYSDOT will further refine analysis in advancing assessments for the Preferred Alternative. (Although in this chapter NYSDOT uses the singular term "Tier 2 analysis," individual projects within the Empire Corridor Program will be further evaluated for compliance with NEPA/SEQR.) The "Future Analysis" section addresses Tier 2 analysis. Potential mitigation measures to be identified in Tier 2 are also addressed in this chapter. A map of the program corridor is shown in Exhibit 4-1.

This chapter characterizes the affected environment within study areas that have been identified for each alternative under consideration. The study areas for the High Speed Rail Empire Corridor Program Tier 1 Final EIS are defined as follows:

- The 90/110 Study Area used for analysis of Alternatives 90A, 90B, and 110 consists of the existing 464-mile long Empire Corridor and Niagara Branch.[50,51]
- The 125 Study Area used for analysis of Alternative 125, which follows portions of the existing Empire Corridor and also bypasses the railroad along new alignment, is 450 miles long.[52]

Specific study areas for the natural and physical environment, and cultural resources vary from 600 feet to a mile in width depending on the resource, and are centered about the existing or prospective

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[49] The Tier 1 Draft EIS included eight improvements that were previously programmed as part of the Base Alternative. Since the publication of the Tier 1 Draft EIS, these individual projects have been completed. The discussion in this chapter presents the Base Alternative, as a basis of comparison with the other Build Alternatives. This discussion retains the original estimates of takings to form a basis of comparison with the Build Alternatives (e.g., number of historic impacts).

[50] The 90/110 Study Area (existing Empire Corridor) included an approximate 1-mile extension of the Niagara Branch, terminating at the Niagara Falls International Railway Station and Intermodal Transportation Center (Niagara Falls Station) that was completed in 2016 as part of the Base Alternative.

[51] Mileposts for the existing Empire Corridor, as designated by the railroads, skip a mile where the Hudson Line, originating at Grand Central Station, merges with the Empire Corridor at the Manhattan-Bronx county line near Spuyten Duyvil Station.

[52] Mileposts for the 125 Study Area, beginning at Albany-Rensselaer Station and proceeding west to Buffalo, are referenced with the designation QH preceding the number. Mileposts for the Niagara Branch are referenced with the designation QDN preceding the number.

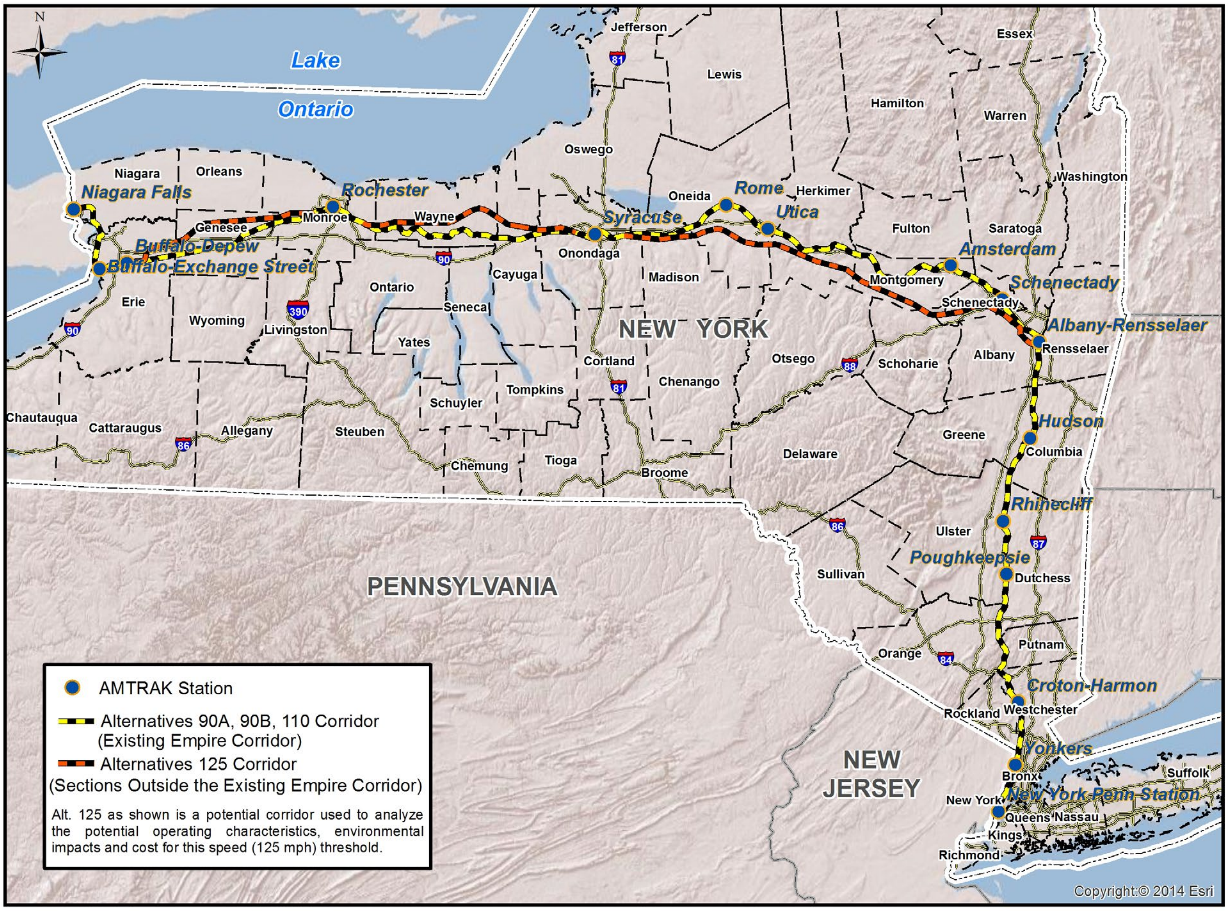

Exhibit 4-1—Corridor Map of the Build Alternatives

rail line centerlines. Generally, specific study areas for the human environment, noise, and air quality are more expansive, and are defined by factors such as community sizes, geographical and political boundaries, and census boundaries.

4.2. Land Use

4.2.1. Regulatory Context

The Federal Railroad Administration's *Procedures for Considering Environmental Impacts* (Federal Register, Vol. 64, No. 101, May 26, 1999) requires consideration of potential environmental impacts on existing and future land use. The NYSDOT Project Development Manual also requires consideration of potential impacts on land use and local master plans and private development plans.

4.2.2. Methodology

Existing land uses were characterized for study areas within 300 feet of the corridor centerline for all alternatives. Land uses were identified using U.S. Geological Survey land use land cover

Geographic Information System (GIS) mapping. Land uses were characterized by county and for the nine major cities within the study area. Land uses surrounding the sixteen existing Amtrak station sites were also identified through review of Google aerial photography and mapping.

Future land use plans were accounted for using regional level consistency reviews of existing Long-Range Transportation Plans and Comprehensive Plans at the Metropolitan Planning Organization (MPO) or county level. This plan review included the major metropolitan areas along the study area. Major business districts are described in Section 4.3.3, "Business Districts."

4.2.3. Existing Conditions

The 600-foot wide "land use" study area for Alternatives 90 and 110 consist of twenty counties and intersects 97 cities/towns and 45 villages. The 600-foot wide study area for Alternative 125 includes portions of twenty-one counties, 92 cities/towns, and 24 villages. There are eight major metropolitan areas that are within the catchment area of nine MPOs, as described in Section 2.2. The land uses in the study area are described below from south to north (New York City to Rensselaer County) and east to west (Albany County to Buffalo/Niagara Falls) and are shown in Exhibit G-1 of Appendix G.1, Land Cover Maps (Sheets 1 through 3). Appendix G.1 presents a detailed overview of the land uses in each county, which are summarized in Exhibit 4-2 and Exhibit 4-3, as well as the major cities and station sites.

Empire Corridor South

The Empire Corridor South segment, from New York City to Rensselaer, extends 142 miles and in many locations closely follows the east bank of the Hudson River. The most urbanized segment of the study area extends roughly 10 miles through New York City from Pennsylvania Station (southern terminus of the Empire Corridor) in Manhattan to the northern border of the City of Yonkers in **Westchester County**, as shown in the land use totals in Exhibit 4-2. In New York City, the county boundaries coincide with the boroughs. The study area extends through **Manhattan (New York Borough)** and the **Bronx (Bronx Borough)**.

The Hudson Valley Region north from New York City includes **Westchester, Putnam, Dutchess, and Columbia Counties**, which extend along the east side of the Hudson River and become less urbanized to the north, as shown in Exhibit 4-2. The Capital District includes **Rensselaer County** on the northern end of this program segment. The predominance of surface waters, wetlands, and undeveloped forest area in many locations where the river bank is undeveloped or consists of parkland reflects the location of the rail line in close proximity to the river's edge in many locations.

Empire Corridor West/Niagara Branch: 90/110 Study Area

The 322-mile-long Empire Corridor West/Niagara Branch, with the exception of the metropolitan areas within and surrounding the major cities, has a rural agricultural character, as shown in the land use totals in Exhibit 4-2. This route extends through the Capital District (**Albany and Schenectady Counties**); the rural **counties of Montgomery, Herkimer, Oneida**; the Central New York Region (the **counties of Madison, Cayuga, and Onondaga**); the Finger Lakes Region (**Onondaga, Cayuga, Wayne, and Monroe Counties**), and the Buffalo-Niagara Region (**Erie and Niagara Counties**). As shown in Exhibit 4-2, the urbanized areas center around the cities of Albany (Albany County), Schenectady (Schenectady County), Utica (Oneida County), Syracuse (Onondaga County), Rochester (Monroe County), Buffalo (Erie County), and Niagara Falls (Niagara County).

Empire Corridor West/Niagara Branch: 125 Study Area

The 125 Study Area, extending 308 miles from the Rensselaer County line to Niagara Falls, takes a more direct route than Empire Corridor West through rural and agricultural areas between Rensselaer County and Buffalo. The 125 Study Area bypasses several of the major metropolitan areas and existing stations along the Empire Corridor West, with the exception of two 16-mile sections roughly centered on the Syracuse and Rochester metropolitan areas. The more rural nature of the corridor, particularly in the agricultural land cover type, is evident in the land use totals shown in Exhibit 4-3.

Exhibit 4-2—Land Use/Land Cover in the 90/110 Study Area (in acres)

County	Residential	Commercial Services	Industrial	Transportation/ Utilities	Industrial and Commercial	Mixed Urban Land	Agricultural	Rangeland	Forest Land	Surface Water	Wetlands	Barren Land	**Totals**
New York	19	91	14	135	0	453	0	0	0	4	0	0	716
Bronx	33	14	0	3	0	43	0	0	0	97	0	0	190
Westchester	369	118	344	180	0	231	0	0	225	821	0	0	2,288
Putnam	6	5	0	0	0	0	0	0	216	417	34	0	678
Dutchess	125	32	137	60	42	101	125	0	1,252	1,290	107	44	3,315
Columbia	346	55	0	0	0	0	417	0	1,067	104	31	125	2,145
Rensselaer	196	39	33	29	0	0	276	0	346	51	0	0	970
Albany	52	72	219	83	33	24	2	0	327	12	0	31	855
Schenectady	333	46	80	86	0	39	147	0	311	11	0	12	1,065
Schoharie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Montgomery	288	225	0	179	0	112	962	174	852	44	0	97	2,933
Herkimer	63	316	0	33	0	26	584	143	530	126	0	17	1,838
Oneida	135	149	46	204	0	0	832	221	171	0	323	0	2,081
Madison	32	42	0	0	0	11	263	110	504	0	21	26	1,009
Onondaga	63	156	333	299	0	292	343	0	569	18	164	38	2,275
Cayuga	0	0	0	23	0	0	641	0	106	9	54	0	833
Wayne	9	54	36	0	0	4	1,638	0	658	0	284	16	2,699
Monroe	226	342	257	145	20	159	833	0	142	0	92	33	2,249
Genesee	113	18	29	5	0	34	1,818	0	78	15	65	1	2,176
Erie	424	317	550	136	0	90	630	0	146	0	28	22	2,343
Niagara	126	70	29	117	95	92	479	0	0	0	0	41	1,049
Totals	2,958	2,161	2,107	1,717	190	1,711	9,990	648	7,500	3,019	1,203	503	33,707

Source: The United States Geological Survey (USGS) National Mapping Program.

Exhibit 4-3—Land Use/Land Cover in the 125 Study Area (in acres)

County	Residential	Commercial Services	Industrial	Transportation/ Utilities	Industrial and Commercial	Mixed Urban Land	Agricultural	Rangeland	Forest Land	Surface Water	Wetlands	Barren Land	**Totals**
New York	19	91	14	135	0	453	0	0	0	4	0	0	716
Bronx	33	14	0	3	0	43	0	0	0	97	0	0	190
Westchester	369	118	344	180	0	231	0	0	225	821	0	0	2,288
Putnam	6	5	0	0	0	0	0	0	216	417	34	0	678
Dutchess	125	32	137	60	42	101	125	0	1,252	1,290	107	44	3,315
Columbia	346	55	0	0	0	0	417	0	1,067	104	31	125	2,145
Rensselaer	179	22	17	29	0	0	276	0	346	47	0	0	916
Albany	99	20	37	675	0	0	19	0	123	12	0	34	1,019
Schenectady	83	47	0	127	0	18	632	8	332	0	0	0	1,247
Schoharie	0	0	0	0	0	53	214	0	188	0	0	0	455
Montgomery	0	0	0	0	0	0	1,094	0	383	0	68	0	1,545
Herkimer	27	0	0	0	0	31	788	32	969	0	0	0	1,847
Oneida	67	5	0	6	0	27	923	0	501	0	75	0	1,604
Madison	25	15	0	0	0	25	684	53	244	0	0	16	1,062
Onondaga	54	156	354	306	0	306	811	0	787	22	252	37	3,085
Cayuga	0	0	0	23	0	1	1,177	0	300	15	121	0	1,637
Wayne	28	54	36	0	0	37	3,501	0	1,206	0	400	16	5,278
Monroe	368	342	266	147	21	179	1,409	0	342	0	92	33	3,199
Genesee	113	18	29	5	0	34	3,640	0	201	15	251	32	4,338
Erie	459	324	550	142	0	104	1,165	0	283	24	65	71	3,187
Niagara	125	70	29	117	95	92	479	0	0	0	0	41	1,048
Totals	2,525	1,388	1,813	1,955	158	1,735	17,354	93	8,965	2,868	1,496	449	40,799

Source: The United States Geological Survey (USGS) National Mapping Program.

Consistency with the New York State Smart Growth Public Infrastructure Policy Act

An evaluation of the program's consistency with the New York State Smart Growth Public Infrastructure Policy Act (Environmental Conservation Law, Article 6) determined that the program meets the Smart Growth criteria specified in the Act. The program's consistency with the ten criteria are summarized below:

- **Use, maintenance, or improvement of existing infrastructure:** Consistent—the Preferred Alternative utilizes and follows the existing Empire Corridor rail corridor.
- **Location in municipal centers:** Consistent—the program extends through the state's largest metropolitan areas: New York City, Buffalo, Rochester, Yonkers, Syracuse, and Albany
- **Infill Development:** Consistent—review of regional and local master plans for communities along the corridor finds support for HSR and concentration of development along the rail corridor.

- **Protection of State's Resources:** Consistent—the program will result in a net positive impact on greenhouse gas emissions, the net annual operational benefits for the Preferred Alternative would be roughly equivalent to eliminating the emissions associated with the energy and electricity consumption of 2,500 to 4,200 average U.S. single family homes every year.
- **Smart Growth planning:** Consistent—the program facilitates access to existing stations collocated with downtown redevelopment opportunities in the state's largest cities.
- **Mobility and transportation choices:** Consistent—the program's purpose is to improve rail service, including on-time performance, reduced travel times, increased frequency of service, and attracting additional ridership, providing an alternative to use of highways and automobiles.
- **Inter-governmental coordination:** Consistent—FRA and NYSDOT invited 34 agencies to participate in program scoping and as NEPA cooperating and/or participating agencies to provide input into the program. NYSDOT also formed the Empire Project Advisory Committee with representatives from key agencies, metropolitan planning organizations, and stakeholders to guide decision-making during the environmental review process.
- **Community-based planning:** Consistent—NYSDOT developed and implemented a multi-faceted Public Involvement Plan to engage and inform the public, key stakeholders, and government agencies at key milestones throughout the planning process.
- **Predictability and reliability in building and zoning codes:** Not applicable.
- **Sustainability Development:** Consistent—the program will strengthen communities by providing commuting and travel options and improve environmental quality by facilitating rail use and reducing reliance on automobile travel.

The program's consistency with the New York State Smart Growth Public Infrastructure Policy Act is addressed in detail in Exhibit G-2 in Appendix G.1. Under the state's Smart Growth Act, the state infrastructure agencies may not approve, undertake, support or provide financial assistance to a public project unless the project is consistent with the Smart Growth criteria.

<u>Consistency with Regional/Local Plans</u>

A review of existing comprehensive plans and long-range transportation plans prepared by state, county and local governmental agencies demonstrated their consistency with the proposed high-speed rail improvements program planned for the Empire Corridor. Many of these plans indicate support for improved use and access to rail service including the introduction of high-speed rail, improvements to the rail corridor, and revitalizing station areas and fostering transportation-friendly land uses. In some cases, these plans advocate the relocation of existing rail facilities to a more accessible location.

Other common rail transportation objectives cited in the plans that support the development of high-speed rail include the following:

- Strengthen alternative modes of transportation,
- Improve intercity passenger rail service,
- Improve on-time performance for intercity passenger rail service,
- Expand ridership for intercity passenger rail service,
- Improve multi-modal transportation connections, and
- Foster economic development.

Exhibit G-3 in Appendix G.1 identifies those state, Metropolitan Planning Organization (MPO), county and city plans reviewed and addresses the extent to which they reference transit improvements and the introduction of high-speed rail.

The program is consistent with the 2009 New York State Rail Plan and the New York Senate High Speed Rail Task Force Action Program, as well as the state's Multimodal Transportation Program Submission 2009-2014. These rail multimodal plans all endorse and program improvements for improved intercity passenger rail and high-speed rail improvements in the Empire Corridor. Although many, but not all of the plans, specifically reference support for high-speed rail or Empire Corridor improvements, the MPO, county, and city plans reviewed overwhelmingly support improvements in intercity passenger rail service, and generally endorse improvements in transit and/or station access.

4.2.4. Environmental Consequences

Comparison of Alternatives

This section describes potential land use impacts of the alternatives, based on review of aerial photography and GIS land use mapping. Potential short-term impacts during construction are addressed in Section 4.25.3. Review of aerial mapping and plans indicates that the Base Alternative and Alternative 90A would have no direct impacts to properties outside of the right-of-way. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads.

Alternative 90B, the Preferred Alternative, would involve greater property impacts in discrete areas than the Base Alternative and Alternative 90A, with addition of third track and limited areas of fourth track. The proposed work for the Preferred Alternative will include the addition of track, as well as maintenance service roads in selected areas. The Preferred Alternative would involve property takings affecting land uses in approximately 9 areas in 6 counties. In most of these locations, the areas affected are rural lands or industrial properties. The only potential neighborhood impact may occur as a result of a highway realignment, if needed, at one location.

Alternative 110 would have discrete areas of impacts to properties in more locations than Alternative 90B, with construction of third and fourth tracks extending further outside of the right-of-way in more locations. The third tracks would be offset 30 feet from the existing tracks, and 20 additional miles of fourth track would be added. Alternative 110 would directly affect approximately 53 areas in 8 counties – mostly along the Empire Corridor West and Niagara Branch. These anticipated effects are described in detail in Appendix G.1.

Alternative 125 would involve the greatest property impacts to existing land use as it extends 236 miles as a sealed corridor on new alignment through primarily rural areas. Alternative 125 would involve construction of a total of 236 miles of track on new alignment from roughly Albany-Rensselaer to Buffalo. Alternative 125 would include new right-of-way in most areas, but would merge back with the Empire Corridor over two 15- and 16-mile segments centered on Syracuse and Rochester, respectively. Alternative 125 would require acquisition of two to three thousand acres of land for creation of a sealed corridor between Albany and Buffalo. Appendix G.1 provides a detailed description of the affected land uses.

Exhibit 4-2 and Exhibit 4-3 provide acreages of types of affected land use within the 90/110 and 125 study areas, and Appendix G.1 provides detailed descriptions of impacts associated with the Base Alternative and Alternatives 90A, 110, and 125. The design and advancement of the Preferred

Alternative will involve efforts to avoid property encroachments as design is advanced as part of Tier 2 assessments.

Long-term indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (e.g., growth inducing effects related to changes in the pattern of land use, and population density or growth rate). Of the alternatives evaluated, the Base and 90A Alternatives would involve the least long-term indirect, growth-inducing impacts. Alternatives 110 and 125 would involve the greatest indirect impacts, with larger transportation benefits, and a greater degree of secondary development impacts. The Preferred Alternative would involve growth-inducing indirect impacts that would be greater than the Base and 90A Alternatives but would be more moderate than Alternatives 110 and 125.

Alternative 90B (Preferred Alternative)

This land use assessment identified potential for land use impacts that can occur as a result of long-term acquisitions or encroachments. Although the extent of these impacts cannot be quantified at this time, this assessment identified land uses proximal to the proposed Tier 1 conceptual corridor.

Empire Corridor South

The impacts of the Preferred Alternative include Alternative 90A projects. As with Alternative 90A and the Base Alternative, work would occur largely within the right-of-way along the Empire Corridor South; this corresponds to a similar finding anticipating no direct land impacts for this segment.

Empire Corridor West/Niagara Branch

Alternative 90B would directly affect properties in nine areas in six counties along the Empire Corridor West/Niagara Branch.

- The proposed third track and maintenance service road at the connection to the Selkirk Branch at MP 168.3 in **Schenectady County** may impact the edges of agricultural/industrial property adjacent to Route 5. The proposed improvements may pass through the wooded edges of this area, although no impacts to buildings are anticipated.
- Just west of Amsterdam Station in **Montgomery County**, the third track and maintenance access road may impact wooded property that houses utility structures between the Mohawk River and Route 5 at approximate MP 177.7. No buildings or aboveground structures will be impacted with Alternative 90B at this location. Continuing west, just beyond this area at approximate MP 177.8, the third track and maintenance access road would encroach upon Route 5 where the land between the Mohawk River and Route 5 narrows, potentially impacting the roadway alignment. This realignment may impact an adjoining street to the north in a residential neighborhood. At MP 192.3, the maintenance access road and track may extend into the wooded edge of a residential property and to the west would cross and realign Route 5 where the railroad and road are near the river, affecting wooded property. Near MP 200.7, the new maintenance access road and new passenger track and associated right-of-way may be close enough to affect industrial buildings.
- In **Herkimer County**, the maintenance service road adjacent to the new third and fourth tracks may impact a farm building at approximate MP 210.8 on land closely adjoining both the railroad and Route 5 to the north.

- In **Wayne County**, the addition of a maintenance surface road may impact an industrial building structure at approximate MP 341.1, west of Route 88, where a new track siding is proposed.
- Just west of Interstate 390 in **Monroe County**, at approximate MP 374.7, the proposed third track and maintenance access road extends beyond the right-of-way and may impact industrial property to the north.
- In **Erie County**, the addition of a fourth track to the south of the existing track at Buffalo-Depew Station (MPs 431 to 432) will impact the existing station building as well as additional industrial land west of the station to where the proposed third track meets the proposed No. 20 turnout.
- The double tracking along 10 miles of the Niagara Branch (between QDN MPs 2 to 7 and QDN 17 to 22.8) and upgrades to 3 miles (QDN 25 to 28) is anticipated to be performed within the right-of-way and is not expected to result in land use impacts.

The first four areas of potential impact described above are primarily rural/agricultural in nature, while work in Monroe County (industrialized areas along I-390 and Route 33) and Erie County (at Buffalo-Depew Station) is proximal to urban downtown areas.

4.2.5. Potential Mitigation Strategies

During the Tier 2 process, refinements in design will include efforts to avoid and minimize impacts on adjoining buildings and properties of the Preferred Alternative, Alternative 90B. If it is not possible to avoid property impacts, mitigation measures will include providing relocation assistance and compensation, as appropriate, to affected property owners, in conformance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601 et seq.). This law requires that fair and equitable assistance be provided to those persons displaced by federal or federally funded actions.

Other potential mitigation measures include considering regional and local plans for transit connections and site development and consulting with regional and local officials in the siting and design of passenger facilities and amenities. Mitigation measures for temporary land use impacts during construction could involve compensation to the property owners and restoring affected parcels, as appropriate. Construction mitigation is addressed in Section 4.25.

4.2.6. Future Analysis

During the Tier 2 process, the NYSDOT will refine property and right-of-way mapping, and the extent of property acquisitions and building impacts will be defined. NYSDOT will make efforts to refine the design to avoid property takings and impacts on neighborhoods, businesses, parks and recreation areas, community facilities, residences, and other environmentally sensitive land uses to the extent practicable. Additional research will be performed regarding planned development in the vicinity of the station sites. Consistency with local plans and zoning will be addressed, and effects on land use patterns will be assessed as part of the Tier 2 evaluations. The effects on businesses and neighborhoods/community cohesion are addressed above in the preceding sections as part of the Tier 1 assessment. Job creation is addressed in Section 4.3.4 (Regional Population, Employment, and Business Districts), and secondary development and cumulative impacts are addressed in Section 4.24 (Indirect and Cumulative Impacts). When designs are further advanced in Tier 2 assessments, these impacts will be reevaluated in more detail.

4.3. Regional Population and Employment, and Business Districts

4.3.1. Regulatory Context

The Federal Railroad Administration's *Procedures for Considering Environmental Impacts* (Federal Register, Vol. 64, No. 101, May 26, 1999) requires consideration of both beneficial and adverse impacts of program alternatives on the socioeconomic environment, including demographic shifts and impacts on commerce, metropolitan areas, and business districts. The NYSDOT Project Development Manual also requires consideration of potential impacts on neighborhoods and communities, regional and local economies, and business districts in the evaluation of program alternatives.

4.3.2. Methodology

The Tier 1 socioeconomic analysis examined population and employment trends for twenty-five counties that transect or adjoin the program corridor, comparing existing conditions to future (2035) projections. Although the ridership and market assessments for transportation analysis focused on the major metropolitan market areas, the study area for environmental assessments was based on county level data. The MPOs and MSAs define a broader area extending outside counties (and even states) immediately adjoining the existing rail lines, and not all counties along the tracks are within the nine MPOs/eight MSAs.

The 2010, 2019, and projected 2035 population were compared to identify changes in demographics along the corridor. Existing county population statistics came from the 2010 U.S. Census Bureau Decennial Census and the 2019 U.S. Census Annual Population Estimates Program. Future county population projections obtained from Woods & Poole Economics, Inc.[53] provided uniform county-level projections over the statewide study area that traverses multiple regional planning areas. These projected figures do not consider any changes in public policy and infrastructure investments, such as the High-Speed Rail Empire Corridor, which could potentially change the population and employment outlook particularly for the western corridor. Existing population data was also compiled for the years 2010 and 2019, using U.S. Census data for the nine major cities along the corridor, including New York City, Yonkers, Poughkeepsie, Albany, Schenectady, Utica, Syracuse, Rochester, and Buffalo. These cities form the core for seven of the eight metropolitan regions or MSAs within the study area (see Section 2.2, "Major Markets Served by the Empire Corridor"). Historical growth of these cities was also gauged by using 2006 U.S. Census data obtained from the Population Estimates Program.

This analysis also considered labor statistics including county employment trends, unemployment (2010 and 2019) and local business activity within the study corridor. The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) supplied existing employment data (2010 and 2019) for each county, as these represent a complete measure of part-time and full-time employment. This analysis compared the BEA existing employment figures to the Woods & Poole Economics, Inc. future 2035 employment forecasts. Employment data obtained from these sources account for wage and salary workers, proprietors or business owners (farm and non-farm), private household employees, and miscellaneous workers. The U.S. Bureau of Labor, Local Area Unemployment Statistics supplied unemployment statistics for 2010 and 2019. The socioeconomic profile identifies key labor market

[53] Woods & Poole Economics, Inc. is an independent firm that specializes in long-term county economic and demographic projections, based on comprehensive historical county database and the integrated nature of the projection model.

areas that may become more accessible as a result of the program.

The analysis provides a discussion of the potential effects of the program alternatives on the socioeconomic environment within the more populated and urban areas as noted. The assessment is qualitative in nature and focuses on general socioeconomic effects that could occur along the corridor. Future Tier 2 analyses would include a more detailed examination of potential impacts of the Preferred Alternative, including a detailed evaluation of means to avoid or minimize impacts through design and mitigation strategies to offset remaining unavoidable impacts.

4.3.3. Existing Conditions

<u>**Population**</u>

Overview

This section describes the socioeconomic conditions and trends at the county and city levels for the years 2010, 2019, and 2035. The study area covers twenty–five counties with a total population of 9,016,633 as of 2019, an increase of 65,108 (or 0.7%) from 2010 (refer to Exhibit 4-4). The study area comprises approximately 46 percent of New York's 2019 estimated population. As discussed in Section 2.2, "Major Markets Served by the Empire Corridor," estimated ridership for the program would extend over a wider region that includes entire metropolitan areas (served by the Metropolitan Planning Organizations). Projections indicate that the study corridor will realize a 7.2 percent gain in population from 2019 to 2035 or an increase of 651,782 persons.

The eleven most populous counties along the 142-miles of the Empire Corridor South from Manhattan (New York County) to Rensselaer County contain 62 percent of the 90/110 and 125 study area population for 2019. The fourteen counties in the less populated areas along the Empire Corridor West/Niagara Branch extending 322 miles from Albany County west to Niagara Falls (Niagara County) comprise 38 percent of the 2019 study area population. Empire Corridor South has over one and half times the population in an area roughly half the size as Empire Corridor West/Niagara Branch. Appendix G.2 presents a detailed county by county description of population statistics.

Empire Corridor South

The counties of **New York, Bronx, Westchester, Rockland, Putnam, Orange, Dutchess, Ulster, Columbia, Greene, and Rensselaer**, comprise the more urbanized and populous segment of the Empire Corridor. These counties had a 2010 population of 5,456,031 persons that grew by 104,591 persons (or 1.9%) by 2019, and comprised almost 2/3 of the study area population. Projections indicate that the total population will grow by 674,731 persons or 12.1 percent by the year 2035. Exhibit 4-4 compares the 2010, 2019, and 2035 populations by county for the entire Empire Corridor.

Empire Corridor West/Niagara Branch

The population in the fourteen counties (**Albany, Schenectady, Schoharie, Montgomery, Herkimer, Oneida, Madison, Onondaga, Cayuga, Wayne, Monroe, Genesee, Erie and Niagara**) along Empire Corridor West/Niagara Branch totaled 3,495,494 persons in 2010 and decreased by 39,483 (or 1.1%) by 2019. In contrast to the counties to the south, the forecast is for these counties to experience a loss in population, totaling 22,949 persons (or -0.7%) by 2035. This decline follows historic population losses precipitated by the decline of the region's core manufacturing and industrial base.

Major Cities

As discussed in the previous section, the principal cities located along the Empire Corridor include New York City, Yonkers, Poughkeepsie, Albany, Schenectady, Utica, Syracuse, Rochester, and Buffalo. Each of these urban centers had a 2010 population over 50,000, with the exception of Poughkeepsie (32,736), as noted in Exhibit 4-5 below. In 2019, each of these urban centers had a population over 60,000, with the exception of Poughkeepsie (30,515). The City of Poughkeepsie, listed below, also serves as the geographic and, to a large degree, transportation and institutional center of the Hudson Valley Region. New York City and Yonkers experienced an increase in population between 2010 and 2019. The Business District discussion contains additional descriptions of the major cities.

Exhibit 4-4—2010, 2019, and 2035 Population for Counties in the Study Area

County	2010 Population	2019 Population	2035 Population	2019-2035 Change	
				Change in No. of Persons	% Change
New York	1,585,873	1,628,706	1,700,678	71,972	4.4%
Bronx	1,385,108	1,418,207	1,610,926	192,719	13.6%
Westchester	949,113	967,506	1,052,815	85,309	8.8%
Rockland	311,687	325,789	359,957	34,168	10.5%
Putnam	99,710	98,320	141,646	43,326	44.1%
Orange	372,813	384,940	512,458	127,518	33.1%
Dutchess	297,488	294,218	358,964	64,746	22.0%
Ulster	182,493	177,573	218,775	41,202	23.2%
Columbia	63,096	59,461	67,724	8,263	13.9%
Greene	49,221	47,188	53,027	5,839	12.4%
Rensselaer	159,429	158,714	158,383	-331	-0.2%
Empire Corridor South (Total)	**5,456,031**	**5,560,622**	**6,235,353**	**674,731**	**12.1%**
Albany	304,204	305,506	288,503	-17,003	-5.6%
Schenectady	154,727	155,299	149,352	-5,947	-3.8%
Schoharie	32,749	30,999	34,793	3,794	12.2%
Montgomery	50,219	49,221	46,379	-2,842	-5.8%
Herkimer	64,519	61,319	61,942	623	1.0%
Oneida	234,878	228,671	222,788	-5,883	-2.6%
Madison	73,442	70,941	72,721	1,780	2.5%
Onondaga	467,026	460,528	450,453	-10,075	-2.2%
Cayuga	80,026	76,576	81,368	4,792	6.3%
Wayne	93,772	89,918	97,899	7,981	8.9%
Monroe	744,344	741,770	740,760	-1,010	-0.1%
Genesee	60,079	57,280	57,516	236	0.4%
Erie	919,040	918,702	912,661	-6,041	-0.7%
Niagara	216,469	209,281	215,927	6,646	3.2%
Empire Corridor West / Niagara (Total)	**3,495,494**	**3,456,011**	**3,433,062**	**-22,949**	**-0.7%**
ENTIRE CORRIDOR TOTAL	**8,951,525**	**9,016,633**	**9,668,415**	**651,782**	**7.2%**

Source: 2010 and 2019 population data obtained from the U.S. Census Bureau Decennial Census
2035 population projections prepared by Woods and Poole Economics, Inc.

Exhibit 4-5—Population of Major Cities in the Study Area

City	2006 Population	2010 Population	2019 Population	2010 to 2019 Change	
				No. of Persons	Percentage
New York City	8,214,426	8,175,133	8,336,817	161,684	2.0%
Yonkers, Westchester County	197,852	195,976	200,370	4,394	2.2%
Poughkeepsie, Dutchess County	30,050	32,736	30,515	2,221	-6.8%
Albany, Albany County	93,963	97,856	96,460	-1,396	-1.4%
Schenectady, Schenectady County	61,560	66,135	65,273	-862	-1.3%
Utica, Oneida County	59,082	62,235	59,750	-2,485	-4.0%
Syracuse, Onondaga County	140,658	145,170	142,327	-2,843	-2.0%
Rochester, Monroe County	208,123	210,565	205,695	-4,870	-2.3%
Buffalo, Erie County	276,059	261,310	255,284	-6,026	-2.3%

Source: US Census Bureau, Population Estimates Program

Employment

Overview

The study area comprised 57 percent of the total state employment of 12,873,579 in 2019, the third largest state labor market in the country. Employment in the twenty-five study area counties totaled 6,372,282 in 2010 and grew by 949,344 jobs (or 14.9%) by 2019. Both in 2010 and 2019, the majority of jobs were located in the eleven counties along Empire Corridor South, which accounted for most (70%) of the study area employment. The fourteen counties along Empire Corridor West/Niagara Branch provided approximately 30 percent of study area employment. Appendix G.3 describes employment and forecasted trends by county for the study area. Exhibit 4-6 shows historic (2010), existing (2019) and future (2035) employment as well as 2019 annual average unemployment rates for each county. Between 2010 and 2019, annual average unemployment rates dropped in all study area counties by 3 to 4 percentage points reflecting strong employment in the region.

Empire Corridor South

The eleven counties along Empire Corridor South provided 4,307,858 jobs in 2010. This labor market is projected to increase by 19.2 percent by 2035, with a projected increase of 825,889 jobs.

The two study area counties within New York City, **New York (Manhattan Borough) and Bronx Counties** accounted for half (50.3% in 2019) of study area employment, and this does not account for employment within the remaining three counties within New York City. This labor market experienced the largest growth from 2010 to 2019, increasing by 579,512 jobs (22.2%) in Manhattan and by 91,156 (23.0%) jobs in Bronx County. In 2019, average annual unemployment stood at 2.8 percent in Manhattan, and 4.4 percent in Bronx County.

Westchester County was the second largest labor market, outside of Manhattan, comprising 572,419 jobs in 2010 and grew by 69,848 jobs (or 12.2%) in 2019. This job base is projected to expand by 10.6 percent by 2035 (67,785 jobs). In 2019, the average annual unemployment rate in Westchester County stood at 3.8 percent.

The remaining five counties close to New York City (Rockland, Putnam, Orange, Dutchess and Ulster) similarly provided a significant job base, with the smallest number of jobs provided in **Putnam County** (39,168 jobs in 2010, increasing by 3,337 jobs, or 8.5%, by 2019). These five counties accounted for 602,421 in 2010 or 9.5 percent of study area employment. The job base for these counties grew by 74,120 jobs or 12.3 percent by 2019. The projection is for the job base to expand by an additional 15.5 percent (an increase of 104,856 jobs) by 2035. These five counties had an average annual unemployment rate of 3.7 percent in 2019.

Empire Corridor West/Niagara Branch

The fourteen counties along Empire Corridor West/Niagara Branch accounted for 2,064,424 jobs in 2010 and grew by 125,969 jobs (or 6.1%) by 2016. This labor market is forecasted to expand by 15.4 percent by 2035, with a projected increase of 337,272 jobs.

Exhibit 4-6—2010, 2019 and 2035 Employment and 2016 Unemployment Rates for Study Area Counties

County	2010 Employment	2019 Employment	2035 Employment	2019-2035 Change		2019 Annual Average Unemployment Rate
				No. of Jobs	Percentage	
New York	2,615,450	3,194,962	3,011,516	-183,446	-5.7%	2.8%
Bronx	397,413	488,569	465,307	-23,262	-4.8%	4.4%
Westchester	572,419	642,267	710,052	67,785	10.6%	3.8%
Rockland	152,836	181,419	188,895	7,476	4.1%	3.5%
Putnam	39,168	42,505	49,249	6,744	15.9%	3.8%
Orange	175,491	202,366	237,400	35,034	17.3%	3.9%
Dutchess	148,391	157,724	192,940	35,216	22.3%	3.6%
Ulster	86,535	92,527	112,913	20,386	22.0%	3.7%
Columbia	29,464	33,453	41,869	8,416	25.2%	3.2%
Greene	20,877	21,477	27,268	5,791	27.0%	4.7%
Rensselaer	69,814	73,964	96,338	22,374	30.3%	3.7%
Albany	258,939	282,482	330,785	48,303	17.1%	3.5%
Schenectady	80,665	80,756	84,890	4,134	5.1%	3.8%
Schoharie	12,668	13,120	16,643	3,523	26.9%	4.8%
Montgomery	24,883	24,782	29,158	4,376	17.7%	5.4%
Herkimer	23,300	23,858	27,669	3,811	16.0%	5.4%
Oneida	133,696	133,794	188,186	54,392	40.7%	4.5%
Madison	30,342	31,206	37,879	6,673	21.4%	4.9%
Onondaga	299,205	315,100	362,124	47,024	14.9%	4.0%
Cayuga	34,471	34,562	42,302	7,740	22.4%	4.7%
Wayne	39,004	38,406	42,897	4,491	11.7%	4.7%
Monroe	463,325	499,626	596,481	96,855	19.4%	4.3%
Genesee	29,482	29,996	35,210	5,214	17.4%	4.4%
Erie	546,166	588,739	634,748	46,009	7.8%	4.5%
Niagara	88,278	93,966	98,693	4,727	5.0%	5.6%
Total	**6,372,282**	**7,321,626**	**7,661,412**	**339,786**	**4.6%**	**4.2%**

Source: U.S. Department of Commerce, Bureau of Economic Analysis (2010 and 2019), Woods and Poole Economics, Inc. (2035 projections), Annual 2019 Unemployment rates: Bureau of Labor Statistics, "Labor Force Data by County."

Erie County had the largest employment base in 2019, with 588,739 jobs, followed by **Monroe County** (499,626 jobs), **Onondaga County** (315,100 jobs), **Albany County** (282,482 jobs), **Oneida County** (133,794 jobs) and **Niagara County** (93,966 jobs). Together, these six counties accounted for approximately 26 percent of the study area employment in 2019, and are forecasted to grow by 15.5 percent (or 297,310 jobs) by 2035. The 2019 unemployment rates were highest in the western counties. Niagara County had the highest unemployment rate in 2016 (5.6%), and the remaining counties had unemployment rates that ranged from 3.5 percent (Albany County) and 5.4 percent (Montgomery and Herkimer Counties) in 2019.

<u>Business Districts</u>

The eight major business districts along the study directly abut the Empire Corridor for the 90/110 Study Area, and all but Schenectady and Utica are located directly along the 125 Study Area. However, under Alternative 125, the existing Amtrak service provided to all of these cities would remain the same.

New York City

New York City is the financial capital of the country, and along with London and Tokyo regarded as a global financial center. Midtown Manhattan is the largest central business district in the U.S., and Lower Manhattan is the third largest. If the two study area counties, New York County (Manhattan) and Bronx County, were cities, they would each rank among the top 10 cities nationwide in terms of population.

New York City is the center of one of the most populous metropolitan areas in the world. New York City is the center of the New York-Northern New Jersey-Long Island, New York-New Jersey-Pennsylvania Metropolitan Statistical Area (MSA), which had a population that grew by 893,180 persons from 2010 (or 4.9%) to a total of 19,216,182 persons in 2019. In 2019, the gross metropolitan product of the New York metropolitan area (New York-Newark-Jersey City, New York-New Jersey-Pennsylvania MSA) was 1.861 trillion dollars, larger than the combined gross domestic product of Pennsylvania and New Jersey, and larger than all but one state (California)[54]. This GDP grew by 39.1 percent from 2010. Based on commuting patterns, a wider region is defined by the U.S. Census Bureau as the New York-Newark-Bridgeport, New York-New Jersey-Connecticut-Pennsylvania Combined Statistical Area. One of every fifteen Americans lives within this wider region.

New York City's labor market totaled 6,193,192 in 2019, comprising 48.1 percent of New York State's employment. This labor market grew by 1,347,579 jobs from 2010, an increase of 28 percent. The city is critical to the state's economic vitality and is a driver of the national economy.

Yonkers

Yonkers is part of the New York City metropolitan area and is the fourth largest city in the state. It is the largest city in Westchester County and is situated within 12 miles of midtown Manhattan. The Yonkers central business district serves a largely local population with major retail activity and anchors, similar to the retail mall complexes in nearby White Plains. The downtown waterfront has historically played an important role in the city's economy, and the city is embarking on an ambitious,

[54] Global Insight, *U.S. Metro Economies: GMP—The Engines of America's Growth, Gross Metropolitan Product with Housing Update.* Prepared for the U.S. Conference of Mayors and the Council for the New American City, June 2008; Updated using U.S. Bureau of Economic Analysis, "Gross Domestic Product by State/Metropolitan Area." 2019.

mixed-use waterfront revitalization program.

Poughkeepsie

The City of Poughkeepsie is the seat of Dutchess County, and along with the Town of Poughkeepsie, is the de facto center of the Hudson Valley. The city is located midway between New York City and Albany, and is the largest principal city of the Poughkeepsie-Newburgh-Middletown Metropolitan Statistical Area, which encompasses all of Dutchess and Orange Counties. Poughkeepsie is the mid-Hudson Valley's regional governmental, educational, and cultural center and a civic center for federal, state, and county government offices.

Albany/Schenectady within the Capital District

The City of Albany is the state capital and is the seat of Albany County. Albany is the heart of the Capital District that includes the neighboring City of Schenectady. The City of Schenectady is the seat for Schenectady County. Both cities are part of the Albany-Schenectady-Troy Metropolitan Statistical Area, the fourth largest in the state, which grew by 9,665 persons, or 1.1 percent, from 2010 to a total population of 880,381 in 2019. Based on commuting patterns, Albany and Schenectady are part of a larger area defined by the federal government as the Albany-Schenectady-Amsterdam, New York Combined Statistical Area.

Albany and Schenectady have been a center for higher education as well as government and healthcare, for over a century, and the economies of both cities has historically been dependent on these three sectors. Albany is home to major institutions of higher learning including the Albany Medical Center, Albany Law School, Albany College of Pharmacy and Health Sciences, and University of Albany, State University of New York (aka SUNY Albany).

Utica

Utica is the seat of Oneida County and, along with the neighboring City of Rome, are the principal urban centers of the Utica-Rome Metropolitan Statistical Area. The population of the Utica-Rome Metropolitan Statistical Area lost 9,407 persons (or -3.1%) from 2010 to total 289,990 persons in 2019.

Syracuse

Syracuse is the seat of Onondaga County and the fifth largest city in the state. It is the center of the Syracuse Metropolitan Statistical Area, which lost population (-13,984 persons or -2.1%) from 2010 to 2019, totaling 648,593 persons in 2019. This MSA is part of a larger Syracuse-Auburn, New York Combined Statistical Area.

Syracuse is the economic and educational hub of Central New York. It has access to major convention sites in the downtown convention center complex and, west of the city, the Empire Expo Center (site of the annual Great New York State Fair). It is also home to Syracuse University, a major research institution; the State University of New York Upstate Medical University; and other colleges and universities.

Rochester

Rochester is the third largest city and the Rochester MSA represents the third largest regional economy in New York. Rochester is the county seat for Monroe County. The population of the Rochester MSA grew by 15,321 persons (or 1.5%) from 2010 to total 1,069,644 persons in 2019.

Based on commuting patterns, a larger area has been defined by the federal government as the Rochester-Batavia-Seneca Falls, New York Combined Statistical Area.

Rochester is a center for higher learning and medical/technological development. It is the home of the University of Rochester and the Rochester Institute of Technology.

Buffalo

Buffalo, the second most populous city in the state and the seat of Erie County, is located on the eastern shore of Lake Erie and at the head of the Niagara River. It is the principal city of the Buffalo-Cheektowaga-Niagara Falls Metropolitan Statistical Area, which lost population (-7,526 persons or -0.7%) from 2010 to total 1,127,983 in 2019. In 2019, this MSA was the second largest regional economy in the state. Today, healthcare and education are major stalwarts of the economy, with expansion of the Buffalo Niagara Medical Center and the University of Buffalo contributing to the city's economic growth.

4.3.4. Environmental Consequences

Comparison of Alternatives

With the Base Alternative, population and employment will continue to grow as projected, but mobility may be adversely impacted without additional transportation improvements to accommodate a larger populace and growing employment base, particularly in major employment centers, such as New York City. Under the Build Alternatives, the improvements to intercity passenger service that result in increases in ridership and improve mobility and travel choices may influence the attractiveness of the area for businesses and residents. This, in turn, could result in increases in population and employment, beyond those forecasted for 2035. With the Base Alternative, this effect, if discernible, will be a minimal increase. As speeds and ridership would increase under each of the Build Alternatives, this effect on population and employment is anticipated to become more pronounced, particularly in the vicinity of the station sites. Alternative 90A, although it would increase ridership and accrue mobility and economic benefits, these would not be as pronounced as for the Preferred Alternative. Although the higher speeds afforded by Alternatives 110 and 125 would result in larger increases in ridership and would present greater benefits for mobility and economic growth and development, these alternatives would also involve greater property displacements and direct impacts on businesses than the Preferred Alternative. The following section describes effects of the Preferred Alternative, and Appendices G.2 and G.3 describe the impacts on population and employment/businesses of the other alternatives considered. The following sections focus on long-term impacts, while short-term construction impacts are addressed in Section 4.25. The program has the potential for long-term economic benefits, as discussed in the following section, and the program construction could also be expected to generate positive economic benefits, both directly through job creation and indirectly through spending and other inputs into the economy.

Alternative 90B (Preferred Alternative)

Population

Alternative 90B would include the 90A improvements and provide further reductions in travel time, with a dedicated third track and sections of fourth track provided between Schenectady and Buffalo. Alternative 90B also proposes double track along 10 miles, and upgrades to 6 miles, of the Niagara Branch.

Overall, improved intercity passenger rail service, with more frequent trips and faster service, would improve mobility and travel choices, making the program area potentially more attractive to residents, commuters, and tourists. The United States Conference of Mayors report, *The Economic Impacts of High-Speed Rail on Cities and their Metropolitan Areas*, projects that incremental speed improvements in high-speed rail service would provide positive impacts on the tourism industry in the Capital District/Albany region, with a growth of visitors and increases in the local job base. The Preferred Alternative, Alternative 90B, could result in increases in population that would be greater than for the Base Alternative and Alternative 90A. This effect may be more pronounced in the vicinity of the station sites. These increases in ridership and the additional mobility benefit afforded cities and bedroom communities west of Albany may offset to some degree the projected decreases in population (from outmigration and/or deaths outpacing births) that forecasts indicate will occur by 2035 within counties along the Empire Corridor West/Niagara Branch.

Employment and Businesses

Faster travel times and more frequent service would better serve businesses and could potentially result in greater increases in employment and business activity than for the Base Alternative or Alternative 90A. Better segregation of passenger service and freight service by adding additional trackage between Schenectady and Buffalo, and any corresponding improvements in freight traffic, could provide more benefits to those businesses that rely on freight traffic, by increasing freight capacity. Alternative 90B is anticipated to potentially result in increases in business activity that would be greater than that for both the Base Alternative and Alternative 90A, particularly in the vicinity of the station sites, based on increased ridership and improved travel times and performance for both passenger rail and freight rail. The U.S. Conference of Mayors report projects that incremental speed improvements (79 to 90 mph) and more frequent service (32 roundtrips from NYC to Albany) could result in an addition of approximately 3,184 jobs in 2035 in the Capital District/Albany region alone. This report also forecasts increases in 2035 of sales output in the Capital District alone of $357.9 million per year and increases in 2035 wages of $158.7 million per year. Alternative 90B would involve isolated right-of-way impacts in limited areas in six counties. The limited property displacements for the Preferred Alternative could affect businesses.

4.3.5. Potential Mitigation Strategies

The mitigation considered will depend on the extent of impacts associated with the Preferred Alternative, Alternative 90B, which will be determined when this alternative is advanced in Tier 2 assessments. Mitigation measures could range from site-specific mitigation to general program-wide measures, and will depend on the level of impact determined in Tier 2. If required, NYSDOT will develop mitigation strategies in consultation with the affected communities, including discussion of station access, pedestrian accommodations, and connections to existing transit and highways. Potential site-specific mitigation strategies might include impact minimization/relocation of affected residences and businesses, improved grade crossing protection, and accommodation of pedestrian access. Short-term construction mitigation measures can include outreach to affected communities regarding potential traffic disruptions and compensation to affected property owners for use of affected property. Mitigation during construction is addressed in Section 4.25.

4.3.6. Future Analysis

The Tier 2 assessment will include further evaluation of improved service, ridership, and potential direct effects on localized population, employment, and businesses. The design and mapping showing the proposed rights-of-way limits will be advanced.

NYSDOT will determine the need for the following evaluations in Tier 2 for the Preferred Alternative, as appropriate:

- Effects of property displacements and business impacts of these displacements and relocation studies;
- Effects on community cohesion for displacements within residential neighborhoods; and
- Effects on station and pedestrian access and vehicular traffic circulation on roadway networks around passenger rail stations.

4.4. Environmental Justice and Title VI

4.4.1. Regulatory Context

Environmental justice refers to social equity in sharing the benefits and burdens of a project or program. Title VI, enacted as part of the U.S. Civil Rights Act of 1964 (42 U.S.C 2000d) prohibits discrimination on the basis of race, color, or national origin in federally assisted programs or activities. In addition, Title II of the U.S. Americans with Disabilities Act (42 U.S.C. 12101) and Section 504 of the U.S. Rehabilitation Act of 1973 (29 U.S.C. 794) prohibit discrimination on the basis of disability in all public transportation. Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires each federal agency to identify and address, as appropriate, "*disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations*."[55]

The United States Department of Transportation (U.S. DOT) issued Order 5610.2(a) to address environmental justice for minority and low-income populations.[56] The Council on Environmental Quality (CEQ) provides policy guidance in implementing NEPA[57] that defines minority and low-income populations as either:

- The minority or low-income population of the affected area exceeds 50 percent, or
- The population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

The New York State Department of Environmental Conservation (NYSDEC) Commissioner's Policy 29, Environmental Justice and Permitting, provides additional guidance on incorporating environmental justice concerns into environmental reviews and projects subject to the State Environmental Quality Review Act (SEQR), where NYSDEC has a lead agency role.[58] While NYSDEC is not a lead agency for the program, this guidance provides useful background information for an environmental justice analysis.

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[55] Executive Order 12898. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Federal Register, Volume 59, No. 32, February 11, 1994.
[56] U.S. Department of Transportation, 2012. U.S. DOT Order 5610.2(a), "Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Federal Register, Volume 77, No. 99, May 10, 2012.
[57] National Environmental Policy Act, 1969. Title II, Council on Environmental Quality. Amended, January 1, 1970, July 3, 1975, August 9, 1975 and September 13, 1982.
[58] NYSDEC, 2003. "Commissioner Policy 29, Environmental Justice and Permitting." New York State Department of Environmental Conservation, March 19, 2003.

NYSDEC's Environmental Justice Policy defines a minority community as a contiguous area with multiple census block groups, having a minority population equal to or greater than 51.1 percent of the total population in an urban area and 33.8 percent of the total population in a rural area. NYSDEC's Environmental Justice Policy defines a low-income community as one where the low-income population is equal to or greater than 23.59 percent of the total population.

The Statewide Language Access Policy[59] requires executive state agencies to offer language assistance services. It also requires translation of vital documents into the ten most common non-English languages spoken by limited English Proficiency (LEP) individuals, those speaking English "less than very well" according to the US Census Bureau. As of March 2021, this includes Spanish, Chinese, Russian, Yiddish, Bengali, Korean, Haitian Creole, Italian, Arabic, and Polish.

New York State's "Uniform State Policy" outlines American's with Disability Act requirements for state agencies in its "*Procedures for Implementing Reasonable Accommodation in Programs and Services for Individuals with Disabilities*." Percent of individuals who report any one of the six disability types on the Census, including hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty, are considered to have a disability.

4.4.2. Methodology

Data on minority and low-income populations, LEP persons, persons at least 65 years of age, and persons with disabilities were collected and presented by county, the geographic unit used to map disadvantaged populations for this study. Similar population data was collected at the city level for the nine major cities along the corridor (as described in Section 4.4.1) to supplement the county-wide data. The 2020 U.S. Decennial Census data identified minority populations. The U.S. Census American Community Survey 5-Year Estimates (2015-2019) data for persons living below the poverty level identified low-income populations. The ACS data was also used to identify LEP persons, persons at least 65 years of age, and persons with disabilities.

These statistics were compared to statewide averages and minority and low-income populations were also compared to federal (CEQ) and state (NYSDEC) environmental justice criteria. Federal guidance on EJ allows for agencies to defer to state or local definitions of EJ populations, provided they are at least as inclusive as federal definitions. Federal EJ criteria is also presented, but the NYSDEC criteria is more conservative than the federal criteria in rural areas (for minorities) and for low-income. The NYSDEC criteria for race are different for urban and rural areas. The counties in both the 90/110 and the 125 Study Areas were considered to be urban areas, as defined by U.S. Census 2010 urban area boundaries, with the exception of Columbia, Schoharie, Herkimer, Madison, Cayuga, Wayne, and Genesee Counties.

Once the environmental justice populations were identified, a Tier 1 assessment of disproportionate impacts was completed for each of the alternatives. Within the future Tier 2 assessment, census block group data will be used to identify minority, low-income, and disadvantaged populations within the study area. This level of data may identify additional environmental justice communities not identified in Tier 1, which uses county level data.

[59] Governor's Executive Order 26.1 signed in March 2021, amended the original Executive Order 26 issued October 6, 2011.

4.4.3. Existing Conditions

Overview

The environmental justice study area consists of 20 counties for the 90/110 Study Area and 21 counties for the 125 Study Area, as these study areas are defined in Section 4.1. Exhibit 4-7 shows the minority and low-income populations for the study area. Overall, the State of New York has a minority population of 47.5 percent and a low-income population of 14.1 percent. The NYSDEC criteria for environmental justice include a minority population equal to or greater than 51.1 percent in urban areas. This Environmental Justice assessment considered this to be the threshold for a potential environmental justice area for most of the study area counties except for seven rural counties (Columbia, Schoharie, Herkimer, Madison, Cayuga, Wayne, and Genesee Counties), where the threshold of 33.8 percent for minority populations applied. The NYSDEC criterion for a low-income population is 23.59 percent. The environmental justice statistics were generally higher in the cities than for the counties along the rail corridor, as shown in Exhibit 4-7.

The following sections describe the environmental justice characteristics for the 90/110 Study Area. Appendix G.4 discusses the statistics for minority, low-income, and disadvantaged populations in each county for the 125 Study Area along the Empire Corridor West/Niagara Branch.

Empire Corridor South

The Empire Corridor South segment, from New York City to Rensselaer, extends 142 miles and in many locations closely follows the east bank of the Hudson River. All of the Build Alternatives follow the existing Empire Corridor South for the majority of its length, deviating only in Rensselaer County, where the 125 Study Area splits off 1.6 miles south of where the existing Empire Corridor (the 90/110 Study Area) turns to the west. This program segment includes the study area counties of New York County (Manhattan Borough), Bronx County, Westchester County, Putnam County, Dutchess County, Columbia County, and Rensselaer County.

The most urbanized segment of the study area extends roughly 10 miles through New York City from Pennsylvania Station (the southern terminus of the Empire Corridor) in Manhattan north to the border of Yonkers in Westchester County. The study area extends through Manhattan (New York County) and the Bronx (Bronx County). Minority populations in New York County and Bronx County are the highest of any county in the Empire Corridor study area. Minority populations are 69.1 percent (up from 42.6 percent in 2010) for **New York County** and 91.1 percent (up from 72.1 percent in 2010) for **Bronx County**, compared to 47.5 percent for the state as a whole. Both counties exceeded the NYSDEC criterion (51.1%) for minority populations. Low-income populations are also among the highest of all Empire Corridor counties, with 15.8 percent and 28.0 percent of persons living below the poverty level in New York County and Bronx County, respectively. Both counties have low-income populations above statewide averages (14.1%), although only Bronx County exceeded the applicable NYSDEC criterion of 23.59 percent. In addition, New York City itself, which includes three other counties/boroughs outside the program area, has a minority population of 69.1 percent and 17.9 percent of persons living below the poverty level. The minority population of the city exceeds the applicable NYSDEC (51.1%) for minority populations in an urban area.

Persons with Limited English Proficiency (LEP) make up 26.0 percent of the population in the Bronx, the highest percentage of any county along the Empire Corridor. LEP persons comprise 14.8 percent of the New York County population, slightly higher than for the entire State of New York (13.3%). At 22.5 percent, New York City has a higher proportion of LEP persons than any city along the Empire

Corridor.

The percent of the population that is at least 65 years of age in New York County (16.2%) is similar to that of the entire State of New York (16.1%). Persons that are at least 65 account for 12.5 percent of the Bronx County population. A total of 10.3 percent of the New York County population and 15.2 percent of the Bronx County population have a disability. For comparison, a total of 11.5 percent of the entire State of New York population have a disability. A total of 14.5 percent of the New York City population are at least 65 years of age, and a total of 10.8 percent have a disability.

As the alignment moves north, it enters the Hudson Valley Region consisting of Westchester, Putnam, Dutchess and Columbia Counties. The major populated center in **Westchester County** is the city of Yonkers. Outside these populated centers, the area around the alignment is dominated by surface waters and forested land associated with the Hudson River. The minority population is just under the NYSDEC criterion of 51.1 percent at 50.5 percent and is higher than the statewide average. The low-income population drops to 8.8 percent. The city of Yonkers itself continues to have a high minority population (67.4%), but a lower low-income population (14.9%), both below the NYSDEC criterion.

LEP persons in Westchester County account for 12.9 percent of the total population, slightly lower than in the State of New York (13.3%). A total of 16.7 percent of the population is at least 65 years of age in the county and a total of 9.5 percent have a disability. Persons that are at least 65 years of age make up 16.5 percent of the city of Yonkers population, while persons that have a disability make up 12.0 percent.

Entering **Putnam County**, the alignment passes through the village of Cold Spring; however, the area around the alignment is primarily natural areas consisting of forested land and surface waters. The minority population and low-income population in Putnam County are lower compared to other counties along the alignment at 26.3 percent and 5.0 percent, respectively. The low-income population in Putnam County is the lowest of any of the counties in the Empire Corridor study area.

LEP persons account for 5.1 percent of the Putnam County population, as compared to 13.3 percent for the entire State of New York. A total of 16.7 percent of the Putnam County population is at least 65 years of age, and a total of 9.9 percent have a disability.

In **Dutchess County**, the minority population increases to 32.9 percent while the low-income population remains relatively low at 9.0 percent. The increase in minority population in this County is likely due to the alignment passing through the major urban center of Poughkeepsie, which has a minority population of 65.6 percent and a low-income population of 19.4 percent. As the alignment enters **Columbia County**, it passes through less developed land and the minority population drops to 17.5 percent and the low-income population remains low at 11.6 percent. The proportion of the Columbia County population that is LEP is low (3.0%).

The proportion of the Dutchess County population that is at least 65 years of age (17.1%) is somewhat higher than the State of New York (16.1%). The proportion of persons with disabilities is also somewhat higher (12.7%) than the State of New York (11.5%). The proportion of persons that are at least 65 years of age is higher in Columbia County (23.1%) than any county along the Empire Corridor. Persons with disabilities account for 14.8 percent of the population in this county. The major urban center located along the alignment in Columbia County is the city of Hudson.

Entering **Rensselaer County**, the alignment leaves the Hudson Valley Region and enters the Capitol

District Region (made up of Rensselaer, Albany and Schenectady counties). Primarily, the area around the alignment is rural or residential in the south portion of this area; however, as the alignment approaches the city of Rensselaer in the north, the population density increases, and the suburbs of the Albany-Rensselaer area are located along the alignment. There is a slight increase in minority and low-income populations associated with this urban area. Rensselaer County has a minority population of 22.7 percent and a low-income population of 11.7 percent. LEP persons comprise 2.4 percent of the population, which is fairly low compared to all other counties along the Empire Corridor. The percent of persons with disabilities is 14.0 percent.

Empire Corridor West/Niagara Branch: 90/110 Study Area

The 322-mile long Empire Corridor West/Niagara Branch 90/110 Study Area, with the exception of the metropolitan areas within and surrounding the major cities, has a distinctively more rural agricultural character than the segment to the south.

As the railroad leaves Rensselaer County and enters Albany County, it crosses the Hudson River and passes through the city of Albany before heading northwest towards the city of Schenectady in Schenectady County. The area between these cities is generally more populated and developed and there is a slight increase in minority and low-income populations in these two counties. The minority population is 33.0 percent in Albany County and 33.6 percent in Schenectady County. The low-income population is 11.9 percent in Albany County and 11.4 percent in Schenectady County. The minority population is above the NYSDEC criterion (51.1%) at 55.3 percent in the city of Albany. The low-income population is below the 23.59 percent NYSDEC criterion at 22.9 percent. In the city of Schenectady, the minority population is above the NYSDEC criterion at 56.5 percent but the low-income population is below the NYSDEC criterion at 19.4 percent.

LEP persons comprise 4.7 percent of the Albany County population and 3.5 percent of the Schenectady County population. The percent of persons at least 65 years of age in Albany County (16.5%) and the percent of persons with disabilities (11.3%) are both similar to the entire State of New York (16.1% and 11.5%, respectively). Alternatively, the percent of persons at least 65 years of in Schenectady County (16.8%) and percent of persons with disabilities (13.5%) are both slightly higher than the State of New York.

The LEP population is 6.5 percent in the city of Albany and 5.0 percent in the city of Schenectady. In the city of Albany, the percent of people with disabilities (13.0%) is slightly higher than that for the state, and the percent of persons at least 65 years of age is lower (at 12.9%). In the city of Schenectady, a total of 13.8 percent of persons are at least 65 years of age, and a total of 16.2 percent of persons have a disability, which is higher than the state as a whole.

As the railroad leaves Schenectady County and the Capitol District Region and heads primarily west, it enters Montgomery County and then Herkimer County. These counties are generally more rural along the alignment, but pass through the populated centers of Amsterdam in Montgomery County and Little Falls and the city of Herkimer in Herkimer County. The minority population is 22.8 percent in Montgomery County and 9.1 percent in Herkimer County, the lowest of any county in the Empire Corridor study area. Low-income populations in Montgomery and Herkimer counties are 19.8 percent and 13.6 percent, respectively. The low-income population in Montgomery County is higher than the statewide average (14.1%), but is below the NYSDEC criterion (23.59%).

LEP persons comprise 4.4 percent and 1.4 percent of the Montgomery County and Herkimer County populations, respectively. A total of 18.3 percent of the population in Montgomery County is at least

65 years of age, compared to a total of 20.1 percent in Herkimer County. A total of 16.5 percent of the population in Montgomery County has a disability, as compared to a total of 16.0 percent in Herkimer County.

The railroad enters Oneida County west of Herkimer County. Oneida County is primarily rural with urban populations centered on the city of Utica. There is a minority population of 22.0 percent and a low-income population of 15.5 percent in Oneida County. This is a slight increase from the adjacent Herkimer County to the east. The minority population is below the NYSDEC criterion (51.1%) at 47.6 percent in the city of Utica; however, the low-income population is above the 23.59 percent NYSDEC criterion at 29.4 percent.

LEP persons comprise 4.9 percent of the Oneida County population. Persons that are at least 65 years of age represent 18.4 percent of the population, and persons with a disability represent 14.4 percent. The city of Utica has 14.5 percent LEP persons and 16.7 percent persons with disabilities, both higher than the state as a whole. The population of persons at least 65 years of age in the city of Utica is lower than the state as a whole, with 15.2 percent.

Continuing west, the railroad enters the Central New York Region, which is made up of Madison, Onondaga and Cayuga counties. Madison County is generally rural, and the minority and low-income populations are generally low at 10.4 percent and 9.8 percent, respectively. The LEP population is also low at 1.1 percent in Madison County. As the railroad moves west into Onondaga County, it passes through the larger city of Syracuse. In this county, the minority and low-income populations increase to 27.1 percent and 14.1 percent, respectively, likely due to the city of Syracuse. The minority population was formerly (in 2010) below the NYSDEC criterion (51.1%), at 44.0 percent, but is now 54.1 percent after updates from the 2020 census, in the city of Syracuse; and the low-income population is above the 23.59 percent NYSDEC criterion at 31.0 percent. LEP persons make up 4.0 percent of the Onondaga County population. Only a small segment of the railroad passes through the more rural Cayuga County. The minority population is 13.0 percent and the low-income population is 12.1 percent in Cayuga County. LEP persons comprise 1.3 percent of the Cayuga County population.

In Madison County, the percentages of people with a disability (12.4%) and persons at least 65 years of age (17.6%) are slightly higher than for the state as a whole. In Onondaga County, these percentages also exceed those for the state, with a total of 16.6 percent of the population is at least 65 years of age, and a total of 12.7 percent of the population has a disability. The percent of persons at least 65 in Cayuga County is also higher, at 18.4 percent, and the percent of persons with a disability in Cayuga County is 14.6 percent.

The Finger Lakes Region consists of four counties: Onondaga, Cayuga (also included in the Central New York Region), Wayne and Monroe. Wayne County is similar to Cayuga County with a minority population of 13.2 percent, a low-income population of 11.6 percent and a LEP population of 1.7 percent. However, as the railroad enters Monroe County it passes through the major city of Rochester and its suburbs of East Rochester, Fairport and Gates. There is an increase in the minority and the low-income population to 33.4 percent and 14.4 percent, respectively, in Monroe County. Both the minority population and the low-income population are above the NYSDEC criterion in the city of Rochester, 67.0 percent and 31.3 percent, respectively. There is also an increase in the proportion of LEP persons in Monroe County (5.5%) and the city of Rochester (9.5%).

A total of 18.4 percent of the population in Wayne County is at least 65 years of age and 15.3 percent have a disability, which exceed percentages for the state as a whole. In Monroe County, the proportion of persons above the age of 65 (16.9%) and the proportion of persons with a disability (13.9%) are also higher than for the state as a whole. The population of the City of Rochester has 18.7 percent people with disabilities and 10.9 percent persons at least 65 years of age.

The railroad leaves the Rochester area and enters Genesee County to the west where it transitions back to a more rural area. The minority population drops to 12.7 percent in Genesee County, and the LEP population drops to 1.0 percent. The low-income population decreases slightly to 10.9 percent. Entering the Buffalo-Niagara region, the railroad passes through Erie and Niagara Counties and terminates in Niagara Falls. In Erie County, the rail corridor passes through the city of Buffalo. The minority population in Erie County increases to 28.9 percent and the low-income population increases slightly to 14.2 percent. The percentage of persons at or below the poverty level is slightly above the statewide average of 14.1 percent, but is below the NYSDEC criterion of 23.59 percent. The minority population was formerly (in 2010) below the NYSDEC criterion (51.1%), at 49.6 percent but increased in 2020 to 61.0 percent, in the city of Buffalo; the low-income population is above the 23.59 percent NYSDEC criterion at 30.1 percent. The LEP population decreases to 3.9 percent in Erie County and increases to 8.1 percent in the City of Buffalo. Niagara Falls is the main urban center in Niagara County and the terminus of the Empire Corridor. The minority population is 18.3 percent, the LEP population is 1.7 percent and the low-income population is 13.5 percent in Niagara County.

In Genesee County, a total of 18.3 percent of persons are at least 65, and a total of 14.7 percent of persons have a disability, which is higher than for the state as a whole. In Erie County, the percentage of persons at least 65 decreases to 17.6, and the percentage of persons with a disability decreases to 13.2 percent, but these exceed the percentages for the state as a whole. In Niagara County, the percent of persons at least 65 years of age is 18.6, and the percent of persons with a disability are 13.9 percent.

4.4.4. Environmental Consequences

Overview

Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionately high and adverse environmental impacts that may exist in those communities.

Disproportionately high and adverse effects are defined as either of the following:

- A negative impact predominantly borne by minority or low-income households,
- A negative impact experienced by these populations in a way that is appreciably more severe or greater in magnitude than would be experienced by non-minority or non-low-income populations.

At the county level, the long-term impacts of this program of improvements under any of the alternatives is unlikely to result in disproportionately high and adverse impacts to minority and low-income communities, as the program will provide improved transportation access to all persons, while community and residential displacement will be minimized with the location of added new tracks largely within the existing right-of-way. Tier 2 analysis will include a more detailed and refined study to document the presence of low-income and minority communities, and then to evaluate if the Preferred Alternative, Alternative 90B, would involve disproportionately high and adverse site-

Exhibit 4-7—Minority, Low-income, and Disadvantaged Population Percentages by County/Major City Along the Empire Corridor Study Area

County	Major City	Percent Minority[1]	Percent Low-income[2,3]	Percent LEP [4]	Percent Disabled[5]	Percent Over 65[6]
New York		***53.2***	15.8	14.8	10.3	16.2
Bronx		***91.1***	***28***	26	15.2	12.5
	New York City[9]	***69.1***	17.9	22.5	10.8	14.5
Westchester		50.5	8.8	12.9	9.5	16.7
	Yonkers	***67.4***	14.9	18.6	12	16.5
Putnam		26.3	5	5.1	9.9	16.7
Dutchess		32.9	9	4.7	12.7	17.1
	Poughkeepsie	***65.6***	19.4	6.8	16.8	16.0
Columbia[7]		17.5	11.6	3	14.8	23.1
Rensselaer		22.7	11.7	2.4	14	16.5
Albany		33.0	11.9	4.7	11.3	16.5
	Albany	***55.3***	22.9	6.5	13	12.9
Schenectady		33.6	11.4	3.5	13.5	16.8
	Schenectady	***56.5***	19.4	5.0	16.2	13.8
Schoharie [7, 8]		10.3	12.1	1	16.5	21
Montgomery		22.8	19.8	4.4	16.5	18.3
Herkimer[7]		9.1	13.6	1.4	16	20.1
Oneida		22.0	15.5	4.9	14.4	18.4
	Utica	47.6	***29.4***	14.5	16.7	15.2
Madison[7]		10.4	9.8	1.1	12.4	17.6
Onondaga		27.1	14.1	4	12.7	16.6
	Syracuse	***54.1***	***31***	7.1	15.8	12.6
Cayuga[7]		13.0	12.1	1.3	14.6	18.4
Wayne[7]		13.2	11.6	1.7	15.3	18.4
Monroe		33.4	14.4	5.5	13.9	16.9
	Rochester	***67.0***	***31.3***	9.5	18.7	10.9
Genesee[7]		12.7	10.9	1	14.7	18.3
Erie		28.9	14.2	3.9	13.2	17.6
	Buffalo	***61.0***	***30.1***	8.1	16.3	12.4
Niagara		18.3	13.5	1.7	13.9	18.6
State of New York		47.5	14.1	13.3	11.5	16.1
NYSDEC		**51.1/33.8**	**23.59**			

[1]/ NYSDEC's Environmental Justice Policy (Commissioner's Policy 29, "Environmental Justice and Permitting," NYSDEC Policy, Issuing Authority: Commissioner Erin M. Crotty, Date Issued: 3/19/03) defines a minority community as a contiguous area with multiple census block groups, having a minority population equal to or greater than 51.1 percent of the total population in an urban area and 33.8 percent of the total population in a rural area.

[2]/ Percent of ***individuals*** living below the poverty level

[3]/ NYSDEC's Environmental Justice Policy defines a low-income community as one where the low-income population (i.e., persons living below the poverty threshold) is equal to or greater than 23.59 percent of the total population.

[4]/ An individual is considered to be LEP if he or she speaks English less than —very well according to the US Census Bureau.

[5]/ Percent of individuals who report any one of the six disability types are considered to have a disability, including hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty.

[6]/ According to the Census, population aging is commonly measured as an increasing median age or a rising share of the population above a certain age, such as 65.

[7]/ Considered a rural county based on U.S. Census Bureau urban area 2010 boundaries.

[8]/Only for the 125 Study Area.

[9]/ New York City also includes three other counties/boroughs besides New York (Manhattan) and Bronx.

Bold and italicize indicates communities that exceed the minority or low-income community thresholds

Source: U.S. 2020 Decennial Census (2015-2019 American Community Survey 5-Year Estimates) specific effects on those communities. Short-term impacts related to construction are discussed in Section 4.25.3.

Comparison of Alternatives

Since there are fewer improvements in the Base Alternative compared with the various Build Alternatives, there will also be fewer benefits in terms of increased service and reliability to the low-income and minority communities, as well as populations protected under Title VI (Limited English Proficiency populations, and persons with disabilities and at least 65 years of age). Proposed work for the Preferred Alternative would not likely result in disproportionately high and adverse impacts to these minority and/or low-income communities since work would primarily be within the current right-of-way. All of the Build Alternatives would provide increased transit options that would provide a benefit for the minority, low-income, and other disadvantaged communities. Alternative 90A and Alternative 90B, the Preferred Alternative, would require less displacements and property impacts compared to Alternatives 110 and 125. Therefore, Alternatives 110 and 125 have a greater potential for impacts on disadvantaged populations.

The program plans track improvements and upgrades for all alternatives in urban locations like New York, Yonkers, Poughkeepsie, Albany, Schenectady, Utica, Syracuse, Rochester and Buffalo where minority or low-income population (or both) register above noted criterion. With Alternative 90A and Alternative 90B, the Preferred Alternative, upgrades to stations and increased trip frequency would ultimately provide a benefit to communities. Disproportionately high and adverse impacts to minority, low-income, or disadvantaged communities would be unlikely with these alternatives, as both involve minimal property impacts. Increased frequency of service could have the potential to incur additional noise impacts from train passbys, however the additional trips represent a minimal increase over current rail traffic that includes frequent CSXT freight rail and Metro-North commuter rail traffic. Construction of the program could involve temporary noise and air quality impacts, but these would be temporary in nature. The Preferred Alternative would also involve lesser visual impacts than Alternative 110 and 125, but greater visual impacts than the Base Alternative and Alternative 90A.

The following section addresses the impacts of the Preferred Alternative, and Appendix G.4 presents impacts of the other alternatives considered.

Alternative 90B (Preferred Alternative)

Alternative 90B station upgrades, travel time reduction, and increased trip frequency would ultimately provide a benefit to communities. Disproportionately high and adverse impacts to minority or low-income communities would be unlikely.

It is unlikely that there would be a disproportionately high and adverse impact to minority or low-income communities at the county-level. Bronx County exceeded NYSDEC environmental justice criterion; however, second track improvements proposed for Bronx County (MPs 9 to 13) would occur within the current right-of-way and would be unlikely to have a disproportionately high and adverse impact to minority and low-income communities in this area. Construction may involve noise and dust impacts and would be short-term in nature, but these would likely not disproportionately affect EJ/disadvantaged populations, because mitigation measures will be employed to minimize any impacts or disruptions to nearby properties and uses. Construction would be staged to minimize residential and business impacts to the extent practicable.

Proposed signal upgrades, station improvements and areas of extra track proposed along the corridor would occur within the major urban areas of Poughkeepsie, Albany, Syracuse and Rochester.

Minority and/or low-income populations that exceed the NYSDEC criterion are located in these improvement areas; however, the Preferred Alternative improvements, which includes Alternative 90A projects, (including signal upgrades and extra track) are anticipated to be contained within the existing right-of-way. Therefore, property impacts would not occur, and disproportionately high and adverse impacts to minority or low-income communities would be unlikely. The Preferred Alternative, Alternative 90B, will not increase noise levels over the Base Alternative between New York City and Schenectady, and the increases west of this point would be imperceptible (0 to 2 decibels). Construction may involve noise impacts, but these would be short-term in nature and would be staged to minimize residential and business impacts.

Station improvements for the Preferred Alternative at the Syracuse and Buffalo-Depew stations also are anticipated to be contained within the right-of-way, but would involve larger construction impacts (e.g., temporary noise increases); however, upgrades to the stations and increased trip frequency would ultimately provide a benefit to these communities and disproportionately high and adverse impacts to minority or low-income communities would be unlikely. Construction may involve noise and dust impacts, but these would not disproportionately affect EJ/disadvantaged populations and would be short-term in nature.

Alternative 90B includes doubletracking along ten miles of the Niagara Branch. It is unlikely that there would be disproportionately high and adverse impacts to minority or low-income communities at the county-level for these improvements, since it is anticipated to involve no or minimal residential displacements or encroachments. Construction may involve noise and dust impacts and would be short-term in nature, but these would likely not disproportionately affect EJ/disadvantaged populations, because mitigation measures will be employed to minimize any impacts or disruptions to nearby properties and uses. Construction would be staged to minimize residential and business impacts to the extent practicable. The majority of the Empire Corridor West/Niagara Branch passes through rural land; however, there are planned third and fourth track improvements that would occur in more urban locations. These include the cities of Schenectady, Utica, Syracuse, Rochester and Buffalo. Minority and/or low-income communities that exceed the NYSDEC criterion are located in the cities of Schenectady, Utica, Syracuse, Rochester and Buffalo; however, third and fourth tracks would generally be added within the existing right-of-way and would be unlikely to have disproportionately high and adverse impacts to minority or low-income communities both for long-term operation and during the construction program. Temporary impacts during construction could temporarily result in elevated noise or air quality impacts, but mitigation measures will be employed to minimize any impacts or disruptions to nearby properties and uses.

4.4.5. Potential Mitigation Strategies

For the Preferred Alternative, Alternative 90B, for displacements or other property impacts, a more detailed and refined study will be completed as part of the Tier 2 analysis to document the presence of low-income and minority communities, and then to evaluate if there would be disproportionately high and adverse site-specific effects on those communities. Public outreach efforts would continue as design of the Preferred Alternative is advanced during Tier 2 analysis. Construction mitigation is described in Section 4.25.

4.4.6. Future Analysis

Within the Tier 2 assessments, any residential property displacements will consider and evaluate census block group data to identify minority and low-income populations within the study area as outlined in NYSDOT and NYSDEC guidance. This level of data may identify additional environmental justice communities not identified in the Tier 1 analysis

To evaluate if there would be disproportionately high and adverse effects on these communities, Tier 2 studies would involve a quantitative analysis for parameters that have the potential to affect these communities, such as:

- Right-of-way (number of acquisitions in low-income or minority communities versus in the general reference population),
- Noise and vibration (number of noise and vibration impacts in low-income or minority community versus in the general reference population),
- Other applicable parameters that may directly or indirectly affect identified environmental justice communities.
- Permitting by the NYSDEC through Commissioner's Policy 29 for environmental justice may be required depending on the results of the Tier 2 analysis.[60] This policy provides guidance for incorporating environmental justice concerns into the NYSDEC environmental permit review process for individual projects in the program.

4.5. Community and Public Facilities

4.5.1. Regulatory Context

The Federal Railroad Administration's Procedures for Considering Environmental Impacts (Federal Register, Vol. 64, No. 101, May 26, 1999), states that: "*the following aspects of potential environmental impact should be considered:…solid waste disposal…impacts on the socioeconomic environment, including…the potential for community disruption…and impacts on local government service…Public health; Public safety…*"

4.5.2. Methodology

Community and public facilities were identified for study areas within 1,000 feet of the centerline for all alternatives, based on review of available mapping and information. This inventory identified facilities that provide services to the public and gathering places and cultural centers such as museums and arenas. Data was collected on schools, colleges, fire stations, police stations, medical facilities (hospitals, emergency services, and medical offices), post offices, libraries, and places of worship. Also identified were public facilities, such as military facilities; government offices; Departments of Public Works/maintenance; sewer, solid waste, landfill, and recycling/transfer facilities; prisons; airports; cemeteries; and tourist information centers.

The New York State Geographic Information Systems Clearinghouse provided information on federal and state non-recreation property, schools and colleges, government offices, libraries, points of interest, and tourist information centers. A review of Google aerial photography and maps was performed to identify other community and public facilities within the 2,000-foot-wide study area for both corridors. This review included publicly accessible facilities, such as golf courses or golf clubs that are privately owned, but are either open to the public or used for recreation by members.

[60] NYSDEC. "Commissioner Policy 29, Environmental Justice and Permitting." March 19, 2003.

4.5.3. Existing Conditions

There were a total of 224 community and public facilities located within 1,000 feet of the centerline for the 90/110 Study Area. Of these, approximately 81 community and public facilities are located along Empire Corridor South (142 miles in length), and 141 are located along Empire Corridor West/Niagara Branch (322 miles in length). For the 125 Study Area, there were 161 community and public facilities located within 1,000 feet of the corridor centerline. Of the facilities in the 125 Study Area, approximately 80 are located along Empire Corridor South and 81 are located along Empire Corridor West. Community facilities are summarized in Exhibit 4-8 and Exhibit 4-9 and are also described and shown in Appendix G.5 and Exhibit G-4 of Appendix G.

Exhibit 4-8—Educational, Emergency/Medical, Government, and Religious Facilities in the Study Area

Counties	School, College		Fire, Police		Medical		Post Office		Library		Places of Worship		Govt. Office	
	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area
New York	18	18			2	2	1	1	1	1				
Bronx	1	1			1	1								
Westchester	7	7	1	1	4	4	2	2	3	3			2	2
Putnam			1	1							1	1		
Dutchess	4	4	1	1	4	4	1	1	1	1				
Columbia							1	1						
Rensselaer							3	3	2	1	3	3	2	2
Albany	2			1		1	1					1	1	
Schenectady	1						1		1				2	
Schoharie		1						1						1
Montgomery			3		2		3		3		5		6	
Herkimer					2		1				2			
Oneida														
Madison		1	1			1			2		1	1		
Onondaga	2	1	1				3	2	2	1	2	1	1	1
Cayuga		1												
Wayne	2		2				1			1	1		1	
Monroe	3	3					1	1	1	1	3	3	1	1
Genesee							2		2		3		2	
Erie	3	3	1		1		1		1	1			3	4
Niagara	2	2	1	1							1	1	2	2
TOTAL	45	42	12	5	16	13	22	12	19	10	22	11	23	13
Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.														

Exhibit 4-9—Military, Cultural, DPW/Solid Waste, Correctional, Airport, and Cemetery Facilities in the Study Area

Counties	Military		Cultural, Museum		DPW Solid Waste Sewer		Correctional Institution		Airport		Cemetery		Total ALL Facilities	
	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area
New York			1	1									23	23
Bronx													2	2
Westchester	1	1	2	2			1	1					23	23
Putnam	1	1											3	3
Dutchess			1	1	4	4							16	16
Columbia			2	2							1	1	4	4
Rensselaer													10	9
Albany		1	1	5	1								6	9
Schenectady	1		1	1							1	2	8	3
Schoharie													0	3
Montgomery			3	1	2					1	3		30	2
Herkimer				1							2		7	1
Oneida			2	1	1		1						4	1
Madison			1									2	5	5
Onondaga			2	3					1	2	3	2	17	13
Cayuga			1								1		2	1
Wayne			1								1		9	1
Monroe			4	5	1	1							14	15
Genesee			1										10	0
Erie			2	5			3		1		4	5	20	18
Niagara	1	1							1	1	1	1	9	9
TOTAL	4	4	25	28	9	5	5	1	3	4	17	13	224	161

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.

4.5.4. Environmental Consequences

Comparison of Alternatives

The sections below describe impacts to community and public facilities, including cultural sites. Review of aerial mapping indicates that the Base Alternative, Alternative 90A, and Alternative 90B (the Preferred Alternative) would have minimal impacts to community and public facilities. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. For Alternative 110, greater impacts to community facilities will occur, due to the more urbanized corridor and greater property takings required, and Alternative 125 has the greatest potential to affect public and cultural facilities. Alternative 125 would displace a far greater number of properties and land, including undeveloped or parklands, but is located along a more rural corridor. The proposed work will include the addition of track, as well as maintenance service roads in selected areas.

Because proposed work with the Base Alternative and Alternative 90A are anticipated to be located entirely within the right-of-way, no land acquisitions are anticipated, and therefore no direct impacts to community facilities are anticipated. Alternative 125 has the potential to affect 13 community/publicly used facilities (including cemeteries, privately owned golf courses/golf clubs, and a school ballfield) in 8 counties largely where it extends on new right-of-way. By comparison, Alternative 110 is projected to have potential effects on 4 community facilities (e.g., fire stations, post office) in 1 county. The other alternatives (including the Preferred Alternative, Alternative 90B) are not expected to have any direct impacts to community facilities. Appendix G.5 addresses potential impacts of the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

Increased frequency of service could have the potential to incur additional visual and noise impacts from train passbys, however the additional trips represent a minimal increase over current rail traffic that includes frequent CSXT freight and Metro-North commuter rail traffic (see discussion in Section 4.21). Relocations of adjoining roadways may indirectly affect community facilities (e.g., through property acquisition or changes in access), and would be better defined in Tier 2 including measures to avoid or minimize any adverse effects. Short-term impacts related to construction are discussed in Section 4.25.3.

Alternative 90B (Preferred Alternative)

Alternative 90B would provide further reductions in travel time, by adding 273 miles of dedicated third track and sections of fourth track (totaling 39 miles) between Schenectady and Buffalo. The new tracks would be offset 15 feet from the existing railroad and from each other. Alternative 90B also proposes double track along five miles of the Niagara Branch.

Empire Corridor South

The Preferred Alternative include Alternative 90A projects along Empire Corridor South. For this work within the right-of-way, no impacts on community facilities are anticipated to occur.

Empire Corridor West/Niagara Branch

- Improvements for Alternative 90B would start at MP 159.5 in the City of Schenectady and would extend west. At MP 160, the proposed siding and crossover would be adjacent to a state agency office and the Empire State College of the State University of New York, but would not extend outside of the right-of-way.
- At MP 168, Vedder Cemetery is mapped just north of the railroad. Although Alternative 90B extends outside of the right-of-way to the west of this point to connect to the Selkirk Branch, the proposed third track and maintenance service road is within the right-of-way immediately adjacent to the cemetery.
- Work that may extend outside of the right-of-way between MPs 234 to 238 around the Boehlert Transportation Center at Union Station (Utica Station) in Oneida County and around the William F. Walsh Regional Transportation Center, or Syracuse Station, (MPs 291 to 292) will be located within an urban area and will not affect community facilities. New passenger tracks will be added south of the tracks in the areas adjoining Alliance Stadium, a minor league baseball stadium in Syracuse, but will not directly affect the facility.

- In Monroe County, the addition of a fourth track around the Rochester Station could also involve right-of-way impacts (MPs 371 to 376 and MPs 378.2 to 378.6, and MPs 379.15 to 379.6), this work will extend in the vicinity of facilities such as Frontier Field, a minor league baseball stadium, but will not directly affect community facilities.

There are also locations where relocations of adjoining roadways may result in indirect impacts to community facilities, but these locations would be better defined in Tier 2.

4.5.5. Potential Mitigation Strategies

During the Tier 2 assessment, the design of the Preferred Alternative, Alternative 90B, will be refined to avoid or minimize impacts on community facilities to the extent feasible. If appropriate, relocation planning and studies will be performed as part of Tier 2, and relocation assistance provided in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601 et seq.). Other considerations will include the visual and noise impacts on adjoining or affected community facilities, and further assessments of these impacts will also be advanced in Tier 2.

4.5.6. Future Analysis

The Tier 2 assessments will include a thorough inventory of community facilities that may be affected by Alternative 90B, the Preferred Alternative, including water supplies, municipal buildings, offices, schools, libraries, and other cultural institutions. Detailed property mapping and information on ownership and the extent of public use of community facilities in the vicinity of the program will be obtained. If any impacts may occur, consultation with public officials and property owners/officials with jurisdiction will be performed regarding potential impacts and mitigation measures, as appropriate.

4.6. Surface Waterbodies and Watercourses

4.6.1. Regulatory Context

The U.S. Clean Water Act (1972 amendments to the Federal Water Pollution Control Act) is the cornerstone of surface water quality protection in the United States and provides for the regulation of the discharge of pollutants from point sources to waters of the U.S.[61] Under the Section 404 of the CWA, impacts to waters of the U.S., including open water features, must be avoided, minimized, or mitigated (in order of preference), with the goal of achieving no net loss of functions and values of jurisdictional wetlands (33 United States Code 1251 et seq.). Section 303(d) of the U.S. Clean Water Act requires states, as part of required periodic assessment and reporting, to identify Impaired Waters, where specific designated uses are not fully supported. For these Impaired Waters, states must consider the development of a Total Maximum Daily Load (TMDL) or other strategy to reduce the input of the specific pollutant(s). The New York State Section 303(d) List of Impaired TMDL Waters identifies those waters that do not support appropriate uses and details the type, cause/pollutant, source, and class of impairment.[62]

[61] U.S. Clean Water Act of 1972, 33 U.S.C. 1251 et seq. (2002). Retrieved from <http://epw.senate.gov/water.pdf>

[62] The most recent list is the Final New York State 2010 Section 303(d) List which was approved in June 2010. The list can be accessed on the New York State Department of Environmental Conservation (NYSDEC) website. The FINAL New York State 2010 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy, <http://www.dec.ny.gov/docs/water_pdf/303dlistfinal10.pdf>

Section 402 of the Clean Water Act also established the National Pollutant Discharge Elimination System (NPDES) permit program. Under this program, the U.S. Environmental Protection Agency (U.S. EPA) has regulatory authority over point source discharges on a sector-wide basis to protect water quality of the receiving waters and can designate permitting authority to the states. Point sources are discrete conveyances such as pipes or man-made ditches.

Article 17 of the New York State Environmental Conservation Law (ECL) entitled "Water Pollution Control" was enacted to protect water resources and authorized creation of the State Pollutant Discharge Elimination System (SPDES) program.[63] The program is designed to eliminate the pollution of New York waters and to maintain the highest quality of water possible.

The New York State Department of Environmental Conservation (NYSDEC) also sets water quality standards for surface waters as part of its Protection of Waters Regulatory Program (Environmental Conservation Law, Article 15). All waters of the state are provided a class and standard designation that denotes their existing or best uses for freshwaters (classes A, B, C, and D) and saline or marine waters (classes SA, SB, SC, I, and SD).[64] In general, these rankings are assigned as follows:

- The classification AA or A is assigned to waters used as a source of drinking water.
- Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water.
- Classification C is for waters supporting fisheries and suitable for non - contact activities.
- The lowest classification and standard is D.

Additional classifications of "T" or "TS" denotes if a water body has sufficient amounts of dissolved oxygen to support trout and trout spawning. The letter classifications and their best uses are described in Exhibit G-5 in Appendix G.6.

Protected streams are streams and small water bodies along streams that are designated as C(T) (trout supporting waters) or higher (i.e., C(TS), B, or A) and are subject to the stream protection provisions of the NYSDEC Protection of Waters regulations. New York City also implements a Long-term Watershed Protection program under the ECL, Article 15.[65]

In addition to the above regulations, the New York State Department of Transportation (NYSDOT) Environmental Manual (TEM), Chapter 4 Water and Ecology, provides guidance for NYSDOT's procedures regarding water and water quality for NYSDOT transportation projects.[66]

4.6.2. Methodology

Surface water crossings of all alternatives were identified using existing mapping collected from federal and state agencies. Geographic Information System (GIS) data and other available

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[63] New York ECL – Article 17, Title 8 – "State Pollutant Discharge Elimination System," Accessed September 15, 2011, < http://www.dec.ny.gov/permits/6308.html>

[64] NYSDEC, ECL §3-0301 and §24-1301, Chapter X-Division of Water, Part 701 "Classifications-Surface Waters and Groundwaters." Accessed April 18, 2011. <http://www.dec.ny.gov/regs/4592.html>

[65] NYSDEC, "Protection of Waters Program," ECL, Article 15, Implementing Regulations, 6 NYCRR PART 608. Accessed September 15, 2011. < http://www.dec.ny.gov/permits/6042.html>

[66] NYSDOT, Environmental Procedures Manual, Chapter 4-"Water and Ecology," Accessed September 15, 2011 <https://www.dot.ny.gov/divisions/engineering/environmental-analysis/manuals-and-guidance/epm/chapter-4>

information were compiled from the United States Geological Survey, the New York State GIS Clearinghouse, and the New York State Department of Environmental Conservation. Data sets used included NYSGIS hydrography, NYSDEC water quality classifications, and NYSDEC water inventory/priority waterbodies (impaired waters) list. Crossings were listed by approximate milepost for each alternative (Appendix G.6). Alternative improvements based on mileposts were then used to tally the total potential crossings of surface waters for each alternative.

4.6.3. Existing Conditions

Overview

Watersheds

New York State consists of 17 major drainage basins.[67] The six basins located in the water resources study area of the Empire Corridor are the Lower Hudson River Basin, Mohawk River Basin, Oswego/Finger Lakes Basin, Lake Ontario Tributaries Basin, Genesee River Basin, and the Niagara River/Lake Erie Basin. Exhibit 4-10 presents the percentages and areas of each of these watersheds within the 90/110 and 125 Study Areas.

Exhibit 4-10—Watersheds in the 90/110 and 125 Study Areas

Watershed Name	Percentage of 90/110 Study Area	Percentage of 125 Study Area
Lower Hudson River	32% (17.06 square miles)	37% (18.82 square miles)
Mohawk River	22% (11.37 square miles)	17% (8.52 square miles)
Oswego River/Finger Lakes	23% (12.03 square miles)	21% (10.62 square miles)
Lake Ontario and Minor Tributaries	3% (1.57 square miles)	7% (3.56 square miles)
Genesee River	6% (3.46 square miles)	6% (3.17 square miles)
Niagara River/Lake Erie	14% (7.28 square miles)	12% (6.37 square miles)

New York State Canal System

The 294-mile section of Empire Corridor West/Niagara Branch (90/110 Study Area) between Albany (Albany County) and Niagara Falls (Niagara County) crosses, closely adjoins, or follows the New York State Canal System in a number of locations.

The Erie Canal was originally constructed in the early 1800's to transport goods from Lake Erie to the Hudson River. This system was constructed and enlarged over time to accommodate larger barges, with the most recent improvements made in the early 1900's. The modern-day New York State Canal System links the Hudson River, the Finger Lakes, Lake Champlain, Lake Ontario, and the Niagara River with communities throughout the state. Four canals make up the New York State Canal System (formerly called the New York State Barge Canal):

- The **Erie Canal** (the main canal between Hudson River and Lake Erie/Niagara River that flows through Oneida Lake and Onondaga Lake),

[67] NYSDEC, *Watersheds, Lakes, Rivers.* Accessed April 18, 2011. <http://www.dec.ny.gov/lands/26561.html>

- The **Champlain Canal** (which follows and then extends north from the Hudson River to Lake Champlain on the New York-Vermont border),
- The **Cayuga-Seneca Canal** (which extends south to Cayuga Lake and Seneca Lake), and
- The **Oswego Canal** (a branch extending north of the Erie Canal north of Syracuse to Lake Ontario).

The railroad crosses the Erie Canal several times along the Empire Corridor West. The easternmost crossing occurs west of the Schenectady Station (MP 160). The canal system crosses the railroad for the final time in the Town of Tonawanda (MP QDN13.5).

Remnants of the Old (historic) Erie Canal remain in portions of the study area in Madison and Onondaga Counties. The Old Erie Canal parallels the tracks through the eastern half of Madison County, before crossing the railroad at MP 272 and crosses the railroad again in Onondaga County at MPs 302.5 to 303.

Surface Waterway Crossings

The 464-mile section of the existing Empire Corridor (90/110 Study Area) crosses a total of 287 tributaries and waterways along its length, including the Harlem River, Hudson River, Mohawk River, Erie Canal, Genesee River, and Seneca River and tributaries to these rivers. The 450-mile 125 Study Area crosses a total of 378 tributaries and waterways. Of these crossings, 105-106 are located along Empire Corridor South, south of and including Rensselaer County to Manhattan.

Exhibit 4-11 shows the number of waterbodies crossed in each county for both corridors and the number that are considered to be an impaired/priority waterway (under Section 303(d) of the U.S. Clean Water Act) and those that are classified as protected streams (designated as C(T) (trout supporting waters) or higher (i.e., C(TS), B, or A) under the NYSDEC Protection of Waters regulations. There are a total of 248 impaired/priority waterways along the 90/110 Study Area, compared to 319 impaired/priority waterways along the 125 Study Area. Of these, 74 to 75 are along Empire Corridor South. There are 125 protected waters along the 90/110 Study Area, and 131 protected waters along the 125 Study Area. Of these, 77 are along the Empire Corridor South.

Exhibits G-6, G-7, and G-8 in Appendix G.6 presents a detailed listing of the waterways crossed in each county and their classification as an impaired/priority waterway or as a protected waterway. These exhibits also list the 303(d) segments impaired by pollutants related to construction, as specified in the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, and pollutants of concern for municipal separate storm sewer systems (MS4s), as specified in the SPDES General Permit for Stormwater Discharges from MS4s. The watersheds and waterbodies crossed and their classifications (as impaired priority water or protected water) in each county for each program corridor are described in detail in Appendix G.6.

4.6.4. Environmental Consequences

Comparison of Alternatives

Proposed activities that would have a higher potential to directly impact existing surface water resources may include the construction of new tracks immediately adjacent or over waterways, bridge construction and/or culvert improvements, rock slope stabilization adjacent to waterways, and embankment improvements.

In general, actions that would constitute direct impacts include the destruction or alteration of all or part of the surface water through diversion, channelization, embankments construction, dredging, filling, or other direct modifications of the waterway. In addition, direct impacts include the deterioration of the surface water quality through the direct discharge of pollutants and/or sediment to the waterway during construction (i.e., releases from equipment, sediment runoff) and/or operational activities (i.e., increased train traffic could generate additional surface and air particulates, which could settle in surface waters). Potential long-term impacts on surface waters include permanent reduction of aquatic habitats and potential reduction in surface waters available for recreation. Short-term impacts on surface waters, such as adverse short-term impacts on water

Exhibit 4-11—Empire Corridor Surface Waterway Crossings in the Study Area

County	Number of Surface Waterway Crossings		Number of Impaired (303d)/ Priority Water		Number of Protected Waters	
	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area
New York	1	1	1	1	0	0
Bronx	0	0	0	0	0	0
Westchester	23	23	11	11	18	18
Putnam	12	12	9	9	11	11
Dutchess	38	38	28	28	34	34
Columbia	22	22	19	19	14	14
Rensselaer	10	9	7	6	0	0
Albany	4	3	3	2	2	2
Schenectady	9	18	9	15	2	3
Schoharie	0	9	0	9	0	0
Montgomery	35	21	35	21	10	1
Herkimer	19	39	19	37	4	15
Oneida	12	18	12	18	4	7
Madison	11	20	11	20	4	5
Onondaga	16	20	13	15	4	5
Cayuga	5	15	5	12	0	1
Wayne	18	43	18	42	5	3
Monroe	19	23	18	18	6	9
Genesee	17	25	16	22	4	1
Erie	7	10	6	6	3	2
Niagara	9	9	8	8	0	0
TOTAL	287	378	248	319	125	131

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 300 feet of the program centerline.

Source: NY GIS Clearinghouse, 2011; NYSDEC GIS Data, 2011 quality, can temporarily disturb aquatic wildlife and vegetation and can adversely effect aquatic species.

The Base Alternative and Alternative 90A would have the least impacts to surface waters because of fewer proposed improvement areas occurring over, or adjacent to, waterways, with Alternative 90A potentially affecting 107 crossings. In addition, these alternatives would involve work largely within the right-of-way, with tracks added in the location of the former track beds or existing access roads.

Alternative 90B, the Preferred Alternative, and Alternative 110, with 218 to 219 crossings, would have greater potential to impact surface waters and water quality in more locations than the Base Alternative or Alternative 90A, especially where new third and fourth track construction would occur over, or adjacent to, waterways. Although the number of waterway crossings for Alternatives 90B and 110 are similar, Alternative 110 would be located 15 feet further from the existing railroad (for a total of 30 feet of separation) and would generally involve more construction to add or modify existing crossing structures (bridges of culverts) than Alternative 90B.

Alternative 125 would involve the greatest impacts to surface waters and water quality, potentially affecting 361 surface waters, as it extends primarily on new alignment throughout the Empire Corridor West.

The sections below identify the areas where the Preferred Alternative or new track will be constructed in, or adjacent to, surface waters. There would be potential impacts, as described above, at all crossings; however, the specifics of impacts will be documented as part of the Tier 2 analysis. Appendix G.6 addresses the potential impacts of the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

Alternative 90B (Preferred Alternative)

Improvements from Alternative 90B would involve approximately 219 surface water crossings, including those proposed for Alternative 90A. Direct impacts would generally occur in areas where the surface water underlies, or is located immediately adjacent to the proposed track activities. Proposed activities that would have a higher potential to directly impact existing surface water resources may include the construction of new tracks immediately adjacent or over waterways, bridge construction and/or culvert improvements, rock slope stabilization adjacent to waterways, and embankment improvements. In general, actions that would constitute direct impacts include the destruction or alteration of all or part of the surface water through diversion, channelization, embankments construction, dredging, filling, or other direct modifications of the waterway. In addition, direct impacts include the deterioration of the surface water quality through the direct discharge of pollutants and/or sediment to the waterway during construction (i.e., releases from equipment, sediment runoff) and/or operational activities (i.e., increased train traffic could generate additional surface and air particulates, which could settle in surface waters). The potential for impacts to these waterway crossings are not yet fully known in Tier 1.

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects along Empire Corridor South. Alternative 90B improvements along Empire Corridor South would involve 47 waterway crossings. This work includes four miles of second track through urbanized areas of Manhattan (MPs 9 to 13), and 1.4 miles (MPs 23.8 to 25.2) of new track, extending under the Tappan Zee Bridge, for the Tarrytown Pocket Track/Interlocking. Both projects would occur over waterways associated with the tributaries of the Hudson River, including the Harlem River at MP 10.

In addition, the rail line would be located directly adjacent to the Hudson River in these improvement areas. Depending on design, these improvements could have the potential to impact surface waters and water quality.

With the Preferred Alternative, there would be signal improvements proposed along 43 miles (MPs 32.8 and 75.8). In addition, along this section there would be 10 miles of new third track (MPs 53 to 63) and there would be improvements at the Poughkeepsie Yard/Storage Facility (MPs 71 to 75.8). North of Poughkeepsie and south of Albany-Rensselaer Station (MPs 75.8 to 140), proposed improvements would also include rock slope stabilization (MPs 105 to 130) and three new control points (CP 82, CP 99, and CP 136), as well as station improvements at Rhinecliff Station (high-level platforms) and Hudson Station (new Ferry Street Bridge and track realignments). In addition, the rail line would be located directly adjacent to the Hudson River in these improvement areas. Impacts to surface waters and water quality would be more likely in areas where there would be new track construction.

Empire Corridor West/Niagara Branch

Alternative 90B, the Preferred Alternative, would include the following Alternative 90A improvements.

- Replacement of the Livingston Avenue Bridge would pass over the Hudson River at the Rensselaer/Albany County Line; therefore, work on this bridge could have the potential to impact surface water and water quality associated with the Hudson River.
- With Alternative 90B, track improvements would include 10 miles of third track between MPs 169 and 179, and Amsterdam Station improvements. This entire 10-mile segment would closely adjoin the banks of the Mohawk River and would cross approximately nine waterways. Although impacts in these areas could be contained within the current right-of-way, there would still be potential for minimal impact of surface waters and water quality.
- West of MP 175, work extending to MP 295 would consist of upgrading interlockings, automatic block signals, and control points. Alternative 90B would also include Syracuse Station track improvements (MPs 290 to 294) within this improvement segment. The alignment would continue to closely adjoin the banks of the Mohawk River and Erie Canal through MP 253. In addition to the above crossings, the alignment would cross approximately 27 waterways between MPs 175 and 295. Although work would consist of upgrading signals, control points and interlocking, and this work would be performed within the current right-of-way, it could minimally impact surface waters and water quality within improvement areas.
- Alternative 90B would include third track improvements along nine miles (MPs 373 to 382) west of Rochester station and the addition of a third track along 11 miles (MPs 382 to 393) in western Monroe and eastern Genesee Counties. Together, these improvements could impact approximately 16 streams.
- The proposed double track (MPs QDN17 to QDN23.2) and Niagara Falls track improvements (MPs QDN25 to QDN28) could have the potential to impact surface waters and water quality associated with seven waterway crossings.

Third and fourth track improvements for Alternative 90B would start at MP 160 in the City of Schenectady, and extend west to MP 430, east of Buffalo and would have the potential to impact surface waters and water quality associated with approximately 164 waterways. Depending on design, there would be potential to directly or indirectly impact these surface water features and their water quality from the construction of new track, and increased train traffic. The addition of new tracks could potentially affect waterway crossings if there is a need to extend existing culverts, bridges, or railbed. The additional railbed and trains could result in an incremental increase in stormwater runoff from these operations into adjoining waterways.

- In Schenectady County, additional track and improvements to the Schenectady Station included in Alternative 90B would cross approximately eight waterways. The Mohawk River, which would cross the alignment at MP 160, would closely adjoin the rail line from approximately MP 166 to the county line (MP 169.5).
- The railroad would continue to adjoin the north bank of the Mohawk River/Erie Canal through all of Montgomery County, largely remaining within 50 to 1,000 feet of the river/canal. In addition, there would be approximately 35 waterway crossings, primarily over tributaries of the Mohawk River.
- The railroad would continue to adjoin the north bank of the Mohawk River/Erie Canal through all of Herkimer County. In addition, there would be approximately 19 waterway crossings, primarily over tributaries of the Mohawk River.
- Alternative 90B would extend through Oneida County, paralleling the Erie Canal/Mohawk River between Utica and Rome before diverging west to flow into Oneida Lake. New track would cross approximately 12 waterways in this county.
- In Madison County, Alternative 90B new track would cross 11 waterways.
- There would be 16 waterway crossings that the proposed new track of Alternative 90B would traverse in Onondaga County.
- In Cayuga County, Alternative 90B new track would cross approximately five major waterways.
- There would be approximately 18 water crossings in Wayne County.
- New track proposed with Alternative 90B would cross 19 waterway crossings in Monroe County.
- Alternative 90B would cross approximately 17 waterways in Genesee County.
- Alternative 90B third track improvements would cross three surface waters including Ellicott Creek (MP 422.5) in Erie County.
- The double track along the Niagara Branch between MPs QDN 2 and 7 would extend in proximity to the waterfront along Lake Erie and the Black Rock Canal along the Niagara River and would cross Scajaquada Creek.

4.6.5. Potential Mitigation Strategies

The Tier 1 design of the program alternatives has already incorporated minimization to some extent through use of retaining walls, such as adjacent to proposed flyovers, and track realignments to minimize encroachment on adjoining streams and properties. In the Tier 2 assessment, NYSDOT will also further evaluate and identify means of avoiding and minimizing waterway impacts through shifts in location of tracks and other facilities and use of design measures such as retaining walls or steeper slopes. Other potential mitigation to be considered will include permanent Best Management Practices (BMPs), such as stormwater treatment or detention/retention facilities or drainage channels/facilities where appropriate to improve stormwater management/flow and water quality.

The relevant permits and regulatory approvals from federal and state agencies for work in waterways will be obtained, and work will be conducted in conformance with applicable regulatory guidelines and standards. Pursuant to Section 402 of the Clean Water Act (CWA), stormwater discharges from certain construction activities are unlawful unless they are authorized by a National Pollutant Discharge Elimination System (NPDES) permit or by a state permit program. New York's SPDES is a NPDES-approved program with permits issued in accordance with the Environmental Conservation Law (ECL). This general permit is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. In accordance with the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-20-001, effective January 29, 2020), construction projects that disturb more than an acre of land and that involve a stormwater discharge to surface waters of the United States, either indirectly through stormwater sewers or directly to waterways, must prepare Stormwater Pollution Prevention Plans (SWPPPs). This plan will also meet the requirements set forth by the New York City Department of Environmental Protection (NYCDEP).

All NYSDOT projects that fall below SPDES thresholds are required to prepare erosion and sediment control plans. Application of BMPs identified in the SWPPPs or Erosion and Sediment Control (ESC) Plans will reduce the amount of erosion and sedimentation resulting from construction activities. Temporary and permanent construction BMPs, such as seed, mulch, embankment protectors, grade techniques, inlet protection, silt fences, development of a Spill Prevention Control Plan (SPCC), Stormwater Management Plans (SWMPs) and vehicle tracking prevention will be used as appropriate. The design of permanent and temporary BMPs to improve the quality of stormwater runoff will be developed and designed in accordance with NYSDOT and NYSDEC criteria.

4.6.6. Future Analysis

During the Tier 2 assessments, program impact assessment based on design of the Preferred Alternative, Alternative 90B, and site-specific mapping will occur to better define the extent of work and type of activities potentially affecting surface waters. The locations of protected streams and impaired (303(d))/priority waters that may require special consideration will also be better defined and mapped, particularly for those waterways impaired by pollutants related to construction or pollutants of concern for MS4s, as identified in the SPDES general permits.

An owner or operator may obtain coverage under the NPDES/SPDES general permit by submitting a Notice of Intent (NOI) to the NYSDEC. Therefore, during the Tier 2 design and assessment, the SPDES permitting requirements will be reviewed with respect to the proposed activities, in coordination with NYSDEC and the U.S. EPA.

If required, a joint permit application with the U.S. Army Corps of Engineers (U.S. ACE) and NYSDEC will be prepared and filed to obtain Section 10 (U.S. Rivers and Harbors Act) and Section 401 Water Quality Certification and Section 404 Wetland Permit (U.S. Clean Water Act) and a NYS Protection of Waters permit. The NYSDEC/NYSDOT Memorandum of Understanding (MOU) could apply to this program relative to ECL Article 15 (Protection of Waters); the MOU states that NYSDOT does not need to obtain an individual Protection of Waters Permit, provided that NYSDOT conducts its environmental screening and NYSDEC consultation in accordance with the MOU.

4.7. Wild, Scenic, and Recreational Rivers

4.7.1. Regulatory Context

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.[68] Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Each river is administered by either a federal or state agency. Designated segments need not include the entire river and may include tributaries. For federally administered rivers, the designated boundaries generally average one-quarter mile on either bank in the lower 48 states.

Rivers are classified as wild, scenic, or recreational as described below.

- **Wild river areas:** Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic river areas:** Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- **Recreational river areas:** Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The National Park Service (NPS) also publishes a Nationwide Rivers Inventory (NRI) list. The NRI list consists of some 2,400 miles of Inventory Rivers in New York State that are potentially-eligible for inclusion in the National System and would also require a permit if impacted by a project. Under a 1979 Presidential Directive, and related Council on Environmental Quality (CEQ) procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments. [69]

In addition to the federal regulations above, the New York State Wild, Scenic and Recreational Rivers Act protects those rivers of the state that possess outstanding scenic, ecological, recreational, historic, and scientific values.

4.7.2. Methodology

National and State Wild, Scenic and Recreational rivers for study areas within 300 feet of the centerline for all alternatives were identified using existing mapping collected from federal and state agencies. National Wild and Scenic Rivers were identified using Geographic Information System (GIS) data provided by the U.S. Forest Service. The river segments listed on the Nationwide Rivers Inventory were compared to the list of waterways developed based on existing surface water mapping to identify the potential for impacts, which would be further researched as part of Tier 2. Existing surface water mapping was compared to the list of state-designated segments to identify state Wild, Scenic, and Recreational Rivers.[70]

4.7.3. Existing Conditions

Empire Corridor South

There are no mapped National Wild or Scenic Rivers in the Empire Corridor South segment.

[68] Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) -- Public Law 90-542, approved October 2, 1968, (82 Stat. 906)

[69] National Park Service, 2011. "National Center for Recreation and Conservation, Nationwide Rivers Inventory," <http://www.nps.gov/ncrc/programs/rtca/nri/index.html>, website accessed February 2012.

[70] NYSDEC, "Wild, Scenic, and Recreational Rivers." Accessed October 3, 2011. <http://www.dec.ny.gov/lands/32739.html>

However, three segments of the Hudson River are listed on the Nationwide Rivers Inventory. The southernmost listed segment in Columbia, Dutchess, and Ulster Counties extends five miles north of Barrytown (near MP 95) to south of Malden-on-Hudson. There are two listed segments in Greene and Columbia Counties: a 4-mile segment extending north of Hudson (near MP 114.5) to south of Coxsackie and a 5-mile segment extending north of Coxsackie Island to above New Baltimore (near MP 128).

Empire Corridor West/Niagara Branch

There are no mapped National Wild or Scenic Rivers in the Empire Corridor West segment. However, there are two segments listed on the Nationwide Rivers Inventory: an 8-mile section of the Mohawk River in Oneida that terminates to the north near the Empire Corridor (near MP 250) in Stanwix and the Black Creek (MP 386) that crosses the Empire Corridor in Monroe County and Genesee County (MP 396.5).

4.7.4. Environmental Consequences

Comparison of Alternatives

No currently-designated National or State Wild, Scenic or Recreational Rivers were identified in the program study area. Therefore, none of the alternatives would have the potential to impact known designated National or State Wild, Scenic or Recreational Rivers.

Alternative 90B (Preferred Alternative)

The program will not impact designated National or State Wild, Scenic or Recreational Rivers.

However, the program has potential to impact some waterways listed on the Nationwide Rivers Inventory (NRI); namely: Black Creek (in Monroe County), Mohawk River (near Rome) and three segments of the Hudson River (in Dutchess, Ulster, Columbia, and Green counties). The Black Creek crosses the Empire Corridor at MP 386, near the location of 11 miles of proposed third track.

No direct or indirect impacts to the Hudson or Mohawk River segments are anticipated.

4.7.5. Potential Mitigation Strategies

Permitting will be performed to comply with all applicable regulatory requirements. Since there would be no anticipated impacts to designated National or State Wild, Scenic or Recreational Rivers, mitigation is not anticipated at this time. However, as discussed in the following section, additional research will be performed regarding potential impacts on the rivers listed on the Nationwide Rivers Inventory, and appropriate mitigation measures will be identified in Tier 2.

4.7.6. Future Analysis

There are three lists that will need to be reviewed again during the Tier 2 analysis for any change in status to National or State Wild, Scenic or Recreational Rivers: the National Wild and Scenic Rivers list, the state list published by NYSDEC and the National Park Service (NPS) NRI.

If work is proposed that could alter or affect a river on the Nationwide Rivers Inventory, the following steps may be required in the Tier 2 assessment:

- Determine whether the proposed action could affect an Inventory river and identify and analyze the environmental effects of their actions, including whether the proposed action could have an adverse effect on the natural, cultural and recreational values of the Inventory river segment;
- Consult with agencies with jurisdiction by law or special expertise (in this case, the National Park Service (NPS));
- Develop and study alternatives;
- Determine whether the proposed action could foreclose options to classify any portion of the Inventory segment as wild, scenic, or recreation river areas; and
- Incorporate avoidance/mitigation measures into the proposed action to maximum extent feasible within the agency's authority and use all practicable means and measures to preserve important historic, cultural, and natural aspects of our national heritage.

4.8. Navigable Waters

4.8.1. Regulatory Context

The U.S. Rivers and Harbors Act established federal jurisdiction over navigable waters. Section 10 of the U.S. Rivers and Harbors Act Act grants the U.S. ACE regulatory authority over work in, over, or under navigable waters, including wharfs, piers, and structures (excluding bridges and structures permitted by the USCG), and work such as dredging or disposal of dredged material, or excavation, filling, or other modifications to navigable waters.[71]

Under the state definition, navigable waters include lakes, rivers and other waterways and water bodies on which water vessels with a capacity of one or more persons are operated or can be operated.[72] Regulations do not require that NYSDOT obtain Article 15 Protection of Waters permits, but do require that NYSDOT coordinate activities regulated by Article 15 with NYSDEC as per the "Memorandum of Understanding Between the New York State Department of Transportation and the New York State Department of Environmental Conservation Regarding ECL Articles 15 and 24." The MOU states that NYSDOT does not need to obtain an individual Protection of Waters Permit, provided that NYSDOT conducts its environmental screening and NYSDEC consultation in accordance with the MOU.

Under state law, New York State also owns the land beneath large rivers and lakes, and the underwater holdings are managed by the New York State Office of General Services. Work within underwater lands may require approvals or easements for their use. In addition, the New York State Canal Corporation manages lands under and along the states canals and canalized rivers, including the Erie Canal, and has regulatory jurisdiction over activities in and along these waterways.

4.8.2. Methodology

Various sources were used to identify navigable waters under federal jurisdiction crossed by or within 300 feet of the centerline of Program alternatives, including a published list of from the U.S.

[71] Section 10 of The Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. 403; Chapter 425, March 3, 1899; 30 Stat. 1151).

[72] NYSDEC, "Excavation or Placement of Fill in Navigable Waters." Accessed September 29, 2011.
< http://www.dec.ny.gov/permits/6548.html>.

ACE.[73] In addition, the U.S. Coast Guard was consulted with regards to existing bridge permits over navigable waters within the study area. The U.S. Coast Guard, First Coast Guard District, in correspondence dated July 7, 2011, provided copies of bridge permits for five bridges along the Empire Corridor South, and the published list of navigable waterways for the Ninth (Buffalo) Coast Guard District was also consulted.[74]

4.8.3. Existing Conditions

Federally regulated navigable waterways are defined as waters subject to ebb and flow of the tide and that provide a channel for interstate commerce and transportation of people and goods.[75] The Empire Corridor extends through New York State crosses or parallels numerous waterways considered navigable by the U.S. ACE or U.S. Coast Guard. Exhibit 4-12 lists the navigable waters within the 600-foot wide study area identified from published lists and bridge permits provided by the USCG, and Appendix G.7 describes navigable waterways in each program segment.

Along the 90/110 Study area, the rail corridor crosses 19 navigable waterways, and along the 125 Study Area, the rail corridor would cross 12 navigable waterways. In many cases, these crossings are of the same waterbody, for instance, there are multiple crossings of the Erie Canal. In other instances, the rail corridor closely parallels navigable waterways, without crossing (such as the Hudson River along many segments of Empire Corridor South or the Erie Canal along portions of Empire Corridor West).

4.8.4. Environmental Consequences

Comparison of Alternatives

All alternatives have the potential to impact navigable waters as a result of construction in and around navigable waters, with the potential for discharges and stormwater runoff to affect surface water quality. Long-term impacts could include excavation and placement of permanent fill for bridge piers and abutments and installation of spans over the waterway, or riprap below. Short-term impacts, such as construction of access roads, staging for pier construction, or placement of spans, could involve temporary sedimentation or placement of fill or structures. Placement of permanent or temporary spans and piers/pilings could affect navigational clearances and access for marine traffic on either a long-term or temporary basis.

The Base Alternative and Alternative 90A have the least potential to impact navigable waters, with the potential to modify between two to five crossings over navigable waters. Alternative 125 has the potential to impact the navigable waters at four new crossings. Alternative 90B, the Preferred Alternative, and Alternative 110 would cross a greater number of navigable waterways. For Alternatives 90B and 110, 15 existing crossings over navigable waters could be modified with potential for impacts. Alternative 110 would involve track construction located 15 feet further from the existing track than Alternative 90B, and therefore would be expected to involve greater construction at navigable waterway crossings.

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[73] U.S. Army Corps of Engineers. "Navigable Waterways in Buffalo District Where Department of the Army Permits are Required, State of New York State." Accessed September 9, 2011. <http://www.lrb.usace.army.mil/regulatory/waterway_ny.pdf>.

[74] U.S. Coast Guard. "Ninth Coast Guard District Federally Navigable Waters by State," updated March 2010. Accessed September 9, 2011. <http://www.uscg.mil/d9/D9Legal/water/new_york.pdf>.

[75] Definition of waters of the U.S. (as defined in 33 CFR 329.4 and 40 CFR 230.3)

Exhibit 4-12—Navigable Waters in the Study Area

County	River/Stream Crossing (Appx. Milepost)[1]	Name	River/Stream Crossing (Appx. Milepost)[1]	Name
	90/110 Study Area		125 Study Area	
New York	10	Harlem River (Spuyten Duyvil Railroad Bridge) Hudson River	10	Harlem River (Spuyten Duyvil Railroad Bridge) Hudson River
Bronx		Hudson River		Hudson River
Westchester	32.5-33 42	Croton Bay (Metro-North Railroad Bridge) Peekskill Bay (Metro-North Railroad Bridge) Hudson River	32.5-33 42	Croton Bay (Metro-North Railroad Bridge) Peekskill Bay (Metro-North Railroad Bridge) Hudson River
Putnam		Hudson River		Hudson River
Dutchess	65	Wappinger Creek (New Hamburg Railroad Bridge) Hudson River	65	Wappinger Creek (New Hamburg Railroad Bridge) Hudson River
Columbia		Hudson River		Hudson River
Rensselaer		Hudson River		Hudson River
Albany	143	Hudson River (Livingston Avenue Railroad Bridge)	QH143.5	Hudson River
Schenectady	160	Mohawk River/ Erie Canal	None	NA
Schoharie	NA	NA	None	NA
Montgomery		Mohawk River/Erie Canal	None	NA
Herkimer	 230-231.5 234	Mohawk River/Erie Canal Erie Canal Mohawk River	None	NA
Oneida	248.5	Mohawk River Erie Canal	None	NA
Madison	None	NA	None	NA
Onondaga	292	Erie Canal Onondaga Lake	QH278.5	Erie Canal Onondaga Lake
Cayuga	None	NA	None	NA
Wayne	328-330 335, 339.5	Clyde River/Erie Canal Erie Canal	None	NA
Monroe	371.5 374.5	Genesee River Erie Canal	QH356.75 QH359	Genesee River Erie Canal
Genesee	None	NA	None	NA
Erie	422.5, QDN12.5 QDN6	Ellicott Creek Lake Erie Scajaquada Creek	QH411.5 QDN12.5 QDN6	Ellicott Creek Ellicott Creek Lake Erie Scajaquada Creek
Niagara	QDN13.5	Tonawanda Creek/Erie Canal	QDN13.5	Tonawanda Creek/Erie Canal

Notes:
1 Milepost shown if stream/water body crosses the railroad. If not shown, water bodies are within the 300-foot buffer, but do not cross the railroad.
NA Not Applicable.
The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 300 feet of the corridor centerline.

Source: U.S. Army Corps of Engineers, 2011; U.S. Coast Guard, 2011

The sections below identify the areas where the Preferred Alternative's improvements and or new track will be constructed over navigable waters. There would be potential impacts, as described above, at all crossings; however, the specifics of impacts will be documented as part of the Tier 2 analysis.

Alternative 90B (Preferred Alternative)

Because the exact nature and extent of impacts on the navigable waters in the vicinity of the program are not yet known, this Tier 1 level assessment identified the potential for both long-term and construction impacts by identifying those areas where the program extends within 300 feet of navigable waters. These areas are described below.

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects.

- The addition of a second track over the Harlem River at the Spuyten-Duyvil Railroad Bridge (MP 10) could have waterway impacts. The alignment in these improvement areas would also closely adjoin the Hudson River; however, work would likely remain within the existing right-of-way and would be unlikely to impact the Hudson River waterway.
- With the Preferred Alternative, signal improvements proposed along 43 miles (MPs 32.8 to 75.8) would cross the Hudson River at two U.S. Coast Guard permitted bridges: one over Croton Bay (MPs 32.5 to 33) and the other over Peekskill Bay (MP 42). Even though work on the bridges would be minimal and likely contained within the existing right-of-way, it could have waterway impacts. In addition, the alignment in these improvement areas also closely adjoins the Hudson River; however, work would likely remain within the existing right-of-way and would be unlikely to impact the Hudson River waterway.
- Alternative 90B also includes replacement of the Livingston Avenue Bridge, which would pass over the Hudson River and will need to be permitted by the U.S. Coast Guard. Improvements and replacement activities could result in permanent and temporary waterway impacts, depending on the design.

Empire Corridor West/Niagara Branch

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects.

- Syracuse track improvements including upgrade of interlockings, automatic block signals, and control points and track improvements at the Syracuse Station (MPs 290 to 294) would involve the crossing of the Erie Canal and could also result in permanent and temporary impacts.
- Rochester third track improvements along nine miles (MPs 373 to 382), west of the Rochester Station, would involve a crossing of the Erie Canal (MP 374.5). Improvements and construction activities at this crossing could result in permanent and temporary waterway impacts.

Third and fourth track improvements for Alternative 90B would start at MP 160 in the City of Schenectady, and extend west to MP 430, east of Buffalo. Third track improvements would include the crossing of five navigable waters at 11 crossings. Areas of fourth track improvements would not cross navigable waters.

- Third track improvements over the Mohawk River would occur in three counties: Schenectady (MP 160), Herkimer (MP 234), and Oneida (MP 248.5), and could result in permanent and temporary impacts. Third track improvements over the Erie Canal would also occur in three counties: Herkimer (MPs 231.5), Wayne (MPs 328 to 330, 335, 339.5), and Monroe (MP 374.5), and could also result in permanent and temporary impacts.

- Alternative 90B would also have third track improvements at crossings of the Erie Canal in Syracuse (MP 292), the Genesee River in Rochester (MP 371.5) and Ellicott Creek, just east of Buffalo-Depew (MP 422.2). Improvements at these three crossings could result in permanent and temporary impacts.

There would also be locations where relocations of adjoining roadways may result in impacts to navigable waters, but these specific locations would be defined in the Tier 2 analysis.

4.8.5. Potential Mitigation Strategies

Project design changes to the Preferred Alternative, Alternative 90B, to avoid or minimize impacts may include adjusting pier and riprap locations outside of the ordinary high-water mark. Project design will be refined to minimize obstructions to navigation and the need for fill and dredging activities. Program component projects may require permits, approvals, or coordination with the USCG, U.S. ACE, NYSDEC, New York State Canal Corporation, New York State Office of General Services, and local harbormasters.

In coordination with the regulatory agencies, for new or modified bridge construction, engineers will determine the need for subsurface cables and the required depth of emplacement and the requirements for removal of existing bridge footings and subsurface cables. If applicable, engineers will also determine time-of-year work restrictions for bridge construction affecting navigation in consultation with these agencies. Plans for fendering and other features affecting navigation will be developed in consultation with the agencies with jurisdiction. For new movable bridges, considerations during design may include potential for contamination from lubricants and fuels stored on the bridge and whether special measures or plans (e.g., Spill Response Plans or Environmental Operation and Maintenance Manuals) are required to prevent contamination during operation.

4.8.6. Future Analysis

During the Tier 2 analysis, further coordination will be performed to identify navigable waters in the study and issues of concern for the USCG and the U.S. ACE. For new or modified crossings of navigable waterways, information available on the location and depths of the navigation channels will be researched and obtained. Detailed cross-sections of bridges may be developed to fully understand the potential impacts to the crossings. Depending on the type and extent of improvements proposed at bridge crossings, additional research on the type and heights of navigational vessels may be required for new bridge construction, as part of a bridge type study. Research on peak navigation seasons may be required for any navigational closures. Coordination with the U.S. Coast Guard, the U.S. ACE, and NYSDEC will be completed during the design of new or rehabilitated/reconstructed bridges and development of plans for placement of any associated submarine cables and other structures within navigable waterways.

4.9. Floodplains

4.9.1. Regulatory Context

Floodplains are the lands on either side of a stream that are inundated when the capacity of the stream channel is exceeded. The National Flood Insurance Program (NFIP) was established pursuant to the National Flood Insurance Act of 1968 (amended)[76] and the Flood Disaster Protection Act of 1973 (as amended)[77], to encourage sound floodplain management programs at the state and local levels. To provide a national standard without regional discrimination, the Federal Emergency Management Agency (FEMA) has adopted the area with 1% annual chance of flooding as the base flood for floodplain management and flood insurance purposes.

Executive Order (EO) 11988, Floodplain Management[78] (1977) directs federal agencies to "*provide leadership and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains*."[79] In addition, the U.S. DOT Order 5650.2 describes policies and procedures for "*ensuring that proper consideration is given to avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs and budget requests*."[80]

FRA Procedures for Considering Environmental Impacts states that each project shall determine whether any of the alternatives would affect a base floodplain. If the Preferred Alternative, Alternative 90B, would affect a base floodplain, considerations for the permitting and/or Tier 2 environmental documentation include: any risk associated with each such alternative; the impacts on natural and beneficial floodplain values; and the adequacy of the methods proposed to minimize harm.

Generally, these regulations are enforced at the local level by local governments, with assistance from the New York State Department of Environmental Conservation (NYSDEC). In New York State, local communities that participate in the NFIP regulate development in Special Flood Hazard Areas. An exception is development funded and undertaken by the state or federal government, which is regulated by the responsible agency, subject to technical assistance by the NYSDEC and FEMA. Nearly all New York communities, defined as a town, city or village, participate in the NFIP. Each participating community in the state has a designated floodplain administrator, usually the building inspector or code enforcement official.[81,82]

4.9.2. Methodology

Flood-prone areas were identified using GIS mapping and Flood Insurance Rate Map (FIRM) panels of 100-year floodplain areas identified by FEMA for study areas within 300-feet of the corridor centerline for all alternatives. A floodplain is the area that is inundated with water during a flood. A 100-year flood is calculated to be the level of flood water that has a one percent (%) chance of being equaled or exceeded in any single year. A floodplain is composed of two parts: the floodway and the floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment in order that the 100-year flood is carried without increasing the

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[76] National Flood Insurance Act of 1968. 42 U.S.C.4001 et seq. (1968).

[77] Flood Disaster Act of 1973 [42 U.S.C.4001 et seq.] (amended).

[78] Executive Order 11988, "Floodplain Management," President of the United States, 1977.

[79] As updated and amended by Executive Order 13690-"Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input," January 30, 2015.

[80] U.S. Department of Transportation Order 5650.2, "Floodplain Management and Protection," April 23, 1979.

[81] New York State Department of Environmental Conservation. "Floodplain Construction Requirements in New York State." September 2007, Accessed April 19, 2011. <http://www.dec.ny.gov/docs/water_pdf/floodplainconstruction.pdf>

[82] 6 New York Codes, Rules and Regulations (NYCRR) Part 502, Floodplain Management Criteria for State Projects (authority Environmental Conservation Law [ECL] section 1-0101, 3-0301 and Article 36).

water surface elevation by more than one foot. The floodway fringe is the outer portion of the floodplain beyond the floodway. Changes in the floodway such as adding fill material, constructing buildings or bridges, or limiting the natural conveyance of floodwaters can cause a rise in the 100-year water surface and can subsequently impact properties not previously affected by a 100-year storm event.

GIS mapping was obtained from NYS GIS and FEMA, and was based on FEMA Flood Insurance Rate Maps (FIRMs). Areas of 100-year floodplains within the 600-foot wide study area were calculated. GIS mapping of FEMA floodplains was not available for Wayne County, and areas of 100-year floodplains were calculated manually using FIRM panels.

4.9.3. Existing Conditions

There are approximately 9,681 acres of mapped 100-year floodplains in the 90/110 Study Area and approximately 6,875 acres of mapped 100-year floodplains in the 125 Study Area from New York City to Niagara Falls. Exhibit 4-13 below summarizes mapped 100-year floodplains within the study area and a description of floodplains in each county is presented in Appendix G.8.

4.9.4. Environmental Consequences

Comparison of Alternatives

The sections below describe encroachments on mapped areas of 100-year floodplains for the Preferred Alternative, Alternative 90B, and Appendix G.8 describes the encroachments for other program alternatives. The installation of tracks on existing former rail embankments, signals, and other ancillary facilities would, in many instances, involve minimal long-term impacts or changes to ground surface elevations. In general, any new embankment material or structures, such as bridges, placed within a floodway may permanently alter the 100-year floodplain limits. Changes to existing drainage structures, such as culverts through the embankment, or addition of new waterway crossings may change long-term peak flow rates upstream and downstream and the 100-year surface water elevation. Placement of new or modified bridge spans could change the hydraulic openings and either increase or decrease flood flows in the long-term.

It is assumed for this evaluation that all new structures, embankments, filling, paving, or other modifications to open channels in floodways would be considered a floodplain encroachment. Encroachments to the floodplain would not necessarily result in a rise to the 100-year surface water elevation. For instance, raising the elevation of spanning structures or reducing the extent of floodplain encroachment could improve floodflows, resulting in a long-term reduction in flooding.

Review of GIS mapping indicates that the Base Alternative and Alternative 90A would have the least impacts to the 100-year floodplain. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. Alternative 90B, the Preferred Alternative, and Alternative 110 would have potential impacts on the 100-year floodplain in more locations than the Base and 90A Alternatives, especially where new third and fourth track construction would occur within a floodway. However, Alternative 90B would involve far fewer floodplain impacts than either Alternatives 110 or 125, due to less filling and work outside of the right-of-way. Since Alternatives 90B and 110 add tracks alongside existing railroad crossings of waterways and floodplains they may involve modifications or use of these existing structures, minimizing the extent of fill required in floodplains. Alternative 110 would add tracks located 15 feet further from the existing tracks than 90B and would involve greater potential for floodplain impacts. Alternative 125 would involve the greatest impacts on the 100-year floodplain as it would extend on an entirely new alignment, requiring new bridge or culvert construction to accommodate new waterway/floodplain crossings. Short-term impacts related to construction activities are discussed in Section 4.25.3. Appendix G.8 provides more information on potential effects of the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

Exhibit 4-13—Mapped FEMA 100-year Floodplains in the Study Area

County	Acres of 100-Year Floodplains[2]	
	90/110 Study Area	125 Study Area
New York	256	256
Bronx	179	179
Westchester	703	703
Putnam	340	340
Dutchess	1,766	1,766
Columbia	1,244	1,244
Rensselaer	751	752
Albany	90	43
Schenectady	179	40
Schoharie	0	131
Montgomery	7	0
Herkimer	904	45
Oneida	780	81
Madison	226	110
Onondaga	712	547
Cayuga	316	45
Wayne[1]	720	8
Monroe	237	296
Genesee	234	247
Erie	15	20
Niagara	22	22
TOTAL	**9,681**	**6,875**

Notes
1 No digital data available from FEMA. Approximate calculations completed manually.
2 Numbers have been rounded to the nearest acre.
The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 300 feet of the corridor centerline.
Source: Federal Emergency Management Agency, Flood Insurance Rate Maps, 2010, 2018.

Alternative 90B (Preferred Alternative)

Because the extent to which the Preferred Alternative will involve encroachments and fill that may increase flood hazards is not yet known, the assessment identified the potential for impacts. The discussion below identifies the locations where Alternative 90B may incur work within or proximal to floodplains and potentially involve impacts on floodplains. The Preferred Alternative has the potential to increase flood hazards, however, this could be mitigated by design in the Tier 2 assessments.

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects:

- Construction of four miles of second track through Manhattan (MPs 9 to 13), and 1.4 miles (MPs 23.8 to 25.2) of new track under the Tappan Zee Bridge, for the Tarrytown Pocket Track/Interlocking, would encroach on floodplains associated with the Hudson River and minor tributaries, such as the Harlem River at MP 10.
- Along this section, portions of the 10 miles of new third track (MPs 53 to 63) and improvements at the Poughkeepsie Yard/Storage Facility (MPs 71 to 75.8) would be located within mapped floodplains associated with the Hudson River and its tributaries such as Breakneck Brook, Catskill Aqueduct, Cascade Brook, Gordons Brook and Fishkill Creek.
- North of Poughkeepsie and south of Albany-Rensselaer Station (MPs 75.8 to 140), proposed improvements would include rock slope stabilization (MPs 105 to 130) and three new control points (CP 82, CP 99, and CP 136), and improvements at Rhinecliff Station (high-level platforms) and Hudson Station (new Ferry Street Bridge and track realignments). Much of the railroad alignment in this area would pass through Hudson River floodplains and floodplains of tributaries east of the Hudson River, but some of these improvements that are at-grade may have a minimal impact on flooding characteristics.
- Alternative 90B would also include replacement of the Livingston Avenue Bridge, which would pass over the Hudson River and its floodplain at the Rensselaer/Albany County Line.

Empire Corridor West/Niagara Branch

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects.

- With Alternative 90B, track improvements would include 10 miles of third track between MPs 169 and 179, and Amsterdam Station improvements. This entire 10-mile segment would closely adjoin the banks of the Mohawk River through Schenectady and Montgomery counties. Floodplains associated with the Mohawk River and its tributaries are located along the alignment. Although impacts in these areas may be contained within the current right-of-way, there would still be potential for minimal encroachment on floodplains in these areas.
- West of MP 175, the railroad alignment would continue to closely adjoin the banks of the Mohawk River and Erie Canal through MP 253. Floodplains associated with the Mohawk River and the Erie Canal, as well as numerous tributaries would be located along the track. From MPs 253 to 295, the alignment would cross numerous waterways and their associated floodplains. Since this work would be performed within the current right-of-way, it would be unlikely to impact the floodplain through this segment.
- In the area of the Syracuse Station track improvements, Alternative 90B would pass through floodplains associated with Ley Creek (MP 287), the Erie Canal and Onondaga Lake (MPs 292.5 to 292.75).

- Rochester third track improvements are proposed along nine miles (MPs 373 to 382) west of Rochester Station. These third track improvements could have the potential to impact floodplains associated with the Erie Canal (MP 374.5) and Little Black Creek (MPs 377.5 to 378.5).
- Alternative 90B would also include the addition of a third track along 11 miles (MPs 382 to 393) in western Monroe and eastern Genesee Counties. The addition of this track will encroach on floodplains associated with Little Black Creek, Robins Brook and Black Creek.
- The proposed double track (MPs QDN17 to QDN23.2) could have the potential to impact floodplains associated with Bergholtz Creek (MP QDN20) and Cayuga Creek (MP QDN21.5).

Third and fourth track improvements for the Preferred Alternative, Alternative 90B, start at MP 160 in the City of Schenectady and extend west to MP 430, east of Buffalo.

- In Schenectady County, Alternative 90B would cross approximately eight waterways. Floodplains exist along these waterways, especially along the Mohawk River, which crosses the alignment at MP 160 and closely adjoins the rail line from approximately MP 166 to the county line (MP 169.5). There would be potential to directly or indirectly impact floodplains in these areas from the construction of new track.
- The railroad would continue to adjoin the north bank of the Mohawk River/Erie Canal through all of Montgomery County, largely remaining within 50 to 1,000 feet of the river/canal. In addition, there would be approximately 35 waterway crossings, primarily over tributaries of the Mohawk River. Floodplains exist along the Mohawk River in Montgomery County at MP 201.
- The railroad would continue to adjoin the north bank of the Mohawk River/Erie Canal through all of Herkimer County, largely remaining within or adjacent to the mapped floodplains of the Mohawk River and Erie Canal. In addition, Alternative 90B would cross the floodplains of East Canada Creek (MP 210) and West Canada Creek (MP 223).
- Alternative 90B would extend through Oneida County, paralleling the Erie Canal/Mohawk River between Utica and Rome and remaining within or adjacent to its floodplain, before diverging west to flow into Oneida Lake. The alternative would cross approximately 12 waterways in this county. In addition to the Mohawk River/Erie Canal floodplain (roughly between MPs 254 and 264), Alternative 90B would cross floodplains associated with Sauquoit Creek (MP 240.5), Oriskany Creek (MP 244.5), Mud Creek (MPs 256 to 256.5) and Stony Creek (MP 261) and enter the floodplain of Oneida Creek at the county line (MP 264).
- In Madison County, Alternative 90B would cross 11 waterways and would cross seven mapped floodplain areas associated with these crossings. Entering the county, the alternative would be located within the floodplain of Oneida Creek (MP 264) and then would pass floodplains associated with Cowaselon Creek (MP 266), Dutch Settlement Creek (MPs 268 to 268.5), the Old Erie Canal/Owlville Creek (MP 272), Canaseraga Creek (MPs 272.5 to 273.75), Chittenango Creek (MPs 276 to 277) and Pools Brook (MP 278).
- There are 16 waterway crossings and 10 floodplain areas that Alternative 90B would traverse in Onondaga County. The alignment would enter the eastern portion of the county within the floodplain of Pools Brook (MP 278.5). It would then pass through floodplains associated with Lake Brook and Limestone Creek (MPs 280 to 283.5), Butternut Creek (MP 285), Ley Creek (MP 287), the Erie Canal and Onondaga Lake (MPs 292.5 to 292.75), Geddes Brook (MPs 294.75 to 295.75), Nine Mile Creek (MPs 296.5 to 296.75), White Bottom Creek (MPs 302.5 to 303.5), Carpenters Brook (MP 305.5), and Skaneateles Creek (MPs 307 to 309 at the county line).
- In Cayuga County, Alternative 90B would enter the county and would remain within or adjacent to floodplains associated with Skaneateles Creek (MPs 309 to 311.5). The railroad alignment

would then pass through floodplains associated with Putnam and Spring Brook (MPs 311.75 to 312.5), Owasco Outlet (MPs 315.5 and 315.75), and Swamp Brook (MPs 316.25 to 316.5). The alignment would be in, or adjacent to, floodplains associated with the Seneca River from MP 318 to the county line (MP 320).

- There would be approximately 18 waterway crossings in Wayne County. Floodplains exist along these waterways, especially along Black Creek, the Erie Canal, Ganargua Creek, Red Creek and numerous unnamed tributaries to these waterways that cross the alternative. Therefore, both third and fourth track improvements in this county could have the potential to impact floodplains in these areas.
- Alternative 90B would be in or adjacent to seven floodplain areas associated with 19 waterway crossings in Monroe County. The railroad alignment would be within, or adjacent to, floodplains associated with Thomas Creek for roughly 2.5 miles in eastern Monroe County (MPs 359 to 361.5). It would also traverse floodplains associated with Irondequoit Creek (MP 363), Allen Creek (MP 365.5), the Genesee River (MP 371.5), the Erie Canal (MP 374.5), Little Black Creek (MPs 377.5 to 378.5) and Black Creek (MP 386).
- There would be approximately 17 waterway crossings in Genesee County and numerous floodplain areas that Alternative 90B would cross. The alignment would traverse floodplains associated with Black Creek and its tributaries (MPs 389 and 396.5). It would then be within, or adjacent to, floodplains associated with Tonawanda Creek (MPs 402.5 to 404.5) and several crossings of floodplains associated with Murder Creek and its tributaries (MPs 411.75 to 412.25, 413.75 to 414.25 and 417.5).
- Alternative 90B third track improvements would only traverse two floodplain areas associated with Ellicott Creek (MP 422.5) and Scajaquada Creek (MP QDN 6.3) in Erie County.

4.9.5. Potential Mitigation Strategies

Project development will incorporate avoidance and minimization of floodplain impacts to the extent practicable. Hydraulic analysis may be required to demonstrate the effects the design will have on mapped floodplains, and to determine mitigation appropriate for any effects on flood elevations. For new or modified bridges or culverts, mitigation might include improving hydraulic openings to accommodate passage of flood flows. Other types of mitigation that might be considered include minimizing encroachments in floodway areas and floodway fringe areas or providing compensatory flood storage in other areas.

In general, the authority for requiring a hydraulic analysis to satisfy the "no-rise" criteria stems from 44 CFR 60.3(d)(3). Specific state authority to require a "no-rise" analysis (for state-owned and state-funded projects, only) stems from 6 NYCRR 502.4(b). Local authority stems from Article 36 of the Environmental Conservation Law (ECL), as well as various provisions in the applicable local law for flood damage prevention, which are based on FEMA minimum standards, and require technical evaluations for "no-rise" and "no adverse effect." While a hydraulic analysis is considered an option for satisfying the "no adverse effects" criteria for proposed development solely in the floodway fringe, it may be unreasonable to require such an analysis for anything but a large development with a large quantity of fill.[83]

If required by the NYSDEC or FEMA, a Conditional Letter of Map Revision (CLOMR) will be prepared

[83] NYSDEC, 2012. Floodplain Construction Requirements in New York State. <http://www.dec.ny.gov/lands/40576.html>, accessed March 2012.

to request a modification of the floodplain and floodplain maps to mitigate for increases in flood elevations. Where the floodplain elevations and limits are changed by the program, it will be necessary to file a Letter of Map Revision (LOMR) with FEMA after construction is complete so that the FIRMs can be updated.

Section 4.20.5 describes resiliency measures for sea level rise being undertaken in portions of the program area by Metro-North and the New York State Canal Corporation.

4.9.6. Future Analysis

During the Tier 2 assessments, refinements to the impact assessment based on design of the Preferred Alternative, Alternative 90B, and site-specific mapping, and updated floodplain maps available will be obtained. All proposed floodplain development must meet the "no adverse affect" criteria, while proposed floodway development must also meet the "no-rise" criteria.[84]

Ultimately, it is the responsibility of the local Floodplain Administrator (FPA) to determine what form of technical evaluation is acceptable. In addition, pursuant to 6 NYCRR Part 501, NYSDEC may require a permit for any regulated activity on flood control lands under the jurisdiction of NYSDEC.[85]

As mentioned above, proposed modifications to floodplains will be submitted to FEMA for approval of a CLOMR prior to construction and where the floodplain elevations and limits are changed by the program, it will be necessary to file a LOMR with FEMA after construction is complete so that the Flood Insurance Rate Maps (FIRMs) can be updated.

4.10. Wetlands

4.10.1. Regulatory Context

Federal agencies are required to avoid and minimize wetland impacts to the extent possible per Executive Order (EO) 11990,[86] and the U.S. ACE has jurisdictional responsibilities under Section 404 of the U.S. Clean Water Act. Many wetlands and other aquatic features are considered "waters of the U.S.," and these "jurisdictional" areas are protected under Section 404. Wetlands are defined under the U.S. Clean Water Act (CWA)[87] as, "*Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas*."[88]

The national standard for wetland classification is the U.S. Fish and Wildlife Classification System, which is used in the mapping of wetlands and deepwater habitats performed for the National

[84] NYSDEC, 2012. Floodplain Development and Floodway Guidance. NYSDOT, <http://www.dec.ny.gov/lands/24281.htmll>, website accessed March 2012.

[85] NYSDEC, 2012. Part 501: Use of Flood Control Lands. NYSDEC, <http://www.dec.ny.gov/regs/4472.html>, website accessed March 2012.

[86] As amended by EO 12608, September 9, 1987.

[87] As defined by the U.S. ACE (Title 33 CFR 328.3, 1986) and the U.S. EPA (40 CFR 230.3, 1980).

[88] Environmental Laboratory. *Corps of Engineers Wetland Delineation Manual Technical Report Y-87-1.* Prepared for the U.S. ACE, Washington, D.C. Final Report. January 1987.

Wetlands Inventory (NWI).[89] The five major wetland and deepwater systems are marine, estuarine, riverine, palustrine (non-tidal freshwater or salinities less than 0.5 parts per thousand), and lacustrine.

In New York State, two types of wetlands are the focus of protection: tidal and freshwater. The New York State Tidal Wetlands Act has been enacted for the preservation and protection of tidal wetlands, located at the critical interface between land and tidal waters. Appendix G.9 presents tidal and freshwater wetland classifications found in the study area. The New York State Freshwater Wetlands Act regulates wetlands according to four classes of wetlands (Classes I through IV), with Class I wetlands having the highest value. Under both sets of regulations, adjacent areas, or the buffer zone around wetlands, are defined and regulated. Under the tidal wetland regulations, adjacent areas are defined as areas not included in any of the defined tidal wetland categories (refer to Appendix G.9 for study area categories) that are generally not inundated by tidal waters and that extend 300 feet landward of the most landward tidal wetlands boundary or to an elevation of ten feet.

4.10.2. Methodology

Federal and state tidal and freshwater wetlands within 300 feet of the corridor centerline (study area) for each corridor were mapped and characterized. Available GIS mapping from the U.S. Fish and Wildlife Service National Wetlands Inventory and the NYSDEC Hudson River tidal wetlands and freshwater wetlands were compiled for the 600-foot-wide study area. The three wetland layers were overlaid to create the wetland totals shown in Exhibit 4-14.

Exhibit 4-14 displays the study area wetlands and also accounts for the overlaps in the various federal and state wetland layers. Electronic mapping available from NYSDEC included delineation of tidal wetland adjacent areas, so these areas were also tabulated in this exhibit.

4.10.3. Existing Conditions

There are approximately 8,426 acres of mapped NWI and NYSDEC wetlands in the 90/110 Study Area. There are approximately 6,135 acres of mapped NWI and NYSDEC wetlands in the 125 Study Area. The deepwater and wetlands mapped in the National Wetlands Inventory (NWI) in the Empire Corridor Study area are classified by the U.S. Fish and Wildlife Service into seven groups: estuarine deepwater, estuarine wetlands, riverine, freshwater (or palustrine) emergent wetlands, freshwater forested/shrub wetland, freshwater pond, and lakes.

State-regulated wetlands in the study area include: 1) Tidal wetlands, which are found around New York City and up the Hudson River, and 2) Freshwater wetlands which are found on river and lakes across the state. The NYSDEC tidal wetland categories mapped in the Empire Corridor include open water (71% of tidal wetlands); broad-leaf vegetation (7%); graminoid vegetation (14%); coastal shoals, bars, and mudflats (1%); vegetated coastal shoals, bars, and mudflats (1%); swamp shrub (1%); and swamp tree (5%).

In the existing Empire Corridor (90/110 Study area), NYSDEC freshwater wetlands include the highest value wetlands, Class I, which comprises 40 percent of total NYSDEC freshwater wetlands. Class II wetlands comprise 55 percent of NYSDEC freshwater wetlands in the study area, compared to Class III (3%), and Class IV (2%) of total freshwater wetlands in the study area counties.

[89] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S., Fish and Wildlife Service (FWS), FWS/OBS-79/31, 1979.

Exhibit 4-14—Summary of Federal and State Wetlands in the Study Area

County	Acres of Wetlands[1]														Total	
	NWI		NWI and NYSDEC Freshwater Wetlands		NWI and NYSDEC Tidal Wetlands		NWI, NYSDEC Freshwater and Tidal Wetlands		NYSDEC Freshwater		NYSDEC Tidal Wetlands		NYSDEC Tidal and Freshwater Wetlands			
	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area	90/ 110 Study Area	125 Study Area
New York	56	57	0	0	0	0	0	0	0	0	0	0	0	0	56	57
Bronx	21	21	0	0	0	0	0	0	0	0	0	0	0	0	21	21
Westchester	150	137	0	0	393	371	11	11	0	0	60	60	1	1	615	580
Putnam	0	0	0	0	211	206	40	42	0	0	37	37	1	1	289	286
Dutchess	0	0	0	0	1,017	1,020	185	185	0	0	104	104	6	6	1,312	1,315
Columbia	0	0	0	0	449	451	422	427	0	0	62	61	27	27	960	966
Rensselaer	0	0	0	0	66	62	76	76	0	0	13	13	9	10	164	161
Albany	75	4	28	0	6	7	0	0	26	0	1	1	0	0	136	12
Schenectady	39	60	22	0	0	0	0	0	24	0	0	0	0	0	85	60
Schoharie	0	51	0	0	0	0	0	0	0	0	0	0	0	0	0	51
Montgomery	336	62	113	43	0	0	0	0	181	65	0	0	0	0	630	170
Herkimer	288	72	40	4	0	0	0	0	26	5	0	0	0	0	354	81
Oneida	224	62	348	118	0	0	0	0	258	72	0	0	0	0	830	252
Madison	196	80	54	11	0	0	0	0	32	0	0	0	0	0	282	91
Onondaga	152	102	212	163	0	0	0	0	204	219	0	0	0	0	568	484
Cayuga	68	45	96	86	0	0	0	0	36	27	0	0	0	0	200	158
Wayne	343	123	430	191	0	0	0	0	146	38	0	0	0	0	919	352
Monroe	138	138	125	106	0	0	0	0	43	21	0	0	0	0	306	265
Genesee	250	234	119	182	0	0	0	0	52	11	0	0	0	0	421	427
Erie	176	184	26	83	0	0	0	0	10	13	0	0	0	0	212	280
Niagara	66	66	0	0	0	0	0	0	0	0	0	0	0	0	66	66
Total	**2,578**	**1,498**	**1,613**	**987**	**2,142**	**2,117**	**734**	**741**	**1,038**	**471**	**277**	**276**	**44**	**45**	**8,426**	**6,135**

[1]/ Adjacent Area Tidal wetland buffer classification are not included in the totals.

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 300 feet of the corridor centerline.

In the 125 Study Area, NYSDEC freshwater wetlands include the highest value wetlands, Class I, which comprises 55 percent of total NYSDEC freshwater wetlands. Class II wetlands comprise 32 percent of NYSDEC freshwater wetlands in the study area, compared to Class III (13%), and Class IV (less than 1%) of total freshwater wetlands in the study area counties.

A detailed discussion by county of the existing federal and state wetlands along the 90/110 Study Area and the 125 Study Area is presented in Appendix G.9.

4.10.4. Environmental Consequences

Comparison of Alternatives

This Tier 1 preliminary assessment describes potential impacts of program alternatives to mapped areas of National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation (NYSDEC) State Regulated Wetlands. Although mapped NWI and NYSDEC wetlands overlap the existing mainline track bed in some locations, it is unlikely that wetlands would be found within the railbed; however, there would be potential for wetlands to occur within the existing right-of-way. Therefore, work conducted within and beyond the right-of-way may have the potential to impact wetlands.

Work activities such as track widening for new track, road realignment, station improvements, culvert widening, and other ground disturbance have the potential to affect wetlands through impacts such as dredging or filling. Temporary impacts may include temporary placement of fill material into wetlands or other water features, the removal of vegetation from areas that would be later regraded and reseeded, temporary loss of aquatic habitat, and disturbance and displacement of wildlife during construction. These impacts would be associated with construction activities such as temporary staging areas and construction access roads. Long-term impacts may include permanent filling for railroad facilities, such as embankments or piers or construction of permanent access roads. This loss of wetlands could, in turn, reduce attenuation of floodflows and drainage from track areas and thereby decrease stormwater retention and stormwater quality. Short-term impacts related to construction activities are discussed in Section 4.25.3.

The Base and 90A Alternatives and Alternative 90B (the Preferred Alternative) would involve work largely within the right-of-way, with tracks added in the location of the former track beds or existing access roads, and minimal impacts to wetlands would be anticipated. Alternative 110 may have more impacts to wetlands than the Base Alternative or Alternatives 90A and 90B because proposed work would involve activities extending further from the current mainline track and extending 15 feet further than Alternative 90B. Alternatives 90A, 90B, and 110 would have potential to affect 39 new and existing crossings along Empire Corridor South. Alternative 90A would potentially impact 29 existing crossings along Empire Corridor West, compared to potential impacts for track additions at 454 crossings (Alternative 90B) and 473 crossings (Alternative 110). Alternative 125 would involve even greater impacts to wetlands as it would be located on new alignment through primarily undeveloped and rural areas, with potential for impacts at 513 new or existing wetland crossings.

The sections below identify the areas where improvements or new track for the Preferred Alternative (Alternative 90B) would be constructed in or adjacent to mapped wetlands. Appendix G.9 addresses the potential impacts of the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

Alternative 90B (Preferred Alternative)

Road realignment, access road construction, and culvert improvements proposed under Alternative 90B would occur within and outside of the right-of-way, although the location of this proposed work would be further refined in the Tier 2 process.

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects. Although some of the work would be conducted within the existing right-of-way, ground disturbance in proposed work areas that overlap mapped wetlands, either inside or outside the existing right-of-way, could cause wetland impacts through dredging, filling or other disturbance. Depending on design, there is potential for impact to wetlands and waters associated with the Hudson River and its tributaries through dredging, filling or other construction impacts.

- Alternative 90B would include construction of four miles of second track through urbanized areas of Manhattan (SRP-1, MPs 9 to 13) and 1.4 miles of new track extending under the Tappan Zee Bridge (SRP-2, 23.8-25.2). The Hudson River is adjacent to the rail line throughout these proposed improvement areas. One mapped NWI and NYSDEC wetlands associated with the Hudson River and the Harlem River confluence is located in the proposed work area. Additional track construction over the Harlem River (MP 10) could have the potential to temporarily or permanently impact mapped wetlands at this location. Improvements under the Tappan Zee Bridge would be within the current right-of-way and impacts to wetlands would be unlikely.
- With Alternative 90B, signal improvements proposed along 43 miles (MPs 32.8 and 75.8) would cross mapped NWI and NYSDEC wetlands approximately 30 times. Crossings are generally small areas of overlap connected to larger adjacent mapped areas associated with the Hudson River and its tributaries to the east. Proposed work would primarily involve signal upgrades within the existing rail bed; therefore, it is unlikely that impacts would occur to wetlands for these improvements.
- New third track in Dutchess County (SRP-3, MPs 53 to 63) would cross wetlands associated with Breakneck Brook (MP 54) and, depending on construction design, a cove at the confluence of Fishkill Creek and the Hudson River (MPs 57.5 to 57.75).
- In addition, improvements at the Poughkeepsie Yard/Storage Facility (MPs 71 to 75.8) would cross Sunfish Cove and its associated wetlands. Ground disturbance in the above-mentioned work areas that overlap wetlands could cause impacts through dredging, filling or other disturbance.
- North of Poughkeepsie and south of Albany-Rensselaer Station, the alignment would cross mapped wetland areas approximately 7 times. NYSDOT anticipates that the new control points and station improvements would occur largely within the right-of-way or current station footprint, and would not likely involve impacts to wetlands.
- Alternative 90B would include the replacement of the Livingston Avenue Bridge over the Hudson River (ES-15, MP 143).

Empire Corridor West/Niagara Branch

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects. For Alternative 90B, track improvements along the Empire Corridor West/Niagara Branch would include the following:

- Ten miles of third track would be added between MPs 169 and 179 (EW-14a), with improvements at the Amsterdam Station along the west end of this segment (EIS-1, MP 177.6). Mapped wetlands associated with the Mohawk River abut the right-of-way on its southern edge for a majority of the proposed work areas along this 10-mile segment and cross the alignment three times around MP 178. Although this work would occur within the existing right-of-way, ground disturbance and construction in proposed work areas that overlap wetland areas could cause wetland impacts through dredging or filling activities. Updates to three control points (EW-05, MPs 175, 239 and 248) would not cross any wetlands and would not likely involve impacts to wetlands.
- Alternative 90B would include Syracuse Station track improvements (EIS-6, MPs 290 to 294), and third track improvements along 11 miles (EW-16, MPs 373 to 382) west of the Rochester Station. Work for the Syracuse Station would adjoin mapped wetlands associated with Ley Creek and Onondaga Lake and would also include crossings of eight mapped wetlands along the Erie Canal and Onondaga Lake. West of the Rochester Station, proposed improvements would cross two mapped NWI and NYSDEC wetlands associated with the Erie Canal (MP 374.5), and a tributary of Black Creek (MP 379.5). Therefore, reconstruction of the Syracuse Station and third track improvements west of Rochester would have the potential to impact wetlands through dredging, filling, or construction activities at these crossings.
- The third track proposed along 11 miles located largely west of the designated urban area around Rochester (EW-20, MPs 382 to 393) will cross mapped wetland areas, primarily associated with Black Creek and its tributaries, approximately 11 times. Although this work would occur within the existing right-of-way, ground disturbance and construction in proposed work areas that overlap wetland areas could cause wetland impacts through dredging or filling activities.
- The proposed station improvements of the Buffalo-Depew Station (EIS-10, MPs 429 to 433) would cross two small mapped wetland areas. In addition, along the proposed double tracking work area (EW-17, MPs QDN17 to QDN23.2 along the Niagara Branch), work would cross three mapped wetland areas associated with Bergholtz and Cayuga Creeks. Work conducted within these mapped wetland areas described above would have the potential to impact the wetland through dredging, filling or construction activities.

NWI and NYSDEC have mapped several wetland features within the proposed work areas of third and fourth track installation associated with the Preferred Alternative, Alternative 90B, both within and outside of the current right-of-way. There would be approximately 429 locations where new third or fourth track would cross mapped wetland areas and dredging or filling activities from construction of new track could cause wetland impacts. In addition, construction where wetlands are present would have the potential to temporarily impact wetlands through staging and storage of equipment. These areas are further described below.

- In Schenectady County, new track proposed for Alternative 90B would cross 19 mapped wetlands. These mapped wetlands are associated with the Hudson River (MP 160.5), an unnamed tributary (MP 162.75) and a small wetland area associated with Verf Kill near the western end of the county (MP 167.75).
- Proposed third and fourth tracks for Alternative 90B would cross approximately 55 mapped wetland areas in Montgomery County. Alternative 90B would closely follow the northern banks of the Mohawk River through Montgomery County, and all the mapped wetlands areas are associated with the Mohawk River or its tributaries to the north. Most of the wetlands that would be crossed by the third or fourth track improvements are small individual areas; however, there

are several areas where multiple crossings are part of a larger complex of wetlands (MPs 177.5 to 178.75, 188.75 to 189.5 and 193 to 194).

- Proposed third track would only cross 52 mapped wetlands in Herkimer County associated with the Mohawk River/Erie Canal (MPs 232 to 232.5).
- There would be approximately 53 crossings of wetlands in Oneida County with the addition of new track for Alternative 90B. In the eastern half of the county, the majority of wetlands are associated with the Mohawk River and Erie Canal. These include numerous small crossings of larger complexes north and south of the proposed alignment. After passing Rome, the proposed alternative would move south of the Mohawk River/Erie Canal and would cross numerous wetlands associated with Mud Creek (MPs 256 to 257.5), Stony Creek (MP 261) and tributaries of these creeks. In Madison County, proposed new track would only cross 27 mapped wetland areas. The track cross through several unnamed streams, one small area associated with and unnamed pond (MP 266) and one associated with Chittenango Creek (MP 276.5).
- In Onondaga County, new track associated with Alternative 90B would cross approximately 38 mapped wetland areas. Around Onondaga Lake, Alternative 90B would cross several small wetland areas associated with the Old Barge Canal and the lake (MPs 291 to 293), before heading further west and crossing numerous small wetland areas associated with Nine Mile Creek, Dead Man Creek and other tributaries. Several crossings within larger complexes are associated with White Bottom Creek and the Erie Canal (MPs 301.5 to 304) and Carpenters Brook and the Old Erie Canal (MPs 305 to 307.5).
- In Cayuga County, new track from Alternative 90B would cross wetlands approximately 11 times. Most of these are small individual wetlands associated with Putnam Brook, Spring Brook and Swamp Brook; however, the alignment would cross a larger complex associated with the Seneca River and Hog Island Wildlife Management in the western portion of the county (MPs 318 to 320).
- Alternative 90B would cross mapped wetlands approximately 100 times in Wayne County. The majority of these crossings would be over small wetlands associated with the Erie Canal, Black Creek, Clyde River, Ganargua Creek and Red Creek and their tributaries.
- Alternative 90B would cross mapped wetlands approximately 25 times in Monroe County. The alignment would cross one wetland area associated with Irondequoit Creek (MP 362.75), several small wetland areas, and wetlands associated with the Genesee River, the Erie Canal and Black Creek.
- In Genesee County, new track for Alternative 90B would cross mapped wetlands areas approximately 45 times. The alignment would cross several small wetland areas as well as small areas associated with Robins Brook, Black Creek, Tonawanda Creek, Bowen Creek and Murder Creek. In addition, Alternative 90B would cross mapped wetlands several times through a larger complex associated with a tributary of Murder Creek (MPs 409 to 412.5).
- New track for Alternative 90B would cross mapped wetlands approximately 15 times in Erie County. Most of these crossings would be over small wetland areas (MPs 418.5 to 418.75, 421.75, 427 to 428.5 and 429.75). One crossing would be over wetlands associated with Ellicott Creek (MP 422.25).

Depending on design, these wetlands features would have the potential to be directly or indirectly impacted by any dredging or filling associated with proposed work under Alternative 90B.

4.10.5. Potential Mitigation Strategies

Under the Section 404 of the CWA, impacts to waters of the U.S., including wetlands and open water features, must be avoided, minimized, or mitigated (in order of preference), with the goal of achieving no net loss of functions and values of jurisdictional wetlands (33 United States Code 1251 et seq.). In planning, design, and construction in Tier 2 assessments, means of avoiding and minimizing wetland impacts will be identified for the Preferred Alternative, Alternative 90B. Where avoidance and minimization would not be practicable, mitigation for impacts to wetlands could be achieved through the use of temporary and permanent Best Management Practices (BMPs).

Temporary BMPs would include implementing measures specified in the Stormwater Pollution Prevention Plan or Erosion and Sedimentation Control Plan. Temporary BMPs could include, but are not limited to:

- Covering areas of temporary construction disturbance with geotextile, straw, soil, or construction matting prior to use;
- Placing orange temporary fences and sediment-control measures to protect existing wetlands that are outside the planned area of disturbance;
- Coordinating with the local jurisdiction for the location and design of stormwater ponds;
- Implementing the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, or diversion channels to reduce erosion and sedimentation during all phases of construction;
- When practicable, constructing in waterways during low-flow or dry periods;
- Diverting flowing water around active construction areas;
- Not storing fill material in wetlands or open water features;
- Not allowing staging equipment, storing materials, chemical use (e.g., soil stabilizers, dust inhibitors, and fertilizers), or equipment refueling within 50 feet of wetlands or open water features;
- Designing any new or modified bridges to minimize direct discharge of stormwater runoff into wetlands; and
- Incorporating measures to prevent spread or propagation of invasive species.

Depending on the extent of impacts of the Preferred Alternative, Alternative 90B, and the need for an individual permit, findings and evaluations under Section 404(b)(1) Guidelines may be required in Tier 2.

Impacted wetlands and open water features will be mitigated in accordance with current U.S. ACE and state jurisdictional mitigation policies. The U.S. ACE and NYSDEC generally requires compensatory mitigation on a site-specific basis for impacts to wetland functions and values.[90] Mitigation plans to compensate for impacts to NYSDEC protected wetlands are developed on a case-

[90] USACE, New York District. "Public Notice Announcing the Compensatory Mitigation Guidelines and Mitigation Checklist For Review of Mitigation Plans For the U.S. ACE, New York District." January 10, 2005. Accessed March 2011. Available: <http://www.nan.usace.army.mil/business/buslinks/regulat/index.php?compensatory>.

by-case basis, depending on the type of wetlands that would be impacted.[91]

A mitigation plan would be developed in coordination with the U.S. ACE and other appropriate agencies, if needed, during wetland permitting. Strategies to offset impacts to wetlands would include on-site or off-site restoration, creation, or enhancement of wetlands within the same watershed as any impacted wetlands.

4.10.6. Future Analysis

Tier 2 assessments will refine the Tier 1 impact assessment based on advanced design for the Preferred Alternative, Alternative 90B, and site-specific mapping and delineation of existing mapped and newly identified wetlands that may be impacted. Wetland boundaries will be refined using wetland delineation techniques for those projects that may involve impacts. This assessment will include further evaluation of avoidance, minimization, or mitigation measures and identification of design refinements needed in these locations.

In most instances, any activity that proposes dredging, filling, or other modification to areas designated as wetlands would require a permit from federal and state regulatory agencies. A permit under Section 404 of the U.S. Clean Water Act, administered by the U.S. ACE, would be necessary to authorize direct impacts (discharge of dredged or fill material) to waters of the U.S., including wetlands. Under Section 10 of the U.S. Rivers and Harbors Act, work in, over, or under navigable waters also requires permit authorization from the U.S. ACE. Under the Section 404/10 permit program, the U.S. ACE issues two types of permits: individual and general permits.

General permits are issued for categories of projects that are presumed to have not more than minimal impacts on the aquatic environment. Individual permits are used for impacts exceeding the regulatory thresholds created for each specific category. The type of U.S. ACE (General or Individual) permit for any wetland impacts will be determined after design of the Preferred Alternative is further advanced and impacts are known.

The NYSDEC also administers permits for regulated activities that would affect protected tidal and freshwater wetlands under the state's Environmental Conservation Law Article 24 (freshwater wetlands) and Article 25 (tidal wetlands). Permit applications must propose mitigation measures to offset any impacts to wetland resources.

4.11. Coastal Resources

4.11.1. Regulatory Context

The New York State Division of Coastal Resources, within the Department of State, implements the Federal Coastal Zone Management Act,[92] as well as the state's Waterfront Revitalization of Coastal Areas and Inland Waterways Act.[93] The defined coastal zone includes the Hudson River south of the Troy Lock and Dam and Lake Erie and Lake Ontario.

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[91] NYSDEC. "Freshwater Wetlands Permit Program: Application Procedures." Accessed March 2012. <http://www.dec.ny.gov/permits/6277.html>.

[92] U.S. Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.) as amended through Public Law No. 109-58, the Energy Policy Act of 2005.

[93] NYS Waterfront Revitalization of Coastal Areas and Inland Waterways, Article 42: (910-923).

The State Waterfront Revitalization Program also includes designated inland waterways. Designated inland waterway are major lakes, rivers, and streams designated by the State Legislature as significant because of value as natural, scenic, recreational, historic, and/or economic resources. Projects within designated coastal zone or communities with approved Local Waterfront Revitalization Programs must be consistent with coastal policies.

The state coastal program also designates for protection designated scenic areas and habitats. The state Coastal Atlas identifies the coastal boundary, as well as Scenic Areas of Statewide Significance (SASS) and Significant Coastal Fish and Wildlife Habitats (SCFWH). SASS designation protects scenic landscapes through review of projects requiring federal or state actions, including direct actions, permits, or funding. Similarly, projects affecting SCFWH must address consistency with applicable coastal policies in the federal/state consistency review process.

Federal and state protections and designations for the Hudson River Estuary are also provided under federal and state law. The Hudson River National Estuarine Research Reserve was established as part of the National Estuary Research Reserve System in 1982. The National Estuarine Research Reserve System (NERRS) was created by the Coastal Zone Management Act (CZMA) of 1972, as amended, 16 U.S.C. 1461, to augment the Federal Coastal Zone Management (CZM) Program. The reserve system is a network of protected areas established to promote informed management of the Nation's estuaries and coastal habitats. The reserve system currently consists of 27 reserves in 22 states and territories, protecting over one million acres of estuarine lands and waters.

4.11.2. Methodology

The available GIS mapping delineating the state coastal boundary, Scenic Areas of Statewide Significance, and Significant Coastal Fish and Wildlife Habitats were obtained for study areas within ½ mile of the corridor centerline for all alternatives, and information available from the New York State Division of Coastal Resources website was consulted on these protected SASSs[94] and SCFWHs.[95] The lists from the NYS Division of Coastal Resources website of coastal waterways and designated inland waterways[96] and municipalities that have enacted Local Waterfront Revitalization Plans[97] were also consulted. Information on the Hudson River National Estuarine Reserve was obtained from the NYSDEC website.[98,99]

4.11.3. Existing Conditions

Coastal Zone

New York State's coastal zone includes the Hudson River Valley, which extends 150 miles from New York City into upstate New York, and the Great Lakes-St. Lawrence River region, a vast, freshwater

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[94] NYS Division of Coastal Resources, "Scenic Areas of Statewide Significance," Accessed January 5, 2012. <http://nyswaterfronts.com/waterfront_developed_SASS.asp>.

[95] NYS Division of Coastal Resources, "Significant Coastal Fish and Wildlife Habitats," Accessed January 5, 2012. <http://www.nyswaterfronts.com/waterfront_natural_narratives.asp>.

[96] "Environmental Protection Fund Local Waterfront Revitalization Program: List of Coastal Waterbodies and Designated Inland Waterways," Accessed January 3, 2012. <http://www.nyswaterfronts.com/downloads/pdfs/Waterways%20List_07-10.pdf>.

[97] "NYS Coastal Management Program: List of Approved Coastal Local Waterfront Revitalization Programs (LWRPs) December 2010," Accessed January 4, 2012. <http://www.nyswaterfronts.com/LWRP_Status.asp>.

[98] NYSDEC, "Hudson River National Estuarine Research Reserve," Accessed January 9, 2012. <http://www.dec.ny.gov/lands/4915.html>.

[99] NYSDEC, "Hudson River Estuary Action Agenda," Accessed January 9, 2012. <http://www.dec.ny.gov/lands/5104.html>.

non-tidal coastal system. Designated coastal waterways include the Hudson River, Harlem River, Lake Erie, and the Niagara River.

The Empire Corridor South between New York City (Milepost 1) to Rensselaer/Albany Counties (Mileposts 143-144) is entirely within the coastal zone. The Great Lakes coastal zone includes Irondequoit Bay and Creek, a tributary to Lake Ontario, in Monroe County, which crosses the Empire Corridor West in East Rochester/Perinton (Milepost 363).

The Niagara Branch crosses the coastal zone at several locations. It extends into the coastal zone along the Lake Erie waterfront area in Buffalo (between Mileposts QDN 2 and 4) in Erie County and at the Scajaquada Creek, a tributary of the Niagara River, in Buffalo (Milepost 6.3). The Niagara Branch crosses the coastal zone at the Erie Canal crossing at Tonawanda/North Tonawanda (Milepost 13.5) and extends close to the coastal zone along the Niagara River extending north to Milepost 17.5. The end of the Niagara Branch extends into the coastal zone at the Niagara River in Niagara Falls (Milepost QDN 28).

The coastal zone and coastal resources are identical for the 90/110 and the 125 Study Areas, as the corridors merge in these three coastal areas: Hudson River, Great Lakes/Irondequoit Bay and Creek, and Lake Erie/Niagara River. The communities with Local Waterfront Revitalization Programs are largely the same for the alternatives, with the exception of a few communities.

Hudson River Estuary

Four distinct tidal wetland sites on the Hudson River Estuary were designated the Hudson River National Estuarine Research Reserve in 1982, as field laboratories for estuarine research, stewardship and education. The reserve is operated as a partnership between New York State and the National Oceanic and Atmospheric Administration (NOAA) and relates to federally-designated and state-protected sites along 100 miles of the estuary. The reserve is a federal-state partnership program that relates to four federally-designated and state-protected sites along 100 miles of Hudson River Estuary: Piermont Marsh and Iona Island (both located west of the Hudson River), Tivoli Bays, and Stockport Flats.

Inland Designated Waterways

The inland designated waterways in the study area include the Mohawk River, Onondaga Lake, Genesee River, and Tonawanda Creek. However, this designation does not in itself confer protection to the waterway unless the communities have enacted Local Waterfront Revitalization Plans.

Local Waterfront Revitalization Plans

Under the Local Waterfront Revitalization Program (LWRP), communities along the designated coastal waterbodies and these inland designated waterways can enact Local Waterfront Revitalization Plans. Along the Empire Corridor South, there are 19 communities within a half mile of the corridor centerline on the east side of the Hudson River that are covered by LWRPs, which are described in Appendix G.10.

Scenic Areas of Statewide Significance

The coastal zone along the Empire Corridor South also includes six state-designated Scenic Areas of Statewide Significance. The Hudson River Valley coastal region includes six areas in Columbia, Greene, Dutchess and Ulster Counties, which were designated in 1993 as Scenic Areas of Statewide Significance (SASS): The Hudson Highlands SASS, the Estates District SASS, the Esopus/Lloyd SASS, the Ulster North SASS, the Catskill-Olana SASS, and the Columbia-Greene North SASS, which are described in Appendix G.10. The areas in both the Hudson Valley and East End encompass unique, highly scenic landscapes accessible to the public and recognized for their outstanding quality.

Significant Coastal Fish and Wildlife Habitats

The coastal zone along the study area includes 31 Significant Coastal Fish and Wildlife Habitats (SCFWH) as shown in Appendix G.10. These SCFWH areas include areas within the Hudson River National Estuarine Reserve (Tivoli Bays, Iona Islands), a National Natural Landmark (Iona Islands on the west side of the Hudson River), and other federal and state parklands. Of these areas, all but three are located along the Hudson River.

The Tivoli Bays is designated by NYSDEC as a Natural Heritage Area in New York State. The Tivoli Bays is also included in the Mid-Hudson Historic Shorelands Scenic District designated under Article 49 of the Environmental Conservation Law.

4.11.4. Environmental Consequences

Comparison of Alternatives

The sections below describe impacts to coastal resources, including the coastal zone, Significant Coastal Fish and Wildlife Habitats, and Scenic Areas of Statewide Significance. The protections to Inland Designated Waterways are implemented through Local Waterfront Revitalization Plans in the communities shown in Appendix G.10, so work proposed in these communities will need to be consistent with the local plans.

Along Empire Corridor South, the railroad transects the coastal zone along the Hudson River, which is the area with the greatest potential for coastal impacts. The Empire Corridor crosses through 11 Significant Coastal Fish and Wildlife Habitats (SCFWHs) and 6 Scenic Areas of Statewide Significance (SASSs) in this area. For the Base Alternative and Alternative 90A (which are included in Alternative 90B), proposed work within or adjoining these SCFWHs and SASSs along this corridor will not involve substantial impacts outside of the right-of-way and will not result in appreciable changes in visual quality, and no impacts to the scenic qualities of the SASSs are anticipated. All of the Build Alternatives will involve bridgework in coastal areas along both Empire Corridor South and all but Alternative 90A will involve bridgework in coastal resources along Empire Corridor West. The impacts of the other Build Alternatives are comparable to that of the Preferred Alternative, as described in detail in Appendix G.10. Coastal impacts are addressed for Alternative 90B (the Preferred Alternative) below.

Alternative 90B (Preferred Alternative)

Long-term impacts of work within the coastal zone may include potential for visual impacts or resource degradation due to loss or filling of wetlands or waterways or water quality impacts (e.g., potential for spills or releases from train operations). Short-term impacts related to construction are discussed in Section 4.25.3.

In the Tier 1 assessment, the extent to which the Preferred Alternative would involve permanent fill or temporary construction disturbances to coastal resources cannot be quantified, so the potential areas of coastal resources that may be affected by the program are described below.

Empire Corridor South

The Preferred Alternative includes improvements for Alternative 90A that will extend through or in the vicinity of the following SCFWHs and SASSs along Empire Corridor South.

- The **Lower Hudson Reach SCFWH** adjoins the railroad where it closely borders the Hudson River between MPs 1 to 17 (including MPs 9 to 13 where 4 miles of second track will be built in midtown Manhattan), but the second track would be located within the right-of-way, and this work is not anticipated to involve coastal impacts. Alternative 90B also includes 1.4 miles of new track (MPs 23.8 to 25.2), extending under the Tappan Zee Bridge, for the Tarrytown Pocket Track/Interlocking. This work would not affect SASSs or SCFWHs and would be within the right-of-way, and is not anticipated to involve coastal impacts.
- To the north, the railroad extends through the **Hudson Highlands SASS** between MPs 40.5 to 57.8. The signal improvements and addition of a third track (between MPs 53 and 63) would not affect the visual quality of this SASS.
- With Alternative 90B, signal improvements proposed along 43 miles (MPs 32.8 and 75.8) extend through urban areas (Westchester and Dutchess Counties). Along this section, 10 miles of new third track (MPs 53 to 63) and improvements at the Poughkeepsie Yard/Storage Facility (MPs 71 to 75.8) are also proposed in Dutchess County. The **Croton River and Bay SCFWH** adjoins or crosses the railroad between MPs 31 to 33.5, and the **Haverstraw Bay SCFWH** adjoins the railroad between MPs 34 and 37. The railroad extends adjacent to or through the **Hudson River Mile 44 to 56 SCFWH** between MPs 42.5 and 54.5. The railroad adjoins the **Constitution Marsh SCFWH**, on the west, between MPs 50.5 to 52.3. The railroad extends through or adjoins the **Fishkill Creek SCFWH** between MPs 57.3 and 57.7. The railroad adjoins or extends through the **Wappinger Creek SCFWH** between MPs 63.8 and 65. The **Poughkeepsie Deepwater Habitat** extends within 200 feet west of the railroad between MPs 67.5 and 79.4. New third track 53 to 53.2 and from 53.5 to 54.5 will adjoin the east side of the **Hudson River Mile 44-56 SCFWH**, but since work would be contained within the right-of-way, impacts to this area are not anticipated. The remaining SCFWHs would not be affected by Alternative 90B improvements, which would be confined to the right-of-way.
- This area extends through the **Estates District SASS**, which extends to the mean high tide line on the eastern shore of the Hudson River between MPs 76.5 and 103.5. The district borders the adjoining **Esopus-Lloyd SASS** (MPs 70 to 87.5) and **Ulster-North SASS** (MPs 95 to 103.5) to the west and including the river. The railroad passes through the **Catskill-Olana SASS** between MPs 87 and 112. Improvements at the Poughkeepsie Yard/Storage Facility (MPs 71 to 75.8) and Rhinecliff Station (MP 89.2), and Hudson Line Reliability Improvements at CPs 82 and 99 (MPs 82 and 99) would extend within the southern SASSs, but should not change the visual quality of these areas.
- The railroad extends through the **Vanderburgh Cove and Shallows SCFWH** between MPs 85 and 87. However, no work is proposed in this area, the Rhinecliff Station improvements are located two miles to the north (MP 89.2). Between MPs 95.3 and 98.3, the railroad extends through the **North and South Tivoli Bays SCFWH**, which is one of four tidal wetland sites federally designated and state-protected as part of the **Hudson River National Estuarine Research Reserve**. Alternative 90B does not involve work at these locations, so no impacts would occur at these SCFWHs. Between MPs 99 and 100, the railroad closely borders on the **Esopus Estuary SCFWH**, extending within 100 feet over a distance of 700 feet. This is in the vicinity of the proposed crossover (CP99 at MPs 98.4 to 98.94) but this work would not extend outside of the right-of-way and is not anticipated to affect the Esopus Estuary SCFWH.

- Between MPs 100.5 to 105.3, the railroad adjoins the eastern side of the **Germantown-Clermont Flats SCFWH**, and rock slope stabilization proposed at five locations from MPs 105.3 to 106 would occur within the right-of-way and is not anticipated to impact coastal impacts. At MP 108, the railroad closely borders the **Roeliff Jansen Kill SCFWH** to the east, and work for Alternative 90B is not anticipated at this location.
- Between MPs 115.3 and 131.5, the railroad extends through the **Columbia-Green North SASS**. Rock slope stabilization proposed at MP 119.5 (one location) and MPs 128.1 to 130 (4 locations) would extend within this SASS, but would not change the scenic quality of the area.
- No work is proposed in the immediate vicinity of the **Mill Creek Wetlands SCFWH** (MPs 125.5 to 127).
- A new crossover, CP 136, is proposed at MP 136, and this work would extend within the **Papscane Marsh and Creek SCFWH** (MPs 135 to 139.3), but is not anticipated to impact the SCFWH.
- The replacement of the Livingston Avenue Bridge (MPs 143.2 to 144) will occur within the coastal zone, but will not affect SCFWHs or SASSs. The disturbance to the coastal zone will be temporary in nature and represents a replacement of an existing structure.

Along Empire Corridor South, coastal zone impacts are not anticipated to occur as this work is expected to be confined to the right-of-way.

Empire Corridor West/Niagara Branch

Alternative 90B improvements include the Livingston Avenue Bridge replacement and the double track along the Niagara Branch, which will both extend within the coastal zone. These impacts are, or were, anticipated to be temporary in nature.

Improvements for Alternative 90B, the Preferred Alternative, are located outside of the coastal zone, with the exception of two track improvements along the Irondequoit Creek and the Niagara River.

- Track improvements for relocated freight track would extend over the **Irondequoit Creek** at MP 362.92. The coastal zone at this crossing includes the **Irondequoit Bay and Creek SCFWH**, and modification or replacement would be required to the existing bridge structure. Work to modify or construct a new bridge over the waterway to accommodate the additional track would be temporary in nature, and since the bridge would span the waterway, no impacts to the coastal zone or coastal habitat area are anticipated.
- The proposed double track along the Niagara Branch (at MPs QDN2 to QDN7) intersects the coastal boundary along the **Niagara River**. These improvements would be located within the right-of-way and would not involve substantial coastal impacts.

4.11.5. Potential Mitigation Strategies

Measures to avoid or minimize impacts on coastal resources and Coastal Special Management Areas will be identified in the Tier 2 assessment, as appropriate, for the Preferred Alternative, Alternative 90B. The proposed program's environmental benefits for the coastal zone include promoting energy-efficient travel and reducing greenhouse gas emissions, which could be considered beneficial from the standpoint of potential future sea level rise. For these reasons, the program would be considered to be consistent with coastal zone management policies.

If required, coastal consistency reviews will be performed to determine how the program complies with federal, state, regional, and local coastal policies, and appropriate mitigation measures will be identified based on these reviews. Mitigation strategies may include permanent measures, such as providing permanent compensation for visual or coastal impacts. Temporary construction measures, such as time of year fisheries restrictions for silt-producing work within coastal waters or restrictions to avoid navigational impacts, could also be employed. Mitigation measures during construction operations include minimizing damage by debris, sedimentation, and other foreign materials being carried into the coastal waters. Areas of exposed soil would be minimized, and erosion and sediment control items should be implemented as part of Stormwater Pollution Prevention Plans and Erosion and Sediment Control Plans. If appropriate, consultation with the NYSDOS and entities with LWRP or Harbor Management Plans will be performed regarding mitigation measures proposed.

4.11.6. Future Analysis

As discussed above, as applicable, Tier 2 will identify potential impacts to Coastal Special Management Areas for the Preferred Alternative, Alternative 90B, and may include consultation with NYSDOS to identify consistency with coastal policies and issues of concern. For projects within the program that may impact coastal resources, in order to determine state consistency with coastal policies, a State Coastal Assessment Form under Part 600 of Title 19 of the NYCRR may need to be completed and submitted to NYSDOS to assist in making a determination of significance under SEQR.

If applicable, federal consistency review would involve submitting Federal Aid Notification letter to NYSDOS and completing the Federal Consistency Assessment Form, including documenting consistency with state coastal policies and LWRPs (submitting copies of correspondence with/from the LWRP). For the purposes of U.S. ACE permitting, if the program involves a General Permit, the program may be programmatically determined to be consistent with coastal policies of the General Permit. If an individual U.S. ACE or USCG permit is required for work in coastal resources, a Federal Consistency Assessment Form may need to be submitted, along with a completed joint U.S. ACE/NYSDEC Permit Application and/or USCG Bridge Permit application and any required NEPA documentation, and all information and data necessary to assess the effects of the proposed activity on and its consistency with the Coastal Management Program.

If applicable, documentation will also be submitted to potentially affected local municipalities with LWRPs addressing consistency with the LWRPs.

4.12. Aquifers

4.12.1. Regulatory Context

The sole source aquifer program provides federal protection of critical groundwater supplies. The United States Environmental Protection Agency (U.S. EPA) defines a sole source aquifer as an aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally and economically supply all those who depend on the aquifer for drinking water. There are two types of "sole source aquifers" (SSAs) designated sole or principal source aquifers.[100]

[100] U.S. EPA Sole Source Aquifer Protection Program (under 1974 Safe Drinking Water Act, Section 1424(e) and 1986 amendments to the Act).

New York State also has a sole source aquifer protection program.[101] The purpose and goals of this program are to provide funds for the implementation of groundwater protection plans and protect water quality in designated "special groundwater protection areas." The program establishes a process for nominating and designating special groundwater protection areas within federally designated sole source aquifer areas contained within counties having a population of one million or more people.

In order to enhance protection of aquifers that are most productive and most vulnerable, the New York State Department of Environmental Conservation (NYSDEC), in cooperation with the United States Geological Survey (USGS), has mapped eighteen primary aquifers throughout the state. Primary aquifers are defined as "*highly productive aquifers presently utilized as sources of water supply by major municipal water supply systems*." The New York State Department of Environmental Conservation (NYSDEC) believes that all of the primary aquifers in New York State would qualify for designation as federally protected sole source aquifers.[102]

Principal aquifers are "*aquifers known to be highly productive or whose geology suggests abundant potential water supply, but that are not intensively used as sources of water supply by major municipal systems at the present time*."[103]

4.12.2. Methodology

Groundwater resources for study areas within 300 feet of the corridor centerline for all alternatives were mapped using available GIS information. The New York State Department of Environmental Conservation (NYSDEC), in cooperation with the United States Geological Survey (USGS), has mapped primary aquifers (1:24,000 scale) and is in the process of identifying principal aquifers, or the remainder of the unconsolidated aquifers in New York that are generally capable of providing 10 to 100 or more gallons per minute at 1:24,000 scale.

Due to the large number of aquifers in New York State, the federal-state cooperative mapping program must continue for some time before all principal aquifers have been mapped. In the meantime, for those areas not mapped the NYSDEC Division of Water refers to a series of USGS maps titled "Unconsolidated Aquifers in Upstate New York," to show potential areas of principal aquifers (1:250,000 scale). Areas mapped as "Unconfined Aquifer 10 to 100 gallons per minute" or "Unconfined Aquifer more than 100 gallons per minute" are generally considered to be principal aquifers unless contradictory site-specific information is made available to the NYSDEC.[3]

GIS information obtained includes U.S. EPA sole source aquifers (SSA), NYSDEC/USGS primary aquifers (1:24,000 scale), and NYSDEC/USGS unconsolidated aquifers (at 1:250,000 scale) to identify and map principal aquifers within the 300-foot buffer.

4.12.3. Existing Conditions

The Empire Corridor 90/110 Study Area passes over 2.03 square miles of one known SSA: the Schenectady-Niskayuna Aquifer within the 600-foot wide study area. It is approximately 20 miles long and underlies approximately 30 square miles in the lower and easternmost part of the Mohawk

[101] New York Environmental Conservation - Article 55 Sole Source Aquifer Protection.

[102] NYSDEC, Sole Source Aquifers, Accessed, October, 20, 2011 <http://www.dec.ny.gov/lands/36151.html>.

[103] NYSDEC, *Primary and Principal Aquifers*, Accessed April 20, 2011 <http://www.dec.ny.gov/lands/36119.html>.

River Basin, with a small overlap into the Lower Hudson River Basin. The 125 Study Area also passes over the same SSA; however, it only passes over 0.06 square mile of it.

The 90/110 Study Area passes over a combined 4.75 square miles of five primary aquifers: the Croton-Ossining, Schenectady, Baldwinsville, Irondognessee, and Batvia aquifers. The 125 Study Area passes over a combined 2.67 square miles of three of these primary aquifers: the Croton-Ossining, Baldwinsville and Irondognessee. Principal aquifers also underlie both study areas. There are approximately 15.32 square miles of principal aquifers underlying the 90/110 Study Area and 7.03 square miles underlying the 125 Study Area.

Exhibit 4-15 presents the aquifer areas by county, and Appendix G.11 describes the aquifers in each county.

4.12.4. Environmental Consequences

Comparison of Alternatives

This section below describes anticipated direct and indirect impacts of the program (Alternative 90B, the Preferred Alternative) and other alternatives considered on groundwater resources (see Appendix G.11 for further discussion of other alternatives considered). The Preferred Alternative will involve work in more areas with greater potential for impacts than the Base and 90A Alternatives. The Base Alternative would involve the least impact, with minimal effects on underlying aquifers from the remaining work for the Syracuse Track Configuration project. Alternative 90B would involve work overlying sole source, primary or principal aquifers areas in 9 counties, similar to Alternative 110. Although Alternative 125 would involve work in more areas (13 counties), the area of sole source, principal, and primary aquifers in the 125 Study Area is lower than for both Alternative 90B and Alternative 110.

The proposed addition of third and fourth tracks, particularly in areas where the railbed is already in place would have minimal or no direct impacts on the underlying aquifers or the quantity of groundwater recharge. The addition of ballast for the new tracks would be considered pervious to infiltrating stormwaters. There may be a slightly increased potential for contaminants reaching the underlying aquifer with increased train traffic on the new tracks, however this would be considered to be a minimal effect. Any proposed structures that would require substantial excavations would have a higher potential to directly impact existing groundwater resources. These actions may include construction of new stations, extension of platforms, bridge construction, and other similar activities.

In general, actions that would constitute impacts on groundwater would include deep excavations that may intersect the groundwater table and/or any increase in impervious surfaces (construction of foundations, placement of compacted fill or impervious pavement), which could reduce infiltration rates of recharge efficiency. Actions that may result in the release of contaminants as a result of construction or operation may also affect the underlying aquifers and potentially drinking water supplies. Any changes in groundwater level near perennial streams, wells or mines may potentially cause a long-term impact to the underlying aquifers. Short-term impacts related to construction are discussed in Section 4.25.3.

Exhibit 4-15—Federal Sole Source and State Primary/Principal Aquifers in the Study Area

County	Aquifer Area within 600-foot wide Study Area (Square Miles)					
	Sole-Source (Schenectady-Niskayuna)		Primary Aquifers (Aquifer Name)		Principal Aquifers (Mapped)	
	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area
New York	-	-	-	-	-	-
Bronx	-	-	-	-	-	-
Westchester	-	-	0.26 (Croton-Ossining)	0.26 (Croton-Ossining)	0.03	0.03
Putnam	-	-	-	-	0.09	0.09
Dutchess	-	-	-	-	0.03	0.03
Columbia	-	-	-	-	0.41	0.41
Rensselaer	-	-	-	-	0.80	0.83
Albany	0.43	0.06	-	-	0.93	1.23
Schenectady	1.60	-	1.29 (Schenect-ady)	-	0.30	0.59
Schoharie	-	-	-	-	-	0.33
Montgomery	-	-	-	-	4.47	0.41
Herkimer	-	-	-	-	2.70	0.73
Oneida	-	-	-	-	1.83	0.47
Madison	-	-	-	-	-	0.10
Onondaga	-	-	1.95 (Baldwins-ville)	1.52 (Baldwins-ville)	0.20	0.02
Cayuga	-	-	-	-	0.71	0.23
Wayne	-	-	-	0.02 (Irondon-genessee)	2.41	0.84
Monroe	-	-	0.88 (Irondon-genessee)	0.87 (Irondon-genessee)	0.37	0.29
Genesee	-	-	0.37 (Batvia)	-	-	0.12
Erie	-	-	-	-	0.04	0.28
Niagara	-	-	-	-	-	-
TOTAL	**2.03**	**0.06**	**4.75**	**2.67**	**15.32**	**7.03**

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 300 feet of the corridor centerline.

Sources: 1) U.S. EPA, Sole_Source_Aquifers.shp, 2011; 2) NYSDEC, *primary_aquifers.shp*, 2011; 3) NYSDEC, Unconsolidated Aquifers at 1:250,000, 2011; 4) New York State Division of Water, *Water Wells.shp*, 2011.

Alternative 90B (Preferred Alternative)

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects, since Alternative 90A projects are included as part of Alternative 90B. With Alternative 90B, improvements would primarily occur within the existing right-of-way, and would likely not include a change to the existing water quality and impervious surfaces; therefore, the proposed improvements would have minimal direct and/or indirect impacts to the identified aquifers in these areas. Work in the vicinity of identified primary or principal aquifers includes the following.

- With Alternative 90B, signal improvements proposed along 43 miles (MPs 32.8 and 75.8) in would pass over the Croton-Ossining Primary Aquifer (MPs 32 to 35), as well as principal aquifers located north of Peekskill in Westchester County (MPs 41 to 43), south of Cold Spring in Putnam County (MPs 51 to 52), and south of New Hamburg in Dutchess County (MP 65).
- North of Poughkeepsie and south of Albany-Rensselaer Station (MPs 75.8 to 140), proposed improvements would include rock slope stabilization (MPs 105 to 130) and three new control points (CP 82, CP 99, and CP 136), as well as station improvements at Rhinecliff Station (MP 89) and Hudson Station (MP 113). New York State principal aquifers would underlie three small areas along this segment of track (near MPs 108, 111, and 135). The area underlying the Hudson River is designated as a New York State principal aquifer, and portions of the track would pass over, or would be located immediately adjacent to, the aquifer. Although proposed improvements such as rock slope stabilization may potentially increase impervious surfaces, depending on the design, this would have minimal or no impacts on underlying aquifers.
- In addition, Alternative 90B would include the replacement of the Livingston Avenue Bridge, which would extend over the Hudson River between the cities of Rensselaer and Albany. The area underlying the Hudson River is designated as a New York State principal aquifer. Depending on the construction and excavation depths and the design of the proposed bridge replacement, associated construction activities in this area would have the potential to directly and/or indirectly impact the aquifer, but these impacts would be temporary in nature.

Empire Corridor West/Niagara Branch

Alternative 90A improvements included in the Preferred Alternative include work over the following aquifer areas, since Alternative 90A projects are included as part of Alternative 90B. Proposed improvements would primarily occur within the existing right-of-way, and would not likely include a change to the existing water quality and impervious surfaces.

- With Alternative 90B, track improvements would include approximately 10 miles of third track between MPs 169 and 178.5, and Amsterdam Station improvements along the west end of this segment. MP 169 is located on the westernmost edge of the Schenectady Primary Aquifer; the remainder of the segment, including the Amsterdam Station, would be generally located within a principal aquifer that generally underlies the Mohawk River. Adding rail ties and ballast for the new track would involve minimal impacts to underlying aquifers, as the ballast is pervious; therefore, the proposed improvements would have minimal direct and/or indirect impacts to the above-mentioned primary and principal aquifers.
- Upgrades to interlockings and automatic block signals would also occur at three control points in the Cities of Amsterdam, Utica, and Rome (CP 175, CP 239, and CP 248, respectively). The control points would be located within the boundaries of the principal aquifer, which would generally underlie the Mohawk River.

- Alternative 90B would include Syracuse Station track improvements (MPs 290 to 294), Rochester Station track and platform improvements (MPs 368 to 373), and third track improvements along 11 miles (MPs 373 to 382) west of the station. Where the railroad enters the City of Syracuse, it would pass over the Baldwinsville Primary Aquifer. Adding rail ties and even ballast for the new track would involve minimal impacts to underlying aquifers. Depending on the construction and excavation depths associated with the proposed station and platform improvements, station improvements could have the potential to minimally impact the Baldwinsville Primary Aquifer. The improvements in the City of Rochester west of the station, including the addition of a third track along 11 miles located largely west of the City of Rochester (MPs 382 to 393) and extending into Genesee County would not be located over an aquifer; therefore, impacts would not be anticipated in this area.

The third and fourth track improvements for Alternative 90B would include work over the following aquifer areas. Adding rail ties and ballast for the new track would involve minimal impacts to underlying aquifers, since the ballast is pervious; therefore, the proposed improvements would have minimal direct and/or indirect impacts to the aquifers.

- In Schenectady County, the proposed new track construction for the Preferred Alternative, Alternative 90B, would occur between MP 159 and MP 167, extending from the City of Schenectady to the west. In addition, proposed improvements would occur at the Schenectady Station (MP 159), and a larger track shift, is proposed for the westernmost part of the county (MP 168). All of the proposed improvements would occur above two aquifer types: the Schenectady-Niskayuna SSA and the Schenectady Primary Aquifer.
- Within Montgomery, Herkimer and Oneida counties, there would be new track additions throughout the county. In addition, proposed station improvements would occur at the Amsterdam Station. The majority of the alignment in these counties would be underlain or immediately adjacent to principal aquifers that generally underlie the Mohawk River.
- Within Onondaga County the proposed new track construction and proposed improvements at the Syracuse Station (MPs 290 to 294) would occur in areas underlain by the Baldwinsville Primary Aquifer (MPs 290 to 307) and principal aquifers (MPs 307 to 309).
- In Cayuga and Wayne counties, the proposed new track construction would pass over areas underlain by principal aquifers on the eastern portion of Cayuga County (MPs 309 to 315) and principal aquifers associated with the Ganargua Creek and nearby tributaries to the Erie Canal (MPs 332 to 337 and 340 to 357) in Wayne County.
- Within Monroe County, the proposed new track construction would extend through areas underlain by the Irondongenessee Primary Aquifer on the eastern portion of the county (scattered in and around MPs 358 to 367). In addition, principal aquifers would underlay the alignment on the eastern portion of the county (MPs 357 to 360). Improvements at the Rochester Station (MPs 368 to 373), would occur to the west of the identified aquifers; therefore, no impacts would be anticipated in this area.
- In Genesee County, the proposed new track construction would extend through areas underlain by the Batvia Primary Aquifer (MPs 401 to 405); no other aquifers underlay the alignment in this county.
- In Erie County, the proposed third track construction along Empire Corridor West and the double tracking along the Niagara Branch (between MPs QDN2 and QDN7) would not be underlain by a principal aquifer and impacts would not be anticipated.

4.12.5. Potential Mitigation Strategies

To the extent appropriate, project development and design will incorporate measures to minimize and/or avoid impacts to water quality and recharge of underlying aquifers. To comply with state water quality standards (i.e., 6 NYCRR Part 703), NYSDOT will identify and incorporate, as appropriate, Stormwater Pollution Prevention Plans (SWPPPs) prepared in accordance with the NYSDEC State Pollutant Discharge Elimination System (SPDES) permit program or Erosion and Sediment Control (ESC) Plans. Application of BMPs as defined in the SWPPPs or ESC plans will reduce the amount of erosion and sedimentation resulting from construction activities. BMPs could include centralized refueling, storing absorbent material and booms on-site, and locating portable fuel tanks in upland sites on a low permeability substrate.

4.12.6. Future Analysis

The proposed activities may not require further groundwater assessments, based on the activities proposed, which would involve minimal impacts on groundwater quality or recharge of the underlying aquifers. During the Tier 2 analysis, program impact assessments based on design of Alternative 90B, the Preferred Alternative, and site-specific mapping will be prepared. If a project is federally funded and will impact a Sole Source Aquifer, federal review and/or approval is required pursuant to Section 1424(e) of the U.S. Safe Drinking Water Act is required. If a Section 1424(e) review is required, NYSDOT would prepare a Groundwater Assessment Report, which would be included in the Tier 2 Draft Design Approval Document and program NEPA document(s).

To comply with state law, the NYSDOT must document whether a project would adversely affect a NYSDEC designated primary aquifer, principal aquifer, or drinking water supply sources (e.g., reservoirs, wells, etc.,). Tier 2 will include additional research to identify and document water supplies potentially affected by individual projects constructed as part of the Preferred Alternative, Alternative 90B, as appropriate.

4.13. General Ecology and Wildlife Resources

4.13.1. Regulatory Context

Wildlife and aquatic habitats are protected under several regulatory programs at the federal and state level. The U.S. Endangered Species Act prohibits the "take" of any plant or animal species listed as endangered or threatened under this act, or their designated critical habitat. Section 7 of the Act requires consultation for actions that may affect listed species or their designated habitats with the U.S. Fish and Wildlife Service (U.S. FWS) (for freshwater and wildlife) and National Marine Fisheries Service (NMFS) (for marine and anadromous species).[104]

State protection of listed species is provided under New York State Environmental Conservation Law (ECL) Title 5-11-0535 Endangered and Threatened Species and Title 15-9-1503 Removal of Protected Plants and corresponding regulations.[105]

Provisions in the U.S. Magnuson-Stevens Fisheries Conservation and Management Act require the NMFS to identify and protect important habitats of federally managed marine and anadromous fish

104 United States Endangered Species Act (16 United States Code [U.S.C.] 1531-1543).

105 6 NYCRR Part 182 (Environmental Conservation Law—Endangered and Threatened Species) and Part 193 (Protected Native Plants)

species, or Essential Fish Habitat (EFH). Federal agencies that fund, permit, or undertake activities that may adversely affect EFH are required to consult with the NMFS regarding the potential effects of their actions on EFH.

The ecological and environmental inventory and evaluation considered the impacts of program activities on the environment and are consistent with the approach to environmental impact assessments as described in the Council on Environmental Quality (CEQ) report, *Incorporating Biodiversity Considerations into Environmental Impact Analysis under the National Environmental Policy Act (NEPA)* and Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts (65 Federal Register [FR] 28545). This ecological assessment also was performed in accordance with the NYSDOT Environmental Manual (TEM), which provides guidance and restrictions for planning and designing applicable highway projects.

Protection of migratory birds is also provided under U.S. FWS Migratory Bird Treaty Act of 1918, which prohibits, unless permitted by regulations, the "take" of any migratory bird.[106] The Federal Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) provides for the protection of bald and golden eagles. State legislation establishing the Bird Conservation Area (BCA) program was enacted on September 5, 1997 to safeguard and enhance populations of native wild birds and habitats that birds are dependent upon on state-owned lands and waters.

4.13.2. Methodology

The U.S. FWS, the NYSDEC, and the New York Natural Heritage Program provided information on ecological habitat and endangered and threatened species for study areas within a half-mile of the corridor centerline for all alternatives. Information from the U.S. FWS and NYSDEC on federal and state listing status and occurrences by county were consulted. The U.S. FWS IPaC report is incorporated in Appendix I (Agency Correspondence), but largely incorporates the data from the state GIS, which provided a comprehensive GIS database of federally and state-protected species locations. The New York Natural Heritage Program applies species-specific screening distances, so the half-mile buffer also included locations within:

- a one-mile buffer around bald eagle nests,
- 0.81 mile of Blanding's turtle locations,
- 1.5 miles of timber rattlesnake locations,
- 2.5 miles of Indiana bat locations,
- 1.5 miles of non-wintering northern long-eared bat locations,
- 5 miles of northern long-eared bat hibernacula.

While the documented locations of these species are often not within the half-mile buffer, these species regularly travel these respective distances and may potentially occur in the portions of the half-mile buffers. The detailed species listings in Exhibits G-18 and G-19 in Appendix G.12 denotes those species with the buffer zones that intersected the mile-wide study area, as described above. In addition, these exhibits in Appendix G.12 also identifies those species with potential occurrences (i.e., historical records before 1980, or precise locations not known, or recent presence not confirmed).

The Information for Planning and Consultation (IPaC) Online System was also utilized to determine threatened, endangered, proposed and candidate species, as well as proposed and final designated

[106] Migratory Bird Treaty Act of 1918 (MBTA), (16 U.S.C. 703–712).

critical habitat that may occur within the boundary of the proposed project. The official species list (Appendix I) generated through the IPaC, fulfills the requirements of the U.S. Fish and Wildlife Service under Section 7(c) of the Endangered Species Act of 1973, as amended (16 U.S.C 1531 et seq.). The results from the IPaC have been included in the subsequent narrative.

The National Marine Fisheries Habitat Conservation Division for the Northeastern U.S. *Guide to Essential Fish Habitat Designations* and *Guide to Essential Fish Habitat Descriptions* for the Hudson River was consulted to identify EFH. GIS information obtained included NYSDEC mapping of ecological zones and New York Natural Heritage Program mapping of occurrences of listed species. Digital data from NYSDEC consulted included mapping of significant natural communities. [107] NYSDEC GIS mapping for designated bird conservation areas was also consulted.

4.13.3. Existing Conditions

This section discusses the documented occurrences and likelihood of occurrences for federally and state-endangered/threatened species in each study area, along with documented occurrences of NYNHP-designated Natural Heritage Areas and significant natural communities within a half- mile of the corridor centerlines. The EFHs protected under the Magnuson-Stevens Fisheries Conservation and Management Act, state-protected Bird Conservation Areas on public lands, and other ecologically significant areas (such as National Natural Landmarks) within a half-mile of the corridor centerline are also covered. Appendix G.12 presents additional information on ecological zones and these protected species and habitats and their occurrences in the study area.

Threatened and Endangered Species

Upon consultation with the resource agencies, 72 federally and/or state-endangered or threatened plant and wildlife species were documented as occurring in the vicinity of the Empire Corridor (90/110 Study Area) and 86 species in the vicinity of the 125 Study Area. Exhibits G-18 and G-19 of Appendix G.12 presents the list of federally and state-endangered and threatened species documented or suspected to potentially occur within the one-mile-wide study area for both the 90/110 mph and the 125 mph study areas. The species protective status and county of known occurrence for both study areas are included in Exhibit 4-16 and Exhibit 4-17, along with a summary of the number of species occurrences by county.

Of the 72 species in the 90/110 Study Area, two are mammals, three are fish species, ten are birds, five are reptiles, two are invertebrates, and the vast majority (50) are plants. There are 7 federally listed endangered or threatened species, and 70 state-listed species.

Of the 87 species in the 125 Study Area, two are mammals, three are fish species, nine are birds, seven are reptiles, two are invertebrates, and the remainder (64) are plants. There are 8 federally listed endangered or threatened species, and 85 state-listed species.

There are four federally endangered species in the study area: shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrhynchus*), Indiana bat (*Myotis sodalis*), and Karner blue (*Lycaeides melissa samuelis*). The Hudson River provides habitat for federally protected species in all Empire Corridor South counties between New York and Albany. The NMFS, in correspondence received March 28, 2014, has identified the presence of federally endangered shortnose sturgeon between upper Staten Island and the Troy Lock and Dam. The New York Bight Distinct Population

[107] NYSDEC, GeoData Inventory: <http://www.dec.ny.gov/geodata/>.

Segment of Atlantic sturgeon was listed under the U.S. Endangered Species Act on February 6, 2012[108] and is also documented in the Hudson River. The NMFS correspondence identifies the presence of migratory and spawning habitat for Atlantic sturgeon within the river, with seasonal changes in occurrence, and the highest likelihood of occurrences in the area from May through September. According to the NYSDEC website, in New York, Atlantic sturgeon is generally found in the deeper portions of the Hudson River.[109] The northern long-eared bat (*Myotis septentrionalis*) was listed as federally threatened on April 2, 2015. Although this species occurred in all counties (but New York City) prior to 2006,[110] declines caused by white-nose syndrome have reduced documented occurrences of this species to roughly half of the study area counties, although the USFWS lists all study area counties as within the range of this species.[111]

Exhibit 4-16 and Exhibit 4-17 summarize the numbers of endangered and threatened species occurrences within a half-mile of the corridor centerline. The species protective status and county of known occurrence for both study areas are included in these exhibits, along with a summary of the number of species occurrences by county.

Essential Fish Habitat

The NMFS has designated eleven species of fish as EFH in the study area. Appendix G.12 shows species for which NMFS has designated an EFH and the life stage that has the potential to be found in the study area.

EFH species in the study area from New York to Greene Counties include summer flounder (*Paralicthys dentatus*), red hake (*Urophycis chuss*), winter flounder (*Pseudopleur onectes americanus*), windowpane flounder (*Scopthalmus aquosus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), clearnose skate (*Raja eglanteria*), little skate (*Leucoraia erinacea*), longfin inshore squid (*Doryteuthis peagleii*), and winter skate *(Leucorgia ocellata*).

Natural Heritage Areas/Significant Natural Communities

The only designated Natural Heritage Area in the study area is the Tivoli Bays. In 2007, the Tivoli Bays was designated by NYSDEC as the first Natural Heritage Area in New York State.[112] The designation of the Tivoli Bays Natural Heritage Area made the protection of rare plants, fauna, and natural habitats a key management priority of the site.

The NYNHP maintains a comprehensive database on the status and location of natural communities in New York State. The NYNHP considers "significant" natural communities to be those that are rare in New York State or that are "outstanding" examples of more common communities. Presently, 174 natural community types are monitored throughout the state. Of these, 69 communities are located in the existing Empire Corridor (90/110 Study Area) and 92 communities are located in the 125 Study Area. Appendix G.12 shows the known distribution of significant natural communities located

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[108] NMFS, "Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Atlantic Sturgeon in the Northeast Region," Federal Register/Vol. 77, No. 24, 50 CFR Parts 223 and 224. February 6, 2012.

[109] NYSDEC, "New York Sturgeon," Accessed October 27, 2011. < http://www.dec.ny.gov/animals/7025.html >

[110] NYSDEC, "Northern Long-eared Bat Occurrences by Town," May5, 2016. <http://www.dec.ny.gov/docs/wildlife_pdf/nlebtowns.pdf>

[111] USFWS, "Northern Long-eared Bat Range Map/Counties in Long-eared Bat Range," updated March 29, 2017. <https://www.fws.gov/Midwest/endangered/mammals/nleb/nlebRangeMap.html>

[112] NOAA, *Hudson River National Estuarine Research Reserve: Revised Management Plan, 2009-2014.* Accessed January 12, 2011. <http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrnerrmpall.pdf>

in the vicinity of the study area.

Exhibit 4-16—Federally and State Endangered-Threatened Species Occurrences in the 90/110 Study Area

County	Federal Status		State Status	
	Endangered	Threatened	Endangered	Threatened
New York	2	0	3	1
Bronx	2	0	1	0
Westchester	2	2	5	12
Rockland	2	1	2	5
Putnam	2	1	3	12
Orange	3	1	3	7
Dutchess	3	1	7	20
Ulster	3	1	1	5
Columbia	3	1	5	13
Greene	2	1	4	8
Rensselaer	2	0	2	3
Albany	3	0	4	3
Schenectady	1	0	2	1
Montgomery	0	1	1	3
Herkimer	0	0	0	1
Oneida	0	0	1	5
Madison	0	0	0	3
Onondaga	1	1	2	4
Cayuga	1	0	3	5
Wayne	1	0	3	5
Monroe	0	0	2	3
Genesee	1	0	1	1
Erie	0	1	1	5
Niagara	0	0	2	6

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The study area width is defined as being within a half-mile of the corridor centerline. Totals include occurrences for species-specific screening distances for NYNHP within the ½ mile study buffer (1 mile around bald eagle nests, 0.81 mile of Blanding's turtle locations, 1.5 miles of timber rattlesnake locations, 2.5 miles from Indiana bat locations, 1.5 miles of non-wintering northern long-eared bat locations and 5 miles from NLEB hibernacula). Totals also include species last documented before 1980 (historical records), or for which relatively precise locations or recent occurrences are not known or confirmed.

Sources: U.S.FWS, 2011, 2017; NYSDEC, New York Natural Heritage Program, 2021

Exhibit 4-17—Federally and State Endangered-Threatened Species Occurrences in the 125 Study Area

County	Federal Status		State Status	
	Endangered	Threatened	Endangered	Threatened
New York	2	0	3	1
Bronx	2	0	1	0
Westchester	2	2	5	12
Rockland	2	1	2	5
Putnam	2	1	3	11
Orange	3	1	4	6
Dutchess	3	1	8	20
Ulster	3	1	2	4
Columbia	3	1	4	14
Greene	2	1	4	8
Rensselaer	2	0	2	3
Albany	3	0	4	5
Schenectady	1	0	1	0
Schoharie	0	0	0	0
Montgomery	0	0	1	1
Herkimer	0	0	0	2
Oneida	0	0	0	1
Madison	0	0	0	5
Onondaga	1	1	2	5
Cayuga	0	0	0	4
Wayne	0	0	0	1
Monroe	0	0	2	2
Genesee	1	1	6	8
Erie	0	0	2	5
Niagara	0	0	2	6

Note: The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within a half-mile of the corridor centerline. Totals include occurrences for species-specific screening distances for NYNHP within the ½ mile study buffer (1 mile around bald eagle nests, 0.81 mile of Blanding's turtle locations, 1.5 miles of timber rattlesnake locations, 2.5 miles from Indiana bat locations, 1.5 miles of non-wintering northern long-eared bat locations and 5 miles from NLEB hibernacula). Totals also include species last documented before 1980 (historical records), or for which relatively precise locations or recent occurrences are not known or confirmed.

Sources: U.S.FWS, 2011, 2017; NYSDEC, New York Natural Heritage Program, 2021.

Bird Conservation Areas

There are six bird conservation areas located in both study areas:

- Iona Island/Doodletown bird conservation area in Rockland County
- Constitution Marsh in Putnam County on the east shore of the Hudson River
- Tivoli Bay in Dutchess County [113]
- Schodack Island State Park in Rensselaer County
- Albany Pine Bush Preserve

[113] NYSDEC. "DEC Lands," Accessed June 2011. <http://www.dec.ny.gov/lands/4915.html>

- The Montezuma Wetlands Complex in Wayne County and Cayuga County.[114]

Other Conservation and Ecologically Significant Areas

Other ecological habitats include:

- **Significant Coastal Fish and Wildlife Habitats** designated under the state coastal program: As part of the state's coastal program, 31 Significant Coastal Fish and Wildlife Habitats within a half-mile of the corridor centerline have been designated for protection. These designated areas are addressed in Section 4.11 and Appendix G.10.
- **Critical Environmental Areas designated for protection under the State Environmental Quality Review Act:** The five SEQR Critical Environmental Areas within the study area are addressed in Section 4.14.
- **Publicly Owned and Non-profit Parks**: Of particular note, the **Albany Pine Bush Preserve,** identified in Section 4.16, Parks and Recreation section, is a known area of conservation concern. This area's ecological significance, location within the Empire Corridor study areas, and legal protection, is of particular note. There are approximately 3,631 acres of the preserve located in Albany County within the one-mile-wide existing Empire Corridor (90/110 Study Area); there are approximately 3,984 acres of the preserve within the 125 Study Area. The two Empire Corridor study areas both cross the preserve roughly between the northeastern edge of the City of Albany to the county line with Schenectady.
- **National Natural Landmarks:** There are three properties with National Natural Landmark (NNL) status within a half-mile of the Empire Corridor (90/110 Study Area) corridor centerline, including the **Albany Pine Bush Preserve** in Albany County, **Iona Island** in Rockland County (both described above), and **Moss Island** in Herkimer County. Approximately 252 acres of state-owned Iona Island is a designated NNL based on the island's estuarine habitat and presence of rare plants. The state-owned Moss Island in the Mohawk River is considered to have excellent examples of glacially-influenced hydrology and geology.

  In addition to the Iona Island NNL mentioned above, **Bergen-Byron Swamp** in Genesee County is a NNL within the 125 Study Area. Bergen Swamp and other lands privately held by the Bergen Swamp Preservation Society (BSPS) encompass approximately 3,000 acres in northeastern Genesee County. The BSPS land is actively managed for ecological preservation, education, and science and the property supports a number of known populations of threatened and endangered plant and wildlife species.[115]

4.13.4. Environmental Consequences

Comparison of Alternatives

The section below identifies elements of the Preferred Alternative that have the potential to impact ecological resources, including threatened and endangered plants and animals, avian species protected under the Migratory Bird Treaty Act (MBTA), EFH, NNLs, bird conservation areas, significant natural communities, and other ecologically significant areas. Appendix G.12 addresses the potential ecological impacts of each of the other alternatives considered. Actions associated with

[114] NYSDEC, "DEC Lands, " Accessed June 2011. <http://www.dec.ny.gov/lands/25341.html>

[115] Bergen Swamp Preservation Society. Website homepage. Website accessed January 2012. Available: <http://www.bergenswamp.org/>

each alternative such as direct disturbance of terrestrial habitat, waterway crossings, increased frequency of train trips, and higher operating speeds would all have the potential to impact plant or wildlife species or natural habitats. Both the long-term operation and program construction may involve potential for habitat impacts, including permanent displacements and short-term disturbances to wildlife and vegetation populations. Sections 4.11, 4.14, and 4.16 describe the wildlife habitats and corridors present within the coastal resources, Critical Areas protected under the SEQR Act, and parklands that could be potentially affected by the program.

The Base Alternative would involve the least impact on ecological resources. All of the Build Alternatives would affect EFH and aquatic habitats for the Livingston Avenue Bridge replacement. Along Empire Corridor West, Alternative 90A would involve the least impact of the Build Alternatives, with the potential for vegetation removal at least two locations. The Preferred Alternative, Alternative 90B, would involve potential for impacts at more than seven locations, including NNLs/bird conservation area, eight significant natural communities, and would affect areas with documented occurrences of more than 46 protected resources/species. The Preferred Alternative would have lesser impacts than Alternatives 110 and 125. Alternative 110 would have the potential for impacts at more than 21 locations, including two NNLs, bird conservation area, eight significant natural communities, and would affect areas with documented occurrences of more than 46 protected resources/species. Alternative 125 would involve the greatest potential for impacts, with a new rail corridor affecting two NNLs, six bird conservation areas, 92 significant natural communities, and areas with documented occurrences of 86 protected resources/species.

Potential long-term habitat impacts and fragmentation can result from clearing and vegetation removal, although the trackage to be added along the Empire Corridor may largely be located within previously disturbed rights-of-way and would represent an incremental increase over existing conditions. Short-term impacts related to construction are discussed in Section 4.25.3.

This preliminary assessment of potential impacts to native habitats and both protected and common plant and wildlife species is based on Tier 1 concepts and mapping and will be further refined in Tier 2. As the project development process advances on the Preferred Alternative, Alternative 90B, efforts to avoid impacts to ecological resources will be made when designs are further developed.

<u>Alternative 90B (Preferred Alternative)</u>

Due to the increase in track construction outside of the right-of-way for Alternative 90B, habitat encroachment would be more likely to occur with the Preferred Alternative, Alternative 90B, than for Alternative 90A. There are also a higher number of protected resources with a moderate or high potential for occurrence within a half-mile of the areas where new track and roads are proposed, and therefore Alternative 90B would have a higher potential to impact protected species and habitats, compared to Alternative 90A. Additional station improvements proposed under this alternative would be located within existing building and track infrastructure and would not likely impact ecological resources.

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects. Work proposed for Alternative 90B includes construction in close proximity to the Hudson River, which hosts both federally and state-listed species and EFH, and other ecologically significant sites. However, work in these areas would occur within the existing right-of-way thereby minimizing the potential for ecological impacts.

- For Alternative 90B, there are several records of sensitive species and EFH primarily in the Hudson River within a half-mile of the four miles of second track through Manhattan (SRP-1, MPs 9 to 13), and 1.4 miles of new track under the Tappan Zee Bridge (SRP-2) for the Tarrytown Pocket Track/Interlocking. Construction could affect aquatic species if construction work is conducted within or indirectly affects the Hudson River.
- Ten miles of new third track (SRP-3, MPs 53 to 63) would be installed within or adjacent to a bird conservation area and areas of known occurrences of significant natural communities and protected plant and wildlife populations.
- Improvements at the Poughkeepsie Yard/Storage Facility (ES-13, MPs 71 to 75.8) and rock slope stabilization north of the Poughkeepsie station (ES-04, five locations between MPs 105.3 to 130, one location at MP 119, and four locations at MPs 128.1-130) would include work in areas where there is a potential for protected species and significant natural communities to occur within a half-mile of the corridor centerline.
- In addition, rock slope stabilization near MP 130 would include work near the Shodack Island bird conservation area. Work in the above-mentioned areas that may involve tree clearing or disturbance of terrestrial or aquatic habitats may impact nesting bird habitat, protected species or significant natural communities, and any work conducted over or directly adjacent to the Hudson River would have the potential to impact aquatic resources.
- Alternative 90B would include the replacement of the Livingston Avenue Bridge (ES-15) over the Hudson River. There are records of protected resources at this location, and work there would have the potential to impact EFH, protected aquatic species, or other aquatic habitat through temporary or permanent direct habitat disturbance.

Empire Corridor West/Niagara Branch

Alternative 90A improvements included in the Preferred Alternative includes track improvements, that may involve clearing of vegetation. However, any vegetation removal would have the potential to impact terrestrial habitat, such as nesting birds.

- Improvements proposed include 10 miles of third track between MPs 169 and 179 (EW-14a), and installation of a third track and access road at approximately MP 167. There is one known population of a protected resource (state-threatened species) with a potential for occurrence within a half-mile of the corridor centerline along this stretch of tracks.
- Alternative 90B would include Syracuse Station track improvements (EIS-6, MPs 290 to 294), addition of a third track along 11 miles located largely west of the designated urban area around Rochester (EW-20, MPs 382 to 393), and third track improvements along 11 miles (EW-16, MPs 373 to 382) west of the station. These are primarily urban areas, and there are four known occurrences of state-listed species (including one federally/state endangered species) and one potential/historic (pre-1980) occurrence of a state-endangered species within a half-mile of the corridor centerline at the proposed work locations. Additionally, these sections of railroad would extend in close proximity to Riga Swamp and the Three Rivers Wildlife Management Area/Three Mile Bay WMA.
- Station improvements at the Buffalo-Depew Station (EIS-10, MPs 429 to 433) would involve potential disturbance to vegetated areas within the current station footprint. Although there are no known occurrences of protected plant, wildlife or habitats in these areas, this work could impact habitats through the removal of vegetation. Double track (EW-17, MPs QDN17 to QDN23.2) along the Niagara Branch and Niagara Falls Maintenance Facility and track improvements (EW-18 and EIS-12, MPs 25 to 28) would not involve work outside of the existing

right-of-way, and, therefore, impacts to ecological resources would be unlikely. However, in areas adjoining the right-of-way, sightings of two species of state-listed birds have occurred at one location.

For Alternative 90B, a dedicated third track is proposed between MP 159 in Schenectady County to MP 432 in Erie County. In addition to the resources identified in track segments involving work for a fourth track, there are approximately 28 species with a potential to occur within a half-mile of the corridor centerline.

- In areas identified for a dedicated fourth track and possible access roads (MPs 170 to 179, 204 to 216, 235 to 239, 301 to 309, and 375 to 383), Moss Island, a NNL, and five records of protected resources, are located within a half-mile of the corridor centerline.
- Furthermore, Montezuma Marsh (a NNL and bird conservation area), and nine significant natural communities occur between MP 159 and MP 432. Work within these portions of the Empire Corridor could impact these ecological resources through actions that could result in habitat conversion or habitat disturbance.
- Areas proposed for road realignment or property acquisition at MP 192 would be within less than a half-mile of known occurrences of sensitive resources, and thus would have the potential to impact these resources through habitat disturbance.

Other areas proposed for road realignment or property acquisition under this alternative would not be in the vicinity of sensitive resource occurrences, however any vegetation removal has the potential to impact habitat for wildlife such as birds.

4.13.5. Potential Mitigation Strategies

To the extent practicable, future planning and designs for the Preferred Alternative, Alternative 90B, will incorporate avoidance and minimization of impacts to known protected ecological resources. Where avoidance and minimization are not practicable, mitigation for impacts to protected ecological resources may include:

- Utilization of construction timing windows to avoid disturbance to nesting birds or certain seasonal processes;
- Implementation of construction Best Management Practices;
- Construction of safe wildlife crossings and fencing; or
- Preservation, restoration or rehabilitation of on- or off-site lands.

For work within the Hudson River, NMFS recommends that no in-water work be undertaken from March 1st through June 30th. In the event that this timeframe cannot be avoided, NMFS recommends additional mitigation to minimize shortnose sturgeon impacts include: use of a soft start, use of a vibratory hammer and other Best Management Practices to minimize exposure to elevated levels of noise.

Protected species within the study area include the northern long-eared bat, which live underground during the hibernation season (between November 1st to March 31st in most of the towns in which it occurs in New York), when tree removal will pose the least threat.

For any program element that would require an incidental take permit from a resource agency, mitigation measures to offset any impacts or take must be developed in a mitigation plan. Program-wide and species- or habitat-specific mitigation strategies can be developed with the resource agencies through the permit review process, and mitigation activities can often be combined for multiple species.

4.13.6. Future Analysis

The Tier 2 assessments will refine the impact assessment based on design of the Alternative 90B (the Preferred Alternative). If project activities may affect protected resources, consultation may be required with:

- the U.S.FWS under Section 7 of the U.S. Endangered Species Act,
- the NYSDEC through Environmental Conservation Law (ECL) Article 9 (for plants) or Article 11 (for fish and wildlife),
- the NMFS under Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act for potential impacts to EFH.

If required, species surveys would be focused on areas where a potential for impact has been identified.

For NYSDOT actions involving federally or state listed species, NYSDOT must first conduct an assessment to determine whether the action has the potential to result in "take" of the listed species. If the assessment shows that there may be or is likely to be a take of state-listed species as a result of the action, consultation with the NYSDEC must follow.[116] If NYSDOT finds that an adverse effect to federally listed species may occur, formal consultation must be initiated by the FRA with the U.S.FWS or NMFS. The U.S.FWS or NMFS must prepare a Biological Opinion, stating whether the project would put the continued existence of any listed species or EFH in jeopardy.

If an adverse effect may occur to EFH protected under the U.S. Magnuson-Stevens Fishery Conservation and Management Act, a written EFH Assessment must be prepared describing the effects of the project on EFH and identifying proposed mitigation measures.

4.14. Critical Environmental Areas under the State Environmental Quality Review Act

4.14.1. Regulatory Context

State Environmental Quality Review Act (SEQR) regulations (6 NYCRR 617.14(g)) designate protection for Critical Environmental Areas (CEAs). Under the New York State Environmental Quality Act, state and local agencies may designate specific geographic areas within their boundaries as "Critical Environmental Areas" (CEAs). In order obtain this designation; the area must have one or more of the following exceptional or unique characteristics:

- A benefit or threat to human health;
- A natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space, and areas of important aesthetic or scenic quality);
- Agricultural, social, cultural, historic, archaeological, recreational, or educational values; or

[116] NYSDOT 2010. The Environmental Manual. Section 4.4.9.3 Threatened and Endangered Species. Accessed March 2012. Available: <https://www.dot.ny.gov/divisions/engineering/environmental-analysis/manuals-and-guidance/epm>.

- An inherent ecological, geological or hydrological sensitivity that may be adversely affected by any change.

Following designation, evaluation of the potential impact of any action on the environmental characteristics of the CEA is required in the determination of significance prepared pursuant to Section 617.7 of SEQR.

4.14.2. Methodology

NYSDOT consulted the NYSDEC Division of Environmental Permits regarding the presence and location of SEQR-designated Critical Areas within a half-mile of the corridor centerline (study area). NYSDOT received correspondence from the NYSDEC on May 2, 2011 regarding mapping of SEQR critical areas.[117] On January 12, 2012, correspondence arrived from the NYSDEC regarding future updates to the CEAs, which will be published on the NYSDEC website in February 2012.[118] In addition, NYSDOT consulted the list of SEQR Critical Areas and maps available from the NYSDEC website.[119]

4.14.3. Existing Conditions

Within a half-mile of the corridor centerline for both the 90/110 and the 125 Study Areas, there are three CEAs in Westchester County, three in Dutchess County, three in Monroe County and four in Erie County. Within the Empire Corridor 90/110 Study Area only, there is one CEA in Schenectady County, and one in Onondaga County. These areas are described in Exhibit 4-18. Several of the Critical Environmental Areas overlap or coincide with protected publicly parklands in Dutchess and Westchester Counties.

Two of the CEAs overlap with the Margaret Norrie State Park in Dutchess County (Indian Kill CEA) and NYSDEC lands for the Crum Creek Waterway Access (Hogback Hill). In Westchester County, the Croton Point Park is included in both the Croton Point Park CEA and the “County and State Park Lands” CEA, which also includes Montrose Point State Forest, Oscawana County Park, Rockwood Hall State Park (part of the adjoining Rockefeller State Park Preserve), Rockefeller State Park Preserve itself, and Lenoir Preserve County Park. The Hudson River CEA encompasses much of the waterfront areas along the Hudson River in Westchester County.

The CEAs in Monroe County also include areas zoned as “open space,” lands with slopes greater than 15 percent, heavily wooded land, and drainage systems designated on official street map.

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[117] David Rebecca, NYSDEC, “Re: Empire Corridor High Speed Rail,” e-mail/personal communication with Karen Kays, Pinyon Environmental, Inc., May 2, 2011.

[118] David Rebecca, NYSDEC, “Re: Empire Corridor High Speed Rail data set,” e-mail/personal communication with Rosie Wilson, Pinyon Environmental, Inc., January 12, 2011.

[119] NYSDEC. “Critical Environmental Areas,” website accessed June 2011. <http://www.dec.ny.gov/permits/6184.html.>

Exhibit 4-18—Critical Environmental Areas Designated under SEQR in half-mile Study Area

County	Critical Environmental Area	Designation Date	Designating Agency	Reason
Erie	Freshwater Wetlands within Town Reinstein Woods – 269 acre Nature Preserve with 400' wide peripheral buffer John Stiglmeier Cayuga Creek to 100-year floodplain	9-29-79 7-27-88 9-27-91 9-27-91		None given None Given Preserve wildlife and green area Preserve wildlife and green area
Monroe	Land within 100 feet of Genesee River, Erie Canal, Lake Ontario or River Gorge (except in manufacturing industrial zone) Cobbs Hill Three smaller CEAs are within the study area *	3-14-86	City of Rochester	None given.
Onondaga	Portions of Nine-Mile Creek within Town[1]	9-4-96	Town of Camillus	None given.
Schenectady	Aquifer Area Overlay Zone[1]	4-5-85	Town of Rotterdam	Conserve, improve, protect natural resources.
Dutchess	Hogback Hill Indian Kill Vanderburgh Cove	6-7-09	Town of Hyde Park	Sensitivity to change & habitat and species protection.
Westchester	Croton Point Park County and State Park Lands Hudson River	1-31-90	County of Westchester	Exceptional or unique character.

*the CEAs in Monroe County also include areas zoned as "open space," lands with slopes greater than 15 percent, heavily wooded land, and drainage systems designated on official street map.

[1] CEA located only in Empire Corridor 90/110 study area.

4.14.4. Environmental Consequences

Comparison of Alternatives

The section below identifies elements of the Preferred Alternative that would have the potential to impact the environmental characteristics of Critical Environmental Areas (CEAs) designated under the New York State Environmental Quality Review (SEQR) Act. Appendix G.13 addresses the potential for the other alternatives to affect these CEAs. There are total of 17 CEAs in the study area for the proposed program alternatives: three in Westchester County, three in Dutchess County, one in Schenectady County, one in Onondaga County, five in Monroe County, and four in Erie County.

All of the Build Alternatives would involve either work or increased train traffic in the vicinity of six CEAs along Empire Corridor South. The full extent of the potential impacts to the CEAs will not be known until the program is further developed, but the potential for impacts is described below. The Base Alternative would not involve any impacts to CEAs.

Most of the CEAs whose designation and boundaries are clearly defined are separated from the rail corridor by urban lands and would not likely be impacted by proposed work. Alternatives 90A, 90B, and 110 will involve work in proximity to the same CEAs. Work proposed in the these locations will largely occur within the existing rail right-of-way and will include the installation of a new track in some locations. Direct impacts will be unlikely at many of these locations since work will be contained within the right-of-way.

For Alternatives 90B and 110, third and fourth track improvements and increased train frequency would occur in the vicinity of the same CEAs in Schenectady, Onondaga, Monroe and Erie Counties as are in the vicinity of Alternative 90A. The majority of these CEAs would not cross the proposed improvements; however, the program area would pass directly through "Portions of Nine Mile Creek" and "Land within 100 feet of the Genesee River, Erie Canal, Lake Ontario or River Gorge except in manufacturing industrial zone." Potential long-term impacts could involve noise and/or visual impacts from train operations, with the potential of ROW property acquistion impacts within the two aforementioned CEAs. Short-term impacts related to construction are discussed in Section 4.25.3.

The new Alternative 125 track alignment would fall within the vicinity of the Town of Rotterdam's "Aquifer Area Overlay Zone" CEA in Schenectady County. However, the CEA and proposed track alignment would be approximately a half-mile away from each other and would be separated by urban lands. No impacts to this CEA would be anticipated. All portions of the Alternative 125 track alignment that would not overlap with Alternatives 90A, 90B, and 110 would not be in the vicinity of any designated CEA, and therefore no additional impacts would be anticipated.

Further investigation would be necessary to assess impacts as part of the Tier 2 evaluations of the Preferred Alternative.

Alternative 90B (Preferred Alternative)

Empire Corridor South

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects.

- Two projects, the 1.4 miles of new track for the Tarrytown Pocket Track/Interlocking and signal improvements proposed along 43 miles (MPs 32.8 and 75.8), would occur in the vicinity of the "Hudson River" CEA, designated to extend along the entire length of the Hudson River within Westchester County, from approximately MP 14 to MP 45.
- Additionally, the "County and State Park Lands" CEA includes lands that intersect or run adjacent to the rail right-of-way at MP 17 (Untermyer Park), MP 26 (Kingsland Point County Park and Devries Park), MP 27 (Peabody Field), MP 28 (Rockwood Hall State Park) and MP 37 (Oscawana County Park), although the only changes at most these locations would be the additional train trips.
- The "Croton Point Park" CEA intersects the rail right-of-way at approximately MP 33.
- Direct impacts would not be anticipated to the "Hudson River" and "County and State Park Lands" CEAs since work would occur primarily within the existing right-of-way and would only extend north from MP 33, and would be unlikely to change the unique character of these CEAs.
- Along this section, 10 miles of new third track (MPs 53 to 63) and improvements at the Poughkeepsie Yard/Storage Facility (MPs 71 to 75.8) will not affect CEAs.
- North of Poughkeepsie and south of Albany-Rensselaer Station (MPs 75.8 to 140), proposed improvements in close proximity to CEAs include rock slope stabilization (MPs 105 to 130) and three new control points (CP 82, CP 99, and CP 136). Since work will be confined to the right-of-

way, no changes to these CEAs are anticipated.

Empire Corridor West/Niagara Branch

Alternative 90A improvements that are part of the Preferred Alternative include the following.

- Alternative 90B would be located in the vicinity of, and would result in increased train frequency, near several designated CEAs in Monroe County: "Land within 100 feet of the Genesee River, Erie Canal, Lake Ontario or River Gorge except in manufacturing industrial zone," "Lands with slopes greater than 15 percent," "Heavily wooded land," and "Drainage systems designated on official street map." In addition, proposed improvements under Alternative 90B would occur in the vicinity of an area meeting the City of Rochester CEA definition of "Areas zoned 'open space'" at the western city limit.
- Station improvements at the Buffalo-Depew Station (MPs 429.5 to 432.5) would occur in the general vicinity of three CEAs designated by the Town of Cheektowaga. All three of the Town of Cheektowaga CEAs are no closer than 3,000 feet from the rail right-of-way at MP 433 and are separated from the railroad by urban lands. Although some work outside of the existing right-of-way at MP 433, these CEAs would not likely be impacted due to their distance from the proposed work.

For Alternative 90B, areas where third or fourth track would be located outside the existing right-of-way would not be located in designated CEAs. For Alternative 90B, third and fourth track improvements and increased train frequency would occur in the vicinity of the same CEAs in Schenectady, Onondaga, Monroe and Erie Counties as previously mentioned that are in proximity to the Alternative 90A projects described above. The majority of these CEAs would not cross the proposed improvements; however, the program area would pass directly through "Portions of Nine Mile Creek" and "Land within 100 feet of the Genesee River, Erie Canal, Lake Ontario or River Gorge except in manufacturing industrial zone." Work in these areas would occur within the existing right-of-way and would be unlikely to impact these CEAs.

4.14.5. Potential Mitigation Strategies

Based on preliminary screening of Tier 1 concept alternatives, direct impacts on CEAs are not anticipated. During the Tier 2 assessment, refinements in design, mapping, and impacts assessments for the Preferred Alternative, Alternative 90B, will be performed. If required, program planning will incorporate avoidance and minimization of CEA impacts to the extent practicable. NYSDOT would need to comply with the New York State Environmental Quality Review Act for any potential impacts to environmental characteristics of a CEA.

If avoidance is not possible, measures to minimize or reduce the impacts should be evaluated. The mitigation that is appropriate for each CEA affected may depend on the reason for designation, e.g., a site that is designated for avoidance as a threat as an inactive hazardous waste site might involve drainage improvements and the mitigation may be markedly different from an ecologically significant site. Potential CEA mitigation measures that can be developed in coordination with the state agencies and landowners can include avoidance and minimization in the design phase, installation of wildlife crossings, and implementation of construction Best Management Practices, and improving or optimizing area drainage.

4.14.6. Future Analysis

If additional analysis is required for any impacts on CEAs, outreach to the agency or agencies that made the CEA designation may be performed, as appropriate, to understand why the CEA was designated and its characteristics. An understanding of why an area became a CEA will facilitate a determination of whether the proposed action will have a significant adverse environmental impact. For instance, a CEA designated because of a threat would be something that the municipality or agency would want the public to be aware of so that harm to public health or safety or inappropriate use of the affected area could be avoided. If required, this type of determination would be made as part of the Tier 2 NEPA/SEQR documentation for the Preferred Alternative, Alternative 90B.

4.15. Historic and Cultural Resources

4.15.1. Regulatory Context

This evaluation of historic resources has been performed in accordance with NEPA and Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and associated implementing regulations in 36 CFR Part 800. Section 106 of the NHPA mandates federal agencies consider the effect of their actions on historic properties, defined as "*any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places*." Section 110 of the NHPA also includes specific guidelines for the treatment of National Historic Landmarks (NHLs). NHLs are properties of national significance designated by the United States Department of Interior because they possess exceptional historic value. The NHPA mandates additional protection of NHLs by requiring that federal agencies undertake planning and actions as necessary to minimize harm when considering undertakings that may directly and adversely affect NHLs.

Historic properties are also protected by Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) prohibits actions by the Secretary of Transportation that require "use" of a historic property that is listed or eligible for inclusion in the National Register of Historic Places (NRHP), unless it is determined that there is no feasible and prudent alternative to the use of such property, and all possible planning has been undertaken to minimize harm to the 4(f) property. If a use of a Section 4(f) park or recreation property is determined to occur, a Section 4(f) Evaluation will be prepared and circulated as part of Tier 2 environmental documentation, as appropriate (see Section 4.23).

Recent changes under the Fixing America's Surface Transportation Act (FAST) Act (Public Law 114-94), enacted December 4, 2015, include certain exemptions for active railroad lines, their component elements, and railroad rights-of-way from Section 106 and Section 4(f) requirements. Section 11504 of the Fast Act (49 U.S.C. 24202) mandated the development of a Section 106 exemption for "railroad rights-of-way." These recently enacted or pending FAST Act provisions will be a consideration in formulating the Tier 2 assessments.

The New York State Historic Preservation Act of 1980 (SHPA) requires that state agencies consider the effect of their actions on properties listed or determined eligible for listing in the New York State Register of Historic Places. Separate review under the SHPA is not required when NHPA applies. However, if there is no federal involvement in future tiers or phases of the project, such as grant funding, permits or approvals, then only SHPA would apply to those future tiers or phases and Section 106 of NHPA and Section 4(f) would not be applicable.

4.15.2. Methodology

Tiered Approach

This Tier 1 EIS addresses broad corridor-level issues and proposals of the program. The intended purpose of this Tier 1 EIS is to make broad-corridor level decisions with regard to parameters such as operating speed/travel times, service frequency, and infrastructure requirements.

All alternatives except Alternative 125 would follow the existing Empire Corridor alignment along both the Empire Corridor South and Empire Corridor West. The purpose of developing a conceptual "alignment" for Alternative 125 in the Tier 1 EIS was to provide a basis for comparison of corridor-level performance, cost, and the impact potential of a new corridor alternative versus existing corridor alternatives (i.e., Alternatives 90A, 90B [the Preferred Alternative], and 110). The purpose of the Tier 1 EIS does not include studying alternative alignments to achieve the 125 miles per hour speed, nor does it include selecting a specific alignment. To achieve the higher speed of Alternative 125, much of this alternative along the Empire Corridor West would be on a new corridor outside of the existing Empire Corridor alignment. Because portions of Alternative 125 would not be located within the existing rail corridor, one representative "alignment" was developed for Alternative 125 at a conceptual level.

As previously noted, the Empire Corridor Program sponsors (FRA and NYSDOT) are addressing consideration of potential environmental impacts of the program in accordance with the requirements of NEPA and NHPA using a tiered process, as provided for in 40 CFR 1508.28. The Section 106 implementing regulations allow agencies to use a phased process to comply with Section 106 in coordination with NEPA, per 36 CFR 800.8(c)(1).

As the goal of the Tier 1 EIS is only for planning purposes and alternatives analysis, FRA initiated the Section 106 process under 36 CFR Part 800.3, defined the Areas of Potential Effects (APEs), identified consulting parties, and conducted a preliminary investigation to identify historic properties in the various corridor alternatives. The preliminary identification of historic properties is being used to support these planning activities and this Tier 1 EIS identifies the likely presence of historic properties in the APEs for the five alternatives to help inform future Section 106 requirements.

FRA has determined that the Tier 1 EIS planning process does not have the potential to cause effects to historic properties, and FRA has no further Section 106 responsibilities with respect to Tier 1 activities. Any Tier 2 phase of the program, contingent upon federal involvement such as construction funding, would trigger additional Section 106 requirements that would build upon the Section 106 processes described in this document. Future requirements would include such things as final identification of and evaluation and assessment of effects to historic properties, as well as resolution of adverse effects.

Program sponsors will prepare additional site-specific environmental documentation, including Section 106 documentation as appropriate, for Tier 2 component projects. It is anticipated that Tier 2 activities could be governed under the terms of a Section 106 Programmatic Agreement (PA) executed in accordance with 36 CFR 800.14(b). In advancing individual projects in the Tier 2 assessments, railroad exemptions under Section 11504 of the FAST Act (which directed U.S. DOT in concert with ACHP to develop certain Section 106 exemptions for railroad rights-of-way) will also be assessed. The Draft PA, addressed later in this section (see Appendix H of the Tier 1 Draft EIS), has been preemptively drafted and may provide a mechanism and framework for meeting NHPA compliance obligations in the Tier 2 phase of the program.

Area of Potential Effects

The Section 106 process requires federal agencies to determine the APE, which is defined in 36 CFR 800.16(d) as "*the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties*." The scale and nature of an undertaking both influence the APE.

The APE for each of the alternatives for the Empire Corridor Program has been delineated to indicate the areas in which each of the proposed alternatives could cause potential direct effects and indirect effects. The categories of construction activities that could cause effects include construction of track, modification of track and related infrastructure, service road construction or realignment, and station construction or alteration. Direct physical effects may include such activities as demolition, alteration, or damage from construction, and indirect effects may include things such as the introduction of visual, audible, or atmospheric elements that may alter the characteristics of an historic property in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association. Archaeological resources are potentially directly affected from construction activity resulting in disturbance to the ground such as excavation, grading, pile-driving, cutting and filling, and staging.

Direct APE

For the purposes of this Tier 1 EIS, the APE for potential direct effects has been delineated to extend 100 feet in both directions from the centerline of the existing railroad tracks to encompass all locations where project construction activities could occur. Where the centerlines of the high-speed alternative (90 mile per hour [mph], 110 mph, and 125 Alternatives) alignments would differ from the existing centerline, the direct APE extends 100 feet in both directions from the centerline of those alignments. Areas where the centerlines of the 90 mph and 110 mph alternatives differ from that of the existing alignment are limited, and the alignments never diverge by more than approximately 150 feet. As described above, an inventory of all previously-identified archaeological and architectural resources within the direct APE has been compiled and is presented below.

Indirect APE

For the purposes of this Tier 1 EIS, the APE for indirect effects has been delineated to extend 600 feet in both directions from the centerline of the existing railroad tracks. As in the direct APE, where the centerline of the high-speed (90 mph, 110 mph, and 125 mph APEs) alignments would differ from the existing centerline, the indirect APE extends 600 feet in both directions from the centerline of those alignments. The alignments never diverge by more than approximately 150 feet. The 600-foot APE was developed in consultation with SHPO and federally recognized tribes to encompass potential indirect effects that could be reasonably foreseen at the Tier 1 level. Notably, Alternative 125 is the only alternative that would incorporate overhead catenary systems, which could be visible from longer distances in some areas. If Alternative 125 had been advanced for further study at the Tier 2 level, the APE would be reassessed and expanded to adequately consider the potential for indirect effects. [120] Appendix G.14 includes an inventory of all architectural resources within the indirect APE.

[120] Although FTA noise standards set a standard screening distance of 750' (unobstructed) and (375' obstructed) for noise analyses, preliminary noise analyses completed as part of this Tier 1 EIS indicate that the area in which there is the potential for the proposed program alternatives (with the exception of Alternative 125) to result in noise impacts is substantially smaller than the areas delineated as the APEs for direct and indirect effects. In the case of Alternative 125, the potential for noise impacts is expected to vary by location.

Because the alternatives are at an early design stage, the APEs presented in this Tier 1 EIS are reasonable approximations of the areas in which direct and indirect effects could occur. In June 2013, SHPO provided a letter of concurrence on the proposed APEs. If the Tier 2 analysis of Alternative 90B, the Preferred Alternative, requires modifications to the APEs for component projects, FRA and NYSDOT would alter the APE as appropriate in consultation with the SHPO and/or THPO following the process outlined in 36 CFR Part 800.4(a)(1).

Identification of Historic Properties Including Archaeological Sites and Architectural Resources

This Tier 1 EIS focuses on identifying the "likely presence" of historic properties in the APEs for each alternative by identifying previously designated architectural resources and previously identified archaeological sites (36 CFR 800.4[b][2]). Based on the files of the New York State Historic Preservation Office (SHPO) and the New York State Museum (NYSM), program sponsors compiled an inventory of all previously recorded architectural resources, including buildings, sites, objects, districts, and structures, in the direct and indirect APEs, and archaeological sites in the direct APE, for the 90/110 Alternative and the 125 Alternative. In addition to SHPO and NYSM sites, the Oneida Nation, a federally recognized Indian tribe, provided information on archaeological sites known to the Oneida Nation, as described below under "Tribal Coordination and Consulting Parties." The sites identified by the Oneida Nation, located in Oneida and Madison counties, have been added to the project mapping and inventories of known archaeological sites.

Final identification of historic properties in the APEs, not previously identified by the SHPO, NYSM, or the Oneida Nation, or without an NRHP eligibility designation, would be undertaken as part of the Tier 2 analysis specifically for the Preferred Alternative, Alternative 90B, for this program, as appropriate. To date, no detailed archaeological documentary studies or archaeological field investigations (Phase I archaeological studies) have been prepared as part of the Tier 1 analysis. As described above, previously-identified archaeological sites have been mapped and inventoried to serve as a preliminary indicator of archaeological sensitivity within the APEs. In order to identify archaeological historic properties that could be affected by the program, archaeological documentary studies and field investigations (as appropriate) would be carried out as part of the final identification efforts for the Tier 2 analysis of the Preferred Alternative, Alternative 90B.

Tribal Coordination and Consulting Parties

FRA, in consultation with NYSDOT and SHPO, identified federally-recognized Indian tribes (tribal nations) under Section 106 of NHPA. The tribal nations were identified on the basis of previously-identified geographic areas of interest commonly used by NYSDOT and SHPO. As part of the identification process, FRA utilized the tribal status and contact information on file with the U.S. Bureau of Indian Affairs. On May 3, 2011, FRA sent letters to the following federally-recognized tribal nations inviting them to participate as consulting parties per 36 CFR 800.2(c)(2):

- Cayuga Nation of New York,
- Seneca Nation of Indians,
- Tonawanda Seneca Nation,
- Onondaga Nation,
- Oneida Indian Nation,
- Tuscarora Indian Nation,
- Stockbridge-Munsee Community Band of the Mohican Nation,
- Delaware Nation,
- the Shinnecock Nation,

- St. Regis Mohawk Tribe, and the
- Seneca-Cayuga Tribe of Oklahoma.

The Mohican Nation, the Oneida Nation, and the Seneca Nation replied. These three tribal nations expressed their interest in the program and their desire to be consulting parties in accordance with Section 106 of NHPA.

On May 4, 2012**,** NYSDOT invited all of the federally-recognized tribal nations listed above (and one additional federally-recognized tribe, the Delaware Tribe of Indians) to an information-gathering meeting in Rochester, NY, on May 30, 2012. At the meeting, the program sponsors presented an overview of the program, the proposed Section 106 methodology and the preliminary program APE, and took comments from the tribal nations. At the request of several of the tribes that participated in the May 30, 2012 meeting, NYSDOT sent maps of the alternative alignments showing the approximate locations of previously identified archaeological sites to the tribal nations.

On November 21, 2012, NYSDOT on behalf of FRA sent letters to each of the tribal nations and SHPO describing and illustrating the boundaries of the proposed APE for their review and comment. In a letter to FRA and NYSDOT dated December 14, 2012, the Oneida Nation provided comments on the proposed program and requested a meeting to discuss the proposed program. FRA also arranged a meeting with the Oneida Nation on April 18, 2013 that representatives of NYSDOT attended.

In addition to consultation with federally-recognized Indian tribes, FRA and NYSDOT identified and engaged with consulting parties, including state-recognized tribal nations, in accordance with 36 CFR 800.2(c)(3) through (5) and 800.3(f). In consultation with SHPO, FRA and NYSDOT identified potential consulting parties for the Tier 1 process based on a demonstrated interest in broad, corridor-wide, or regional-level aspects of the proposed undertaking. In addition to the SHPO and ACHP, the list of potential consulting parties included the following non-federally recognized tribes and state or region-wide preservation organizations:

- the Mohawk Nation Council of Chiefs,
- the Unkechaug Nation,
- the Preservation League of New York State,
- the Hudson River Valley Greenway,
- the Erie Canal National Heritage Corridor,
- Preservation Buffalo Niagara,
- the Landmark Society of Western New York, and
- the Preservation Association of Western New York.

Three parties responded expressing interest in participating as consulting parties: the Preservation League of New York State, the National Park Service Erie Canal National Heritage Corridor, and the Preservation Buffalo Niagara. FRA subsequently approved the consulting party status of these three entities.

On May 2, 2013, FRA and NYSDOT met to provide project information to the consulting parties and give them an opportunity to provide comments. Representatives from the Preservation League of New York State and the Erie Canal National Heritage Corridor attended.

On May 2, 2013, the team met with SHPO to discuss utilizing a Programmatic Agreement to govern future requirements under Section 106 of the NHPA. A Draft PA was provided as part of the Tier 1 Draft EIS for review and comment, although it was later decided that adoption was premature and would be taken up again in the Tier 2 assessments. The Draft Section 106 Programmatic Agreement (included as Appendix H of the Tier 1 Draft EIS) intends to address the process by which FRA and NYSDOT would continue to phase Section 106 activities and comply with Section 106 once Tier 2 undertakings are defined. This Draft PA could govern the future identification of historic properties as well as the assessment of and resolution of adverse effects to historic properties, as appropriate. FRA transmitted the Draft Programmatic Agreement to the SHPO, federally-recognized Indian tribes and consulting parties for review and comment. The Preservation League of New York State provided comments. FRA also received comments from the Oneida Indian Nation. On August 6, 2018, FRA notified the SHPO and consulting parties that the Section 106 process for the Tier 1 phase of the program is considered complete. FRA concluded that the Tier 1 EIS represents non-destructive program planning activities, allowed for under 36 CFR Part 800(1)(c), which have no potential to cause effects to historic properties. FRA and NYSDOT remain committed to following the requirements of 36 CFR 800 for Tier 2 projects that receive federal funding, as well as determining the applicability of changes under the FAST Act.

4.15.3. Existing Conditions

Historic Context

It is beyond the scope of this Tier 1 analysis to present a thorough and comprehensive history of the geology, precontact period, and historic period in New York State. However, as described in 36 CFR 800.4(b)(2) and 800.5(a)(3), where alternatives consist of large corridors and a phased approach is being taken, the process should assess the likely presence of historic properties based on background research and consultation. Information collected as part of Tier 1 analysis may be used to evaluate the significance of historic properties identified in later phases of the program. Therefore, a brief overview of precontact period conditions and relevant historic period themes, in particular transportation networks pertinent to the program corridor vicinity, is presented below to provide a basic background for the "Existing Conditions" presented later in this chapter and to identify broad topics for further research as part of the Tier 2 analysis.

Precontact Period

For the purposes of this report, the term "precontact" is used to describe the period prior to the use of formal written records. In the Western Hemisphere, the precontact period also refers to the time before European exploration and settlement of the New World. Archaeologists and historians gain their knowledge and understanding of precontact Native Americans in New York State from ethnographic reports, artifact collections, archaeological investigations, and oral tradition. Artifacts dating to the precontact period potentially found from ground disturbance as a result of the proposed program could include the remains of milling equipment, stone axes, adzes, arrowheads, and clay pottery vessels.

Historic Period

The earliest transportation networks in the State of New York consisted of waterways and Native American trails. The Hudson River was a natural highway for the region, and in the 1620s the Dutch built Fort Orange at the mouth of its principal tributary, the Mohawk River.

Canals and railroads dominated transportation development in the first half of the 19th century and were an important means of getting goods to market and a major factor in the value of land. The Erie Canal, completed in 1825, spurred the westward migration of American settlers, opened the only American trade route west of the Appalachians, and secured New York as the preeminent commercial

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Archaeology

Appendix G.14.1 and Exhibit 4-19 identify the number and type of sites in each county in the direct APEs for the 90/110 Alternative and the 125 Alternative.

90/110 Alternative APE

A total of 166 previously-identified archaeological sites have been identified within the direct APE for the 90/110 Alternative that extends along the Empire Corridor South/West and the Niagara Branch. Of these sites, 47 are SHPO archaeological sites, 117 are NYSM sites, and two are identified by the Oneida Nation (Sites 1 and 2). There are a total of 36 burial/habitation sites.

Direct APE: 125 Study Area

A total of 126 previously-identified archaeological sites have been identified within the direct APE for the 125 Study Area that extends along the Empire Corridor South/West and the Niagara Branch. Of these, 27 are SHPO archaeological sites, 96 are NYSM sites, and three are sites identified by the Oneida Nation (Sites 3 through 5). There are a total of 27 burial/habitation sites.

[73] New York State Canal Corporation. "Unlock the Legend of The New York State Canal System." Pamphlet. 1999.

[74] Ellis, Edward Robb. *The Epic of New York City.* New York: Old Town Books. 1966, 259.

[75] Burrows, Edwin G. and Mike Wallace. *Gotham, A History of New York City to 1898*. New York: Oxford University Press. 1999, 564.

[76] A.G. Lichtenstein & Associates, Inc. "New Jersey Historic Bridge Survey." 1994, 26.

Exhibit 4-19 – Summary of Previously Identified Archaeological Resources within Direct APEs

	SHPO Sites		NYSM Polygon Sites		Oneida Nation Sites		TOTAL	
	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area
TOTALS	47	27	117	96	2	3	166	126
PERIOD	16 historic period sites, remaining Native American sites, 9 unknown	13 historic period remaining Native American sites	1 historic period site, remaining Native American sites	1 historic period site, remaining Native American sites			17 historic period sites, 9 unknown, remaining Native American	14 historic period sites, remaining Native American sites
TYPES OF SITES	Historic period industrial: 4 Native American burial sites:1 camp site: 7	Historic period industrial: 5 Historic burial sites: 1 camp site: 8	Native American camp site: 21 Habitation sites: 25 Burial sites: 12	Native American camp site: 20 Habitation sites: 20			Historic period industrial: 4 Native American burial sites:13 camp site: 26 Habitation sites: 25	Historic period industrial: 5 Native American camp site: 28 Habitation sites: 20 Burial sites: 11

Architectural Resources

Previously-identified architectural resources located within the direct APE for the 90/110 Alternative and the 125 Alternative are summarized in Exhibit 4-20 and Appendix G.14. The NHLs, State and National Register (S/NR)-listed and eligible historic districts are noted in the text below. Exhibit G-25 illustrates the approximate locations of these resources. The previously identified architectural resources within the indirect APEs are summarized in Appendix G.14.

Exhibit 4-20 – Historic Architectural Resources within the Direct APE for each Alternative

County	NHL		S/NR-Listed/Eligible Resources - Individual		S/NR-Listed/Eligible Resources - Districts		**Total Resources**	
	90/110	125	90/110	125	90/110	125	90/110	125
New York			7	7			7	7
Bronx			1	1			1	1
Westchester			14	14	1	1	15	15
Putnam			3	3	2	2	5	5
Dutchess			13	13	2	2	15	15
Columbia			2	2	2	2	4	4
Greene							0	0
Rensselaer			3	2	1	1	4	3
Albany			2		1		3	0
Schenectady				1	1		1	1
Montgomery	1		9		1		11	0
Herkimer			1		1		2	0
Oneida			2				2	0
Madison				1			0	1
Onondaga							0	0
Cayuga							0	0
Wayne							0	0
Monroe			2	1	1	1	3	2
Genesee					1		1	0
Erie			1	2	1	1	2	3
Niagara			1	1			1	1
Multiple Counties	2	2					2	2
TOTALS	3	2	61	48	15	10	79	60

Note: Counties are listed from south to north, then east to west.
Resources that fall within the direct APE are also within the boundaries of the indirect APE.
The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long.

Direct and Indirect APE: 90/110 Alternative

A total of 79 previously-identified architectural resources are located in the direct APE for the 90/110 Alternative. Exhibit 4-20 summarizes these resources by county. Of the 79 architectural resources, three resources are NHLs: Fort Klock in St. Johnsville, Montgomery Country, the Hudson River Historic District in Dutchess and Columbia Counties, and the New York State Barge Canal Historic District.

Fort Klock, a fortified stone homestead built in 1750, is part of a 30-acre complex that includes the historic homestead, a renovated Colonial Dutch Barn, blacksmith shop, and 19th-century schoolhouse.

The 32-square-mile Hudson River National Historic Landmark District stretches from Germantown in Columbia County to Hyde Park in Dutchess County. It includes over 40 riverfront estates, two villages, four hamlets, and significant designed landscapes and farmlands.

The 450-mile New York State Barge Canal National Historic Landmark District includes four branches of the canal system (Erie, Champlain, Oswego, and Cayuga-Seneca) and encompasses 552 contributing structures. It includes the Erie Canal in the study area and canalized river sections (Tonawanda Creek, Mohawk, and Hudson Rivers).

Seventy-six other S/NR-listed or eligible resources are within the direct APE. Of these, 61 are individual properties while 15 are historic districts. At least four S/NR-eligible resources directly associated with the railroad are located in the direct APE.

There are approximately 350 bridges meeting the 50-year age criterion for S/NR eligibility located within the existing railroad alignment and thus within the direct APE. Any bridges 50 years old or older affected by the Preferred Alternative, Alternative 90B, program would also be evaluated for potential S/NR eligibility as part of the Tier 2 analysis, as appropriate. The NYSDOT's *Contextual Study of New York State's Pre-1961 Bridges* (November 1999), *Evaluation of National Register Eligibility* (January 2002), and *Historic Bridge Management Plan* (September 2002) would be consulted, among other documentary sources.

The resources within the 100-foot direct APE were included in the 600-foot indirect APE. A total of 356 previously-identified architectural resources are located in the indirect APE for the 90/110 Study Area that extends along the Empire Corridor South/West and the Niagara Branch. Of the 356 architectural resources, five are NHLs. Of the remaining S/NR-listed or eligible resources, 305 are individual properties and 46 are historic districts. At least eight S/NR-listed or eligible resources directly associated with the railroad are located within the indirect APE.

Direct and Indirect APE: 125 Alternative

A total of 60 previously-identified architectural resources are located in the direct APE for the 125 Alternative. These resources are summarized by county in Exhibit 4-20. Of the 60, two are NHLs: the Hudson River Historic District in Dutchess and Columbia counties and the New York State Barge Canal Historic District (described above). Of the remaining S/NR listed or eligible resources, 48 are individual properties and 10 are historic districts.

A total of 235 previously-identified architectural resources are located in the indirect APE for the 125 Study Area that extends along the Empire Corridor South/West and the Niagara Branch. Of the 235 resources, three are NHLs. Of the remaining S/NR-listed or eligible resources, 199 are individual properties, and 32 are historic districts.

4.15.4. Potential Adverse Effects

Comparison of Alternatives

As described under "Existing Conditions," previously-identified archaeological sites and architectural resources within the direct APE, and architectural resources within the indirect APE, have been inventoried and mapped. Because the design of program improvements has not progressed to a point sufficient to enable site-specific analyses of potential effects, specific potential effects to architectural and archaeological resources will not be provided as part of this Tier 1 Assessment. The Tier 2 level analysis will include an analysis of the Preferred Alternative's, Alternative 90B's, potential to result in long-term effects to specific architectural and archaeological resources, as described in Section 4.15.5, "Potential Mitigation Strategies" and Section 4.15.6, "Future Analysis."

The Preferred Alternative (Alternative 90B) would involve greater impacts than the Base Alternative, and Alternatives 90A and 125. Alternative 90B could involve indirect or direct effects on a total of 303 archaeological and architectural resources (including NHLs, S/NR/listed and eligible individual resources and districts). This compares to indirect/direct effects to 100 archaeological and architectural resources for Alternative 90A, 24 resources for the Base Alternative, and 122 resources for Alternative 125. Impacts for the Preferred Alternative would be roughly comparable to that for Alternative 110, which would indirectly or directly affect 302 archaeological and architectural resources. Although the estimate of resources affected by Alternative 125 is lower, this alternative will involve far greater disturbance to undisturbed ground. The smaller number does not reflect what is anticipated to be a higher number of unidentified archaeological and architectural sites in more rural areas.

Of these impacts, the number of archaeological and architectural resources that would potentially be directly affected by the Preferred Alternative is 154, compared to 48 for Alternative 90A, 153 for Alternative 110, and 86 for Alternative 125. Although the number of resources within the direct APE are similar for Alternative 110 and the Preferred Alternative, the potential for impacts would most likely be greater for Alternative 110 due to the location of the proposed tracks 15 feet further than for Alternative 90B. Short-term impacts due to construction are discussed in Section 4.25.3. Appendix G.14 describes in more detail historic and archaeological resources potentially affected by the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

<u>Alternative 90B (Preferred Alternative)</u>

Direct APE: Archaeological Sites

The archaeological impacts of the Preferred Alternative include the following impacts from Alternative 90A projects. There are 30 previously-identified archaeological sites located in the direct APE for Alternative 90B that could experience direct, physical effects due to construction-related activities, including 12 burial/habitation sites. These include:

- **New York County (Manhattan)** – Native American habitation and midden site and rock shelter (**2 total**)
- **Bronx County** – Native American midden site (**1 total**)
- **Westchester County:** Native American midden and camp sites and three habitation/burial sites, and three other Native American sites (**8 total**)
- **Putnam County** – Native American burial site and other traces of occupation (**2 total**)
- **Dutchess County** – two Native American habitation sites; two camp/burial sites; two N (S) sites; one quarry site (MP 65); and two other sites (**9 total**)
- **Montgomery County** – Native American burial site, a trail site, and two other sites (**4 total**)
- **Onondaga County** – two Native American camp/habitation sites and two other sites (**4 total**)

There are 88 previously identified archaeological sites located in the direct APE for Alternative 90B (see Appendix G.14) that could experience direct, physical effects due to construction-related activities, including 19 burial/habitation sites. These are:

- **Schenectady County** – Native American burial site, a midden, a camp site, and six other sites (**9 total**)
- **Montgomery County** – sixteen other Native American sites, two Native American camp sites and seven habitation sites, three pictographs/petroglyphs, two burial sites, one burial/habitation

three trail sites, a historic industrial site, and five other Native American and historic sites (40 **total**)

- **Herkimer County** – a Native American habitation site, a historic maritime site, four Native American trail/traces of occupation sites, and two other sites (**8 total**)
- **Oneida County** – three Native American camp sites; a burial site; and two sites identified by the Oneida Nation (**6 total**)
- **Onondaga County** – three Native American habitation/camp sites, a historic industrial site, and six other sites (**10 total**)
- **Cayuga County** – one Native American site (**1 total**)
- **Wayne County** – one Native American site (**1 total**)
- **Monroe County** – three Native American burial, trail, and camp sites and two other sites (**5 total**)
- **Genesee County** – two Native American trail sites, two camp sites, one other site, and a historic domestic site (**6 total**)
- **Erie County** – one Native American camp site and one other site (**2 total**)

Direct APE: Architectural Resources

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects. There are a total of 18 previously-identified architectural resources located in the direct APE for Alternative 90B that could experience direct, adverse effects due to construction-related activities. These are:

- **Westchester County** – Lyndhurst (MP 24); and Garrison Landing Historic District (MP 50) (**2 total**)
- **Putnam County** – Cold Spring Historic District (MP 52.5); *Individual*: U.S. Military Academy (MP 51); and West Point Foundry (MP 52) (**3 total**)
- **Dutchess County** – *Historic District*: Wheeler Historic District (MP 64); Stone Street Historic District (MP 65); *Individual*: National Biscuit Company Carton-Making and Printing Plant (MP 59); Mount Gulian (MP 61.5); Carman, Cornelius House (MP 62); Collyer, Capt. Moses W. House (MP 62); Poughkeepsie Railroad Bridge (MP 74); Poughkeepsie Railroad Station (MP 74); and Innis Dye Works (MP 74) (**9 total**)
- **Dutchess/ Columbia counties** – Hudson River Historic District (NHL) (MP 82-102) (**1 total**)
- **Rensselaer County** – Schodack Landing Historic District (S/NR-listed Historic District); Livingston Avenue Bridge (MP 143) (**2 total**)
- **Montgomery County** – Dove Creek Culvert (MP 177.5) (**1 total**)

Work proposed for Alternative 90B along Empire Corridor South is expected to occur within the existing right-of way. These resources are located within 100 feet of work proposed in the right-of-way.

Work proposed for the Preferred Alternative, Alternative 90B—which mainly consists of the construction of new track and new access road work— could have adverse effects on architectural resources located within the direct APE due to construction-related activities.

Only one of the seven existing stations where improvements are proposed for this alternative has been identified as a known architectural resource: Boehlert Transportation Center at Union Station (Utica Station), located in Oneida County. As part of the Tier 2 analysis, if adverse effects are anticipated, the other six stations, including Schenectady Station, Amsterdam Station, Rome Station, Syracuse Station, Rochester Station, and Buffalo-Depew Station, would be evaluated for their potential eligibility for S/NR listing, and effects would be evaluated for any other potentially impacted stations identified as eligible for S/NR listing. Union Station in Utica is S/NR-listed. Proposed work at this station includes the construction of a new center island platform and overhead pedestrian bridge; work in the station area also would include new siding, new passenger and freight track, removal of existing track, and new turnouts.

There are 19 architectural resources located in the direct APE for Alternative 90B (Preferred) that could experience direct, adverse effects due to construction-related activities. These include:

- **Schenectady County** – Stockade Historic District (MP 160) (**1 total**)
- **Schenectady/Montgomery/Madison/Herkimer/Onondaga/Cayuga/Wayne/Monroe/Erie /Niagara counties** – New York State Barge Canal National Register Historic District is designated as a National Historic Landmark (NHL) District (MPs 160, 177, 191, 201, 231, 292, 319, 330, 335, 339, 358.5, 374, and QDN13). The 450-mile historic district encompasses 552 contributing resources located along the railroad corridor, such as a railroad bridge over Erie Boulevard in Schenectady (MP 160), Lock E-13 in the Town of Root, Montgomery County (MP 191), and a moveable dam and lock in the Town of Palatine, Montgomery County (MP 201) (**1 total**)
- **Montgomery County** – Fort Klock (NHL) (MP 205); Nelliston Historic District (MP 201); *Individual*: Guy Park (MP 177); Montgomery County Farm (MP 193-194); Palatine Bridge Freight House (MP 197.8); Property at the northwest corner of Ann and Main Streets, Amsterdam (MP 177.5); Dove Creek Culvert that runs beneath the right-of-way near Steadwell Avenue in the Town of Amsterdam (MP 177.5); H.D.F. Veeder House (MP 188); hexagonal limestone well shelter (MP 198); and the Palatine Bridge cut limestone retaining wall and bridge abutment (MP 198) (**10 total**)
- **Herkimer County** – Little Fall Historic District (**1 total**)
- **Oneida County** – Union Station, Utica (MP 237.5); and a railroad station building in the village of Oriskany (MP 244.5) (**2 total**)
- **Monroe County** – Brown's Race Historic District (MP 370); *Individual*: Coldwater Station (MP 378); and 60 South Main Street (MP 386) (**3 total)**
- **Genesee County** – Lake Street Historic District (MP 389) (**1 total**)

The exact area of the proposed property acquisitions at MPs 168.3, 210.8, 215.6, 237.7, 286.4, 341.1, and 377.6 has not yet been determined. It is assumed for the purposes of this analysis that the property to be acquired would be directly adjacent to the existing right-of-way. There are no previously-identified architectural resources located in close proximity to these mile markers, with one exception: MP 237.7, which is near Union Station in Utica (discussed above). There could be additional adverse impacts to architectural resources as a result of the property acquisitions proposed for Alternative 90B. As part of the Tier 2 analysis, properties proposed to be acquired would be surveyed to identify any potential architectural resources. Effects would be assessed for any resources identified as eligible for listing on the State/National Registers.

Notably, there are a number of rail bridges located within the right-of-way, which could be adversely affected by work proposed for this alternative. These bridges would be identified and evaluated for their potential eligibility for S/NR listing in the Tier 2 level analysis, as appropriate. Effects would be evaluated for any bridges determined to be eligible for S/NR listing.

Indirect APE: Architectural Resources

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects. There are 51 architectural resources located in the indirect APE for these Alternative 90B projects. These include:

- **New York County (Manhattan)** – Fort Tryon Park and the Cloisters (Individual) (MP 9) (**1 total**)
- **Bronx County** –*Individual*: Wave Hill (MP 13); Colgate Robert House (MP 13); and the William E. Dodge House (MP 12) (**3 total**)
- **Westchester County** –*Individual*: Croton North Railroad Station (MP 34); Standard House (MP 41); Peekskill Freight Depot (MP 41); Bear Mountain Bridge and Tollhouse (MP 45); Tarrytown Railroad Station (MP 25); Riverside Hose Company (MP 25); and a resource located on the southeast corner of Central Avenue and North Water Street (MP 41.5) (**7 total**)
- **Putnam County** –*Individual*: Wilson House (MP 49.5); Rock Lawn and Carriage House; and Eagle's Nest (MP 51) (**3 total**)
- **Dutchess County** –*Historic District*: Main Street Historic District (MP 65); Union Street Historic District (MP 73.5); Mill Street-North Clover Street Historic District; *Individual*: Shay's Warehouse and Stable (MP 65); Shay, William Double House (MP65); Zion Memorial Chapel (MP 65); Brower, Abraham House (MP 65); Brower, Adolph House (MP 65); Bannerman's Island Arsenal (MP 55.5); Chelsea Grammar School (MP 62); Church of the Holy Comforter (MP 73.5); Pelton Mill (MP 74); Old St. Peter's Roman Catholic Church and Rectory (MP 74); Hoffman House (MP 74); Roosevelt Point Cottage and Boathouse (MP 76); Rhinecliff Hotel (MP 89); O'Brien General Store and Post Office (MP 89); Riverside Methodist Church and Parsonage (MP 89); Metro-North Railroad Bridge (MP 58); Mid-Hudson Bridge (MP 73); Johnson Plumbing Complex (MP 73); and Cornell Boathouse (MP 74.5) (**22 total**)
- **Columbia County** – Hudson Historic District (MP 114.5) (Historic District); *Individual*: Wiswall, Oliver House (MP 113.8); Requa House (MP 129); and Hudson and Boston Railroad Shop (MP 114.5) (**4 total**)
- **Montgomery County** –*Historic District*: Amsterdam East Main Street Historic District (MP 176); New York Barge Canal System Historic District (NHL) (MP 159-358.5); *Individual*: Guy Park Manor (MP 176.5); 6-8 Voorhees Street (MP 175.5); 366, 399, 401 West Main Street (MP 176.5); Guy Park (MP 177); resource on West Main Street (MP 177); and World War I Memorial (MP 177.5) (**10 total**)
- **Onondaga County** – New York State Fairgrounds Historic District (MP 294) (Historic District) (**1 total**)

There are 117 architectural resources located in the indirect APE for the Preferred Alternative, Alternative 90B. These include:

- **Schenectady County** – Union Street Historic District (MP 159.8); *Individual*: Central Fire Station (MP 159.5); Proctor, F.F. Theater and Arcade (MP 159.5); and Swart House and Tavern (MP 167.5) (**4 total**)
- **Montgomery County** – *Historic District*: Amsterdam East Main Street Historic District (MP 175.8); and Fonda Fairgrounds and Speedway Historic District (MP 186); and *Individual*: Fort Johnson (MP 179); New Courthouse – Fonda (MP 186.5); Wagner, Webster House (MP 198); Frey

House (MP 198.2); Nellis Tavern (MP 205.5); 6-8 Voorhees Street (MP 175); 366, 399, 401 West Main Street (MP 176.5); World War I Memorial (MP 177.8); 2, 3, 4, 9, 11, 19, 23, 25, 27, 29, 31, and 37 East Main Street (MP 186); 4, 6, 8, 10, 12, 14-16, 18, 22, 26, 30, 32, 34, 40, 42, 46, and 56 West Main Street (MP 186); 1 Cayadutta Street; Lock E-14 and Lock House; and the Nelson and Reese House (including cemetery and barn foundations) (MP 207) (**43 total**)

- **Herkimer County** –*Individual*: Herkimer House (MP 214); U.S. Post Office – Little Falls (MP 216.5); Herkimer County Trust Company building (MP 216.5); Palatine German Frame House (Wilder House) (MP 227); and *S/NR-eligible Individual*: 591 East John Street (MP 216.5); 401, 403, 407 South Ann Street (MP 216.5); Fleet Bank (MP 216.5); Snyder Apartments (MP 216.5); 48-54 West Main Street (MP 216.5); 24, 25, 55, 56 West Mill (MP 216.5); 151 Elizabeth Street (MP 217); and 338 West Main Street (MP 217) (**17 total**)
- **Oneida County** – Lower Genesee Historic District (MP 237.5); *Individual*: Foster Brothers Manufacturing Company (MP 237); Hieber, John C. and Company building (MP 237.5); Utica Daily Press building (MP 237.5); Hurd & Fitzgerald building (MP 237.5); and Byington Mill (Frisbie & Stansfield Knitting Company) (MP 237.5) (**6 total**)
- **Madison County** – South Peterboro Street Commercial Historic District; and *Individual*: U.S. Post Office – Canastota (MP 270); United Church of Canastota (MP 270); 203 South Main Street (MP 270); Canastota Public Library (MP 270); 115 South Main Street (MP 270); 223 James Street (MP 270); Alvord House (289.5); and East Palmyra Presbyterian Church (MP 344.5) (**9 total**)
- **Onondaga County** – Alvord House (MP 289.5); and New York State Fairgrounds Historic District (MP 294) (**2 total**)
- **Wayne County** – East Palmyra Presbyterian Church (MP 344.5); and Village of Clyde Historic District (MP 328.5) (**2 total**)
- **Monroe County** – *Historic District*: East Avenue Historic District (MP 368-370); St. Paul-North Water Streets Historic District (MP 371); State Street Historic District (MP 371); Bridge Square Historic District (MP 372); Madison Square-West Main Street Historic District (MP 372); Birch Crescent Historic District (MP 379); Prince Alexander Historic District (MP 370); Public Market Historic District (MP 370); *Individual*: Leopold Street Shule (MP 370.5); German United Evangelical Church Complex (MP 371); Andrews Street Bridge (MP 371); Federal Building (MP 371); Brick Presbyterian Church (371); Washington Street Rowhouses (MP 372); Foster Armstrong Piano Warehouse (MP 364); 1290, 1255-1257, 1239, 1320 University Avenue (MP 368.5); J. Hunderford Smith Company building (MP 369.5); Otis Lumber Company building (MP 369.5); Rochester Public Market (MP 370); Schwalb Coal & Oil Company (MP 370.5); Taylor Instrument Company (MP 373); Building C2 (H.F. Snyder & Son) (MP 386); and Building Z (former Richmond Residence) (MP 386) (**26 total**)
- **Genesee County** – Village of Bergen Historic District (MP 389); and 20 North Lake Street (MP 389) (**2 total**)
- **Erie County** –*Individual*: Buffalo Gas Light Company Works (MP 2.8); Delaware Park-Front Park System (MP 4); 1032 Niagara Street (MP 5); 1073 Niagara Street (MP 5); *Historic District*: Wende Correctional Facility (MP 422); Joseph Ellicot Downtown Historic District (**6 total**)

Although direct, adverse effects to architectural resources due to construction-related activities are not anticipated for resources located within the indirect APE, this assessment also considered the potential for this alternative to incur indirect, contextual effects to these resources.

4.15.5. Potential Mitigation Strategies

A Draft Section 106 Programmatic Agreement (PA) was drafted for this program in anticipation of the Tier 2 assessment level (see Appendix H of the Tier 1 Draft EIS), and proposed a Section 106 process for the component projects advanced for the Preferred Alternative, Alternative 90B. It was later decided that adoption was premature and would be taken up again in the Tier 2 assessments. The Advisory Council for Historic Preservation (ACHP) declined to participate in the development of the PA via e-mail dated July 20, 2012. As applicable, the Tier 2 assessments would adopt a Section 106 process outlining future identification, evaluation, and assessment of effects to historic properties including processes for the resolution of adverse effects. If unavoidable potential direct and/or indirect adverse effects are identified during the Tier 2 analysis, more detailed and specific measures to avoid, minimize and/or mitigate these effects would be defined and implemented in consultation with SHPO, involved THPOs and/or Tribal Organizations, ACHP (if appropriate), and any involved consulting parties.

For archaeological resources, mitigation measures that may be identified for component projects for Alternative 90B, the Preferred Alternative, at the Tier 2 level may include:

- Phase III data recovery, documentation,
- geoarchaeological survey,
- preparation and implementation of archaeological protection plans, and/or
- preparation of public education materials.

For architectural resources, possible mitigation measures include:

- The preservation or relocation of historic buildings;
- Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) documentation;
- Production of educational materials interpreting the history and significance of affected resources for use by local libraries, historical societies, and educational institutions; and
- Installation of signage interpreting the history and significance of affected resources along the proposed rail corridor, or
- Planting vegetation or creating noise barriers along the proposed rail corridor.

Furthermore, in order to avoid inadvertent damage to historic resources located in close proximity to possible project construction, a Construction Protection Plan (CPP) would be prepared, as appropriate. The CPP would identify the historic resources to be included in the plan. It would also set for the specific measures to be used and specifications that would be applied to protect these resources during the construction period.

4.15.6. Future Analysis

The Tier 1 concepts and screenings were conceptual in nature, and not developed to a level that allows full evaluation of historic impacts; these assessments occur in Tier 2. The applicability of the recently enacted requirements in the Fixing America’s Surface Transportation Act (FAST Act) under Section 106 to include new railroad exemptions (including for placement of track in former track locations within rights-of-way and railroad bridges) would be examined in Tier 2 assessments, when details are available regarding project-specific proposals and their relationship to the railroad right-of-way.

As described in the "Methodology" section, the environmental compliance for this program is being conducted using a phased approach as outlined in 36 CFR 800.4(b)(2) and 800.5(a)(3). Determinations of eligibility and effect, as well as resolution of adverse effects under Section 106 of NHPA for the Preferred Alternative, Alternative 90B, will be deferred to Tier 2 of the process.

If the analysis concludes that a proposed project within the Alternative 90B program would have an adverse effect, measures to avoid, minimize, or mitigate adverse effects would be identified.

4.16. Parks and Recreational Areas

4.16.1. Regulatory Context

Federal protection of parklands is provided under Section 4(f) of the U.S. Department of Transportation Act (for federally funded transportation projects) and under Section 6(f) of the U.S. Land and Water Conservation Fund (LWCF) Act (for LWCF-funded parks). Section 4(f) of the U.S. DOT Act (49 U.S.C. 303(c)) of 1969, as amended, states that the Secretary of the U.S. DOT shall not approve any program or project that requires the "use" of any land from a public park, recreation area, wildlife and waterfowl refuge, or historic site, unless there is no feasible and prudent alternative, and such project or program includes all possible planning to minimize harm. FRA *Procedures for Considering Environmental Impacts* states that each project shall consider impact on recreational opportunities and use of (4) properties. Section 4.23 addresses Section 4(f)/Section 6(f) compliance.

Under Section 6(f) of the U.S. Land and Water Conservation Fund (LWCF) Act, the United States Department of the Interior (DOI) provides funding for state, county, and local efforts to advance public recreation. Once LWCF funds are utilized for a particular recreation project, conversion of that park facility for any non-recreational purpose is prohibited unless alternatives are assessed and steps are taken to identify, evaluate, and supply replacement parkland. In addition, the Secretary of Interior must grant prior approval for the conversion and replacement parkland.

If a conversion of Section 6(f) parks or lands may occur, a Section 6(f) Evaluation will be prepared and circulated as part of the Tier 2 assessment. Section 4.23 provides a Tier 1 evaluation of Section 4(f)/Section 6(f) issues.

New York State places similar restrictions on all municipal parklands, which cannot be converted to a non-park use without prior approval from the New York State Legislature (referred to in New York as parkland alienation). The legal basis for the need for "parkland alienation" legislation is not found in statute, but has been established in common law through the New York State courts under the "public trust doctrine." When a municipality accepts federal or state funding for the acquisition or improvement of parklands, additional restrictions apply to the sale, lease, exchange, or use for non-park purposes.

4.16.2. Methodology

Parks and recreation areas for study areas within 1,000 feet of the corridor centerline for all alternatives were identified using existing mapping collected from federal and state agencies.

Federal, state, county, and municipal parks and recreation areas were located using Geographic Information System (GIS) mapping obtained from the New York State GIS Clearinghouse, New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP), and the New York State Department of Environmental Conservation (NYSDEC). The GIS mapping and information from the National Park Service (NPS) staff was obtained of National Wildlife Refuges, National and State Historic Sites, NNLs,[125] National Memorials, and National Monuments.[126] The NPS website was consulted to identify and locate these NPS properties, National Heritage Areas and county-by-county Land and Water Conservation Fund park grants. Aerial photography and Google street mapping were reviewed to supplement existing maps and identify other parks and recreation areas within 1000 feet of the corridor centerline for both the 90/110 and the 125 Study Areas. Publicly owned recreation areas were defined to include publicly owned golf courses (but not "public" golf courses that are open to the public, but privately owned). This section also addresses tribally owned recreational facilities.

4.16.3. Existing Conditions

Overview

The existing parks and recreation areas in the study area are concentrated in two main areas: the Hudson River Valley and the New York State Canal System within the Mohawk River Valley.

- The Hudson River Valley has a concentration of national, state, county, and municipal parks and recreation areas due to its location and scenic views, as well as the concentration of population centers that developed along the river. The area also has a rich cultural and economic heritage and hosts a number of historic districts and sites. The national and state historic sites are important recreational tourism destinations.
- The **New York State Canal System,** owned by the New York State Canal Corporation provide recreational opportunities for water-based navigation and trail users. The **New York State Canalway Trail System** is comprised of a network of more than 300 miles of existing multi-use, recreational trails across upstate New York. Major segments are adjacent to the waterways of the New York State Canal System or follow remnants of the historic original canals of the early 1800s that preceded today's working Canal System. The Canalway Trail System is comprised of four major segments: the Erie Canalway Trail, including the Old Erie Canal State Park Trail in Central New York; the Cayuga-Seneca Canal Trail, the Champlain Canalway Trail, and the Oswego Canalway Trail. Stretching from Buffalo to Albany the 360-mile Erie Canalway Trail, 277 miles of which are presently open to the public, closely follows much of the present and proposed Empire Corridor alignment. Portions of this canal system are nationally or state-designated heritage areas, parks, and trails.

National Parks and Recreation Areas

There are several types of federally designated parks or recreation areas in the study area, including National Heritage Areas, a National Memorial, several NNLs, a National Wildlife Refuge, National Historic Sites, and National Scenic/Recreational Trails (see the eight federally managed sites shown in Exhibit 4-36). National Historic Landmarks and National Register Historic Districts and sites in

[125] Deb DiQuinzio, National Natural Landmarks Program, National Park Service Northeast Region, "Moss Island," E-mail/personal communication to Addie Kim, HNTB Corporation, March 22, 2011; Deb DiQuinzio, National Natural Landmarks Program, National Park Service Northeast Region, "Montezuma Marshes, Bergen-Byron Swamp, and Albany Pine Bush National Natural Landmarks." E-mail/personal communication to Addie Kim, HNTB Corporation, June 5, 2017.
[126]/ Duncan Hay, National Park Service, Northeast Region, "NYSDOT & FRA Compliance (NEPA)," E-mail/personal communication to Addie Kim, HNTB Corporation, March 25, 2001.

the program area are addressed under Section 4.15.3.

- **National Heritage Areas:** Congress established National Heritage Areas to promote historic preservation and an appreciation of the history and heritage of the designated site. National Heritage Areas are administered by state or local governments or non-profit or private corporations, with the National Park Service providing an advisory role. The Empire Corridor traverses through three:
  - **Hudson River Valley National Heritage Area:** Extends from New York City north to Albany, along the Empire Corridor South. The heritage of the region dates back to the Revolutionary War, with several National Historic Landmarks and historic districts, estates of well-known historical figures, scenic parks, and gardens.
  - **Erie Canalway National Heritage Area:** Extends through upstate New York, along most of the central and eastern portions of the Empire Corridor West. This waterway played a key role in turning New York City into our country's most important center for commerce, industry, and finance.
  - **Niagara Falls National Heritage Area:** Stretches from the western boundary of Wheatfield, New York to the mouth of the Niagara River on Lake Ontario, including the community of Niagara Falls at the western end of the Niagara Branch. The region is home to dramatic natural features, rich cultural traditions, and nationally significant historical sites.
- **National Memorial:** Designated by the U.S. Congress for protection as a memorial to a historic person or event.

  The only National Memorial within 1,000 feet of the corridor centerline is the **General Grant National Memorial**, also known as Grant's Tomb, the largest tomb in North America. The site is located within Riverside Park overlooking the Hudson River in Manhattan (Milepost 5). Grant's Tomb commemorates the 18th president and general that presided over the Union victory in the Civil War. The site is part of the system of National Parks of New York Harbor.
- **National Natural Landmark (NNL):** The National Registry of Natural Landmarks includes nationally significant geological and biological features. Areas within 1,000 feet of the corridor centerline include:
  - **Moss Island**, near Milepost 216 and Lock 17 on the Erie Canal in Little Falls, Herkimer County.
  - **Albany Pine Bush Preserve**, extends south of the Empire Corridor.
  - **Montezuma Marshes,** located more than 4 miles from the Empire Corridor.
  - **Bergen-Byron Swamp NNL** lies within 1,000 feet from the Alternative 125 corridor, but more than 1,000 feet from the existing Empire Corridor.
- **National Wildlife Refuge:** The National Wildlife Refuge System, managed by the U.S. Fish and Wildlife Service, is the nation's system of public lands and waters set aside to conserve fish, wildlife and plants. The only national wildlife refuge within 1,000 feet of the corridor centerline is the **Montezuma National Wildlife Refuge** (the Approved Acquisition Area for the refuge is located between Mileposts 323 to 326) in Wayne County. The area known as the Montezuma Marshes once drew thousands of waterfowl making their annual fall migration. In 1938, the Montezuma NWR was formed to restore the wetland habitat with impoundments created by development of the Erie Canal, smaller feeder canals, and agricultural development. Today, the refuge consists of 10,000 acres, and accommodates recreational uses.

- **National Historic Sites:** Two National Historic Sites along the banks of the Hudson River in Hyde Park, Dutchess County are within the 1,000-foot buffer area:
  - **Vanderbilt Mansion National Historic Site:** The 50-room Classical-style mansion on 212 acres (near Milepost 80) was built in 1898. Frederick William Vanderbilt, a grandson of "Commodore" Cornelius Vanderbilt – the shipping and railroad magnate and richest man in America during his lifetime, constructed it. Landscaped grounds feature a formal terraced garden, expansive lawns, carriage roads, and a three-mile-long riverside hiking trail.
  - **Home of Franklin D. Roosevelt National Historic Site:** This site covering approximately 800 acres (at Mileposts 77-78) was the birthplace, lifelong home, and burial place of Franklin Delano Roosevelt, America's 32nd President. The grounds that feature flower gardens, outbuildings, and miles of walking trails. The Rose Garden contains the graves of Franklin and Eleanor Roosevelt.
- **National Scenic/Recreational Trails:**
  - **The Appalachian National Scenic Trail**, a more than 2,180-mile footpath traversing the Appalachian Mountains, extends through the study area at Hudson Highlands State Park.
  - **Old Erie Canal** has also been designated a National Recreational Trail by the National Parks Service.

Appendix G.15 summarizes the publicly owned acreage of all potential 4(f) or 6(f) parkland resources within 1,000 feet of the corridor centerline for the 90/110 and the 125 Study Areas.

__State Parks and Recreation Areas__

New York State has designated 24 state parks, areas of cultural and historic significance, state historic parks, and state historic sites in the study area that are largely administered by the NYSOPRHP (see Exhibit 4-37 and Appendix G.15). New York state forests and state-owned Wildlife Management Areas are administered by the New York State Department of Environmental Conservation, which administers 16 sites, including three boat launches and a fisherman's access, in the study area (see Exhibit 4-38).

- **New York State Heritage Areas System** is a state-local partnership established to preserve and develop areas that have special significance to New York State. The purpose of the program is to develop, preserve, and promote the state's cultural and natural resources as an expression of the state's heritage.

  There are two regional heritage corridors, the **Western Erie Canal Heritage Corridor** and the **Mohawk Valley Heritage Corridor** along the program area. There are six smaller Urban Heritage Areas within 1,000 feet of the corridor centerline:

  - **Harbor Park Heritage Area**
  - **Ossining Heritage Area**
  - **Albany Heritage Area**
  - **Schenectady Heritage Area**
  - **Rochester-High Falls Heritage Area**
  - **Niagara Falls Underground Railroad Heritage Area**
- The **State Parks System** includes state parks, state historic parks and state historic sites that are open to the public as tourist attractions (see Exhibit 4-37). The study area includes 11 state parks, one state park preserve, one state historic park, and six state historic sites. State parks

include the **Old Erie Canal State Historic Park** in Onondaga County (Mileposts 278.3 to 279), Madison County (Mileposts 266.5 to 272), and Oneida County. This 36-mile stretch of the 363-mile Old Erie Canal has been designated a National Recreational Trail by the National Parks Service. The New York State Canal Corporation owns two other canal parks (Guy Park and Lock 9 State Canal Park).

- **State Forests** in New York State administered by the New York Department of Environmental Conservation Division of Lands and Forests include four land classifications, but only two types: **Unique Areas** and **state nature and historic preserves** are present within the study area. **Unique Areas** are defined as parcels of land owned by the state that were acquired due to its special natural beauty, wilderness character, or for its geological, ecological or historical significance for the state nature and historical preserve. The NYSDEC state forests preserves and three unique areas within 1,000 feet of the corridor centerline for both the 90/110 and the 125 Study Areas are shown in Appendix G.15, one of which has received Section 6(f) funding.

  Wildlife Management Areas (WMAs) are lands owned by New York State under the control and management of the New York State Department of Environmental Conservation's Division of Fish, Wildlife and Marine Resources. These lands have been acquired primarily for the production and use of wildlife. However, while fishing, hunting and trapping are the most widely practiced activities on many WMAs, they are not limited to these activities. Most WMAs also provide good opportunities for hiking, cross-country skiing, birdwatching, or quiet enjoyment of nature. The seven WMAs within 1,000 feet of the corridor centerline for both the 90/110 and the 125 Study Areas are shown in Appendix G.15, one of which has received Section 6(f) funding.

County/Municipal Parks and Recreation Areas

There are roughly 100 county, municipal, and non-profit parks identified within the study area. Thirteen county-owned parks were identified within 1,000 feet of the corridor centerline of the 90/110 Study Area, of which two have received federal Land and Water Conservation Funding, as shown in Exhibit 4-39 and Appendix G.15. Within the 125 Study Area, nine county owned parks were identified within 1,000 feet of the corridor centerline, one of which is not within the 90/110 Study Area.

Ninety-four municipal parks were identified within 1,000 feet of the corridor centerline of the 90/110 Study Area, and of these, 27 have received Land and Water Conservation Funds, as shown in Exhibit 4-40 and Appendix G.15. Within the 125 Study Area, eighty-four parks were identified within 1,000 feet of the corridor centerline, of which twenty-two have received Land and Water Conservation Funds. More than half of these municipal parks are located in the more densely populated counties closer to New York City. Fifty parks (including one non-profit park) are located in New York, Bronx, Westchester, and Dutchess counties.

4.16.4. Environmental Consequences

Comparison of Alternatives

Review of aerial and parklands mapping indicates that the Base Alternative, Alternative 90A, and Alternative 90B (the Preferred Alternative) would have minimal long-term impacts to parklands and little or no impacts to parklands outside of the right-of-way. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads.

Alternative 125 has the greatest potential effect on parks and recreational facilities, with 10 such facilities in 6 counties potentially affected (including an Oneida Nation-owned golf course). With the possible exception of two crossings of the Mohawk River and Erie Canal for Alternatives 90B and 110, only Alternative 110 would have any other potential effect on recreational facilities, potentially affecting one county park. This assessment considered proximity impacts on adjoining parks, beyond direct property impacts, and assesses the parks and recreation facilities in the vicinity of the program elements. Please refer to Exhibit 4-36 to Exhibit 4-40 for a comparison of impacts to parks and recreation areas by alternative study areas. Short-term impacts related to construction are discussed in Section 4.25.3. Appendix G.15 provides further discussion of potential impacts on parks and recreation areas for the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

Alternative 90B (Preferred Alternative)

Empire Corridor South

Increased frequency of service could have the potential to incur additional visual and noise impacts from train passbys, however the additional trips represent a minimal increase over current rail traffic that includes frequent Metro-North commuter rail.

Empire Corridor West/Niagara Branch

Improvements for Alternative 90B, the Preferred Alternative, start at MP 160 in the City of Schenectady. Trackwork would extend west from here, crossing over the Mohawk River/Erie Canal on an existing bridge. In the City of Schenectady, Front Street Park and Pool adjoins the south side of the railroad on the south river bank, and the Glenville Bike Trail extends under the bridge on the north river bank, but impacts to the park and trail are not anticipated. Further set back on the southwest side are Riverside Park in Schenectady and Collins Park and Lake in Scotia. At MP 167, the railroad extends north of the Lock 9 Canal Park, which is on the opposite (southwest side) of Route 5, but will not impact the park.

Work that may extend outside of the right-of-way may occur at Amsterdam Station and at MPs 179, 192, and 200 in Montgomery County. Proposed track and station improvements at Amsterdam Station and trackwork at MP 179 are located in the vicinity of the Erie Canal, but should not affect the canal.

In Monroe County, the addition of a fourth track around the Rochester Station could also involve right-of-way impacts (MPs 371 to 376 and MPs 378.2 to 378.6, and MPs 379.15 to 379.6). This work will extend in the vicinity of facilities such as Upper Falls Park in the City of Rochester and will cross the Erie Canal and the Erie Canalway Heritage Trail at MP 374.5, but are not anticipated to directly affect parklands. The potential for impacts at the canal crossing will be evaluated as designs are advanced in the Tier 2 assessment.

Double track along the Niagara Branch between MPs QDN2 and QDN7 would extend in proximity to Front Park and La Salle Park in Buffalo, but no direct impacts outside the right-of-way are anticipated that could affect these parklands. Additional train passbys have the potential for additional visual and noise impacts, but the increased service frequency represents a minimal increase.

4.16.5. Potential Mitigation Strategies

Mitigation for impacts of the Preferred Alternative, Alternative 90B, on parklands and recreation areas will include avoiding and minimizing impacts to the extent practicable and minimizing any required right-of-way takings (e.g., at canal crossings). Compliance with the requirements of Section 4(f) of the U.S. Department of Transportation Act requires that alternatives that avoid or minimize impacts be evaluated, and, if impacts are proposed, mitigation measures be developed, in consultation with officials with jurisdiction. If parklands that have received Land and Water Conservation Fund Act grants will be converted, Section 6(f) requires that recreation property of equal fair market value and usefulness be provided as compensation.

Mitigation measures may include permanent measures, such as providing trail connections or compensatory parkland, or construction mitigation, such as maintaining trail or park access during construction or using time-of-year restrictions on construction work. Other considerations will include minimizing potential visual and noise impacts on adjoining parks or recreation areas, and further assessments of these impacts of the Preferred Alternative, Alternative 90B, and mitigation measures will also be advanced in Tier 2.

4.16.6. Future Analysis

For the Preferred Alternative, Alternative 90B, the Tier 2 assessments will include a thorough inventory of publicly owned parks and recreation facilities, as well as non-profit parklands that may be potentially affected. Detailed property mapping and information on the extent of public access, use and ownership for parks and recreation areas will be obtained. Further discussion of Section 4(f)/Section 6(f) evaluations is presented in Section 4.23, "Section 4(f)/Section 6(f)."

New York State places similar restrictions on all municipal parklands, which cannot be converted to a non-park use without prior approval from the New York State Legislature (referred to in New York as parkland alienation). Further research will be performed to identify municipal parklands, and if a conversion may occur, requirements for legislative approval for parkland alienation will be identified as part of Tier 2.

4.17. Visual Resources

4.17.1. Regulatory Context

The FRA Procedures for Considering Environmental Impacts states that evaluation of environmental impacts should include a consideration of aesthetics and design quality. Under the topic of aesthetic environment and scenic resources, the FRA NEPA guidance states that: "*The EIS should identify any significant changes likely to occur in the natural landscape and in the developed environment*."

4.17.2. Methodology

The assessment considers the visual impacts of high-speed rail trains for all viewer groups, including adjacent land users (views of the project) as well as high-speed train users (views from the train). The visual assessment has been developed through the use of readily available Geographic Information System (GIS) data sets and aerial imagery. Field visits have not been conducted to verify the data for the Tier 1 EIS due to the length of the corridor and numerous areas where there will be no change to the existing condition.

The assessment identifies visual characteristics of the existing view from and of the railroad, such as elevated structures, water crossings, and presence of trees and vegetated buffers and urban development. In addition, the assessment identifies those viewsheds for affected groups sensitive to visual changes, such as residents, park users, and travelers along the major interstates crossing the proposed facility. The "Existing Conditions" section identifies sensitive receptors in the program area and characterizes the area in terms of built environment and natural environment. For the 125 Study Area, since the exact alignment would be further refined and defined in Tier 2, a more generalized assessment of viewsheds of and from the railroad was performed.

4.17.3. Existing Conditions

Views of and views from the program area were considered, although in many rural locations (particularly along Empire Corridor West) the railroad itself is not visible or a prominent visual element unless it follows highways, waterways, or other vantage points where there are adjoining uses.

There are a number of designated scenic areas along the railroad where the railroad extends along the Hudson River, Erie Canal/Mohawk Valley, and Lake Erie/Niagara River. These include:

- Six **Scenic Areas of Statewide Significance** (Hudson Highlands, Estates District, Esopus/Lloyd, Ulster North, Catskill-Olana, Columbia-Greene North SASSs) in the study area are designated under the state's coastal program, as described under Section 4.11, "Coastal Resources."
- Three **National Heritage Areas** (Hudson River, Erie Canalway, and Niagara Falls), and numerous **federal and state parks and wildlife refuges** (described in Section 4.16, "Parks and Recreational Areas").
- The **Hudson River** has been designated as an **American Heritage River**, one of fourteen in the country, due to its rich history and substantial environmental recovery. The rail line between New York City and Albany generally parallels the Hudson River, in many areas within 300 feet of the river's edge. The Hudson River is also designated by the state[127] as a Hudson River Greenway Water Trail, and the Designated Hudson River Valley Greenway Trails is a system of park trails and also includes New York State Bike Route 9.
- The **Mid-Hudson Historic Shorelands Scenic District** designated under Article 49 of the New York Environmental Conservation Law extends between Hyde Park (MP 80) and Germantown (MP 140).
- The **Mohawk Towpath Scenic Byway**, a National Scenic Byway that follows the Erie Canal in a portion of Schenectady County, extends parallel and close to the Empire Corridor over a small portion (0.2 mile) in the City of Schenectady.
- The **Revolutionary Trail**, a New York State designated **scenic byway**, generally parallels the rail corridor from the village of Scotia in Schenectady County to the City of Rome in Oneida County.
- The **U.S. Route 20 Scenic Byway**, a New York State designated scenic byway, generally parallels a roughly 8.5-mile section of the 125 Study Area, where the scenic route originates in Duanesburg and extends west 108 miles.
- The **Great Lakes Seaway Trail, a National Scenic Byway**, is in the vicinity of the rail corridor as it extends from Buffalo north through Tonawanda to Niagara Falls.

[127] *Hudson River Valley Greenway Act of 1991*. New York State Legislature. Revised July 2007. Accessed May 10, 2012. <http://www.hudsongreenway.ny.gov/Libraries/PDF_s/GreenwayAct_Legislation_revised_as_of_July_2007__2011.sflb.ashx>.

Empire Corridor South

Views of the Railroad

The most prominent visual element within the seven counties along the Empire Corridor South is the Hudson River to the west of the tracks. The tracks generally follow the eastern shoreline of the Hudson River, although views of the river are cut off through some of the towns, industrial areas, and natural points of land, it visually unifies the 142-mile corridor. Views of the railroad in most locations along the Empire Corridor South where it follows the eastern bank of the Hudson River are more prominent from bridges and other points on the river, as the railroad forms an integral linear element of the landscape where it borders along the river's edge. The railroad is prominently visible along the west river bank from major bridges, including:

- The Tappan Zee Bridge (I-287),
- The Newburgh-Beacon Bridge (I-84),
- The Bear Mountain Bridge (U.S. Routes 202/6),
- The Mid-Hudson Bridge (U.S. Route 44 and State Route 55),
- The Kingston-Rhinecliff-Bridge (State Route 199),
- The Rip Van Winkle Bridge (State Route 23),
- The Castleton Bridge (Berkshire Connector of the New York State Thruway), and
- A major pedestrian bridge at the Walkway over the Hudson (a former rail bridge).

The railroad itself is a particularly prominent visual element in the landscape where it crosses waterways on bridge structures and causeways. The Spuyten Duyvil Bridge swing span bridge over the Harlem River, the rail bridges over Croton Bay and Peekskill Bay, the New Hamburg Railroad Bridge over the Wappinger Creek, and the Livingston Avenue swing span over the Hudson River are several of the notable and largest bridge crossings along the Empire Corridor South.

Because of the extensive width of the Hudson River along the railroad, where it extends along the riverbank, the railroad is most visible from the opposite river bank when trains are passing. Where the railroad extends inland, it is visible only from adjoining roadways and developments. Even in some of the more densely populated areas, such as New York City, the views of the railroad can be obscured by its location in tunnels, its location in cuts, or by vegetation particularly where the railroad extends along the river's edge.

Views from the Railroad

The detailed county by county description of views from the railroad is presented in Appendix G.16. Where the railroad runs aboveground, the viewshed in **Manhattan** is entirely urban, with views of adjoining highways, bridges, multi-story buildings, as well as parks and playgrounds. The Hudson River includes greenery and dominates the views to the west, and the landform is flat.

In the Hudson River Valley, the railroad closely follows the edge of the Hudson River in many locations. Views to the west are of the Hudson River, and of the forested buffer on both sides of the rivers. The railroad passes through a mix of urban downtown areas, particularly near many of the station locations, such as Yonkers in **Bronx County**, and rural residential landscapes. The views from the railroad include high bridges over the Hudson River, including the I-95/George Washington Bridge and the Tappan Zee Bridge (I-287) and the railroad that extends along the opposite river bank.

Further north, the views transition from a primarily urban landscape to a rural forested landscape with coves and high bluffs. Further north in **Westchester County**, the railroad extends inland on curves and through the scenic areas within the Hudson Highlands, where there are several short tunnels and the railroad is flanked by steep terrain. There are also crossings of inlets and bays where the railroad is built on causeways that include bridges to drain the associated rivers and streams. In areas where the railroad heads inland, the views include forest or marsh areas. In **Putnam County**, scenic views of forested bluffs include the West Point Military Academy on the west river bank and the railroad continues through Hudson Highlands State Park, before passing through two tunnels before continuing into Dutchess County.

In **Dutchess County**, the railroad continues to closely border the east river bank and passes through Hudson Highlands State Park and crosses through the Estates District and extends in the vicinity of a number of historic estates and parks continuing north between Hyde Park and Staatsburg. The railroad continues on a causeway across Vanderburgh Cove, passing through Rhinecliff-Kingston Station, before passing through a tunnel and over another causeway over Tivoli Bay, another Hudson scenic district.

In **Columbia County**, the railroad continues to closely follow the east river bank particularly on the south side of the county. Views from the railroad are dominated by forested vegetation, open space, and the Hudson River and its islands and marshes on the southern half of the county. The railroad extends past several islands where it extends along the shoreline. To the north, the railroad passes another island (Middle Ground Flats), north of the Hudson Station, where the railroad extends across a long causeway over North Bay. To the north, the railroad extends past the Hudson River Islands, where it extends on causeway over several coves.

The viewshed in the **Rensselaer County** section varies from forested and agricultural to urban, with the urban areas clustered in and around the city of Rensselaer at the north end of the county. The southern third of Rensselaer County continues alongside the island in the Hudson River (Schodack Island/Castleton Island State Park. The railroad extends under the Castleton Bridge (Berkshire Connector of the New York State Thruway) and continues along the bank of the Hudson River past the north end of Schodack Island, passing through the village of Castleton-on-Hudson. Just outside the city of Rensselaer, the adjoining uses along the river and extending into the city include industrialized uses and fuel tank farms. Approaching the Albany-Rensselaer Station, there are views of the Albany skyline across the river, and adjoining urbanized areas also include residential neighborhoods and office buildings.

<u>Empire Corridor West/Niagara Branch (90/110 Study Area/125 Study Area)</u>

Views of the Railroad

The predominant landscape types along the majority of Empire Corridor West are farmlands and forestland. The views of the railroad in the thirteen or fourteen counties along the Empire Corridor West/Niagara Branch (for both the 90/110 Study Area and the 125 Study Area) are limited to some degree since this area, outside the cities and towns along the corridors, is predominantly rural agricultural, with more limited opportunities for views by passerbys and residents. Moreover, due to the schedule for the Amtrak service and speeds of the trains, the Amtrak trains are not expected to disrupt views of the rural landscape, as these would be quick and infrequent passbys providing fleeting views of the train.

Vantage points of the railroad are limited to adjoining roads or developments. Outside of urbanized areas, the railroad is visible where it parallels or crosses portions of the New York State Canal System and the New York State Thruway (I-90) and Route 5. In many locations, even where the railroad adjoins these features, vegetation obscures existing views of the railroad tracks from adjoining roadways, canals, and development. The majority of the landscape is relatively flat, particularly in rural agricultural areas, and the railroad tracks may only be visible when trains are passing, particularly in areas where vegetation screens the right-of-way from view.

In Erie and Niagara Counties, the railroad extends close to Lake Erie and Niagara River, and is an integral element of the waterfront in these locations.

Several of the notable bridges where the railroad is more visible include the Mohawk River in Schenectady, Erie Canal along the south side (outlet to) Onondaga Lake, and the bridge over Canada Creek, the bridge over the Montezuma Marshes near Savannah, and the Genesee River Bridge in Rochester. Where these bridges are in remote locations (Montezuma Marshes) or are constructed at close to the existing grade, they may not necessarily be a prominent visual element of the landscape to users. However, even where vegetation obscures views of the railroad, the tracks remain visible at overpassing roadway bridges, and the rail bridges are visible at underpassing roadways.

Views from the Railroad: 90/110 Study Area

The detailed county by county description of views from the railroad is presented in Appendix G.16 and is summarized below. After crossing the Livingston Avenue Bridge into **Albany County**, the viewshed includes parks/greenways along the river and industrialized waterfront development in the city of Albany. The eastern half of the county includes adjoining or overpassing highways and interchange ramps for I-90 (New York State Thruway) and I-87 at the crossing just past the city limits.

In the city of Schenectady in **Schenectady County**, the views from the train include views of institutional uses and the downtown business district. To the north, the railroad extends through increasingly more rural forested areas with pockets of farmlands to the north. Views includes intermittent views of Route 5 and the Mohawk River/Erie Canal where the railroad parallels or crosses these features.

The eastern half of the Empire Corridor West is quite scenic as the railroad closely follows the Mohawk River/Erie Canal to Herkimer. In **Montgomery County**, the railroad closely parallels Route 5 and the Mohawk River/Erie Canal throughout much of the county. Views throughout the county are of predominantly rural agricultural, forested, and residential lands. Urban viewsheds are largely limited to the city of Amsterdam, with the Amsterdam Amtrak Station; the village of Fonda; and the village of St. Johnsville. The railroad continues to parallel Route 5 and the Mohawk River/Erie Canal throughout much of **Herkimer County.** The viewshed along the railroad consists of forest, agricultural, and rural residential uses outside the cities of Little Falls and Herkimer.

In **Oneida County**, the railroad closely adjoins a section of Route 5S to the west, passing into industrialized areas surrounding the Utica Boehlert Transportation Center at Union Station at the northern edge of city. The railroad is set back from the Erie Canal in Rome and further west, the railroad continues through farmlands, wetlands, forestlands. Entering **Madison County**, the railroad extends through the less developed areas of the city of Oneida. The viewshed in the county is predominantly forest land and agricultural land with urban development concentrated in the middle of the county in the village of Canastota. The railroad adjoins the Old Erie Canal through portions of the county.

Crossing into **Onondaga County**, the viewshed continues to be primarily agricultural and forested and includes views of the Erie Canal and Onondaga Lake. The railroad extends through increasingly urbanized and industrial/commercial areas in and around the city of Syracuse, with views of the

Syracuse Regional Transportation Center, Alliance Bank Stadium, Dewitt Yard and the State Fairgrounds, west of the city.

In **Cayuga and Wayne counties**, the primary viewshed consists of agricultural and forest lands with rural, low-density development, and views of the Erie Canal where the railroad adjoins or crosses the canal in several locations. In this project segment, the railroad also crosses marshes within the Montezuma National Wildlife Refuge.

In **Monroe County**, the viewshed includes the Erie Canal, where it adjoins the railroad and areas of forested/undeveloped areas with lower density development outside of the city of Rochester. Approaching the city, the views become increasingly urban and dominated by hardscape, with parking lots, businesses, and industries closely adjoining the railroad. The viewsheds in the city include Rochester Station, railyard, the Rochester public market, and Frontier Field other crossing highways.

In **Genesee County**, the viewshed is primarily agricultural with smaller areas of forest and views of residential and scattered commercial/industrial uses. In **Erie County**, the viewshed from the railroad consists primarily of agricultural and forested lands. The viewshed becomes increasingly urban approaching the city of Buffalo where the railroad passes by Buffalo-Depew and Buffalo Exchange stations, with views of Frontier railyard, Buffalo Terminal, and Coca Cola Field.

Entering **Niagara County**, the railroad passes through the Gateway Park on the Erie Canal and continues on a raised forested embankment through densely developed neighborhoods in the city of North Tonawanda, and continues at-grade through less densely developed industrial areas approaching the Niagara River riverfront to the north. Approaching the city of Niagara Falls, the viewshed becomes more urban, and the railroad crosses under I-190 through industrialized areas before extending north of the Niagara Falls yard to the Niagara Falls International Railway Station and Intermodal Transportation Center (Niagara Falls Station) in downtown.

Views from the Railroad: 125 Study Area

The detailed county by county description of views from the railroad is presented in Appendix G.16. In **Rensselaer County** (MPs QH142 to QH143), Alternative 125 would follow along the existing the Empire Corridor north to the Albany-Rensselaer Station, then would continue south to a new crossing of the Hudson River. The views along this mile would be largely residential and industrial, along with the views of the Hudson River to the west.

In **Albany County**, the 125 Study Area extends through industrialized waterfront, then would follow interstate highways between the I-787 convergence with the New York State Thruway (I-87) and the Schenectady County line. Entering **Schenectady County**, the 125 Study Area continues to follow the New York State Thruway (I-90), and the corridor extends north of I-90 alongside industrial and residential areas, passing along the outskirts of the more urbanized area in the town of Rotterdam.

The landscape through the remainder of Empire Corridor West is primarily rural or undeveloped with, agricultural lands or low-density development. In **Schoharie County**, the corridor continues adjacent to, and south of, U.S. Route 20, a New York State scenic byway, over a distance of approximately 8.5 miles. The corridor extends through primarily forested and agricultural lands. In **Montgomery County**, the 125 Study Area extends through predominantly rural agricultural and forested areas that bypass urban areas and villages. In **Herkimer County**, the viewsheds consist predominantly of rural agricultural and forestlands, with the majority of urban views where the corridor crosses the southern outskirts of the village of Ilion. The 125 Study Area would provide views of primarily rural agricultural and forested lands in **Oneida County.** In **Madison County**, the corridor would provide views of largely rural forested and agricultural lands, passing through relatively undeveloped lands on the outskirts of the city of Oneida.

In **Onondaga County**, the 125 Study Area provides views of primarily agricultural and forested areas where it extends through the eastern part of the county, rejoining the 90/110 Study Area in the village of Minoa on the south side of the Dewitt Rail Yard. From this point, the views are the same as for the 90/110 Study Area where it extends through downtown Syracuse, as described in the previous section. Outside and west of the city, just east of the Camillus Airport, the 125 Study Area deviates from the 90/110 Study Area to the northwest, extending through primarily rural agricultural and forested lands.

In **Cayuga and Wayne counties**, the viewshed consists primarily of rural agricultural and forested lands. In **Monroe County**, the 125 Study Area extends through primarily residential neighborhoods, crossing Route 31F, which is fronted by commercial uses before rejoining the 90/110 Study Area near the Fairport Village line and following the existing railroad where it extends through the city of Rochester, as described above. The 125 Study Area diverges from the 90/110 Study Area just east of the I-490 crossing west of the city of Rochester, where more urban/industrial viewsheds closer to the interstate transition to largely forested viewsheds, with more rural agricultural lands to the west.

In **Genesee County** and the eastern portion of **Erie County**, the viewsheds consist primarily of rural agricultural and forested rural landscapes. Where the 125 Study Area turns south, crossing the New York State Thruway, views of more urban, commercial/industrial areas are more prominent along Route 31 and where the corridor merges with the 90/110 Study Area approaching Cheektowaga and the Buffalo-Depew Station.

4.17.4. Environmental Consequences

<u>Comparison of Alternatives</u>

Long-term visual impacts will be minimal under the Base Alternative, Alternative 90A, and the Preferred Alternative, Alternative 90B. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. The proposed work will include the addition of track, as well as maintenance service roads in selected areas.

Alternative 110 would involve a greater degree of long-term visual impacts with greater displacements and tracks extending outside of the right-of-way, and Alternative 125 would involve the greatest visual impacts, with a new, grade-separated, electrified corridor (with overhead catenary) between Albany-Rensselaer Station and Buffalo. The Preferred Alternative will involve lesser impacts than these Build Alternatives, but comparatively more impacts than the Base or 90A Alternatives. Short-term impacts related to construction activities are discussed in Section 4.25.3. Appendix G.16 provides further discussion of potential visual effects of the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

Alternative 90B (Preferred Alternative)

Empire Corridor South

For Alternative 90A improvements included in the Preferred Alternative, visual impacts are not anticipated to occur. It is anticipated that work will be contained within the right-of-way, and, for the most part, for track and signal improvements, no significant changes in the visual appearance of railroad facilities, or views from the railroad, are anticipated. There are six Scenic Areas of Statewide Significance in the vicinity of these Alternative 90B improvements. As described in detail under Section 4.11.4 ("Coastal Resources"), no changes in the visual quality of these SASSs would occur as a result of Alternative 90B.

Replacement of the Livingston Avenue Bridge may also change the appearance of this crossing, depending on the configuration of the improved historic rail bridge. A rehabilitated structure or structure with a similar design and height would involve less of a change in the visual appearance of the bridge. A change in the appearance or construction of the bridge may not involve an adverse aesthetic impact, but may change the historic contextual appearance of the bridge.

Empire Corridor West/Niagara Branch

The impacts of the Preferred Alternative include impacts from Alternative 90A station projects. As part of Alternative 90B, the following visual changes would occur:

- New station buildings would be constructed at Amsterdam and Buffalo-Depew stations. These station improvements proposed under Alternative 90B are anticipated to improve the appearance of these facilities.
- The additional track improvements for Alternative 90B, the Preferred Alternative, would involve a nominal change in the appearance of the railroad, where areas of third and fourth tracks are proposed to be added, as an additional third or fourth track will likely not be highly visible. In many locations, the tracks are not visible from adjoining properties or vantage points, unless the trains are running on them, or the right-of-way is screened by vegetation, buildings, or slopes. The views from the tracks should not change markedly with the proposed improvements. However, the additional tracks may involve clearing of forest, or property changes/impacts, which may change views of and from the tracks. There would also be more frequent service than for the Base Alternative (although the same frequency of service as Alternative 90A), and trains running on the new tracks would be closer to adjoining properties. Also, modifications to some bridges may be required, which could involve nominal changes in the appearance of the affected crossings.
- The Revolutionary Trail Scenic Byway (Route 5/29) extends alongside the length of the Empire Corridor and the Mohawk River/Erie Canal from Route 5 in Schenectady County to Herkimer, then follows Route 5S and the Erie Canal to Utica and continues northwest along Route 49 and the Erie Canal to Rome in Oneida County. Portions of Route 5 would need to be relocated, but the relocation is anticipated to be a relatively minor in nature and moved only a short distance from the existing route. Therefore, Alternative 90B would not affect the scenic qualities of the byway and the setting.
- Alternative 90B proposes three flyovers along the corridor, at MP 279, MP 366, and MP 427. The first flyover (MP 279) would extend through lightly forested and rural agricultural land, with scattered residences set back at least 500 feet and an at-grade road crossing set back 700 feet. Currently it is not known how tall or extensive the flyovers will be, but this would introduce a

new visual element that may not be visible from the closest houses, depending on the lateral and vertical extent of the structure.

- The second flyover (MP 366) is surrounded by lightly forested land, with residential areas just a few hundred feet southwest of the existing railroad and parkland to the north. This flyover will be situated north of the I-490 & 441 interchange. Depending on the height of the flyover, the flyover may be visible from residential areas and the adjoining parkland, and would introduce a new visual element that would be more prominent than the at-grade railroad.
- Only the 90B Alternative will have a flyover at MP 427, one mile west of the Buffalo-Lancaster Airport. The views from the railroad would primarily be open fields and manufacturing and distribution plants. This would introduce a new visual element, but the affected area is primarily industrial or undeveloped. The railroad is set back approximately 1,000 feet from Walden Avenue, to the north, thereby limiting views from residential properties.
- Double track along the Niagara Branch between MPs QDN2 and QDN7 is proposed, but is anticipated to be contained within the right-of-way in this heavily urbanized area.

4.17.5. Potential Mitigation Strategies

The visual impacts of the program for the Preferred Alternative, Alternative 90B, can be minimized through design of more visually prominent facilities, such as stations and bridges, to improve the aesthetic characteristics. In the area of canal crossings and historic parks, design of bridge abutments, retaining walls, and other structures can consider aesthetic treatments to be consistent with the park environs and setting. Use of vegetated buffers can effectively screen the rail facilities from adjoining areas where there is adequate room for plantings. Consultation with agencies with jurisdiction over the canals and parks would be performed, as appropriate, to obtain input into the development of improvement project design concepts.

4.17.6. Future Analysis

The Tier 2 analysis will consider the visual impact and characteristics in the planning and design of the facilities proposed for Alternative 90B, the Preferred Alternative. The focus would be on design of above ground facilities, which would be more visually-prominent, such as elevated sections, flyovers, stations, and bridges, and areas of visual sensitivity, such as canal crossings, designated scenic areas and parks.

4.18. Farmlands

4.18.1. Regulatory Context

The Federal Farmland Protection Policy Act (FPPA) protects certain soil types which do not have to be currently used for cropland, but excludes urbanized areas. For the purpose of FPPA, farmland includes prime farmland and land of statewide importance.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.

Farmland of statewide importance is land other than prime farmland but that is also highly productive. This is land, in addition to prime farmland, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops.

The State of New York farmland protection program includes the Agricultural District Law (Agriculture and Markets Law- Article 25-AA enacted in 1971) that created 341 agricultural districts containing approximately 21,500 farms (covering about 30% of the state) by April 2002. This protection also mandates that state agencies and local governments and public benefit corporations avoid or minimize impacts on farmland operations within agricultural districts for projects that may involve farmland acquisition or publicly funded construction.

4.18.2. Methodology

Actively farmed areas were identified through review of the U.S. Department of Agriculture 2009 croplands and aerial photography. Federally protected prime farmland and farmland of statewide importance for study areas within 300 feet of the corridor centerline for all alternatives were characterized using available soil survey mapping.

Prime farmland and farmland of statewide importance were initially identified through review of soil survey mapping prepared by the Natural Resources Conservation Service, and the 2010 Census-defined urbanized areas were overlaid with this to exclude urbanized areas. The definition of farmland under the Federal Farmland Protection Policy regulations (7 CFR 658.2) states that *"'Farmland' does not include land already in or committed to urban development or water storage. Farmland 'already in' urban development or water storage includes all such land with a density of 30 structures per 40-acre area. Farmland already in urban development also includes lands identified as 'urbanized area' (UA) on the Census Bureau Map, or as urban area mapped with a 'tint overprint' on the USGS topographical maps, or as 'urban-built-up' on the USDA Important Farmland Maps.*"

The state-designated Agricultural Districts were identified using information obtained from the New York State Department of Agriculture and Markets and the New York State GIS Clearinghouse. The districts for study areas within 300 feet of the corridor centerline for all alternatives were characterized, without consideration given to whether these districts were within Census-defined urban areas.

Impact assessment focused on areas where design located tracks or maintenance service roads outside of the right-of-way, and aerial photos and protected farmland mapping were reviewed to identify potential farmland impacts in these locations.

4.18.3. Existing Conditions

Exhibit 4-21 shows that the 125 Study Area contains roughly twice as much prime farmland as the 90/110 Study area. Appendix G.17 presents more detailed information on prime farmlands, including locations of prime farmlands, agricultural districts, and croplands.

Within the 90/110 Study Area, twenty counties contain approximately 4,015 acres of prime farmland (and an additional 1,984 acres if drained) within 300 feet of the corridor centerline, excluding urbanized areas (as defined by the 2010 U.S. Census). The non-urbanized portion of the study area contains approximately 2,040 acres of farmland of statewide importance. This study area includes approximately 3,667 acres of state-designated Agricultural Districts. The rural areas along Empire Corridor West and Niagara Branch contain the majority of farmland within the study area (approximately 90 percent of both prime farmland and Agricultural Districts).

Exhibit 4-21—Federally and State-Designated Farmlands in the 90/110 and 125 Study Areas

Counties	Prime farmland soils (acres)		Prime farmland, if drained (acres)		Farmland of Statewide Importance (acres)		Agricultural Districts (acres)	
	90/110 mph	125 mph	90/110 mph	125 mph	90/110 mph	125 mph	90/110 mph	125 mph
New York	0	0	0	0	0	0	0	0
Bronx	0	0	0	0	0	0	0	0
Westchester	59	59	2	2	40	40	0	0
Putnam	9	9	1	1	1	1	0	0
Dutchess	120	120	21	21	233	233	113	113
Columbia	69	69	7	7	102	102	148	148
Rensselaer	148	148	0	0	17	17	126	126
Albany	8	64	0	0	26	89	0	0
Schenectady	163	56	0	403	39	263	12	159
Schoharie		132		104		79		25
Montgomery	484	56	6	770	88	488	610	1,078
Herkimer	328	216	4	286	19	460	159	82
Oneida	295	827	270	357	87	111	24	374
Madison	133	244	193	60	154	335	132	366
Onondaga	351	473	256	140	169	319	39	464
Cayuga	266	362	24	90	284	160	223	806
Wayne	609	1,246	138	298	268	271	1,004	2,214
Monroe	155	215	214	76	33	43	118	267
Genesee	755	1,002	463	427	338	369	650	1,476
Erie	60	243	332	283	133	80	225	384
Niagara	3	3	52	52	9	9	84	84
TOTAL	**3,295**	**4,522**	**1,686**	**3,017**	**1,679**	**2,993**	**3,667**	**8,164**

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 300 feet of the corridor centerline.

Source: Natural Resources Conservation Service, New York Department of Agriculture and Markets, New York State GIS Clearinghouse

Within the 125 Study Area, twenty-one counties contain approximately 5,544 acres of prime farmland (and an additional 3,377 acres of prime farmland, if drained) within 300 feet of the corridor centerline. The non-urbanized portion of the study area contain approximately 3,470 acres of farmland of statewide importance. This study area includes approximately 8,164 acres within state-designated Agricultural Districts. The rural areas along the Empire Corridor West and Niagara Branch within the 125 mph study area contains the majority of farmland (approximately 93 to 95 percent of prime farmland and Agricultural Districts).

Empire Corridor South

The Empire Corridor South extending north from (and including) New York through the Hudson Valley to Rensselaer County includes three urbanized counties. All of the Build Alternatives follow the existing Empire Corridor South for the majority of its length, deviating only in Rensselaer County, where Alternative 125 splits off 1.6 miles south of where the existing Empire Corridor turns to the west. The study area within the seven counties of Empire Corridor South contains 405 acres of prime farmland (31 additional acres of prime farmland if drained), 393 acres of farmland of statewide importance, and 387 acres of Agricultural Districts.

Empire Corridor West/Niagara Branch: 90/110 Study Area

The Empire Corridor West and Niagara Branch extending west of (and including) Albany to Niagara Falls includes large tracts of agricultural land within the 600-foot-wide study area. The study area in the thirteen counties contains a total of 3,610 acres of prime farmland, an additional 1,952 acres of prime farmland if drained, and 1,647 acres of farmland of statewide importance. Approximately 3,280 acres of the study area between (and including) Albany County and Niagara County are within state-designated Agricultural Districts.

Empire Corridor West/Niagara Branch: 125 Study Area

The 125 Study Area follows a more direct route between Rensselaer and Buffalo, which bypasses several of the major metropolitan areas and stations sites (Schenectady, Amsterdam, Utica, and Rome) along the Empire Corridor West and extends through more rural and agricultural areas. Within the 600-foot wide study area of the 125 Study Area in the Empire Corridor West/Niagara Branch, there are fourteen counties containing a total of 5,139 acres of prime farmland, an additional 3,346 acres of prime farmland if drained, and 3,076 acres of farmland of statewide importance. Approximately 7,779 acres of the study area from Albany County and Niagara County are within state-designated Agricultural Districts.

4.18.4. Environmental Consequences

Comparison of Alternatives

The following sections describe impacts to mapped areas of prime farmland soils (including soils of statewide importance) and state-designated Agricultural Districts. However, review of aerial mapping indicates that the Base Alternative, Alternative 90A, and the Preferred Alternative, Alternative 90B, would have minimal long-term impacts to actively-farmed areas and little or no impacts to active farms outside of the right-of-way. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. The proposed work will include the addition of track, as well as maintenance service roads in selected areas. Alternative 110 may have isolated impacts to actively farmlands in one or more locations. Alternative 125 would involve substantially greater impacts to farmland as it extends on new alignment through primarily rural areas. Short-term impacts related to construction activities are discussed in Section 4.25.3. Appendix G.17 presents additional information on potential impacts of the other alternatives considered, and the following section addresses potential effects of the Preferred Alternative.

<u>Alternative 90B (Preferred Alternative)</u>

Empire Corridor South

Along Empire Corridor South, farmland impacts are not anticipated to occur. The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects. With Alternative 90B, signal improvements proposed along 43 miles (MPs 32.8 and 75.8) extend through urban areas (Westchester and Dutchess Counties) with limited areas of prime farmland in Putnam County. Only one location is close to an Agricultural District, but work will be contained within the right-of-way and no protected farmland impacts are expected.

Empire Corridor West/Niagara Branch

The impacts of the Preferred Alternative include impacts from the following Alternative 90A projects.

- The eastern five miles of approximately 10 miles of third track between MPs 169 and 178.5, that include Amsterdam Station improvements, in eastern Montgomery County and extending into Schenectady County includes areas of prime farmland and extends close to Agricultural Districts in a few locations. However, this work could be contained within the existing right-of-way.
- Further to the west, the addition of a third track along 11 miles located largely west of the designated urban area around Rochester, and work outside of the right-of-way may affect prime farmlands and Agricultural Districts. However, the majority of the work would be located within the right-of-way.
- Although the proposed double track (MPs QDN17 to QDN23.2) along the Niagara Branch is located within an urban area, work outside the right-of-way in this area may affect Agricultural Districts.

Improvements for the Preferred Alternative, Alternative 90B, start at MP 160 in the City of Schenectady, which is within an urban area that extends west to MP 168.

- The third track at the connection to the Selkirk Branch at MP 168.3 in Schenectady County may affect mapped areas of prime farmlands and borders on urban area, south of the railroad.
- Work that may extend outside of the right-of-way may occur at Amsterdam Station and at MPs 179, 192, and 200 in Montgomery County. At MP 192, track realignment at a curve would extend outside of the right-of-way, but this is outside (but close to) prime farmlands and an Agricultural District.
- Construction of a fourth track and maintenance service road may affect a few prime farmlands in Herkimer County near the Montgomery County Line (MPs 210.5 to 214.8). A maintenance service road in this area (MPs 214.25 and 214. 75) may affect an Agricultural District.
- In Genesee County, the addition of a third track and maintenance service road (MPs 397 to 397.5) may occur in close proximity to or may encroach on actively farmed fields that are part of an Agricultural District.

There are also locations where relocations of adjoining roadways may result in indirect impacts to farmlands, but these locations would be better defined in the Tier 2 assessments.

4.18.5. Potential Mitigation Strategies

During the Tier 2 assessment, refinements in design and mapping for Alternative 90B, the Preferred Alternative, will be performed and the project development will incorporate avoidance and minimization of farmland impacts to the extent practicable. This will include avoidance of active farms, prime farmlands, and parcels included within Agricultural Districts to the extent practicable. The Preferred Alternative, Alternative 90B, will result in lesser or no impacts on active farmlands.

If farmland impacts will occur, NYSDOT will comply with the FPPA for acquisition of prime farmlands. NYSDOT will also comply with the State Agriculture and Markets law for work affecting a designated Agricultural District, if any impacts will occur. The U.S. Department of Agriculture (USDA) and the New York State Department of Agriculture and Markets will be consulted regarding farmland impacts and mitigation strategies that are appropriate.

Potential farmland mitigation measures that can be developed in coordination with the federal/state agencies and landowners can include measures such as avoidance and minimization through design measures, such as use of steeper slopes, minimizing embankments, or relocating structures. Other potential mitigation measures that might be considered include:

- installation of cattle (or other) animal crossings,
- improvements to an existing or creation of new farmland access road for farm equipment and vehicles,
- planting of windbreaks to protect crops from wind damage,
- reconfiguring any affected subsurface drainage or irrigation systems or otherwise improving drainage, and
- staging activities to occur at the end of harvest.

Farmland conversion mitigation can include creating conservation easements on alternative farmland parcels or paying a fee to protect farmland.

4.18.6. Future Analysis

Tier 2 assessments will refine the Tier 1 impact assessment based on design for the Preferred Alternative, Alternative 90B, and site-specific mapping and delineation of existing and required rights-of-way. If significant conversions of prime farmland and impacts on state Agricultural Districts are anticipated in the Tier 2 assessment, alternatives actions, locations, and designs will need to be further explored as part of Tier 2 design. If avoidance is not possible, measures to minimize or reduce the impacts should be evaluated, as discussed above.

If conversions of prime farmlands are anticipated to occur, in accordance with the FPPA, NYSDOT will prepare a Farmland Conversion Impact Rating and submit this rating to the USDA Natural Resources Conservation Service (NRCS). This will also require consultation with the State NRCS FPPA contact and a review of alternative actions that do not require farmland acquisition. Avoidance measures and appropriate mitigation would be determined in consultation with the agencies.

4.19. Air Quality

By potentially altering the modal distribution of inter-city travel within New York State, the proposed action may affect ambient air quality throughout the program study area. Direct effects result from program sources, such as emissions from locomotives along the corridor, while indirect effects are a result of emissions generated by non-program sources, such as vehicles traveling to stations and reduced auto travel in the region. When combined, the net change in emissions due to a large program such as the proposed action can also impact area-wide emissions, affecting air quality in one or more areas. Since the current analysis is part of a Tier 1 EIS, detailed site-specific information (e.g. local traffic conditions at stations) is not available at this time; therefore, local (microscale) air quality analyses are limited to screening for potential local impacts from locomotive emissions (worst case of all alternatives was analyzed), and a qualitative discussion of on-road microscale impacts. The net change in area-wide (mesoscale) emissions is analyzed in this chapter for the Preferred Alternative, and evaluated for potential adverse and/or beneficial impacts on air quality. Appendix G.18 presents more detail on the methodology, detailed assessment information (including analysis for non-criteria pollutants and background on conformity requirements and determinations), and impacts assessed for other Build Alternatives.

4.19.1. Regulatory Context

Pollutants for Analysis

Emissions from motor vehicles and locomotives result from combustion of fuels—on-road vehicles are predominantly gasoline- and diesel-powered, and locomotives are almost entirely diesel-powered, other than electric locomotives.

Carbon monoxide (CO), particulate matter (PM), volatile organic compounds (VOC), and nitrogen oxides (nitric oxide, NO, and nitrogen dioxide, NO_2, collectively referred to as NO_x) are all emitted from the combustion of both gasoline and diesel. However, CO emissions are predominantly from gasoline combustion while NO_x and PM emissions are predominantly from diesel combustion. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x, which includes sulfur dioxide (SO_2) and other sulfur oxides), ammonia, organic compounds, and other gases react or condense in the atmosphere. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOC. Since CO, VOC, PM, and NO_x have all been identified as pollutants of concern for public health under the Clean Air Act (CAA), referred to as “criteria pollutants” (see more below), and are emitted from both on-road and locomotive engines, they have all been included in the mesoscale analysis presented below.

Overall, the significant reduction in CO emissions from motor vehicles due to federal regulations over the past few decades have been very successful, and CO concentrations are generally not of concern in New York State, although regulations are maintained to ensure continued compliance. Although CO does not have an area-wide impact, mesoscale CO emissions were nonetheless analyzed to gauge the overall impact of the program on CO emissions.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it has mostly been of concern further downwind from large stationary point sources, and not a local concern from mobile sources. (NO_x emissions from fuel combustion consist of approximately 90 percent NO and 10 percent NO_2 at the source.) However, with the promulgation of the 2010 1-hour average standard for NO_2, local sources such as vehicular and locomotive emissions may become of greater concern for this pollutant.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source exhaust) or from precursor gases reacting in the atmosphere to form secondary PM. Diesel-powered engines are a significant source of respirable PM, most of which is $PM_{2.5}$ and contains adsorbed organic compounds, sulfate, nitrate and metals.

Emissions of SO_2—also a criteria pollutant under the CAA—are currently associated mainly with stationary sources, and sources utilizing non-road diesel such as diesel trains, marine engines, and non-road vehicles (e.g., construction engines). On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Similarly, non-road diesel federal regulations are being phased in requiring the phase out of sulfur in diesel for all uses. Therefore, SO_2 from transportation sources in general will not be an issue of concern beginning in the near future. Similarly, lead in gasoline has been banned under the CAA, and therefore, lead is not a pollutant of concern for the program. Therefore, SO_2 and lead have not been included in this analysis. Further information on non-criteria pollutants that were analyzed (Hazardous Air Pollutants, also referred to as Mobile Source Air Toxics) are presented in Appendix G.18.

National and State Air Quality Standards

As required by the Clean Air Act, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO_2, ozone, respirable PM (both $PM_{2.5}$ and PM_{10}), SO_2, and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The NAAQS are presented in Exhibit 4-22. New York State has also adopted the NAAQS for CO, annual NO_2, and SO_2 as ambient air quality standards, but the standards are defined on a running 12-month basis rather than for calendar years only.

4.19.2. Methodology

Local (Microscale) Analysis

On a local scale, the potential effect of the program on air quality is limited to increases in locomotive emissions, and both increases and decreases in on-road emissions. Decreases in on-road emissions could have a beneficial impact on local air quality if large numbers of vehicle trips are shifted to rail, occurring along roadways where those trips would otherwise occur. Since the details of that shift are not known at this time, this potential benefit has not been analyzed; however, the regional analysis includes a more meaningful analysis of the region-wide benefits of this mode shift. Since these trips may have the potential to adversely affect air quality, this effect will be analyzed in subsequent environmental analyses. Therefore, the remainder of this section focuses on the potential local effect associated with increases in locomotive emissions.

Exhibit 4-22—National Ambient Air Quality Standards

<table>
<tr><th colspan="2">Pollutant</th><th>Primary/ Secondary</th><th>Averaging Time</th><th>Level</th><th>Form</th></tr>
<tr><td colspan="2" rowspan="2">Carbon Monoxide (CO)</td><td rowspan="2">primary</td><td>8 hours</td><td>9 ppm</td><td rowspan="2">Not to be exceeded more than once per year</td></tr>
<tr><td>1 hour</td><td>35 ppm</td></tr>
<tr><td colspan="2">Lead (Pb)</td><td>primary and secondary</td><td>Rolling 3- month average</td><td>0.15 μg/m3 (1)</td><td>Not to be exceeded</td></tr>
<tr><td colspan="2" rowspan="2">Nitrogen Dioxide (NO_2)</td><td>primary</td><td>1 hour</td><td>100 ppb</td><td>98th percentile of 1-hour daily maximum concentrations, averaged over 3 years</td></tr>
<tr><td>primary and secondary</td><td>1 year</td><td>53 ppb (2)</td><td>Annual Mean</td></tr>
<tr><td colspan="2">Ozone (O_3)</td><td>primary and secondary</td><td>8 hours</td><td>0.070 ppm (3)</td><td>Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years</td></tr>
<tr><td rowspan="4">Particle Pollution (PM)</td><td rowspan="2">$PM_{2.5}$</td><td>primary</td><td>1 year</td><td>12.0 μg/m3</td><td>annual mean, averaged over 3 years</td></tr>
<tr><td>secondary</td><td>1 year</td><td>15.0 μg/m3</td><td>annual mean, averaged over 3 years</td></tr>
<tr><td rowspan="2">PM_{10}</td><td>primary and secondary</td><td>24 hours</td><td>35 μg/m3</td><td>98th percentile, averaged over 3 years</td></tr>
<tr><td>primary and secondary</td><td>24 hours</td><td>150 μg/m3</td><td>Not to be exceeded more than once per year on average over 3 years</td></tr>
<tr><td colspan="2" rowspan="2">Sulfur Dioxide (SO_2)</td><td>primary</td><td>1 hour</td><td>75 ppb (4)</td><td>99th percentile of 1-hour daily maximum concentrations, averaged over 3 years</td></tr>
<tr><td>secondary</td><td>3 hours</td><td>0.5 ppm</td><td>Not to be exceeded more than once per year</td></tr>
<tr><td colspan="6">Notes:
(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.</td></tr>
</table>

Source: U.S. EPA, "NAAQS Table,", **https://www.epa.gov/criteria-air-pollutants/naaqs-table**, accessed May 1, 2021.

The results of the dispersion analysis are discussed in the context of background concentrations and the NAAQS. Further details on the assessment methodology are presented in Appendix G.18.

Regional (Mesoscale) Analysis

Criteria Pollutants

The regional (mesoscale) emissions analysis estimates the net change in emissions associated with the program, including the change in both on-road and locomotive emissions. The analysis does not include the vehicle miles traveled (VMT) decrease associated with trips that may be reduced but that do not use the New York State Thruway system. Since these trips would likely not increase rail trips, the analysis is somewhat conservative (i.e., shows lower reductions and higher net emissions). The VMT were then multiplied by the corresponding emission factor and summed for each non-attainment area modelled in the Tier 1 Draft EIS.

Hazardous Air Pollutants

The Clean Air Act Amendments of 1990 listed 188 Hazardous Air Pollutants (HAPs) and addressed the need to control toxic emissions from transportation. EPA's 2007 Mobile Source Air Toxics (MSAT) rule identified a subset of seven HAPs as having significant contributions from mobile sources: benzene, 1,3-butadiene, formaldehyde, acrolein, naphthalene, polycyclic organic matter, and diesel particulate matter (DPM). The Federal Highway Administration (FHWA) also considers these the priority MSATs for analysis.[128] Analysts assessed MSATs using criteria in the Interim Guidance on Air Toxic Analysis in NEPA Documents, issued February 2006 by FHWA and the September 2009 update. Based on the FHWA guidance, the proposed alternatives do not require a detailed quantitative analysis. Nonetheless, in accordance with the program scope, analysts prepared an estimate of the net change in statewide MSAT emissions, as presented in Appendix G.18.

4.19.3. Existing Conditions

Existing conditions, presented as context for the analyses, were presented in the Tier 1 Draft EIS based on existing ambient air quality information collected by NYSDEC in 2011. These pollutant concentrations along the program corridor have been updated based on data obtained from the New York State Department of Environmental Conservation Air Quality Report for 2019. Details on the data and air pollutants are included in Appendix G.18, Exhibit G-36.

NAAQS Attainment Status and State Implementation Plans

The CAA, as amended in 1990, defines non-attainment areas as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by the U.S. EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment. Exhibit 4-23 summarizes the various non-attainment and maintenance areas in the program study area, and their status is reviewed in this section below.

Effective June 15, 2004, the U.S. EPA designated Nassau, Rockland, Suffolk, Westchester, and the five New York City counties (the New York-New Jersey-Long Island non-attainment area, New York portion) as moderate non-attainment for the 1997 8-hour average ozone standard. On February 8,

[128] FHWA, Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents (HEPN-10), September 20, 2009.

2008, NYSDEC submitted final revisions to the SIP to the U.S. EPA to address the 1997 8-hour ozone standard.

In March 2008 the U.S. EPA strengthened the 8–hour ozone standards. U.S. EPA designated the New York portion of the New York–Northern New Jersey–Long Island, NY-NJ-CT non-attainment area (NAA) as a moderate NAA for the 2008 ozone NAAQS, effective July 20, 2012. In 2015, the U.S. EPA revised the 2008 ground-level ozone standard from 75 ppb to 70 ppb to increase protection for public health and at-risk groups.

Manhattan has been designated as a moderate non-attainment area for PM_{10}. On January 30, 2013, New York State requested that U.S. EPA approve its withdrawal of the 1995 SIP and redesignation request for the 1987 PM_{10} NAAQS, and that U.S. EPA make a clean data finding instead, based on data monitored from 2009-2011 indicating PM_{10} concentrations well below the 1987 NAAQS. Although not yet a redesignation to attainment status, if approved, this determination would remove further requirements for related SIP submissions.

The five New York City counties and Nassau, Suffolk, Rockland, Westchester, and Orange Counties are no longer designated as a $PM_{2.5}$ non-attainment area. New York State submitted a redesignation request and maintenance plan to U.S. EPA in 2013. U.S. EPA had lowered the annual average primary standard to 12 μg/m^3. The New York City Metropolitan Area is also no longer designated as non-attainment with the 2006 24-hour $PM_{2.5}$ NAAQS. Based on monitoring data from 2007-2011, 24-hour average concentrations of $PM_{2.5}$ in this area no longer exceeded the standard. New York had submitted a "Clean Data" request to the U.S. EPA. New York State submitted a redesignation request and maintenance plan to U.S. EPA in 2013. In April 2014, this redesignation as a maintenance area went into effect.

All areas in New York State are currently in attainment of the annual-average NO_2 standard. Based on data from existing monitoring stations, the U.S. EPA has designated the entire State of New York as "unclassifiable/attainment" effective February 29, 2012.

Exhibit 4-23—Non-Attainment Areas in the Study Area

Pollutant	Non-Attainment Area	Severity	Counties
Ozone (8 hour) (2015 standard)	New York-N. New Jersey-Long Island, NY-NJ-CT	Moderate	Bronx Kings Nassau New York Queens Richmond Rockland Suffolk Westchester
PM_{10} (1987 standard)	New York County	Moderate	New York

Source: U.S. EPA, Greenbook, "Current Nonattainment Counties for All Criteria Pollutants," **https://www3.epa.gov/airquality/greenbook/ancl.html**, current as of April 30, 2018, accessed May 1, 2018.

Based on the available monitoring data, all areas in New York State currently meet the new 1-hour SO_2 standard.

In 2002, the U.S. EPA redesignated New York City as in attainment for CO. Under the resulting maintenance plan, New York City is committed to implementing site-specific control measures throughout the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period. The Syracuse area (Onondaga County) is also a maintenance area for CO.

4.19.4. Environmental Consequences

This air quality assessment addresses and compares the long-term impacts of the Preferred Alternative, Alternative 90B, to those of the other alternatives considered, including the Base Alternative. The results of two analyses are included below. A local (microscale) screening is based on the concentration of the pollutants of interest at a specific location. Regional (mesoscale) analyses present the overall change in pollutant emissions. The potential effects of other Build Alternatives and analysis methodology for local and regional are described in more detail in Appendix G.18. Short-term impacts due to construction activities are discussed in Section 4.25.3.

Local (Microscale)

Screening Results

The results of the screening analysis, representing the effect of locomotive emissions along the track and at stations, is presented in Appendix G.18. The resulting concentrations are lower than the NAAQS for both annual-average NO_2 and $PM_{2.5}$—the two critical pollutants for this analysis, indicating that operations of the Preferred Alternative (Alternative 90B) would not result in a significant adverse impact with respect to these standards.

Regional (Mesoscale)

To present these emission changes in context, the emissions were compared with the emissions projected to occur in each analysis area in 2035 from the on-road sector.[129, 130]Although the changes are small in the regional context, the net result is a reduction in all pollutants other than NO_x. The projected increase in NO_x emissions and decrease in VOC emissions represent less than 0.3 percent of emissions in each area (varies by region and alternative). Changes in particulate matter would be negligible. Overall, in all cases these changes range from very small to negligible.

The total net change in criteria pollutant emissions from Alternative 90B (the Preferred Alternative), are presented in Exhibit 4-24 and emissions from Alternatives 90A, 110, and 125 are presented in Appendix G.18. The Preferred Alternative will result in a net reduction of 61 tons per year of CO in the New York-New Jersey-Long Island non-attainment area (for 8-hour ozone) and 44 tons in the Syracuse area, with smaller reductions on VOCs (between 1.8 to 4 tons in the five cities analyzed).

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[129] NYMTC/OCTC, Final Transportation/Air Quality Conformity Determination for the Orange County Portion of the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area, May 12, 2010; PDCTC, Air Quality Conformity Determination Statement for the Poughkeepsie Ozone Non-attainment Area, May 12, 2010.

[130] For the Syracuse, Albany, Rochester, and Buffalo areas, future inventories or budgets were not available. The estimate is based on the ratio of 2008 NO_x emissions in each region (or CO for Syracuse) to the emissions in the NYMA, from the EPA National Emissions Inventory.

Exhibit 4-24—Criteria Pollutant Emissions Net Reduction, 2035, Alternative 90B, Preferred Alternative (tons per year)

Analysis Area	NO_x	VOC	CO	PM_{10}	$PM_{2.5}$
Albany-Schenectady-Troy, NY	-8.0	4.0	NA	NA	NA
Rochester, NY	-3.1	5.0	NA	NA	NA
Buffalo-Niagara Falls, NY	-1.2	1.8	NA	NA	NA
Poughkeepsie, NY	-2.6	1.8	NA	NA	NA
New York-N. New Jersey-Long Island, NY-NJ-CT (ozone 8-hour non-attainment area)	-1.5	2.3	61	NA	0.24
Syracuse, NY	NA	NA	44	NA	NA
New York Co, NY (PM_{10} non-attainment area)	NA	NA	NA	0.00	NA
Notes: NA=Not Applicable. Data presented address only pollutants relevant to each former or current non-attainment area. Negative numbers represent a net increase.					

Conformity with State Implementation Plans

The conformity requirements of the CAA and regulations promulgated thereunder (conformity requirements) limit the ability of federal agencies to assist, fund, permit, and approve projects in non-attainment areas that do not conform to the applicable SIP. When subject to this regulation, the lead agency is responsible for demonstrating conformity for its proposed action. Conformity determinations for federal actions other than those related to transportation plans, programs, and projects that are developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601 et seq.) must be made according to the requirements of 40 CFR 93, Subpart B (federal general conformity regulations).

The general conformity regulations apply to those federal actions in non-attainment or maintenance areas where the action's direct and indirect emissions have the potential to emit one or more of the six criteria pollutants at rates equal to or exceeding the prescribed rates.

General conformity *De Minimis* Threshold Levels for various non-attainment areas and maintenance areas intersecting the program study area are presented in Exhibit 4-25.

Exhibit 4-25—General Conformity Threshold Levels

Non-Attainment Area and Pollutants	Tons per year
Ozone, other non-attainment areas inside an ozone transport region– VOC NO_x	 50 100
CO, maintenance areas	100
PM_{10}, Moderate non-attainment areas	100
$PM_{2.5}$, any non-attainment area Direct emissions SO_2 NO_X	 100 100 100

Sources: 40 CFR 93.153(b)

The general conformity requirements do not apply to federal actions that:

- Do not satisfy either one of the above conditions (where the action's direct and indirect emissions have the potential to emit one or more of the six criteria pollutants at rates equal to or exceeding the threshold levels above within a non-attainment or maintenance area);
- Occur in an attainment area;
- Are related to transportation plans, programs, and projects developed, funded, or approved under Title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601); or
- Qualify for exemptions established at 40 CFR 93.153.

The regulation assumes that a proposed federal action whose criteria pollutant emissions have already been included in the local SIP's attainment or maintenance demonstrations conforms to the SIP.

The program's effect on emissions within the relevant nonattainment areas and applicability of the conformity regulations for operational emissions have been evaluated as part of the regional (mesoscale) emissions analysis.

4.19.5. Potential Mitigation Strategies

This Tier 1 analysis focused on net regional (mesoscale) emissions and on potential increases in concentrations along rail lines. In both cases, no potential significant adverse air quality impacts were found, and therefore, no mitigation will be required. If future analyses of local on-road and locomotive emissions identify potential impacts for Alternative 90B, the Preferred Alternative, appropriate site-specific mitigation can be investigated.

4.19.6. Future Analysis

Tier 2 analysis for the Preferred Alternative, Alternative 90B, can include the potential air quality implications of local traffic to and from stations, and of locomotives and other sources operating in rail yards and other locations other than the line-haul analyzed here for the Tier 1 assessment, as appropriate. If the project is not included in the State Implementation Plan, an applicability analysis can be performed to determine if a general conformity analysis will be performed, if required. In addition, should in line-haul operations change substantially, microscale line-haul and mesoscale emissions likely can be investigated.

4.20. Energy and Climate Change

Potential effects of global climate change on the program alternatives and potential effects of the program alternatives on energy consumption and greenhouse gas (GHG) emissions are assessed in this section. Therefore, this chapter does not identify specific contributions of the proposed program to climate impacts, but rather addresses the changes in GHG emissions associated with each of the program alternatives as compared to the Base Alternative.

4.20.1. Regulatory Context

Greenhouse Gas Policy, Regulations, Standards, and Benchmarks

The energy and GHG analysis was prepared in accordance with the *Draft Air Quality, Energy and Greenhouse Gas Emission Analysis Procedures for Plans and TIPs and Draft Energy and Greenhouse Gas Emission Analysis Procedures for Projects*, February 12, 2003, and subsequent guidance and methods provided by NYSDOT. In addition to the NYSDOT methodology, the general approach follows the New York State Department of Environmental Conservation (NYSDEC) policy document entitled *Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements*, July 15, 2009 (NYSDEC policy). The Council on Environmental Quality's (CEQ) final guidance entitled *Final NEPA Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, August 1, 2016, was consulted as well. Greater detail regarding GHG regulations is included in Appendix G.19.

The U.S. EPA has established various voluntary programs to reduce emissions and increase energy efficiency and has recently embarked on regulatory initiatives related to GHG emissions. At the Federal level, the U.S.DOT corporate average fuel economy (CAFE) standards for light duty vehicles was originally set in 2009 but has been updated to include GHG emissions with the intent to reduce vehicular GHG emissions over time.

In January 2021, the new Presidential Administration signed a series of executive orders to promote climate action. One Executive Order proposes the U.S. EPA create a Federal Implementation Plan to control ozone for several states including New York.[131] Another Executive Order contained several climate-related goals to build resilience to mitigate the impacts of climate change for current future intensities. At the state level, in July 2019, New York State passed the Climate Leadership and Community Protection Act (Climate Act)[132] to adopt measures towards two main goals, to achieve 100 percent zero-emission electricity by 2040 and reduce emissions to at least 85 percent below 1990 levels by 2050.

[131] WhiteHouse.Gov. Presidential Actions. 2021, January 20. *Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/*

[132] New York State Senate. 2019. *Senate Bill S6599.* https://www.nysenate.gov/legislation/bills/2019/s6599.

Pollutants of Concern

This analysis focuses mostly on CO_2, N_2O, and methane resulting from combustion sources such as locomotives and vehicles, as well as sources associated with production of construction materials. Greater detail on pollutants of concern can be found in Appendix G.19.

GHGs are gaseous constituents that absorb and emit infrared radiation (heat) which causes the general warming of the Earth's atmosphere, or the "greenhouse effect." Carbon dioxide (CO_2) is the primary pollutant of concern from anthropogenic sources. removal processes and a relatively high impact on global climate change as compared to an equal quantity of CO_2. There are no significant direct or indirect sources of HFCs, PFCs, or SF_6 associated with the proposed program.

To present a complete inventory of all GHGs, component emissions are added together and presented as CO_2 equivalent (CO_2e)—a unit representing the quantity of each GHG weighted by its effectiveness using CO_2 as a reference. This is achieved by multiplying the quantity of each GHG emitted by a factor called global warming potential (GWP). The GWPs for the main GHGs discussed here are presented in Exhibit 4-26.

Exhibit 4-26—Global Warming Potential (GWP) for Major GHGs

Greenhouse Gas	100-year Horizon GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Oxide (N_2O)	298
Hydrofluorocarbons (HFCs)	124 to 14,800
Perfluorocarbons (PFCs)	7,390 to 12,200
Sulfur Hexafluoride (SF_6)	22,800

Source: IPCC, Climate Change 2007—The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report, Table 2-14, 2007.

Currently, there are no standards or regulations applicable to GHG emission levels or impacts from actions subject to environmental review under NEPA or SEQR. Accordingly, the potential effects of the proposed program have been evaluated in the context of their consistency with the objectives stated in federal and state policies. Appendix G.19 provides additional background on international, federal, and state regulatory framework, policies, and guidance applicable to the GHG emissions assessment.

4.20.2. Methodology

Operational emissions are presented for a single year, 2035, which would be representative of a reasonable worst-case scenario. Emissions related to construction activity and embodied materials would occur over a period prior to and during construction, and are presented both as total emissions and annualized over an estimated 80-year lifetime of the proposed program.

The GHG emissions analysis includes the following sources:

- Locomotives fuel consumption,
- On-road fuel consumption,
- Electricity use (rail only),
- Fuel use for construction material delivery, and
- Building materials production.

Some additional emissions associated with stations and other operations would occur, but are not included at this time since detailed data is not yet available.

Annual emissions that would occur as a result of program operation were conservatively calculated based on the 2035 ridership scenario, representing the maximum emissions associated with the proposed program at full operation. Appendix G.19 describes the methodology used to calculate the GHG emissions from each included source.

4.20.3. Existing Conditions

Consistent with the NYSDOT guidance, GHG analyses are not prepared for existing conditions. In the existing condition, passenger and freight railway operations and maintenance use fuel and occasionally materials, resulting in some energy use and GHG emissions and offsetting energy use and GHG emissions from on-road operations.

4.20.4. Environmental Consequences

Comparison of Alternatives

The long-term impact of the Build Alternatives on energy and greenhouse gas emissions is ultimately always positive, as the on-road benefits persist year after year and eventually offset the initial construction impacts (see Exhibit 4-27 and Appendix G.19). The reduction in energy use and GHG emissions would be 20 percent greater with the Preferred Alternative (Alternative 90B) than Alternative 90A and roughly equivalent to that for Alternative 110 (2% less). For greater detail and comparison of alternatives, see Appendix G.19. The short-term impacts to energy and climate are discussed in Section 4.25.3.

Compared to the Preferred Alternative, Alternative 125 has the greatest potential for decrease in annual energy use (44%) and GHG emissions (by 30%) (see Appendix G.19). However, Alternative 125 is likely to require the greatest quantity of energy and materials for construction. Alternative 90A has the smallest annual benefit but would also require the shortest period to offset the emissions, 20 years, with Alternatives 110 and 125 demonstrating net positive energy and emissions impacts still further into the future, 78 to 92 years and 303 to 317 years, respectively.

Exhibit 4-27—Net Energy Use and GHG Emissions as Compared with Base Alternative, Alternative 90B, Preferred Alternative

	Energy Use (million Btu)	GHG Emissions (metric tons CO_2e)
Rail Operation (per year)	357,886	26,280
Rail Maintenance (per year)	47,827	3,501
On-Road Maintenance (per year)	-25,241	-1,848
On-Road Operation (per year)	-771,699	-61,121
Net (per year)	***-391,227***	***-33,188***
Construction (total)	21,104,757	1,544,912
Offset Period (years)	**54**	**47**

Notes:
Negative numbers indicate reduction as compared to Base Alternative.
Includes well-to-pump emissions for both on-road and rail components.

Alternative 90B (Preferred Alternative)

The long-term impact of the Preferred Alternative (Alternative 90B) on energy and greenhouse gas emissions is ultimately always positive, as the on-road benefits persist year after year and eventually offset the initial construction impacts starting approximately 47 to 50 years after (see Exhibit 4-27). The net annual operational benefits for the Preferred Alternative would be roughly equivalent to eliminating the emissions associated with the energy and electricity consumption of 2,500 to 4,200 average U.S. single family homes every year.[133]

4.20.5. Potential Mitigation Strategies

Greenhouse Gas Emissions

Since global climate change is caused cumulatively by world-wide activity, the impact of a specific program on climate change cannot be determined. Therefore, the approach applied here for evaluating the potential impact of the program is to identify the program's potential GHG emissions, and to evaluate whether it incorporates cost-effective energy efficiency and renewable energy measures into its design, construction, and operation to the maximum extent practicable, consistent with social, economic and other essential considerations. By doing so, the program would demonstrate consistency with state and local policies.

Since this is a Tier 1 EIS, the details of design, construction, and operation are not yet fully available. Therefore, this section identifies potential measures for inclusion, which would reduce the program's energy and GHG footprint if implemented. These measures will be further investigated, and if found to be practicable, incorporated in the program's design and operation.

133 Based on U.S. EPA's GHG Equivalencies Calculator, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

Operational:

- **Shift Locomotives to Biodiesel Fuel**—Options to use biodiesel for the locomotives can be investigated, including blends of B20 and B100 (20 percent biodiesel with 80 percent standard diesel, or pure biodiesel). B20 can be used with current technology while B100 may require some adjustments or new engines. The use of B20 would reduce GHG emissions by 10 percent, and B100 would reduce GHG emissions by 70 percent, reducing operational emissions by 2,300 to 3,000 metric tons CO_2e annually (varies by alternative).
- **Electrification**—The benefits of shifting rail operations along the entire line to electricity have not been quantified at this time. Benefits would increase over the years as the New York grid shifts to increasingly higher fractions of renewable power sources (the New York grid currently includes relatively large fractions of nuclear and hydro power, which result in very little GHG emissions).
- **Sustainable Station Design and Construction**—Although station energy use was not included in this analysis, new stations can be designed in accordance with the requirement of Executive Order 111, "Green and Clean" State Buildings and Vehicles Guidelines (NYSERDA, 2004), outperforming state energy code by 20 percent.

Construction:

- **Use of Local, Renewable, Recycled Materials**—The extraction, production, transport, and disposal of construction materials would account for 75 percent of the construction emissions. Although precise details are not known at this time, the reduction in these emissions can be substantial if local, renewable, and recycled materials are used. The largest contributors are cement and steel. If emissions associated with material can be cut in half (existing strategies demonstrate that this is possible), the emissions payback period could be reduced by nearly 40 percent, resulting in payback periods of 12, 29, 49, 190 years for Alternative 90A, 90B (the Preferred Alternative), 110, and 125, respectively.
- **Biodiesel for Construction Engines**—Biodiesel blends can be used in construction engines as an alternative to conventional fuel.
- **Replanting Trees**—Although not quantified here, any trees that need to be removed for construction could be replaced with a larger number of trees, replacing the trees in kind or more on a tree-mass basis.

Potential Impacts of Climate Change

Examples of mitigation measures that have been employed in other areas to respond to potential impacts of sea-level rise include installing flood barriers, raising mechanical and electrical equipment, waterproofing, installation of pumps, and locating or relocating facilities such as rail yards outside of low-lying floodprone areas.

Since the rail line along the eastern shore of the Hudson would need to be moved or elevated in the future to accommodate increased flooding due to sea level rise, NYSDOT will coordinate with state and federal agencies regarding potential measures for adapting to future climate conditions in order to avoid repeated construction work.

Mitigation measures instituted by Metro-North along the Hudson Line in response to flooding during recent storm events include elevating power supply components, raising critical substation equipment at key locations, and making power equipment watertight where possible. Mitigation being investigated by Metro-North will also explore ways to make signal and communication equipment watertight and elevate signal boxes and other on-ground signal equipment to minimize susceptibility to flooding. Future installation of water level monitoring and alarm devices at critical locations like power substations, yards, and stations will provide Metro-North management with the information to facilitate power shutoffs and avoid equipment damage and risks to customer and employee safety. MTA is also planning to purchase a rail vacuum machine, which are rail-mounted machines with digging arms and vacuum pumps, to reduce track flooding.

Along the Mohawk River portion of the Erie Canal, which closely parallels portions of the Empire Corridor West, certain components of the water control structures along the historic canal system cannot be removed prior to a major flood event. The New York State Canal Corporation is in the process of implementing a FEMA mitigation project to allow the existing movable dams to be raised out of the water in anticipation of a major flood event to remove the hydraulic obstruction that the dams create.

Section 4.9.5, Potential Mitigation Strategies for Floodplains along the project corridor also details other environmental strategies to reduce potential flooding impacts.

4.20.6. Future Analysis

In the Tier 2 analysis, per NYSDEC as part of New York State's recent Climate Leadership and Community Protection Act, "Value of Carbon Guidance" (issued December 30, 2020), detailed GHG reduction measures can be evaluated through a damages-based valuation approach. The guidance document is designed to provide accessibility and practicability to state agencies and authorities by regularly incorporating greenhouse gas emissions and climate change in decision-making contexts.

The guidance document may be reviewed and incorporated in the program for the Preferred Alternative, Alternative 90B, as appropriate. The benefits of measures will be quantified if practicable. If substantial changes in design occur, the overall GHG emissions will be reevaluated as well, and further refined if possible.

4.21. Noise and Vibration

The proposed program alternatives, including the Preferred Alternative (Alternative 90B), could alter rail operations (i.e. speed, frequency, alignment) in the corridor, which would affect noise and vibration levels at sensitive locations in proximity to the rail right-of-way. This chapter assesses the potential for adverse impacts due to changes in rail operations along the Empire Corridor between New York City and Niagara Falls.

4.21.1. Regulatory Context

Noise

A noise assessment was conducted using the methodology set forth in both the FRA guideline document, *High Speed Ground Transportation Noise and Vibration Impact Assessment*[134] for the high-speed rail noise/vibration analyses and the Federal Transit Administration's (FTA) guidance manual,

[134] U.S. Department of Transportation, *High Speed Ground Transportation Noise and Vibration Impact Assessment*, Federal Railroad Administration, Office of Railroad Development, Washington, D.C., September 1998.

Transit Noise and Vibration Impact Assessment[135] for the Amtrak, CSXT, and the Metro-North noise/vibration analyses.

Both FRA and FTA guidance manuals define noise criteria based on the specific type of land use that would be affected, with explicit operational noise impact criteria for three land use categories. These impact criteria are based on either peak 1-hour equivalent noise level ($L_{eq(1h)}$) or 24-hour day-night equivalent noise level (L_{dn}) values. The hourly equivalent sound level is the level of a steady sound that has the equivalent sound energy as does a time-varying sound over a peak 1-hour period. A day-night equivalent sound level is a 24-hour average adjusted for average-day sound source operations. In the case of rail noise, a single operation is equivalent to a single train vehicle pass-by. The adjustment includes a 10-decibel penalty for vehicle pass-bys occurring between 10 p.m. and 7 a.m.

Exhibit 4-28 describes the land use categories defined in the FRA and FTA reports, and provides noise metrics used for determining operational noise impacts. Land uses that are noise-sensitive, but where people do not sleep, are described in Exhibit 4-28, Categories 1 and 3. These require examination using the 1-hour L_{eq} descriptor for the noisiest peak hour. Category 2, which includes residences, hospitals, and other locations where nighttime sensitivity to noise is very important, requires examination using the 24-hour L_{dn} descriptor.

Exhibit 4-29 expresses the criteria in terms of the increase in total or cumulative noise that can occur in the overall noise environment before impact occurs. The impact criteria are keyed to the noise level generated by the program (called "program noise exposure") in locations of varying existing noise levels. Two types of impacts—moderate and severe—are defined for each land use category, depending on existing noise levels. Thus, where existing noise levels are 40 dBA, as in Land Use Categories 1 and 2, the respective L_{eq} and L_{dn} noise exposure from the program would create moderate impacts if they were above approximately 50 dBA, and would create severe impacts if they were above approximately 55 dBA. For Category 3, a project noise exposure level above approximately 55 dBA would be considered a moderate impact, and above approximately 60 dBA would be considered a severe impact. A noise level change that a significant percentage of people would find annoying is described as severe. A change in noise level that is noticeable to most people but would not necessarily result in strong adverse reactions from the community is described as moderate.

Exhibit 4-28—FRA's and FTA's Land Use Category and Metrics for Train Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq(h)}$*	Quiet is an essential element in the intended purpose. Such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use, recording studios, and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels, where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq(h)}$*	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, cemeteries, monuments, museums, campgrounds, recreational facilities, and certain historical sites and parks.
Note: * L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.		

[135] U.S. Department of Transportation, *Transit Noise and Vibration Impact Assessment*, FTA Report FTA-VA-90-1003-06, Federal Transit Administration, Washington, D.C., May 2006.

Exhibit 4-29—Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)			GBN Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Notes:
1 "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2 "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3 "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail systems.
4 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

Vibration

The FRA/FTA criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event. Exhibit 4-29 includes the impact criteria as defined in the FRA/FTA guidance manual. The criteria for acceptable ground-borne vibration are expressed in terms of root mean square [rms] velocity levels in decibels and the criteria for acceptable ground-borne noise are expressed in terms of A-weighted sound level.

The limits are specified for the three land use categories defined below:

- **Vibration Category 1: High Sensitivity**—This category includes buildings where it is essential that ambient vibration be kept very low 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 Category 2: Residential**—This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas. This is primarily because ground-borne vibration and noise are experienced indoors and building occupants have practically no means to reduce their exposure. Even in a noisy urban area, the bedrooms often will be quiet in buildings that have effective noise insulation and tightly closed windows. Hence, an occupant of a bedroom in a noisy urban area is likely to be just as sensitive to ground-borne noise and vibration as someone in a quiet suburban area.

- **Vibration 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.

4.21.2. Methodology

Noise

The analysis of airborne noise was performed using procedures set forth in the FRA and FTA guidance manuals. Following the methodologies set forth in this document, airborne noise impacts should be analyzed using a three-step process that consists of a screening procedure, a general noise assessment, and a detailed noise analysis.

- **Step 1—NOISE SCREENING:** The methodology begins with a noise screening to determine whether any noise-sensitive receptors are within a distance where an impact is likely to occur. According to the FTA screening methodology, potential impacts may occur if noise receptors are within 750 feet from the track centerline for unobstructed sensitive receptors, or 375 feet from the track centerline for obstructed sensitive receptors. According to the FRA screening methodology, potential impacts may occur if noise receptors are within 900 feet from the track centerline for quiet suburban land uses, or 450 feet from the track centerline for urban land uses. Based upon the screening procedure result, there were noise sensitive receptors within these distances along the corridor, and therefore, a General Noise Assessment was performed to determine the potential for adverse effects at specific distances from the right-of-way.
- **Step 2—GENERAL NOISE ASSESSMENT:** The general noise assessment methodology consists of determining a project noise exposure at 50 feet from the centerline of track, and comparing the calculated levels with the criteria based on land use categories. The calculations to predict the noise levels from the increased train speed and change in the alignment along the rail line branch take into account: the type of trains and type of locomotives, number of trains and number of locomotives on each train, the speed of the trains, characteristics of the track, and the time of day. For the Amtrak, CSXT, and the Metro-North assessment, the general noise assessment methodology is presented in Chapter 5 of the FTA Manual.
- **Step 3—DETAILED NOISE ANALYSIS:** A detailed noise assessment is beyond the scope and detail that will be provided in the Tier 1 assessment and provides the highest degree of accuracy using site-specific information. The detailed noise analysis utilizes additional information not included in the General Noise Assessment, including topographic information. Noise impacts identified in the analysis often require in-depth evaluation of mitigation measures. As discussed above, the detailed noise assessment would be conducted in any Tier 2 assessment or project-level environmental document if the results of the General Noise Assessment indicate that the Preferred Alternative would potentially result in an adverse impact.

Vibration

The vibration analysis for the program alternatives was performed using the procedures described in the FRA/FTA guidance manuals. To examine potential impacts during operation, the guidance documents (similar to the approach for assessing noise) lay out a three-step approach for the analysis of vibration and ground-borne noise: a screening procedure, a general assessment methodology, and a detailed analysis methodology.

The screening procedure is used to determine whether any noise-sensitive receptors are within distances where impacts are likely to occur; the general assessment methodology is used to determine locations or rail segments where there is the potential for impacts; and the detailed analysis methodology is used to predict impacts and evaluate the effectiveness of mitigation with greater precision than can be achieved with the general assessment, which would typically be conducted for a project-level or Tier 2 EIS.

4.21.3. Existing Conditions

The program corridor of the alignment currently experiences Amtrak service and CSXT freight service throughout much of the program corridor, and Metro-North Railroad (MNR) commuter rail service operates between New York City and Poughkeepsie. The corridor was divided into the following segments: New York City to Croton; Croton to Poughkeepsie; Poughkeepsie to Albany; Albany to Schenectady; Schenectady to Hoffmans; Hoffmans to Utica; Utica to Syracuse; Syracuse to Rochester; Rochester to Buffalo;and Buffalo to Niagara Falls. Based on information provided by the land use assessment (see Section 4.2, "Land Use"), and aerial photographs, various noise sensitive land uses (i.e., residential, commercial, industrial, institution, open space, etc.) are located in the vicinity of the corridor. Train movement on each segment is described in Exhibit 4-30.

The existing line operators along this segment between New York City (Grand Central Terminal in Manhattan) and Croton Harmon include Amtrak, CSXT, and MNR, with approximately 169 trains operating per day and 42 trains per night. For the purposes of the noise and vibration impact assessment, the maximum speed is 75 mph.

The existing line operators along this segment between Croton and Poughkeepsie include Amtrak, CSXT, and MNR, with approximately 239 trains operating per day and 70 trains per night. For the purposes of the noise and vibration impact assessment, the maximum speed is 90 mph.

The existing line operators along this segment between Poughkeepsie and Albany include Amtrak and CSXT, with approximately 24 trains operating per day and 8 trains per night. For the purposes of the noise and vibration impact assessment, the maximum speed between Poughkeepsie and Hoffmans is 110 mph. The existing line operators along this segment between Albany and Hoffmans include Amtrak and CSXT, with approximately 12 to 14 trains operating per day and no train sources at night.

The existing line operators along this segment between Hoffmans and Utica include Amtrak and CSXT, with approximately 35 trains operating per day and 26 trains per night. For the purposes of the noise and vibration impact assessment, the maximum speed is 79 mph.

The existing line operators along this segment between Utica and to Syracuse and Rochester include Amtrak and CSXT, with approximately 43 to 44 trains operating per day and 30 to 33 trains per night. The existing line operators along this segment between Rochester and Buffalo include Amtrak and CSXT, with approximately 51 trains operating per day and 48 trains per night. For the purposes of the noise and vibration impact assessment, the maximum speed between Utica and Buffalo is 79 mph.

The existing line operators along this segment between Buffalo and Niagara Falls include Amtrak and CSXT, with approximately 10 trains operating per day and 16 trains per night. For the purposes of the noise and vibration impact assessment, the maximum speed is 60 mph.

For sensitive receptors located between 30 and 120 feet from the track centerline, the predicted existing day-night equivalent noise level (Ldn) would range from 65 dBA to 70 dBA Ldn for the overall program corridor. Exhibit 4-30 summarizes the existing train movements and predicted existing noise levels on the entire corridor.

4.21.4. Environmental Consequences

Noise

Using the methodology described previously, the noise analysis for the Tier I EIS consists of a noise screening procedure and a general noise assessment to determine potential impacts in the vicinity of the corridor. Potential noise impacts with the proposed Empire Corridor program were evaluated along the entire track segments. Based upon the screening results, there are sensitive receptors within 750 feet from the track centerline for unobstructed sensitive receptors and 375 feet from the track centerline for obstructed sensitive receptors. Because the screening identified sensitive receptors, a general noise assessment was performed using procedures set forth in the FRA and the FTA guidance manuals, as previously described.

The long-term noise impacts from Empire Corridor train operations are limited to a degree by the relatively small number of additional daily trains proposed compared to combined train trips from freight and commuter rail and other sources, as shown in the table below. Short-term impacts due to construction activities are discussed in Section 4.25.3.

Exhibit 4-30—Existing Empire Corridor Train Movements and Noise Levels

Segment Number	Segment Description	Operator	Number of Trains			Number of Cars per Train	Number of Locomotives per Train	Max Speed (mph)	Existing Noise, Ldn*
			Peak Hour	10pm-7am	7am-10pm				
1	New York City to Croton	Amtrak	3	24	2	5	1	75	65-70
		CSXT	0	2	4	60	3	40	
		MNR-Electric	12	92	22	8	0	75	
		MNR-diesel	7	51	14	6	1	75	
2	Croton to Poughkeepsie	Amtrak	1	23	3	5	1	90	65-70
		CSXT	0	2	4	60	3	50	
		MNR-diesel	8	45	21	6	1	90	
3	Poughkeepsie to Albany	Amtrak	3	22	4	5	1	110	65-70
		CSXT	1	2	4	60	3	50	
4	Albany to Schenectady	Amtrak	2	12	0	6	1	110	65-70
		CSXT	1	2	0	20	1	50	
5	Schenectady to Hoffmans	Amtrak	2	8	0	6	1	100	65-70
		CSXT	0	4	0	30	2	50	
6	Hoffmans to Utica	Amtrak	1	8	0	6	1	79	65-70
		CSXT	10	27	26	80	3	60	
7	Utica to Syracuse	Amtrak	1	8	0	6	1	79	65-70
		CSXT	12	36	30	80	3	60	
8	Syracuse to Rochester	Amtrak	2	6	2	6	1	79	65-70
		CSXT	14	37	31	80	3	60	
9	Rochester to Buffalo	Amtrak	1	6	2	6	1	79	65-70
		CSXT	21	45	46	80	3	60	
10	Buffalo to Niagara Falls	Amtrak	1	3	3	6	1	60	65-70
		CSXT	5	7	13	80	3	40	

Note: The information on existing train movements in this table is based on data from LTK Engineering Services on February 7, 2012.
* Estimated existing noise levels (L_{dn}) were predicted based on Table 5-7 of the FTA Manual.

Train Input

For the purposes of understanding noise sources along the corridor, both existing train data and proposed trains operating under program alternatives (i.e., Base, 90A, 90B, 110, and 125) were used as train input data for noise calculations. Exhibit 4-31 lists the existing and alternatives train movements on the entire corridor.

Exhibit 4-31—Existing and Alternative Train Movements

Segment Number	Segment Description	Operator	Number of Trains						Max Speed (mph)
			Existing	Base	90A	90B	110	125	
1	New York City to Croton	Amtrak	26	26	34	34	34	48	75
		CP	0	6	6	6	6	6	40
		CSX	6	13	13	13	13	13	40
		MNR-Electric	114	102	102	102	102	102	75
		MNR-Diesel	65	75	75	75	75	75	90
2	Croton to Poughkeepsie	Amtrak	26	26	34	34	34	48	90
		CP	0	6	6	6	6	6	50
		CSX	6	13	13	13	13	13	50
		MNR-Diesel	66	76	76	76	76	76	90
3	Poughkeepsie to Albany	Amtrak	26	26	34	34	34	48	110
		CP	0	9	9	9	9	9	50
		CSX	6	10	10	10	10	10	50
4	Albany to Schenectady	Amtrak	12	12	14	14	14	12	110
		CP	0	6	6	6	6	6	50
		CSX	2	4	4	4	4	4	50
5	Schenectady to Hoffmans	Amtrak	8	8	14	14	14	8	110
		CSX	4	2	2	2	2	2	50
6	Hoffmans to Utica	Amtrak	8	8	14	14	14	8	110
		CSX	53	55	55	55	55	55	60
7	Utica to Syracuse	Amtrak	8	8	14	14	14	8	110
		CSX	66	70	70	70	70	70	60
8	Syracuse-Rochester	Amtrak	8	8	14	14	14	8	90
		CSX	68	75	75	75	75	75	60
9	Rochester-Buffalo	Amtrak	8	8	14	14	14	8	90
		CSX	91	86	86	86	86	86	60
10	Buffalo-Niagara Falls	Amtrak	6	6	12	12	12	12	60
		CSX	20	37	37	37	37	37	40
11*	Albany-Syracuse	HST	0	0	0	0	0	30	125
12*	Syracuse-Rochester	HST	0	0	0	0	0	30	125
13*	Rochester-Buffalo	HST	0	0	0	0	0	30	125

Note: The information on existing train movements in this table is based on data from LTK Engineering Services on February 7, 2012

* A two-track grade-separated corridor dedicated to high speed passenger service approximately 280 miles from Albany/Rensselaer station to Buffalo Exchange Street station.

HST=high-speed train

Comparison of Alternatives

The general noise assessment concludes that the potential for noise impacts will occur from New York City through Schenectady (from Segment 1 through Segment 4), Syracuse to Rochester (Segment 8), and Buffalo to Niagara Falls (Segment 10) at sensitive receptors at a distance of 50 feet from the track centerline (Exhibit 4-32). However, this noise impact also reflects contributions from existing and future train traffic from other sources. Over most of these segments, Amtrak (existing and proposed) train traffic does not comprise the majority of the train trips. Along Empire Corridor South (from New York City to Poughkeepsie), Metro-North commuter rail predominates, and along Empire Corridor West, west of Hoffmans, CSXT freight traffic comprises the bulk of the train trips, as shown in Exhibit 4-31.

The methodology for impact assessment is based on the change in noise levels from existing to future conditions, and the Base Alternative reflects the adverse effects of currently known future changes in rail use, including future projected increases in freight traffic and Metro-North commuter rail traffic.

Over most of the project segments, the impacts of the other Build Alternatives (Alternatives 90A and 110) would be similar to that of the Preferred Alternative. Alternative 125 would involve the greatest noise impacts for a new two-track corridor dedicated to high speed passenger service approximately 280 miles from Albany/Rensselaer station to Buffalo Exchange Street station.

However, with Alternative 125, no increase from the Base (Future No Action) Alternative is estimated to occur along the existing Empire Corridor, along which existing (regional) service will be maintained, with the exception of a projected 1 dBA increase along the segment between New York City and Croton. Over the existing Empire Corridor that would be bypassed by Alternative 125, the segments between Hoffmans to Utica (Segment 6), Utica to Syracuse (Segment 7), and Syracuse to Rochester (Segment 8), noise would be minimally lower by 1 to 2 dBA.

Exhibit 4-33 and Exhibit 4-34 show the projected noise levels along the new Alternative 125 corridor. Exhibit 4-33 shows the results of the general noise assessment for the Alternative 125 new at-grade segment. The potential for noise impacts along the new corridor would occur from Albany to Buffalo (Segment 11 through Segment 13), where existing noise levels are fairly low. Exhibit 4-34 shows the results of the general noise assessment for the new elevated segments collocated with the Empire Corridor that are currently impacted by noise, and the potential for noise impacts would also occur for four new elevated segments (i.e., Albany, Syracuse, Rochester, and Buffalo).

Alternative 90B (Preferred Alternative)

Future noise levels with the Preferred Alternative, Alternative 90B will not increase noise from the Base Alternative (Future No Action) Alternative between New York City and Schenectady, and the increase in projected noise level over the Base Alternative between Hoffmans and Rochester would be imperceptible (0 to 2 dBA). Increases of less than 3 dBA are considered to be imperceptible. The proposed program will add between 6 and 10 daily passenger trains on routes that currently experience noise from nearly 200 daily commuter trains operated by Metro-North along the Hudson Line (along Empire Corridor South), and nearly 100 daily freight trains operated by CSXT (along Empire Corridor West).

Warning Horn Noise

Potential noise impacts due to the corridor rail-road crossing with horns were evaluated along the entire corridor track segments that would be affected by the proposed new service. According to the FTA screening methodology, potential impacts may occur if noise receptors are within 1,600 feet and 1,200 feet from the right-of-way for obstructed conditions and unobstructed conditions, respectively. Based upon the screening procedure results, there are noise receptors within these distances along the corridor, and therefore, a General Noise Assessment may be necessary as part of any Tier 2 study of the Preferred Alternative (Alternative 90B) components, to determine the potential for adverse effects at specific distances from the right-of-way.

Exhibit 4-32—General Noise Assessment Results at 50 feet for Program Alternatives

Segment Number	Segment	Existing Noise, Ldn (dBA)	Alternatives Noise, Ldn (dBA)					Program Ldn(dBA) Criteria		Impact
			Base	90A	**90B**	110	125	Impact	Severe Impact	
1	New York City to Croton	70	73	73	73	73	74	64	69	Severe
2	Croton to Poughkeepsie	70	74	74	74	74	74	64	69	Severe
3	Poughkeepsie to Albany	70	73	73	73	73	73	64	69	Severe
4	Albany to Schenectady	70	71	71	71	71	71	64	69	Severe
5	Schenectady to Hoffmans	70	NC*	58	57	58	NC*	64	69	None
6	Hoffmans to Utica	70	61	63	63	63	61	64	69	None
7	Utica to Syracuse	70	61	63	63	63	61	64	69	None
8	Syracuse to Rochester	70	64	65	65	65	64	64	69	Moderate
9	Rochester to Buffalo	70	NC*	61	61	62	NC*	64	69	None
10	Buffalo to Niagara Falls	70	72	72	72	72	72	64	69	Severe

Note: Estimated existing noise levels (L_{dn}) were predicted based on Table 5-7 of the FTA Manual.
* NC: Program noise level remain "No Change" because of no increment on train movements from existing to future conditions.

Exhibit 4-33—General Noise Assessment Results at 50 feet for Alternative 125 New at-grade Segment

Segment Number	Segment Description	Existing Noise, Ldn	Program Noise, Ldn	Program Ldn Criteria		Impact
				Impact	Severe Impact	
11	Albany to Syracuse	45	64	52	59	Severe
12	Syracuse to Rochester	45	64	52	59	Severe
13	Rochester to Buffalo	45	66	52	59	Severe

Note: Estimated existing noise levels (L_{dn}) were predicted based on Table 4-5 of the FRA Manual.

Exhibit 4-34—General Noise Assessment Results at 50 feet for Alternative 125 New Elevated Segment

Segment Number	Segment Description	Existing Noise, Ldn	Program Noise, Ldn	Program Ldn Criteria		Impact
				Impact	Severe Impact	
11	Albany	70	73	64	69	Severe
12	Syracuse	70	68	64	69	Moderate
13	Rochester	70	69	64	69	Severe
14	Buffalo	70	73	64	69	Severe
Note: Estimated existing noise levels (L_{dn}) were predicted based on Table 4-5 of the FRA Manual.						

Vibration

Potential vibration impacts were evaluated along the entire corridor track segments that would be affected by the proposed new service. Potential impacts may occur if vibration receptors are within 220 and 160 feet from the right-of-way for residential uses and institutional uses, respectively. However, as discussed under the noise impacts section, the Amtrak trains do not comprise the majority of train traffic along Empire Corridor South where Metro-North operates frequent commuter rail service, and Empire Corridor West where traffic predominantly consists of CSXT freight trains. Therefore, due to the relatively small increase in total trains operating as a result of the Empire Corridor program, long-term vibration impacts may be limited or minimal. Based upon the screening procedure results, there are vibration receptors within these distances along the corridor segments, and therefore, a General Vibration Assessment may be necessary in any Tier 2 assessment prepared for the Preferred Alternative, Alternative 90B, to determine the potential for adverse effects at specific distances from the new corridor segments. Short-term impacts due to construction activities are discussed in Section 4.25.3.

4.21.5. Potential Mitigation Strategies

Noise

The general noise assessment shows that the combination of existing and projected trains from freight, commuter rail, and the proposed program would have the potential for moderate noise impacts on the segment of Syracuse to Rochester, and severe noise impacts on the segments of New York City to Croton, Croton to Poughkeepsie, Poughkeepsie to Albany, Albany to Schenectady, Buffalo to Niagara Falls, Albany to Syracuse, Syracuse to Rochester, and Rochester to Buffalo.

For Tier 2 studies for the Preferred Alternative, Alternative 90B, if required, more comprehensive analyses can provide prediction of impacts with a greater degree of precision and the assessment of the effectiveness of mitigation, similar to the general assessment results in the prediction of impacts. More detailed preliminary engineering design and operational data will be available and can be incorporated into the impact analysis. Data used for the detail noise analysis is more accurate, detailed and specific than the data used for the general noise assessment. These mitigation options would typically fall into three categories: noise source mitigation measures; path control measures; and receptor control measures. Source control measures may include:

- Vehicle and equipment noise specifications;

- Operational restrictions;
- Resilient or damped wheel treatments;
- Vehicle skirts, uncap absorption;
- Spin-slide control measures;
- Wheel truing;
- Rail grinding;
- Turn radii greater than 1000 feet;
- Rail lubrication on sharp curves; and
- Movable-point frogs.

Path controls measures may include:

- Sound barriers,
- Alteration of horizontal and vertical alignments,
- Acquisition of buffer zones,
- Ballast on at-grade and/or aerial guideways, and
- Resilient tract support.

Receiver control measures may include:

- Acquisition of property rights for construction of sound barriers,
- Building insulation, and
- Alternative building ventilation.

Vibration

For vibration, the need for a detailed vibration analysis will be assessed as part of the Tier 2 studies for the Preferred Alternative, Alternative 90B. This detailed analysis can also utilize detailed preliminary engineering design and operational data, and could include an assessment of potential mitigation measures such as:

- Planning and design of special trackwork;
- Vehicle specifications; and
- Special track support systems (i.e., resilient fasteners, ballast mats, resiliently supported ties, floating slabs, and other marginal treatments), and trenches.

4.21.6. Future Analysis

Any Tier 2 noise and vibration impact assessments performed for the Preferred Alternative, Alternative 90B, will apply the detailed analysis methodology described in the FRA and FTA guidance manuals. The study area will be reviewed to identify land use Categories 1 to 3 for noise and vibration, as discussed in Section 4.21.1. Tier 2 assessments would utilize detailed preliminary engineering design and operational data, and include identification of potential mitigation measures, as appropriate.

4.22. Contaminated and Hazardous Materials

Transportation projects that include the purchase of new right-of-way, excavation, and/or structure demolition or modification have the potential to encounter hazardous materials. The presence or release of hazardous materials on construction sites can expose workers, residents and ecosystems to contaminants that may compromise their health. In addition, the identification of hazardous materials during construction can lead to project delays and can be costly.

4.22.1. Regulatory Context

At the federal level, the United States Environmental Protection Agency (U.S. EPA) regulates the use, storage, transportation and disposal of contaminated and hazardous materials. At the state level, the New York State Department of Environmental Conservation (NYSDEC) enforces many of the environmental regulations.

The U.S. Resource Conservation and Recovery Act (RCRA) of 1976 gives the U.S. EPA the authority to regulate hazardous waste from the "cradle-to-grave."[136] This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for the management of non-hazardous solid wastes. In New York, the NYSDEC is authorized to implement the RCRA program in lieu of the U.S. EPA. NYSDEC issues the permits, conducts inspections, signs consent orders, and gathers and processes data.

The Comprehensive Environmental Resource Conservation and Liability Act of 1980 (CERCLA), commonly known as Superfund, created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. The law authorized the U.S. EPA to identify parties responsible for contamination of sites and compel the parties to clean up the sites.[137]

In 1984, Congress added Subtitle 1 to RCRA requiring the U.S. EPA to regulate underground storage tanks (USTs). The 1986 amendments to RCRA enabled the U.S. EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.[138]

In 1988, the U.S. EPA issued federal UST regulations laying out a comprehensive program for the monitoring and upgrading of USTs in the nation.[139,]

The New York State Navigation Law Oil Spill Prevention, Control and Compensation Act of 1977 regulates major oil storage facilities (MOSF).[140] This law and regulations (6 NYCRR Parts 610 and 611)[141] regulates all oil terminals and transport vessels operating in the "waters of the State", which have a storage capacity of 400,000 gallons or more (or MOSFs).

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136 United States Environmental Protection Agency, "Summary of the Resource Conservation and Recovery Act." Accessed April 19, 2011. <http://www.epa.gov/lawsregs/laws/rcra.html>.

137 Comprehensive Environmental Resource Conservation and Liability Act, 42 United States Code, Chapter 103, 1980.

138 Resource Conservation and Recovery Act, 42 United States Code, Section 6901, 1976.

139 Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST), 40 Code of Federal Regulations, Part 280, 1988; Approval of State Underground Storage Tank Programs, 40 Code of Federal Regulations, Part 281, 1988.

140 New York State Navigation Law Oil Spill Prevention, Control and Compensation Act, New York Environmental Conservation Law, Article 12, 1977.

141 New York State Department of Environmental Conservation, "Regulation of Major Oil Storage Facilities." Accessed April 19, 2011. <http://www.dec.ny.gov/chemical/2644.html>.

4.22.2. Methodology

Areas of known releases were identified within a half-mile of the corridor centerline (program study area) using available federal and state databases. The following Geographic Information System (GIS) data layers were reviewed as part of this analysis.

- **Superfund CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System)** is the tracking database authorized under the Superfund Amendment and Reauthorization Act (SARA) of 1986.
- The **National Priorities List (NPL)** is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the U.S. EPA in determining which sites warrant further investigation under the Superfund cleanup program.[142]
- **RCRA Info** databases track both Treatment, Storage, and Disposal facilities and Large Quantity Generators.
- **Toxic Release Inventory System (TRIS)** is a national database that tracks reported toxic chemical use (over 300 toxic chemicals listed), storage and/or permitted release to the environment (air, water or land).
- The **New York State Chemical Bulk Storage (CBS)** and the **NYS Petroleum Bulk Storage (PBS)** programs are regulated by the NYSDEC under the Hazardous Substance Bulk Storage Program.
- **Major Oil Storage Facilities (MOSF)** database tracks terminals or vessels with a capacity of 400,000 gallons or more.

4.22.3. Existing Conditions

Over 6,400 hazardous materials sites were identified within a half-mile of the corridor centerline (90/110 Study Area) and approximately 5,500 sites were identified within the 125 Study Area, as shown in Exhibit 4-35 and Appendix G.20. Of these, more than half (approximately 3,750) were identified in Manhattan. Appendix G.20 presents a county by county discussion of identified hazardous materials sites and presents information on the types of sites.

The Hudson River PCBs (polychlorinated biphenyl) Superfund Site is located in all of the counties along the 142-mile Empire Corridor South. This site encompasses a nearly 200-mile stretch of the Hudson River extending from Hudson Falls to Battery Park in New York City.[143] In February 2002, the U.S. EPA issued a Record of Decision (ROD) for the Hudson River PCBs Superfund Site that calls for targeted environmental dredging of approximately 2.65 million cubic yards of PCB-contaminated sediment from a 40-mile section of the Upper Hudson River extending north of Troy, upstream of the study area. The cleanup will occur in two phases.

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[142] United States Environmental Protection Agency. "National Priorities List." Accessed September 26, 2011. <http://www.epa.gov/superfund/sites/npl>.

[143] United States Environmental Protection Agency, "Hudson River PCBs." Accessed September 26, 2011. <http://www.epa.gov/hudson/>.

4.22.4. Environmental Consequences

Comparison of Alternatives

The presence or release of contaminated materials can expose workers and residents to substances that impose negative health effects. The acquisition of property can result in NYSDOT incurring liability, since the property owner is responsible for any contamination discovered after property acquisition. The presence of contaminated soil or groundwater can cause serious delays as a result of costly site investigations and remedial actions. Excavation activities to substantial depths in areas with contamination can result in high disposal costs from large volumes of soil. Deeper excavations increase the likelihood of encountering contaminated groundwater, which can also be costly to treat and dispose of.

Exhibit 4-35—Summary of Contaminated and Hazardous Materials Sites within the Study Area

County	Federal		State		Total	
	90/110 mph	125 mph	90/ 110 mph	125 mph	90/ 110 mph	125 mph
New York	70	70	3,678	3,678	3,748	3,748
Bronx	1	1	115	115	116	116
Westchester	32	32	20	20	52	52
Putnam	2	2	12	12	14	14
Dutchess	11	11	95	95	106	106
Columbia	2	2	11	11	13	13
Rensselaer	21	21	70	65	91	86
Albany	24	12	164	56	188	68
Schenectady	4	2	110	34	114	36
Schoharie	0	0	0	1	0	1
Montgomery	15	2	124	1	139	3
Herkimer	13	0	114	4	127	4
Oneida	27	7	254	22	281	29
Madison	2	3	16	26	18	29
Onondaga	42	41	196	198	238	239
Cayuga	1	0	10	1	11	1
Wayne	15	2	65	23	80	25
Monroe	90	86	283	279	373	365
Genesee	8	0	156	21	164	21
Erie	99	98	348	337	447	435
Niagara	27	27	64	64	91	91
Total	**506**	**419**	**5,905**	**5,063**	**6,411**	**5,482**

Note 1: Federal sites include: National Priority List, RCRA – Resource Conservation and Recovery Act, TRIS – Toxic Release Inventory System, State sites include: CBS – Chemical Bulk Storage, PBS – Petroleum Bulk Storage, MOSF – Major Oil Storage Facility.
Note 2: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within a half-mile of the corridor centerline.

Source: NYS GIS Clearinghouse, New York State Department of Environmental Conservation.
NYSDEC. Accessed November 7, 2011. <http://www.dec.ny.gov/geodata/DiscoveryServlet>.
U.S. EPA. Accessed November 7, 2011. <http://www.epa.gov/enviro/geo_data.html>.

In addition to contamination from mapped hazardous materials facilities outside of the existing right-of-way, contamination can occur along railroad corridors as a result of industrial uses along the railroad corridor that rely on freight movements for shipping and deliveries. Most railroad corridors also have residual contamination from a variety of sources with contaminants ranging from metals, hazardous materials and petroleum products, and asbestos.

Program specifics (i.e., excavation depths, construction plans, etc.) have not yet been developed; therefore, the degree of likelihood to encounter long-term impacts from contamination is generally based on the discussion above.

Review of available records indicates that the Base Alternative and Alternative 90A would incur the least amount of long-term impacts as a result of the presence of contaminated materials. These alternatives would largely involve station improvements and work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. A moderate amount of long-term impacts would occur as a result of the presence of contamination within the existing railroad right-of-way and nearby mapped sites.

Alternative 90B (the Preferred Alternative) and Alternative 110 would have a greater potential to encounter contaminated materials than the Base and 90A Alternatives, especially where new third and fourth track subsurface work would occur within highly developed urbanized areas. However, the Preferred Alternative would involve substantially less work extending outside of the right-of-way and less property acquisitions than Alternatives 110 or Alternative 125.

Alternative 125 would include all the improvements considered under Alternative 90A and would also include the extension of 236 miles of new track and alignment. The new rail alignment would extend through a variety of rural, suburban, and urban areas and would require numerous property acquisitions; increasing NYSDOT's risk; however, in many suburban and rural areas these risks may be lower.

Short-term impacts due to construction activities are discussed in Section 4.25.3. The following section addresses the potential long-term impacts of the Preferred Alternative, and Appendix G.20 reviews the potential impacts of the other alternatives considered.

Alternative 90B (Preferred Alternative)

NYSDOT anticipates that work for the Alternative 90A projects that are part of the Preferred Alternative will be contained within the right-of-way, and thus no land acquisitions are expected; therefore, impacts would be reduced with the potential for encountering contaminated materials increasing with subsurface work.

In addition, Alternative 90B would include replacement of the Livingston Avenue Bridge, which extends over the Hudson River between the urbanized cities of Rensselaer and Albany (Rensselaer and Albany counties, respectively). The replacement of the bridge substructure, if proposed, would include extensive subsurface activities (i.e. installation of footings and piers) and therefore the potential to encounter contaminated soils and groundwater would be high. In addition, given the presence of the Hudson River polychlorinated biphenyl (PCB) site, there would be a higher likelihood that PCB-impacted sediment and surface water will be encountered during bridge construction activities.

Activities for the Preferred Alternative, Alternative 90B, would increase the likelihood of encountering contaminated soils and ground water as a result of additional infrastructure improvements including grade crossing modifications, new grade separated flyovers, culvert extensions and new cut areas. But in general, impacts would be similar to those described above under Alternative 90A.

There would be seven locations where new right-of-way would need to be acquired (MPs 168.3, 210.8, 215.6, 237.7, 286.4, 341.1 and 377.6). The acquisition of property would include a potential liability for NYSDOT if the properties currently or historically use, store or dispose of hazardous materials or petroleum products. Property acquisition would also include the acquisition of two current structures, which would require asbestos, lead and hazardous material surveys prior to demolition activities.

The three grade separated flyovers would be located at MPs 279, 366, and 427. The flyover at MP 279 would be located in a more rural area, and no mapped hazardous materials facilities are in the vicinity of the alignment. Flyovers at MPs 366 and 427 are located in more urban areas of Rochester and Buffalo, and there would be mapped PBS facilities located in the vicinity of the improvements. These structures would have a higher likelihood to encounter contaminated soil and groundwater as a result of caisson and abutment construction.

The Preferred Alternative, Alternative 90B, would also include station improvements at the Schenectady, Amsterdam, Utica, Rome, Syracuse, Rochester and Buffalo-Depew stations. Station improvements may entail a greater potential for subsurface excavations that could encounter contaminated soils and groundwater, which has the potential to lead to long-term aquifer contamination.

4.22.5. Potential Mitigation Strategies

Mitigation strategies for the Preferred Alternative, Alternative 90B, will focus on methods to avoid or minimize encounters with contaminated materials. Phase I and Phase II Environmental Site Assessments (ESAs) evaluate environmental issues and risks associated with a site, particularly prior to land acquisitions. A Phase I ESA consists of a review of regulatory records and historic information (e.g., maps, local government records); completion of a site visit; and interviews with owners, occupants, and local government officials. This information is compiled and reviewed to determine the presence of any on- or off-site sources of contamination that may impact the site, classified as Recognized Environmental Conditions (RECs). The Phase II ESA includes field sampling laboratory testing to evaluate the extents and severity of the issues.

Site-specific Health and Safety Plans and Materials Management Plans for the Preferred Alternative, Alternative 90B, will be developed to address contaminated soil and groundwater, as appropriate. If buildings containing lead or asbestos will be demolished, an Asbestos Abatement Plan and a Lead-Based Paint Assessment Plan will be developed.

4.22.6. Future Analysis

The Tier 2 analysis for the Preferred Alternative, Alternative 90B, will assess the potential to encounter contaminated sites, and, if necessary, determine the presence and extent of contamination, in more detail. This will allow NYSDOT to understand potential implications of actions increasing risks for encountering or handling contamination and refine the design to minimize them via efforts, such as reducing soil or groundwater removal and disposal. If appropriate, the first step would be to investigate previous activities and current site uses, following the guidelines of an ASTM-compliant Phase I ESA. This would include the review of aerial photographs, historical (Sanborn) maps, database reports, site visits, and other historical sources. Based on the results of the Phase I ESA, further investigations (limited subsurface reports and Phase II ESAs) including the collection of surficial and subsurface soil samples and groundwater samples may be required to delineate the horizontal and vertical extents of contamination in problem areas.

4.23. Section 4(f)/Section 6(f)

4.23.1. Regulatory Context

This section addresses Section 4(f) and Section 6(f) protections and the preliminary assessments of potential Section 4(f)/Section 6(f) resources performed as part of this Tier 1 Final EIS. Section 4(f) of the U.S. Department of Transportation Act (for federally funded transportation projects) provides federal protection of publicly owned parkland and historic sites. Parklands are also protected under Section 6(f) of the U.S. Land and Water Conservation Fund (LWCF) Act (for LWCF-funded parks).

In the Tier 2 assessment(s), FRA will determine the need for additional Section 4(f) and/or Section 6(f) Evaluation(s), as appropriate. for individual improvement projects comprising the Preferred Alternative.

Section 4(f)

Section 4(f) of the U.S. DOT Act (49 U.S.C. 303(c)) of 1969, as amended, states that the Secretary of the U.S. DOT shall not approve any program or project that requires the "use" of any land from a public park, recreation area, wildlife and waterfowl refuge, or historic site, unless there is no feasible and prudent alternative, and such project or program includes all possible planning to minimize harm. Under Section 4(f), there are three types of transportation uses that may occur:

- **Permanent Use:** Land is permanently incorporated into the transportation facility through outright purchase of the land or through acquisition of sufficient property interests (such as obtaining a permanent easement).
- **Temporary Use:** Temporary occupancy of land creates an adverse effect for the purposes of Section 4(f), including right-of-entry, project construction, temporary easement, or other temporary arrangement involving Section 4(f) property. Temporary occupancy will not constitute a Section 4(f) use if all of the following conditions are met:
  - Duration must be temporary (shorter than construction duration) and there should be no change in ownership of the land;
  - Scope of the work (nature and magnitude of the change to the Section 4(f) property) must be minimal;
  - There are no anticipated permanent adverse physical impacts, nor interference with protected activities, features, or attributes of the property on a temporary or permanent basis;
  - The property must be fully restored and returned to pre-construction conditions;
  - There must be documented agreement of the officials with jurisdiction over the Section 4(f) resource of the above conditions.

- **Constructive Use:** In the absence of a permanent or temporary use, a constructive use occurs when the proximity impacts on a Section 4(f) property are so severe that the activities, features, or attributes of the Section 4(f) resource that qualify it for protection are substantially impaired.

Section 4(f) also considers the "use" from indirect impacts (i.e., effects on context, setting, or access).

Amendments to Section 4(f) under the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) established procedures for *de minimis* impact determinations, when the transportation use does not adversely affect the activities, features, or attributes that qualify the resource for Section 4(f) protection. These procedures include affording an opportunity for public review and comment and receiving written concurrence from the officials with jurisdiction over the property.

Under the FAST Act, Section 11502 (23 U.S.C. 138[f]/49 U.S.C. 303[h]) exempts from Section 4(f) review the use of railroad and rail transit lines, or elements thereof (except for stations or bridges/tunnels not in use), that are in use or historically used for the transportation of goods or passengers. The FAST Act also incorporates a Section 4(f) exemption for common post-1945 concrete or steel bridges and culverts, which is already programmatically exempted from individual review under Section 106.

Section 6(f)

Under Section 6(f) of the U.S. Land and Water Conservation Fund (LWCF) Act, the United States Department of the Interior (DOI) provides funding for state, county, and local efforts to advance public recreation. Once LWCF funds are utilized to acquire or develop, either partially or wholly a particular recreation project, conversion of that park facility for any non-recreational purpose is prohibited unless alternatives are assessed and steps are taken to identify, evaluate, and supply replacement parkland. In addition, the Secretary of Interior must grant prior approval for the conversion and replacement parkland. The replacement property must have equal fair market value as the converted property and must be at least as useful and of similar location as the converted property.

If a Section 6(f) property has been identified near, adjacent to, or within a project area, the decision must be made as to whether or not there will be a conversion or a change in use of the property. A conversion occurs when the use of a Section 6(f) site is changed for longer than six consecutive months to something other than what was funded, regardless of whether the change is temporary or permanent.

If there is a partial conversion or use of the Section 6(f) property, an evaluation of the remaining Section 6(f) property should be conducted to determine whether there has been a change to its usefulness as a viable public outdoor recreation area. If the conversion is approved by the National Park Service and it is determined that the remaining property is altered to the point in which the usefulness has diminished, further evaluation and coordination should take place to establish whether the remaining land should be replaced as well.

A conversion could also occur when a project crosses or effects the same property where the Section 6(f) resource is located, and would not directly affect the Section 6(f) resource, but would affect access to or other reasonable use of the Section 6(f) resource on the site for more than six months.

4.23.2. Methodology

Parks and recreation areas for study areas within 1,000 feet of the corridor centerline for all alternatives were identified using existing mapping collected from federal and state agencies, including the New York State GIS Clearinghouse, New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) and New York State Department of Environmental Conservation (NYSDEC), as well as review of aerial photography and Google street mapping, as presented in Section 4.16. This section also addresses tribally-owned recreational facilities.

For the purposes of this Tier 1 EIS, the Areas of Potential Effects (APEs) for potential direct effects on historic architectural sites and archaeological sites have been delineated to extend within 100 feet from the centerline of the existing railroad tracks and within 100 feet from each alternative to encompass all locations where project construction activities could occur, as described in more detail in Section 4.15. The APE for indirect effects on historic architectural sites has been delineated to extend 600 feet in both directions from the centerline of the existing railroad tracks and from each alternative. The 600-foot APE was developed in consultation with SHPO and federally-recognized tribes to encompass potential indirect effects that could be reasonably foreseen at the Tier 1 level resulting from construction activities associated with the proposed program, as described above.[144] Appendix G.14 includes an inventory of all architectural resources within the direct APE.

When the Section 106 identification and evaluation process is being conducted in a phased manner, as described in 36 CFR 800.4(b)(2), the final identification and evaluation of historic properties may be deferred to future stages of the program if the protocol for the process is established in a Programmatic Agreement or Memorandum of Agreement. In accordance with this guidance, this Tier 1 EIS focuses on identifying the "likely presence" of historic properties in the APE for each alternative by identifying previously-designated architectural resources and previously-identified archaeological sites. More information on the assessment methodology is presented in Appendix G.14.

Identification of historic properties in the APEs from potential architectural resources (such as State Register eligible properties) would occur in Tier 2 assessments to determine National Register eligibility, as appropriate. To date, no detailed archaeological documentary studies or archaeological field investigations (Phase I archaeological studies) have been prepared as part of the Tier 1 analysis. As described above, previously-identified archaeological sites have been mapped and inventoried to serve as a preliminary indicator of archaeological sensitivity within the APEs. In order to identify archaeological historic properties that could be affected by the program, archaeological documentary studies and field investigations (as appropriate) would be carried out as part of the final identification efforts for the Tier 2 analysis.

The purpose of developing a conceptual "alignment" for Alternative 125 in the Tier 1 EIS is to provide a basis for comparison of corridor-level performance, cost, and impact potential of a new corridor alternative versus existing corridor alternatives (i.e. Alternatives 90A, 90B, and 110). The intended purpose of this Tier 1 EIS is to make broad-corridor level decisions with regard to parameters such as operating speed/travel times, service frequency, and infrastructure requirements.

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[144] Although FTA noise standards set a standard screening distance of 750' (unobstructed) and (375' obstructed) for noise analyses, preliminary noise analyses completed as part of this Tier 1 EIS indicate that the area in which there is the potential for the proposed program alternatives (with the exception of Alternative 125) to result in noise impacts is substantially smaller than the areas delineated as the APEs for direct and indirect effects. In the case of Alternative 125, the potential for noise impacts is expected to vary by location.

4.23.3. Existing Conditions

Parks and Recreational Areas

Overview

The existing parks and recreation areas in the study area are concentrated in two main areas: the Hudson River Valley and the New York State Canal System within the Mohawk River Valley.

- The Hudson River Valley has a concentration of national, state, county, and municipal parks and recreation areas due to its location and scenic views, as well as the concentration of population centers that developed along the river. The area also has a rich cultural and economic heritage and hosts a number of historic districts and sites. The national and state historic sites are important recreational tourism destinations.
- The **New York State Canal System,** owned by the New York State Canal Corporation provide recreational opportunities for water-based navigation and trail users. The **New York State Canalway Trail System** is comprised of a network of more than 300 miles of existing multi-use, recreational trails across upstate New York. Major segments are adjacent to the waterways of the New York State Canal System or follow remnants of the historic original canals of the early 1800s that preceded today's working Canal System. The Canalway Trail System is comprised of four major segments: the Erie Canalway Trail, including the Old Erie Canal State Park Trail in Central New York; the Cayuga-Seneca Canal Trail, the Champlain Canalway Trail, and the Oswego Canalway Trail. Stretching from Buffalo to Albany the 360-mile Erie Canalway Trail, 277 miles of which are presently open to the public, closely follows much of the present and proposed Empire Corridor alignment. Portions of this canal system are nationally or state-designated heritage areas, parks, and trails.

The federal, state, regional, and local parks in the study area are shown in the following exhibits. There are several types of federally designated parks or recreation areas in the study area, including National Heritage Areas, a National Memorial, several NNLs, a National Wildlife Refuge, National Historic Sites, and National Scenic/Recreational Trails. Exhibit 4-36 summarizes the publicly owned acreage of the eight federally-protected potential 4(f) or 6(f) parkland resources within 1,000 feet of the corridor centerline for the 90/110 and the 125 Study Areas.

New York State has designated 24 state parks, areas of cultural and historic significance, state historic parks, and state historic sites that are administered by the NYSOPRHP and the New York Canal Corporation, as shown in Exhibit 4-37. New York state forests and state-owned Wildlife Management Areas are administered by the New York State Department of Environmental Conservation. The 16 NYSDEC sites, including state forests preserves, Unique Areas, Wildlife Management Areas, and boat launches within 1,000 feet of the corridor centerline for both the 90/110 and the 125 Study Areas are shown in Exhibit 4-38, one of which has received Section 6(f) funding.

There are roughly 100 county, municipal and non-profit parks identified within the study area. Exhibit 4-39 and Exhibit 4-40 show these parks within the 90/110 and 125 Study Areas and potential protections under Section 6(f) and Section 4(f). Exhibit G-33 in Appendix G.15 shows the locations of the parks and recreation areas in the study area.

Exhibit 4-36—National Memorials, National Scenic Trail, National Natural Landmarks, National Wildlife Refuges, and National Historic Sites and Preserves within Study Area

Name	County	Acreage within 2,000-foot-wide study area		Potential Section 4(f)	Potential Section 6(f)
		90/110 Study Area	125 Study Area		
General Grant National Memorial	New York	0.8	0.8	X	X
Appalachian National Scenic Trail	Putnam	0.4	0.4	X	X
Vanderbilt Mansion National Historic Site	Dutchess	143	143	X	X
Franklin D Roosevelt Home National Historic Site	Dutchess	82	82	X	X
Albany Pine Bush NNL **	Albany	462	283	X	X
Moss Island NNL	Herkimer	15		X	X
Montezuma National Wildlife Refuge	Wayne	1 (556*)		X	X
Bergen-Byron Swamp NNL	Genesee		457	X	X

*/ One acre of the Montezuma National Wildlife Refuge is in the study area, 556 acres of the Approved Acquisition Area for the refuge is in the study area.
**/ Total acreage for Albany Pine Bush Preserve is 3,200 acres, a portion of which is in the study area.
Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.

Source: National Park Service, U.S. Fish and Wildlife Service, New York State GIS Clearinghouse

Exhibit 4-37—State Parks, State Park Preserves, State Historic Sites

Facility Name	Facility Type	County/City	Acreage in Study Area		Potential Section 4(f)	Potential Section 6(f)
			90/110	125		
Hudson River Park	State Park	Manhattan	0.1	0.1	X	
Riverbank State Park	State Park	New York	26	26	X	X
Philipse Manor Hall	State Historic Site	Westchester	0.3	0.3	X	
Old Croton Aqueduct	State Historic Park	Westchester	18	18	X	X
Rockefeller State Park Preserve	State Park	Westchester	153	153	X	
Hudson Highlands State Park	State Park Preserve	Westchester	204	204	X	
Hudson Highlands State Park	State Park Preserve	Putnam	322	322	X	
Hudson Highlands State Park	State Park Preserve	Dutchess	398	398	X	
Hudson Highlands State Park Underwater Lands State Park	State Park	Dutchess	19	19	X	
Walkway over the Hudson State Park	State Park	Dutchess	0.3	0.3	X	
Margaret Lewis Norrie State Park	State Park	Dutchess	234	234	X	X
Staatsburgh State Historic Site	State Historic Site	Dutchess	1	1	X	X
Ogden Mills and Ruth Livingston Mills Memorial State Park	State Park	Dutchess	224	224	X	X
Clermont State Historic Site	State Historic Site	Dutchess	0.1	0.1	X	
Clermont State Historic Site	State Historic Site	Columbia	152	152	X	
Olana State Historic Site	State Historic Site	Columbia	74	74	X	
Conservation Easement (adjoining Olana site)	State Historic Site	Columbia	103	103	X	
Building envelope (adjoining Olana site)	Conservation easement	Columbia	7	7	X	
Hudson River Islands State Park	State Park	Columbia	11	11	X	
Schodack Island State Park	State Park	Columbia	14	14	X	X
Schodack Island State Park	State Park	Greene	9	9	X	X
Schodack Island State Park	State Park	Rensselaer	185	185	X	X
Lock 9 State Canal Park	NYS Canal Corporation	Schenectady	16	0	X	X
Guy Park	NYS Canal Corporation	Montgomery	2	0	X	
Schoharie Crossing	State Historic Site	Montgomery	18	0	X	X
Herkimer Home	State Historic Site	Herkimer	33	0	X	
Oriskany Battlefield	State Historic Site	Oneida	5	0	X	X
Old Erie Canal State Historic Park	State Historic Park	Madison	185	45	X	X
Old Erie Canal State Historic Park	State Historic Park	Onondaga	94	12	X	X
State Fairgrounds	NYS Department of Agriculture & Market	Onondaga	85	85	X	
State Park at the Fair	State Park	Onondaga	1	0.7	X	
Whirlpool State Park	State Park	Niagara	6	6	X	X

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.

Source: New York Office of Parks, Recreation, and Historic Preservation and NYS GIS Clearinghouse

Exhibit 4-38—New York State DEC Lands

Facility Name	County/City	Acreage within 2,000-ft.-wide Study Area		Potential Section 4(f)	Potential Section 6(f)
		90/110 Study Area	125 Study Area		
Tivoli Bay Wildlife Management Area	Dutchess	412	412	X	X
Middle Ground Flats Unique Area	Greene	9.0	9.1	X	
Middle Ground Flats Unique Area	Columbia	1.3	1.3	X	
Hudson River at Germantown	Columbia	*	*	X	
Stockport Flats Tidal Wetland	Columbia	31	31	X	
Rogers Island Wildlife Management Area	Columbia	90	90	X	
Hudson State Boat Launch	Columbia	0.2	0.2	X	
Stockport Flats Wildlife Management Area	Columbia	230	230	X	
Nutton Hook Tidal Wetland	Columbia	292	292	X	
Albany Pine Bush State Unique Area	Albany	138	124	X	X
Nelliston Boat Launch Site	Montgomery	*		X	
Plantation Island Wildlife Management Area (Lock 18 WMA)	Herkimer	50		X	
Oriskany Flats Wildlife Management Area	Oneida	265		X	
Rome State Wildlife Management Area	Oneida	269		X	
Carpenter's Creek Fisherman's Access	Onondaga	0.4		X	
Northern Montezuma Wildlife Management Area	Cayuga	75		X	
Northern Montezuma Wildlife Management Area	Wayne	184		X	
Tillman Road Wildlife Management Area	Erie		20	X	

*Site is a boat launch, acreage is not available
Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.

Source: New York State GIS Clearinghouse, New York State Department of Environmental Conservation

Exhibit 4-39—County Parks within 1,000 feet of the Corridor Centerline

Park	County	Study Area Acreage		Potential Section 4(f)	Potential Section 6(f)
		90/110 Study Area	125 Study Area		
Lenoir Preserve (County Park)	Westchester	9	9	X	
Kingsland Point County Park	Westchester	16	16	X	
Croton Point County Park	Westchester	11	11	X	
Oscawana County Park (undeveloped)	Westchester	80	80	X	
Bowdoin County Park	Dutchess	105	105	X	X
Quiet Cove Riverfront Park	Dutchess	32	32	X	
Papscanee Island County Nature Preserve	Rensselaer	169	169	X	
Bergen Park	Montgomery	2.4*		X	
Onondaga Lake County Park	Onondaga	24	24	X	X
Black Brook County Park	Wayne	17		X	
Blue Cut County Nature Center	Wayne	20		X	
Swift Landing County Park	Wayne	23		X	
Churchville County Park	Monroe		72	X	X
DeWitt County Recreational Facility	Genesee	116		X	

*/ Bergen Park is approximately 2.4 acres and the entire park is within the 90/110 Study Area.

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.

Source: New York State GIS Clearinghouse, LWCF website: <http://waso-lwcf.ncrc.nps.gov/public/index.cfm>

Exhibit 4-40—Number of Municipal and Non-Profit Parks with 1,000 feet of the Corridor Centerline

County	Municipal Parks within 1,000 feet		Potential Section 6(f) Parks		Potential Section 4(f) Parks		Nonprofit
	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area	90/110 Study Area	125 Study Area	
New York	12	12	5	5	12	12	
Bronx	4	4	1	1	4	4	
Westchester	20	20	6	6	20	20	1
Putnam	0	0	0	0	0	0	
Dutchess	12	12	3	3	12	12	
Columbia	1	1	0	0	1	1	1
Rensselaer	0	0	0	0	0	0	
Albany	7	8	2	1	7	8	
Schenectady	6	0	1	0	6	0	
Schoharie	0	0	0	0	0	0	
Montgomery	3	0	1	0	3	0	
Herkimer	2	1	1	0	2	1	
Oneida	0	1	0	0	0	2	1
Madison	1	0	1	0	1	0	
Onondaga	2	2	1	1	2	2	
Cayuga	0	0	0	0	0	0	
Wayne	1	0	0	0	1	0	
Monroe	7	9	2	2	7	9	
Genesee	3	0	0	0	3	0	
Erie	6	7	2	2	6	7	
Niagara	7	7	1	1	7	7	
TOTAL	94	84	27	22	94	84	3

Note: The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long. The study area width is defined as being within 1,000 feet of the corridor centerline.

Source: New York State GIS Clearinghouse, New York State Office of Park, Recreation, and Historic Preservation, and National Park Service LWCF website: < **http://waso-lwcf.ncrc.nps.gov/public/index.cfm**>

Historic and Cultural Resources

Archaeology

Exhibit 4-19 and Exhibit G-22 of Appendix G.14 identify the number and type of sites in each county in the direct APEs for the 90/110 Alternative and the 125 Alternative. A total of 166 previously-identified archaeological sites have been identified within the direct APE for the 90/110 Alternative that extends along the Empire Corridor South/West and the Niagara Branch. A total of 126 previously-identified archaeological sites have been identified within the direct APE for the 125 Alternative that extends along the Empire Corridor South/West and the Niagara Branch.

Historic Architectural Resources

Previously-identified historic architectural resources located within the direct APE for the 90/110 Alternative and the 125 Alternative are summarized in Exhibit 4-41. Detailed tables listing the S/NR-listed and eligible individual resources are provided in Appendix G.14. The approximate locations of these resources are illustrated on Exhibit G-24. The previously identified architectural resources within the indirect APEs are summarized in Exhibit 4-42.

A total of 79 previously-identified historic architectural resources are located in the direct APE for the 90/110 Alternative that extends along the Empire Corridor South/West and the Niagara Branch. These resources are summarized by county in Exhibit 4-41. Of the 80 architectural resources, three resources are NHLs: Fort Klock in St. Johnsville, Montgomery County, the Hudson River Historic District in Dutchess and Columbia counties, and the New York State Barge Canal Historic District. At least four S/NR-eligible resources directly associated with the railroad are located in the direct APE.

It should be noted that approximately 350 bridges meeting the 50-year age criterion for S/NR eligibility are located within the existing railroad alignment and thus within the direct APE.

The resources within the 100-foot direct APE were included in the 600-foot indirect APE. A total of 356 previously-identified architectural resources are located in the indirect APE for the 90/110 Study Area that extends along the Empire Corridor South/West and the Niagara Branch. These resources are summarized in Exhibit 4-42. Of the 356 architectural resources, five are NHLs. At least eight S/NR-listed resources directly associated with the railroad are located within the indirect APE.

A total of 60 previously-identified architectural resources are located in the direct APE for the 125 Alternative that extends along the Empire Corridor South/West and the Niagara Branch. These resources are summarized by county in Exhibit 4-41. Of the 60, two are NHLs: the Hudson River Historic District in Dutchess and Columbia counties and the New York State Barge Canal Historic District.

A total of 235 previously-identified architectural resources are located in the indirect APE for the 125 Study Area that extends along the Empire Corridor South/West and the Niagara Branch. These resources are summarized by county in Exhibit 4-42. Of the 235 resources, three are NHLs.

Exhibit 4-41—Historic Architectural Resources within the Direct APE for each Alternative

County	NHL		S/NR-Listed/Eligible Resources - Individual		S/NR-Listed/Eligible Resources - Districts		**Total Resources**	
	90/110	125	90/110	125	90/110	125	90/110	125
New York			7	7			**7**	**7**
Bronx			1	1			**1**	**1**
Westchester			14	14	1	1	**15**	**15**
Putnam			3	3	2	2	**5**	**5**
Dutchess			13	13	2	2	**15**	**15**
Columbia			2	2	2	2	**4**	**4**
Greene							**0**	**0**
Rensselaer			3	2	1	1	**4**	**3**
Albany			2		1		**3**	**0**
Schenectady				1	1		**1**	**1**
Montgomery	1		9		1		**11**	**0**
Herkimer			1		1		**2**	**0**
Oneida			2				**2**	**0**
Madison				1			**0**	**1**
Onondaga							**0**	**0**
Cayuga							**0**	**0**
Wayne							**0**	**0**
Monroe			2	1	1	1	**3**	**2**
Genesee					1		**1**	**0**
Erie			1	2	1	1	**2**	**3**
Niagara			1	1			**1**	**1**
Multiple Counties	2	2					**2**	**2**
TOTALS	**3**	**2**	**61**	**48**	**15**	**10**	**79**	**60**

Note: Counties are listed from south to north, then east to west.
Resources that fall within the direct APE are also within the boundaries of the indirect APE.
The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long.

Exhibit 4-42—Historic Architectural Resources within the Indirect APEs

County	NHL		S/NR-Listed/Eligible Resources - Individual		S/NR-Listed/Eligible Resources - Districts		**Total Resources**	
	90/ 110	125	90/110	125	90/110	125	90/110	125
New York			62	62	7	7	**69**	**69**
Bronx			4	4			**4**	**4**
Westchester	1	1	36	36	3	3	**40**	**40**
Putnam			5	5	2	2	**7**	**7**
Dutchess			31	31	5	5	**36**	**36**
Columbia			7	7	2	2	**9**	**9**
Greene							**0**	**0**
Rensselaer			32	13	1	1	**33**	**14**
Albany			6	2	2		**8**	**2**
Schenectady	1		4	3	2	1	**7**	**4**
Montgomery	1		50		3		**54**	**0**
Herkimer			17		1		**18**	**0**
Oneida			8		1		**9**	**0**
Madison			6	1	1		**7**	**1**
Onondaga			1	1	1	1	**2**	**2**
Cayuga							**0**	**0**
Wayne			1		1		**2**	**0**
Monroe			20	19	9	9	**29**	**28**
Genesee			1		2		**3**	**0**
Erie			8	9	3	2	**11**	**11**
Niagara			6	6			**6**	**6**
Multiple Counties	2	2					**2**	**2**
TOTALS	**5**	**3**	**305**	**199**	**46**	**32**	**356**	**235**

Note: Counties are listed from south to north, then east to west.
Resources that fall within the direct APE are also within the boundaries of the indirect APE.
The 90/110 Study Area is used for analysis of Alternatives 90A, 90B, and 110 and consists of the existing 464-mile long Empire Corridor alignment. The 125 Study Area is used for analysis of Alternative 125 and consists of portions of the existing Empire Corridor and new alignment and is 450 miles long.

4.23.4. Environmental Consequences

For purposes of this analysis, environmental effects were noted for those parks, recreational areas, wildlife and waterfowl refuges, and historic resources that may potentially be subject to protection under Section 4(f), as well as parklands subject to protection under Section 6(f). At the Tier 1 level, the potential for those effects are noted in the following sections, although the final determination will occur in Tier 2 assessment(s) as to whether this could result in a Section 4(f) use and/or a Section 6(f) conversion.

Parks and Recreational Areas

This preliminary assessment based on Tier 1 concepts and mapping considers direct and indirect effects on adjoining parks and those parks and recreational facilities within 1,000 feet of the program elements. It will be further refined in Tier 2 as the project development process for the Preferred Alternative, Alternative 90B, is further advanced. As the design advances for the Preferred

Alternative, Alternative B, efforts will be made to avoid parkland encroachments.

Review of aerial and parklands mapping indicates that the Base Alternative, Alternative 90A, and Alternative 90B (the Preferred Alternative) have a lower likelihood of directly affecting parklands or indirectly affecting parklands outside of the right-of-way in ways that would result in Section 4(f) uses or Section 6(f) conversions. The potential effects of Alternative 90B (the Preferred Alternative) are addressed in more detail in Section 4.16.4. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. The proposed work will include the addition of track, as well as maintenance service roads in selected areas. Alternative 125 has the potential to involve more parklands and recreational facilities than any other alternative, with 10 such facilities in 6 counties within the affected environment (including an Oneida Nation-owned golf course). With the possible exception of two crossings of the Mohawk River and Erie Canal for Alternatives 90B and 110, only Alternative 110 has the potential to affect one recreational facility, a county park, that may be protected under Section 4(f) and/or Section 6(f). Please refer to Exhibit 4-36 to Exhibit 4-40 for a comparison of potential impacts to parks and recreation areas by alternative study areas.

Historic and Cultural Resources

As described under "Existing Conditions," previously-identified archaeological sites and architectural resources within the direct APE, and architectural resources within the indirect APE, have been inventoried and mapped. Because the design of program improvements has not progressed to a point sufficient to enable site-specific analyses, Section 4(f) use determinations for architectural and archaeological resources will not be provided as part of this Tier 1 Assessment. The Tier 2 level analysis will include an analysis of the Preferred Alternative's, Alternative 90B's, potential to result in a Section 4(f) use of specific architectural and archaeological resources.

Section 4(f) includes protections of historic sites of local, state, or national significance (eligible or listed properties). Historic properties also include artifacts, records, and material remains that are related to and located within such properties, and properties of religious and cultural importance to an Indian Tribe or Native Hawaiian organization, and that meet the National Register criteria. Traditional cultural properties may also be protected under Section 4(f) if they are on or eligible for listing on the National Register of Historic Places.

Implementation of the Build Alternatives could result in a "use" of cultural resources and historic properties protected under Section 4(f) through physical disturbance or demolition of the resource, proximity effects such as noise and vibration, or proposed changes to the visual character or aesthetic qualities. It is important to differentiate National Historic Landmark resources protected under Section 4(f) as these resources require the most stringent consultation under Section 106 of the NHPA to resolve adverse effects.

To the extent that the scope and activities of the various alternatives and their potential impacts can be identified, this information is provided below. Note that potential direct and indirect effects were identified only for areas within the APE for each alternative where work is proposed. A comparison of the number of resources that could be affected by the Base Alternative, Alternative 90A, Alternative 90B (the Preferred Alternative), Alternative 110, and Alternative 125 is provided in Exhibit 4-43 and summarized below.

The Preferred Alternative (Alternative 90B) would involve greater potential to directly or indirectly affect resources than the Base Alternative, and Alternatives 90A and 125. Alternative 90B could affect a total of 303 archaeological and architectural resources (including NHLs, S/NR/listed and eligible individual resources and districts) within the direct and indirect APEs. This compares to direct or indirect effects to 100 archaeological and architectural resources for Alternative 90A, 24 resources for the Base Alternative, and 122 resources for Alternative 125. Impacts for the Preferred Alternative would be roughly comparable to that for Alternative 110, which would affect 302 archaeological and architectural resources within the direct and indirect APEs. Although the estimate of resources affected by Alternative 125 is lower, this alternative will involve far greater disturbance to undisturbed ground. The lower estimate may reflect unidentified archaeological and architectural sites in more rural areas.

The number of archaeological and architectural resources that would potentially be directly affected by the Preferred Alternative is 154, compared to 48 for Alternative 90A, 153 for Alternative 110, and 86 for Alternative 125. Although the number of resources within the direct APE are similar for Alternative 110 and the Preferred Alternative, the potential for impacts would most likely be greater for Alternative 110 due to the location of the proposed tracks 15 feet further than for Alternative 90B.

Exhibit 4-43—Comparison of Potential Impacts to Archaeological Sites and Architectural Resources, by Alternative

RESOURCE TYPE	NUMBER OF RESOURCES														
	Base Alternative			90A			90B			110			125		
	Direct	Indirect	TOTAL	Direct	Indirect	TOTAL	Direct	Indirect	TOTAL	Direct	Indirect	TOTAL	Direct	Indirect	TOTAL
Archaeological Sites	N/A	N/A	**3**	30	N/A	**30**	88	N/A	**110**	86	N/A	**108**	35	N/A	**57**
NHLs	N/A	N/A	**0**	1	1	**2**	1	N/A	**2**	1	N/A	**2**	0	N/A	**1**
S/NR-listed/eligible Historic Districts	N/A	8	**8**	5	6	**11**	6	18	**33**	6	18	**33**	0	0	**9**
S/NR-listed / eligible Individual Resources	N/A	15	**15**	12	45	**57**	12	99	**158**	12	100	**159**	3	5	**55**
TOTAL	0	24	**24**	48	52	**100**	107	117	**303***	105	118	**302***	38	5	**122***

Note: Resources that fall within the direct APE (D) are also located within the boundaries of the (I) indirect APE, as indicated in the Total column.
*The following resources identified in Alternative 90A for the Empire Corridor South are included in the total resource count for Alternatives 90B, 110, and 125: 22 archaeological sites; 1 NHL; 9 S/NR-listed Historic Districts; and 47 S/NR-listed or eligible Individual resources.

4.23.5. Measures to Minimize Harm

Parks and Recreational Areas

The design for the Preferred Alternative, Alternative 90B, will continue to be refined to avoid protected Section 4(f)/6(f) parklands and recreation areas and minimize unavoidable encroachments to the extent practicable. During environmental compliance efforts associated with Tier 2 projects, if applicable, Section 4(f) evaluations will be completed to fully evaluate permanent and temporary uses and de minimis impacts. Mitigation measures required for any encroachments will be developed, in consultation with officials with jurisdiction. If parklands that have received Land and Water Conservation Fund Act grants will be converted, Section 6(f) requires that recreation property of equal fair market value and usefulness be provided as compensation as required under Section 6(f).

Mitigation measures may include permanent measures, such as providing trail connections or compensatory parkland, or construction mitigation, such as maintaining trail or park access during construction or using time-of-year restrictions on construction work. Other considerations will include ameliorating potential visual and noise impacts on adjoining parks or recreation areas, and further assessments of these impacts of the Preferred Alternative, Alternative 90B, and mitigation measures will also be advanced in Tier 2.

Historic and Cultural Resources

Measures to minimize harm to cultural resources and historic properties will be developed during the Section 106 process for the component projects advanced for the Preferred Alternative, Alternative 90B, at the Tier 2 level. As applicable, the Tier 2 assessments would adopt a Section 106 process outlining future identification, evaluation, and assessment of effects to historic properties including processes for the resolution of adverse effects. If unavoidable potential direct and/or indirect adverse effects are identified during the Tier 2 analysis, more detailed and specific measures to avoid, minimize and/or mitigate these effects would be defined and implemented in consultation with SHPO, involved THPOs and/or Tribal Organizations, ACHP (if appropriate), and any involved consulting parties.

For archaeological resources, mitigation measures that may be identified for component projects for Alternative 90B, the Preferred Alternative, at the Tier 2 level may include:

- Phase III data recovery, documentation,
- geoarchaeological survey,
- preparation and implementation of archaeological protection plans, and/or
- preparation of public education materials.

For architectural resources, possible mitigation measures include:

- The preservation or relocation of historic buildings;
- Documentation of resources following Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) standards;
- Production of educational materials interpreting the history and significance of affected resources for use by local libraries, historical societies, and educational institutions; and
- Installation of signage interpreting the history and significance of affected resources along the proposed rail corridor, or planting vegetation or creating noise barriers along the proposed rail corridor.

Furthermore, in order to avoid inadvertent damage to historic resources located in close proximity to possible project construction, a Construction Protection Plan (CPP) would be prepared, as appropriate. The CPP would identify the historic resources to be included in the plan. It would also set for the specific measures to be used and specifications that would be applied to protect these resources during the construction period.

4.23.6. Future Analysis

The Tier 1 concepts and screenings were conceptual in nature, and not developed to a level that allows full evaluation of park and historic impacts; these assessments occur in Tier 2. If federal Department of Transportation funding applies, then the applicability of Section 4(f) will be evaluated for the Tier 2 projects. The applicability of Section 6(f) under the LWCF would be determined for federal or state funded projects.

The applicability of the recently enacted railroad exemptions under the Fixing America's Surface Transportation Act (FAST Act) from both Section 4(f) and Section 106 would be examined in Tier 2 assessments, when details are available regarding project-specific proposals and their relationship to the railroad right-of-way.

Section 4(f) of the U.S. Department of Transportation Act applies to two categories of resources: 1) publicly owned public parks, recreation areas, and wildlife or waterfowl refuges; and 2) significant historic sites, regardless of whether they are publicly or privately owned. The extent of impact and use of Section 4(f) properties will be determined, including the extent to which a "constructive use," "temporary occupancy" of the property, or "*de minimis* impact" may occur, and potential impacts on Section 4(f) properties will be assessed

Section 4(f) has prohibited the U.S. DOT from approving the "use" of Section 4(f) properties unless U.S. DOT makes two findings: 1) that there is no feasible and prudent alternative that avoids the use of Section 4(f) properties, and 2) that the project incorporates all possible planning to minimize the harm that results from the use of those resources. Avoidance and minimization measures will be evaluated in Tier 2, and if it is not possible to eliminate impacts on Section 4(f) resources, appropriate mitigation measures will be identified. The process for evaluations of parks and historic properties are discussed further in the following sections.

<u>Parks and Recreational Areas</u>

For potential parkland impacts, the applicability of Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the U.S. Land and Water Conservation Act will be determined. If a Section 4(f) use may occur, consultation with public officials and property owners/officials with jurisdiction will be performed regarding the use of the parks/recreation areas and potential impacts and mitigation measures. Those parklands for which Land and Water Conservation funds were expended will also be identified.

Section 4(f) requires the U.S. DOT to seek comments from the U.S. Department of the Interior (and in some cases other agencies) before making these findings. The extent of impact of the Preferred Alternative, Alternative 90B, and use of Section 4(f) properties will be determined, and potential impacts on Section 4(f) properties will be assessed. If a use of a Section 4(f) park or recreation property is determined to occur, a Section 4(f) Evaluation will be prepared and circulated as part of Tier 2.

Section 6(f) applies to parklands on which Land and Water Conservation Funding has been expended. If the Preferred Alternative, Alternative 90B, would involve a Section 6(f) conversion, then a Section 6(f) Evaluation must be prepared as part of Tier 2 and approved by the National Park Service. The Section 6(f) Evaluation must evaluate all practical alternatives to converting the Section 6(f) property and demonstrate that there are no feasible means of avoiding the conversion. If a conversion will occur, the Section 6(f) Evaluation must identify replacement property to be acquired of reasonably equivalent usefulness and location and of at least equal fair market value to the converted property.

Historic and Cultural Resources

If there is no federal involvement in future tiers or phases of the project, such as grant funding, permits or approvals, then only New York State Historic Preservation Act of 1980 (SHPA) would apply to those future tiers or phases and Section 106 of NHPA and Section 4(f) would not be applicable.

If Tier 2 does involve federal funding, the Tier 2 assessments would need to determine the applicability of the recently enacted railroad exemptions in the Fixing America's Surface Transportation Act (FAST Act). The FAST Act excludes from Section 106 review the placement of track in former track locations within railroad rights-of-way and certain railroad bridges. Section 11502 of the FAST Act also exempts from Section 4(f) review the use (improvements to or rehabilitation) of railroad lines that are in use or historically used for transportation, whether the element is listed on or is eligible for listing on or is eligible for listing on the National Register of Historic Places.

As described in the "Methodology" section, the environmental compliance for this program is being conducted using a phased approach . Section 4.15.6 outlines the future historic assessments to be conducted in Tier 2 in detail for potential historic resource impacts. For historic resources potentially affected, additional evaluation for Tier 2 analysis could include, as appropriate, determination of National Register eligibility of potential S/NR architectural resources that meet the S/NR criteria.

If the analysis concludes that a proposed project within the Alternative 90B program would have an adverse effect, measures to avoid, minimize, or mitigate adverse effects would be identified.

In addition to Section 106, the effects of the undertaking on historic properties would also be considered under Section 110 of NHPA and Section 4(f) as part of a separate future analysis. Section 110 of NHPA mandates additional protection of NHLs by requiring that federal agencies undertake planning and actions as necessary to minimize harm when considering undertakings that may directly and adversely affect NHLs. Section 4(f) prohibits actions by the Secretary of Transportation that require "use" of a historic property that is listed in or eligible for inclusion in the National Register, unless a determination is made that there is no feasible and prudent alternative to the use of such land, and all possible planning has been undertaken to minimize harm to the 4(f) property.

4.24. Indirect and Cumulative Impacts

Indirect and cumulative impacts include reasonably foreseeable actions and proposed and planned actions, both by NYSDOT and by other agencies. This Tier 1 evaluation presents a generalized assessment of these impacts based on Tier 1 concepts that would be further refined in the Tier 2, once the scope and timing of improvement projects are better defined.

4.24.1. Regulatory Context

The National Environmental Policy Act regulations promulgated by the Council of Environmental Quality define both indirect effects and cumulative impacts,[145] as follows:

[145] Council of Environmental Quality Regulations for Implementing NEPA, 40 CFR 1508.7 and 1508.8, December 21, 1984.

"*Indirect) effects, are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.*"

"Cumulative impact" is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.24.2. Environmental Consequences

Comparison of Alternatives

Cumulative impacts account for the total impact on the environment of incremental actions over time. The suite of railroad improvements along the Empire Corridor that are either proposed or are in the planning stages (e.g., station, track, and signal improvements along the Empire Corridor) have largely been incorporated into the program alternatives as part of the Base or 90A Alternatives. These are carried through to Alternatives 90B, 110, and 125 to varying degrees. This section considers the cumulative impacts of other transportation and infrastructure improvements, as well as indirect impacts such as secondary development, as described below. Appendix G.21 presents other improvements that may also affect the cumulative environmental impact, although these are localized in the immediate area of the proposed improvements. Many of these improvements are minor highway widenings or access/interchange improvements that do not extend more than a mile or so in length and therefore would have a very localized effect, if any.

Indirect impacts include impacts associated with developments that would occur later in time that the program could potentially induce. This type of secondary development would most likely be centered on the existing passenger stations. The improvements in rail service may enhance the attractiveness of the area for businesses and residents, thereby potentially encouraging secondary development. Although this effect may be widespread along the rail corridor, its effects may be most pronounced in the vicinity of the existing station sites. However, since, for the most part, the stations will not be relocated, the potential for secondary development would be smaller than if a new station were constructed or an existing station were to be relocated. Moreover, the potential for development is influenced by factors that include local zoning, market forces, adequate infrastructure and transportation access, and extent of existing development and availability of land for redevelopment/development. Even though secondary development may not occur if passenger rail service improvements are implemented, it is anticipated that there is an increased potential for more indirect economic effects (increase in property values, increased business sales, and even increase in jobs) to occur with improvements in passenger rail service. The additional trackage would also benefit freight transportation, which would also result in economic benefits to the freight rail users and shippers that use or are located along the route.

Of the alternatives evaluated, the Base and 90A Alternatives would involve the least indirect and cumulative impacts. Alternatives 110 and 125 would involve the greatest indirect and cumulative impacts, and would involve the greatest economic and air quality benefits and transportation changes, the great degree of secondary development impacts, and the greatest adverse socioeconomic displacements and environmental impacts. The Preferred Alternative would involve cumulative and indirect impacts that would be greater than the Base and 90A Alternatives, but would be more moderate than Alternatives 110 and 125. This section examines the indirect and cumulative impacts of the Preferred Alternative. Appendix G.21 presents the context for the evaluations and the indirect and cumulative impacts of the other alternatives considered.

Alternative 90B (Preferred Alternative)

Major new infrastructure investments, such as improvements to high-speed rail service, could potentially change the population and employment outlook. For example, according to a U.S. Conference of Mayor's Report, which examined the impact of high-speed rail upon the City of Albany, the introduction of high-speed rail along the corridor can contribute substantially to economic growth by driving higher-density, mixed-use development at train stations; expanding visitor markets and generating additional spending; broadening regional labor markets; and supporting the growth of technology clusters.[146]

The additional tracks segregating freight and passenger service will not only accrue economic benefits from increased ridership, but will also benefit freight rail and movement of goods. Empire Corridor West represents one of CSXT's highest volume freight routes nationwide. The economic benefits associated with the project will extend to freight rail users and shipping companies, as the additional trackage will provide better travel times and less delays for freight. This major freight corridor connects to the border crossing at Niagara Falls, an economically important gateway for international trade.

The station improvements for Alternative 90B also have the potential to increase economic benefits to these cities. Secondary impacts for component projects of Alternative 90B include potential for benefits and secondary development anticipated with new station buildings to be constructed at Amsterdam and Buffalo-Depew Stations. There may be more potential for secondary development in the City of Buffalo, as this station is more centrally located to business or industrial districts and is also a larger city. However, the Buffalo-Depew Station is located within an industrial area and physically isolated from nearby commercial activity. The existing Amsterdam Station is located on the western outskirts of the City of Amsterdam, and land use patterns include established residential neighborhoods. with limited commercial development or zones scattered in the surrounding area and somewhat removed from the existing station. If the new station buildings for Buffalo-Depew and Amsterdam are relocated closer to established commercial activity centers, there would be an increased potential for secondary development.

With the proposed improvements in passenger rail service, this alternative would have a greater potential to increase economic benefits to cities primarily at the station sites. The highest potential for secondary development may occur at Niagara Falls, and major cities in Schenectady, Rochester, and Buffalo where station improvements were recently constructed, as well as other urban centers with station sites.

This alternative would have a somewhat greater potential for secondary development than the Base/90A Alternatives due to improved passenger rail service. However, the potential for any environmental impacts (traffic, land use, community, wetlands, parklands, air quality, noise, etc.) is limited to some extent by the heavily urbanized areas around many of the existing stations, which would limit the potential for impacts to undeveloped lands, farmlands, and natural resources, such as wetlands, and endangered species habitats impacts. Any secondary development in these urban

[146] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail on Cities and their Metropolitan Areas.* Prepared for the U.S. Conference of Mayors (undated), released June 2010.

locations is likely to involve redevelopment of existing developed sites. The secondary development or redevelopment and changes in land use under Alternative 90B, this alternative may produce greater indirect economic effects (increase in property values, increased business sales, increase in jobs) for the downtown areas served than would the Base/90A Alternatives.

4.24.3. Potential Mitigation Strategies

Since the cumulative impacts are anticipated to consist largely of beneficial economic impacts, with limited adverse environmental impacts, due to the already highly developed and urbanized nature of existing station sites, mitigation may not be required. Mitigation strategies during Tier 2 could include consultation with local and regional planning officials regarding local plans and zoning and discussing status of implementation strategies to support Transit Oriented Development (TOD). In the Tier 2 assessment, further research to be performed in the vicinity of station sites could include zoning and the extent of planning to support TOD in the vicinity of station sites. The final siting of stations, including the potential to relocate some stations to sites with more potential for positive secondary development impacts, could consider these factors to further economic development and consistency with regional and local plans.

4.24.4. Future Analysis

The existing land uses and zoning in the vicinity of station sites and consistency with Master Plans will be identified in the vicinity of existing and proposed station improvements. Regional and local planning officials will be consulted regarding station plans, and the secondary development potential of the program will be reevaluated in the context of current market forces and existing/proposed developments and land uses in the vicinity of the stations.

4.25. Construction

The Build Alternatives for the proposed program would involve the construction of new rail infrastructure including sections of track, bridges and other aerial structures, station construction, as well as ancillary and support facilities across the Empire Corridor. This section summarizes what construction of the proposed program may entail and reviews the potential for adverse impacts and measures to avoid, minimize and/or mitigate them. Since the eight projects associated with the Base Alternative are completed, the Base Alternative is not presented in this section.

4.25.1. Methodology

Because this is a Tier 1 assessment, the methodology for determining construction impacts at this stage involves a qualitative conceptual approach. At this early stage of the program, construction plans, including staging areas, construction methods, and materials have not been developed, and the extent of impacts will depend on the methods used, which will not be determined until either final design or even construction. The exact methods may be determined as part of the contractor's means and methods during the construction period. Therefore, impacts will vary, depending on how specific projects are designed and constructed and the findings of any Tier 2 environmental studies, which may identify additional resources or potential impacts. For the Tier 1 analysis, a general overview of the potential construction techniques is identified, along with potential typical short-term impacts.

4.25.2. Construction Types

The program construction would involve the construction of several different elements of the rail infrastructure along the corridor. The general types of construction activities employed as part of the program include:

- At-grade trackwork
  - New tracks and special trackwork
  - Removing tracks, realigning, replacing existing track work
- New and upgraded highway/grade crossings
- Right-of-way fencing
- Creation of additional track right-of-way
  - Expanding embankments, retained fill or cut earthwork
- New Railroad bridges/structures
  - Replacement of existing bridges
    - Installation of foundations
    - Construction of concrete piers and abutments
    - New bridge superstructures
  - New grade separated bridge structures
  - Extensions to culverts
- Rehabilitation of existing Railroad Bridges
  - Strengthening or widening of existing piers and abutments
  - Replacement or widening of superstructures
- Station and Facility work
  - New/rehabilitation of existing station platforms
  - New trackwork/rehabilitation of existing trackwork
  - New and/or upgraded special trackwork for station access
- Signal work/Advanced Train Control
  - New wayside signal and fiber-optic underground cables and conduits
  - New and/or replaced wayside signals
  - Modifications to Positive Train Control system
- Yard/Maintenance facilities
  - Construction of new yard tracks
  - Replacement of special trackwork

The construction of the program may require temporary use of other parcels of land for staging and storage of construction equipment and materials, if the available right-of-way is not sufficient. During final design, the need for temporary construction easements on other properties would be determined, and required permits or approvals would be identified.

4.25.3. Environmental Consequences

Although the precise extent and locations of the different construction types are not yet known in Tier 1 assessment, the following section reviews the types of impacts that can occur from these construction activities. The various alternatives are compared programmatically to determine the relative magnitude of each, with specific impacts identified as applicable to the Preferred Alternative.

Comparison of Alternatives

A comparison of construction impacts related to each resource or parameter studied in this Tier 1 Final EIS can be found in Exhibit 4-44. For many of the resources and parameters discussed, the degree and extent of short term construction impacts would be proportional to the amount of new construction located outside of the existing right-of-way. For example, construction activities on undisturbed locations have a greater potential for natural resource impacts, including the potential use of timber for clearing and subsurface excavation. Given the location of the program alongside or within the existing railroad rights-of-way or previously disturbed areas, and the relatively shallow depths of excavation required for the railroad and its embankment, it is unlikely that the program would affect mineral resources.

Earthwork during construction can create many short-term environmental impacts. These impacts include erosion and sediment transport effecting water quality or terrestrial or aquatic habitats, changes to stormwater routing, potential exposure to contaminated soil and/or groundwater, airborne dust particles, and visual impacts. Alternative 90A would involve the least amount of earthwork during construction and would involve work within the right-of-way. Trackwork for the Preferred Alternative, 90B, would largely be sited within the existing rail right-of-way and would be placed using rail-mounted equipment, which would not involve large quantities of earthwork. Compared to these alternatives, Alternative 110 would involve greater clearing and earthwork, due to the addition of rail outside the existing right-of-way. Earthwork may be involved for all alternatives for station construction, addition of third and fourth track rail embankments, extension of culverts, construction of elevated structures and flyovers, bridgework, and maintenance of access roads. Earthwork would also be needed for clearing and other more intensive activities for foundations and civil work. Due to construction of an exclusive new right-of-way to be built over 280 miles from Albany to Buffalo, Alternative 125 would require the greatest level of construction activity with the largest potential to impact the environment, affecting an estimated two to three thousand acres of land.

For Alternatives 90A, 90B and 110, significant work would take place within the existing right-of-way. This online construction would present both challenges and opportunities. With Alternatives 90B and 110, the location of the new passenger tracks generally on the north side in the location of the former passenger tracks would allow existing rail operations to be maintained, while construction of the new tracks is proceeding. Another advantage is that the existing rail network could be used to deliver materials and equipment and remove excavated materials and construction debris. An important pre-construction task would be to identify, locate, and protect existing railroad systems to avoid construction-related disruptions to vital signal and communications systems.

Construction activities would be carefully staged and scheduled to minimize impacts to the operations of freight and passenger trains. Flagging personnel from the operating railroad would be required to protect rail service and ensure the safety of rail operations, construction personnel and the public. As construction proceeds in a linear fashion along the right-of-way, impacts to adjacent communities and landowners can be expected to be transitory in duration. Installation of new subgrade, ballast, track, and final surfacing would likely occur in a series of passes of specific construction activities resulting in short, but repeated, impacts to any adjoining abutters. The use of construction equipment and supporting work trains would result in noise and in the case of night-time activities, temporary lighting. As construction would pass over highway/grade crossings or would upgrade the crossings, highway vehicle traffic would be temporarily obstructed resulting in delays and potential detours.

Exhibit 4-44—Alternatives Comparison of Construction Impacts

Resource	Potential Construction Impacts by Alternative				
	Base	90A	90B	110	125
Land Use	Impacts from short-term easements commensurate with permanent land use impacts				
Population and Employment	Short-term construction employment proportional to capital expenditure				
Environmental Justice/Title VI	Unlikely to result in disproportional impacts to EJ communities			Higher potential impacts	Greatest potential for impacts
Community and Public Facilities	Proximity impacts during construction proportional to length of construction				
Surface Waterbodies and Watercourses	Least construction work in and around water resources	Low construction work in and around water resources	Moderate construction in and around water resources	Moderate construction in/near water resources, with slightly greater impacts than 90B.	Significant construction in and around water resources
Navigable Waters	Minimal impacts	Short term impacts to2-5 existing crossings	Short term impacts at up to 15 existing crossings	Short term impacts at up to 15 crossings, increased impact with track built 15 feet further out than 90B	Short term impacts at 4 new crossings
Floodplains	Short term impacts are unlikely as permits will likely require that no equipment or material is stored in the floodplain; however, temporary works may increase flood potential or could cause damage in the event of a flood event.				
Aquifers	Short term impacts commensurate with amount of subsurface work.				
General Ecology and Wildlife Resources	Short-term impacts from temporary disturbance, noise, short-term loss of habitat proportional to capital expenditure.				
Historic and Cultural Resources	Least potential impacts	Low potential impacts	Greatest potential for adverse impacts on known resources		Moderate impacts-on known resources. Greater potential for unidentified sites
Parks and Recreation Areas	Short-term impacts to users of adjacent facilities from construction activities proportional to capital expenditure				
Visual Resources	Short-term impacts commensurate with construction but would depend upon local site-specific existing visual resources along the Empire Corridor				Potential for substantial short-term impacts
Farmlands	Minimal impacts to actively farmed areas and little or no impacts to active farms outside of the right-of-way			Isolated short-term impacts to one or more active farmlands	Involve substantially greater short-term impacts to farmland
Air Quality	Potential impacts are proportional to capital expenditure and construction timeline due to potential increase in temporary pollutant emissions over a longer duration				
Energy and Climate Change	Potential energy required for construction is proportional to capital cost				
Noise and Vibration	Potential impacts are proportional to capital cost with the higher cost alternatives requiring more extensive heavy construction. However, site-specific conditions such as surrounding land use would ultimately determine the level of temporary impact				
Contaminated and Hazardous Materials	Risk of encountering contaminated materials commensurate with capital cost, due to work within potentially contaminated right-of-way, increase in subsurface work, and work in highly developed urban areas				Lower risk of encountering contaminated sites, but increase in subsurface work
Traffic/ Transportation	Least potential for temporary impacts	Low potential for temporary impacts	High potential for temporary impacts	Highest potential for temporary impacts	Moderate potential for temporary impacts

In the case of fixed facilities such as bridges, interlockings, stations and yards, construction activities may require months or years for completion. Each of these specific construction activities would require detailed staging plans to ensure that the adjacent rail facilities and communities are minimally impacted, and that construction can efficiently progress. Special rail operating schedules may be required to safely and effectively operate passenger and freight trains through or around construction. In the case of passenger stations, particular attention must be paid to the safe passage of passengers through the construction area.

Construction of the 125 Alternative would reduce the potential construction-related impacts to the operating rail system, since the majority of construction would be on a new rail right-of-way. Connection to the existing rail system at Albany, Syracuse, Rochester, and Buffalo, as well as construction of flyovers, would have extended, but temporary impacts to the rail system, as described above in the discussion on fixed facility construction. On the new portions of the right-of-way remote from the existing Empire Corridor, construction would be able to proceed without delays associated with rail traffic. This fact will increase productivity as the contractors will be able to fully expedite the use of labor, machinery, and materials without restrictions. However, because work will take place along a new right-of-way, there is the greatest potential for adverse short-term impacts from construction to the surrounding environment, including residential or commercial properties, water resources, farmland, wildlife, and natural resources such as minerals and timber.

Alternative 90B (Preferred Alternative)

The potential construction impacts of Alternative 90B, the Preferred Alternative, are summarized below.

- **Land Use:** Easements and temporary use of private or public property outside of the railroad right-of-way may be required for construction activities, including storage of materials and equipment, access to construction areas, and other construction-related activities.
- **Regional Population and Employment** There would be beneficial effects related to new employment opportunities associated with construction activities and positive fiscal impacts. The location of the program almost entirely within the right-of-way would minimize the potential for business or neighborhood impacts. However, there could be potential for adverse effects to some businesses, if property or other impacts, such as temporary loss of parking or difficulty accessing businesses caused by roadway and sidewalk closures, were to occur.
- **Environmental Justice and Title VI:** Potential for transportation and environmental impacts to both Environmental Justice (EJ) and non-EJ populations could include adverse temporary effects, as discussed in Section 4.4, and would be considered EJ impacts only if they disproportionately affected EJ populations. Evaluations of disproportionality would be undertaken as part of Tier 2 evaluations.
- **Community and Public Facilities:** The potential effects on community facilities include access that may be interrupted by temporary traffic pattern changes associated with construction. However, there are very few community facilities directly adjacent to the proposed work, and no direct impacts have been identified in this Tier 1 assessment. Potential short-term noise and vibration impacts would be possible where construction activities are near sensitive uses such as schools, healthcare and eldercare facilities, house of worship, etc.
- **Surface Waterbodies and Watercourses:** Although there are a number of waterways that cross the existing Empire Corridor, where existing culverts and bridges for the existing railroad embankment are wide enough, there may be minimal disturbances to crossing waterways during construction. However, new construction of bridges and culverts, or modifications/extensions

of existing crossings, or the expansion of railroad embankment itself could involve work that could affect crossing or nearby waterways and stream crossings. Potential construction impacts could include stream discharge that may be altered due to silt loading, increased siltation downstream of stream crossings, and increased potential for toxic substance release from construction vehicles or equipment.

- **Wild, Scenic, and Recreational Rivers:** For any construction occurring along a Nationwide Rivers Inventory river, construction may cause temporary impacts to physical and visual access. The Black Creek (potentially eligible for listing as a National Wild and Scenic River) crosses the Empire Corridor at MP 386, near the location of 11 miles of proposed third track.
- **Navigable Waters:** Where the existing bridge crossings are wide enough, there may not be the need for additional bridgework at navigable waterway crossings. Impacts to navigation and marine users could result from construction of bridge piers and abutments, as well as temporary placement of fill or riprap, and surrounding turbidity curtains/cofferdams. Temporary impacts may include the erection of staging facilities and use of construction barges and other work boats during construction to provide access for pier construction staging or placement of spans.
- **Floodplains:** Construction equipment would not be permitted to be stored in the floodplain. Temporary construction facilities, such as construction platforms and barges within waterways, where located within a floodway, could cause temporary elevated flood elevations, depending on the extent of the construction facilities and the severity of a flood event. Construction equipment would not be permitted to be stored in the floodplain to the extent practicable.
- **Wetlands:** Potential for short-term impacts on wetland resources include the placement of fill material in designated wetland areas that may cause soil erosion, sedimentation, or increased risk of contamination associated with presence of heavy equipment. Wetland impacts may also include the removal of vegetation from areas that would be later regraded and reseeded, temporary loss of aquatic habitat, erosion and sedimentation, and disturbance and displacement of wildlife during construction.
- **Coastal Resources:** Along Empire Corridor South, the railroad transects the coastal zone along the Hudson River, a designated coastal waterway, which is the area with the greatest potential for coastal impacts. The Empire Corridor crosses through 11 Significant Coastal Fish and Wildlife Habitats (SCFWHs) and 6 Scenic Areas of Statewide Significance (SASSs) in this area. For the Preferred Alternative 90B, proposed work within or adjoining these SCFWHs and SASSs along this corridor will not involve substantial impacts outside of the right-of-way and will not result in appreciable changes in visual quality, and no impacts to the scenic qualities of the SASSs are anticipated. The Preferred Alternative will involve bridgework in coastal areas for the Livingston Avenue Bridge and modifying or constructing a new bridge over the Irondequoit Creek, another designated coastal waterway, and its associated SCFWH. This work would be temporary in nature and would span these coastal waters.
- **Aquifers:** Proposed structures that would require substantial excavation, deep foundation or dewatering, such as new stations, platform extensions and bridge construction, could impact groundwater. Any construction-related action that may release contaminants can affect underlying aquifers and potentially impact drinking water supplies.
- **General Ecology and Wildlife Resources including CEAs:** The location of the majority of the work within the right-of-way or within previously disturbed areas would minimize the potential construction impacts to wildlife, including the elimination and/or fragmentation of forested habitat. Depending on proximity to aquatic and wildlife habitats, construction noise and construction staging areas may effect or displace some wildlife. Effects to EFH could include

habitat disturbance, and, without protections in place, spawning could be affected by in-water construction work.

- **Historic and Cultural Resources:** Most of the work will occur within the existing right-of-way or within previously disturbed areas, which will minimize the potential for historic or archaeological impacts. The cultural resource inventory captured resources extending within the entire APE (but outside the construction zone in many instances). Where work will occur proximal to historic resources, construction could potentially damage or alter cultural resources and historic properties. Without adequate controls in place, fragile historic buildings and structures could be damaged by activities (e.g., pile driving) that cause high vibration levels. On the surface or belowground, archaeological sites could be damaged or disturbed by grading activities and excavation of undisturbed, natural soils for cuts, foundations for bridges and viaducts, and foundations for ancillary facilities.
- **Parks and Recreational Areas:** Where construction would occur near or adjacent to public open space and parklands, temporary impacts, such as increased noise and reduced access may adversely affect users of the facility. However, there are limited occurrences of work near parks, including existing canal crossings, and at most or all of these, direct impacts are not anticipated at the park/trail properties. The proposed construction includes adding tracks at two crossings over the Erie Canal, including adding trackwork over the Mohawk River/Erie Canal on an existing bridge and adding tracks around Rochester Station that would also cross the Erie Canal and Erie Canalway Heritage Trail. At these and other locations, this work is not anticipated to directly affect the parklands under these bridges. Work would also occur near a riverfront park and underpassing bike trail, but direct impacts to these recreational uses are not anticipated. The potential for impacts at the canal crossings from construction activities will be evaluated in the Tier 2 assessments.
- **Visual Resources:** Visual impacts could include the temporary presence and movement of construction machinery, equipment, building materials, construction access ways, construction cranes, fences, and screens, but only in areas where there are views of the site and receptors close to the construction site.
- **Farmlands:** If construction requires easements for construction access and laydown areas on agricultural property, this could affect the temporary use of and access to agricultural lands. In this case, there would be potential for erosion, sedimentation, and stormwater runoff. Fugitive dust from construction activities may affect farmland functions temporarily. Removal of or damage to vegetation (e.g., trees, shrubs, grass, etc.) during construction can create longer term impacts to nearby farmland.
- **Air Quality:** Fugitive dust emissions from land clearing and grading operations could occur from excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. Mobile source emissions from construction could occur because of operation of heavy-duty diesel and gasoline-powered construction equipment and operation of heavy-duty diesel trucks, and possibly locomotives involved in transporting excavated material and delivering construction materials. Disruption to traffic during construction, such as reduction in roadway capacity and increased queue lengths, could result in short-term elevated concentrations of localized pollutants such as carbon monoxide and particulate matter.
- **Energy and Climate Change:** Potential short-term impacts include direct greenhouse gas emissions from on-site activity during construction. Potential indirect impacts include greenhouse gas production from the extraction, manufacturing, and transport of materials used for construction. The energy expenditures during construction would be substantial and would, to some extent, offset future long-term energy savings and program benefits.

- **Noise and Vibration:** Most of the trackwork would be contained within an active railroad corridor, which currently experiences heavy freight use (CSXT on Empire Corridor West) and commuter rail traffic (Metro-North on Empire Corridor South). Increased noise and vibration from the construction activities may adversely impact sensitive uses during the day and residences at night, although this is an active rail corridor. Construction activities that can be vibration generators include bridgework, foundation work, station/platform construction, retaining wall, and sheet pile construction. Vibration nuisance can occur from pile driving, demolition, rock removal, pavement breaking, and the use of heavy construction vehicles and equipment. In most cases, the construction is anticipated to be far enough away from buildings, that the potential for building damage would be very low. Building damage can occur from construction-related vibration, potentially resulting in structural damage.
- **Contaminated and Hazardous Materials:** Soil disturbance, including excavation, could encounter contaminated soil and/or groundwater. Demolition activities could encounter lead-based paint and asbestos-containing materials as well as PCB containing oils.
- **Traffic and Safety:** Construction activities that impedes access or use of active rail lines could result in potential delays for users of the rail right-of-way. However, the location of the majority of the tracks on the north side (in the location of former tracks) will minimize disruption to active railroad operations. Potential impacts include roadway relocations or diversions during construction in some areas. Construction could affect vehicular operations from lane closures, roadway closures, detours, and disruption of general roadway operations during peak and nonpeak times. Potential impacts to transit stations include loss of or decrease in parking areas and loading zones from construction activities or staging if they extend into the station area. Temporary limitations to vehicular and pedestrian access may occur in certain areas to address public safety and to accommodate the construction activities.

4.25.4. Potential Mitigation Strategies

The construction mitigation will depend on the degree of impacts associated with the Preferred Alternative, Alternative 90B, which will be determined during Tier 2 assessments. At this stage, general construction mitigation strategies have been identified to avoid, minimize, and/or mitigate potential adverse impacts.

It is anticipated that, to the extent possible, and taking into consideration night-time construction noise concerns in residential areas, work will be staged during night-time, weekends, or off-peak hours to minimize service outages and disruptions to the traveling public. However, near residential areas, this will need to be examined and balanced with measures to minimize temporary noise impacts on local residents. Any interruptions in service will be closely coordinated with the affected transportation agencies and freight companies and users and the traveling public and advertised as appropriate.

The following lists potential measures that could be used during construction to avoid, minimize or mitigate the possible temporary adverse impacts outlined above:

- **Land Use:** Local outreach plans will be developed, temporary relocation assistance offered, and compensation provided to affected property owners, as appropriate. For areas used for construction staging, consultation will be performed with affected property owners to provide adequate compensation and minimize property impacts.
- **Regional Population and Employment:** Efforts will be made to avoid impacts on, and prevent construction from affecting, businesses and residential neighborhoods, whether through traffic

disruptions or property impacts. Short-term construction mitigation measures can include outreach to affected communities regarding potential traffic disruptions and compensation to affected property owners for use of affected property. Mitigation will be achieved by providing alternative access or providing temporary relocation services to affected residences and businesses, where applicable.

- **Environmental Justice and Title VI:** Tier 2 analysis will examine in greater detail if any construction impacts are located within an environmental justice population. If necessary, mitigation efforts would include targeted public outreach to affected communities and implementing additional measures, such as noise mitigation and dust controls, to avoid, minimize, or mitigate any adverse effects.
- **Community and Public Facilities:** Tier 2 analysis will determine potential community impacts and determine minimization strategies, as appropriate. Mitigation may include minimizing noise and vibration impacts on adjoining community facilities and coordination on the plans for the construction schedule and activities.
- **Surface Waterbodies and Watercourses:**
  - During construction, stormwater controls will be used, and either an Erosion and Sediment Control Plan (for sites disturbing less than an acre) or a Stormwater Pollution Prevention Plan (for sites disturbing an acre or more of land) will be implemented.
  - Implementing stormwater treatment or detention/retention facilities, as appropriate for the construction site, including drainage channels/facilities to improve stormwater management and water quality, and minimizing damage by debris, sedimentation, and other materials, would mitigate surface water impacts.
  - Temporary construction BMPs, such as seed, mulch, embankment protectors, grade techniques, inlet protection, silt fences, development of a Spill Prevention Control Plan (SPCC), Stormwater Management Plans (SWMPs) and vehicle tracking prevention will be used as appropriate.
  - For work within waterways, the program will implement temporary construction measures, such as cofferdams, turbidity curtains, etc., to prevent and control silt, debris and other materials from being carried into receiving waters.
- **Wild, Scenic, and Recreational Rivers:** For construction near or over Nationwide Rivers Inventory rivers, the program shall maintain physical access to the river, wherever possible, and implement measures to minimize visual impacts (such as use of temporary screens/fencing).
- **Navigable Waters:**
  - To mitigate impacts to navigable waters, coordination with the U.S. Coast Guard will be performed to identify any potentially affected navigational users and the frequency/timing/season for this navigation. An effort will be made to maintain navigable passage, as required, for local users and identify measures to minimize encroachments and disruptions to navigation during the construction period.
  - In-water work shall be limited or phased where possible to limit the area of navigable waters affected at any one time.
  - Safety measures to protect marine users will be implemented, such as notifications through the U.S. Coast Guard, installation of lighting on barges and the cofferdam, and use of automatic identification system transponders affixed to barges and cofferdams to enable electronic locating and tracking.

- Temporary protection of existing underwater utilities will be implemented, as appropriate.

- **Floodplains:** To mitigate floodplain impacts, hydraulic analysis will be performed, if appropriate, to demonstrate effects of the construction staging facilities on hydraulic openings/floodways, and, if needed, equipment and materials will be stored outside of floodplain areas to the extent practicable. Equipment and materials that have the potential to release pollutants (such as fuels and hazardous materials) will be stored outside of floodprone areas, to prevent potential release of contaminants during storm events.
- **Wetlands:**
  - The use of features such as retaining walls and steeper slopes would help avoid encroachment into adjacent wetlands or wetland buffers.
  - Flagging the edges of protected wetland resource areas prior to the start of construction would facilitate avoidance of work extending into these areas.
  - The program shall, to the extent practicable, avoid or minimize disturbances to waterways and wetland resource areas and restore any temporarily impacted areas.
  - The program shall employ temporary construction measures, such as time-of-year fisheries restrictions for protected species for in-water work.
- **Coastal Resources:**
  - During construction, appropriate permits would be obtained from NYSDEC for specific activities in coastal resource areas, and all permit conditions will be adhered to in the design and construction documents.
  - Protection measures could include preparation of a Coastal Consistency Determination, as required, and implementation of a construction environmental compliance plan that protects man-made and natural resources of the specific coastal area in coordination with the Local Waterfront Revitalization Program/Plan and New York Department of State.
- **Aquifers:**
  - During construction, appropriate controls, such as a Spill Prevention Plan, would be used to prevent any release of material that could adversely affect groundwater resources and to identify measures that would provide for proper containment and disposal of oil and hazardous substances.
  - For locations where subsurface work is proposed (e.g., foundations, retaining walls, piles, etc.) in areas of contaminated soil and/or groundwater, a remedial action and waste management plan will be provided, as appropriate, to prevent migration of contaminated groundwater to adjacent aquifers.
- **General Ecology and Wildlife Resources including CEAs:** As required or appropriate, the construction activities will be timed to avoid bird nesting or seasonal ecological processes. Temporary safe wildlife crossings and fencing could be constructed to prevent disturbances to protected habitats and maintain wildlife corridors, as appropriate. The construction activities will be scheduled to comply with timing restrictions for in-water work to protect endangered and threatened species, or could employ less noisy construction techniques, in compliance with any permit stipulations. In protected habitats, additional mitigation could include training of workers to facilitate sightings and protection of rare species. Clearing of trees and other vegetation will be minimized, if critical to habitat for protected species, and flagging or field identification of protected terrestrial species on site could be performed, if appropriate.

- **Historic and Cultural Resources:** If appropriate, the program will prepare a Construction Protection Plan (CPP). If required during construction, geoarchaeological surveys, documentation, and data recovery will be performed. Potentially affected and eligible historic structures will be protected, and, if required, mitigation, such as vibration monitoring will be performed to prevent building damage. If appropriate, in the vicinity of historic resources, vegetation can be planted to enhance visual quality, and noise barriers installed for protection.
- **Parks and Recreational Areas:** Direct impacts to parks, such as use for construction staging and storage, and indirect impacts, such as noise, will be avoided and minimized to the extent possible. The construction activities will be staged to minimize disruptions to, or avoid complete closures of, trail connections, and if required, plans to implement detours or partial closures would be developed, as appropriate. An effort will be made in developing construction plans and identifying staging/storage areas to maintain trail or park access during construction, to the extent practicable.
- **Visual Resources:** Temporary screens/fencing could be installed around active construction sites to minimize visual impacts in heavily trafficked or populated areas. Construction staging, fencing, and materials will be kept neat in appearance, clean and orderly. Construction sites will be restored in a timely fashion. The program will employ directional lighting at night to protect residences from light pollution. If appropriate, the construction will be performed during seasons/times of year that would be less impactful for tourists or visual resources accessed by the public.
- **Farmlands:** Potential mitigation measures for work affecting agricultural properties include installation of crossings for farm animals or creation of new temporary farmland access roads, if the proposed work may impinge on these uses. Where impacts occur to current irrigation systems, these systems will be reconfigured. Construction activities near farmlands could be timed to occur at the end of harvest.
- **Air Quality:** Dust control measures, such as use of water sprays, in accordance with state requirements, will be implemented. Installation of a stabilized construction entrance and cleaning of tires will be performed of construction trucks prior to leaving the construction site to prevent tracking of dirt on local roads. Land and soil disturbance will be minimized, and disturbed areas will be stabilized within required timeframes to prevent dust emissions/erosion. Construction trucks will be covered when hauling soil, stone and debris.

  Best Management Practices may include the use of newer U.S. EPA certified Tier 4 construction equipment, diesel particulate filters, or similar emission control technology. The use of ultra-low sulfur diesel fuel or electric equipment may further reduce GHG emissions. Restrictions will be implemented for idling construction equipment to five minutes or less.
- **Energy and Climate Change:** Mitigation efforts will include a shift to solar, green energy, energy efficient and electric sources of power for construction activities, such as message boards, signage, lighting, etc., to the extent feasible. A shift to biodiesel fuel for construction engines will further reduce construction emissions. Local, renewable, recycled materials for construction materials may be used, when possible.
- **Noise and Vibration:**
  - Noise and vibration emanating from construction vehicles and equipment will be limited through vehicle and equipment noise specifications, mufflers and operational restrictions.
  - Temporary sound barriers and use of buffer zones are other potential means of attenuating temporary noise from construction activities that could be implemented, if appropriate.

- The potential construction impacts from vibration could be limited by establishing applicable criteria in the program construction contract specifications, through the use of vibration monitoring during construction, and pre-construction surveys of potentially affected buildings, as appropriate. Plans for compliance with applicable standards could also be incorporated into the construction contract specifications.
- If appropriate, near noise-sensitive areas, program specifications could develop standards for noise emissions during construction and construction noise monitoring could be performed, and compliance plans developed. When practicable, construction activities near residential communities will be performed during daytime and weekday hours, and construction near schools and community facilities will be performed at night.

- **Contaminated and Hazardous Materials:** Mitigation efforts could include creating site-specific plans to address soil and groundwater contamination, preparing a Spill Prevention Control Plan (SPCC), Asbestos Abatement Plan and Lead-Based Paint Assessment Plan. As required, the program will perform Phase 2 subsurface site investigation where necessary to determine extent of subsurface ground contamination. Site-specific Construction Health and Safety Plans (CHASP) to protect workers, local community, and the general public will be developed and implemented.
- **Traffic and Safety**
    - Staging and phasing will be coordinated so that new track and crossovers are installed off-peak and cutover prior to removals/realignment of existing track. Outages will be coordinated with CSXT to limit impact to daily operations. Preferences will be scheduled to piggyback on adjacent outages required for annual maintenance and State of Good Repair work.
    - To mitigate traffic impacts, the construction work affecting area roadways or railroads could be staged during night-time, weekends, or off-peak hours to minimize service outages and disruptions to the traveling public. Interruptions in service would be closely coordinated with affected transportation and freight agencies.
    - A Maintenance and Protection of Traffic Plan would be created and communicated, if required to address construction traffic on area roadways.
    - The program would create adequate signage and fencing and will provide advanced notice to local officials and communities impacted.
    - Construction security and safety will be enhanced through clean and orderly sites, including fenced off staging areas and properly stored construction materials.
    - Satellite parking could be provided for construction workers and construction deliveries scheduled outside of school and commuter peak hours where possible to avoid adverse effects.
    - Mitigation efforts include coordination with emergency service providers to minimize impacts and disruptions to emergency service routes near construction sites and developing strategies to provide station access and pedestrian accommodations to affected communities, such as connections to existing transit and highways.

4.25.5. Future Analysis

Future analysis will be conducted in Tier 2 environmental documents where additional design data, more detailed designs, and site-specific conditions will allow a more refined analysis and additional insight into potential construction impacts. Based on these results of these analyses, specific measures will be identified to avoid, minimize and/or mitigate potential adverse impacts.

5. Financial Capacity

5.1. Introduction

State and local governments typically support transportation infrastructure and services by a combination of capital and operating funding from various sources. These funding sources may have conditions and restrictions as to how they may be applied to New York's HSIPR program, and these restrictions can have significant implications for the affordability and the feasibility of the High Speed Rail Empire Corridor Program's alternatives. Matching the particular requirements and restrictions among federal, state, municipal and private funding sources with the costs of each alternative helps determine the time frame over which the alternative could be implemented.

In general, public transit agencies build, equip, and maintain their public transportation systems using capital funding from various sources, and operate day-to-day using operating funds derived from fare and advertising revenues and some form of government subsidy. These categories of funding – and the sources for these funds – are described in Sections 5.3 and 5.4.

Chapter 5 describes the costs, ridership and ticket revenues, subsidy requirements, and sources of funding support that are available to advance the High Speed Rail Empire Corridor Program. The Service Development Plan includes detailed operating plans as well as a capital program for the Preferred Alternative that includes costs and projected fiscal construction years. This chapter presents information that has been incorporated into the Service Development Plan. Appendix B presents additional information on how the ridership forecasts were developed, and Appendix F presents additional information on how cost estimates were developed.

5.2. Cost and Revenue Methodology

NYSDOT based the capital and operating costs and operating revenues anticipated for each alternative on ridership forecasts and consistent costing methods, to ensure comparability. Based on proposed operating plans (service frequency and trip time) for each alternative, analysts forecast ridership and generated operating costs. The analysis defined rolling stock requirements, track alignments, catenary requirements (Alternative 125), and railroad signal system configurations in detail sufficient to permit reasonable capital construction cost estimates, and to establish the feasibility of proposed train operating plans, service frequencies, stopping patterns, and express/local/regional service overlays. The Tier 1 Draft EIS presented cost data in 2015 dollars, which were current at that time. This Tier 1 Final EIS expresses costs in 2017 dollars. Analysts developed the costs by applying appropriate measures of inflation for labor, materials, heavy industry, and construction, between 2015 (the date of the original analysis) and 2017 (the date of the most current analysis).

Standard practice for quantifying and comparing costs of different investment programs that transpire over different time frames involves scheduling all the future improvements based on the likely time of their implementation. The current cost of each element is then inflated to its anticipated implementation year based on appropriate inflation factors for the construction and heavy equipment industries (averaging 3.5%/year 2004-2017). These future costs are then discounted back to the target comparison year using net present value (NPV) analysis techniques so that they are comparable in constant-dollar terms. For example, if a locomotive is to be purchased in 2020, but the target comparison year is 2017, the 2012 cost of a locomotive used in the analysis would be inflated to 2020 at 3.5%/year and the resulting value discounted back to 2017 using an appropriate discount rate. Discount rates address a combination of inflation and the "opportunity cost" of using the funding for the subject project rather than for some other purpose (which might give greater or lesser returns). Discount rates typically range between 6 percent and 10 percent, depending on a variety of factors. Following this procedure enables the comparison in a specific analysis year (in the above case, 2017) of various future investments with varying future implementation dates. Projected investments of the Empire Corridor Program would span the time period from 2015 to 2035.

For a Tier 1 analysis, the cost and timing for the specific investments are estimated, since actual implementation dates will depend on the availability of future funding and other factors. Therefore, this Tier 1 analysis is focused on the year 2017 as the point for comparison among the Build Alternatives. The recent costs of elements used in this analysis (2012 for some elements; 2011 for others), such as track, coaches, locomotives, bridge construction, etc., are inflated to the likely cost of purchase and installation at the estimated future implementation year, using an annual inflation rate of 3.5 percent. These costs are then discounted back to 2017 for comparison. While the exact costs or future year of implementation are not precisely known for each alternative, the common treatment of all cost elements across all categories as if occurring in 2017, allows reasonable comparisons among the Build Alternatives.

5.2.1. Capital Cost Estimating Methodology

Capital cost estimates for the alternatives used industry standards for all major components. Infrastructure capital costs were determined on a unit basis. Construction costs for each alternative were derived by multiplying the quantity of each major item by the unit cost for that item, based on standard values or recent costs, with appropriate regional adjustments applied as necessary. Land costs were developed for urban, suburban and rural property. Train and maintenance staffing costs were based on recent Amtrak values projected to the target analysis year. Use of these common factors allows meaningful comparisons among the alternatives in terms of their likely future ridership potential and their capital and operating costs and revenues.

Rolling Stock

The method by which costs for rolling stock were developed is described in Appendix F. In brief, equipment costs are a function of the operating plan intended for each alternative. This includes the number of train sets to be operated along the route and the number of locomotives and passenger coaches that will be needed for each alternative, including spare trains to substitute for trains scheduled for maintenance.

Track and Infrastructure

Track and railroad signal system installation costs were based on standard unit values used throughout the railroad industry, appropriate to the Northeast. Track installation costs are typically recognized on a cost-per-mile basis. Infrastructure costs, for bridges, culverts, grade separations, and retaining walls involved gross cost estimates based on recent experience. Bridge costs were estimated based on length of span and width, culvert costs were estimated based on diameter and length under the ROW, and retaining wall costs were estimated based on the volume of concrete required.

Overhead Catenary Infrastructure

For overhead catenary system, a per-mile installation cost was used. Catenary system costs also include the cost of providing an electric power source, substations on a one per-twenty-five-mile unit of length of the corridor, and associated support equipment.

Signals

Since railroad signal systems must be linked via cable along the ROW to communicate with trains and the various interlockings and crossovers, a per-mile installation cost was used. Railroad signal system costs include electric power for railroad signals, control houses, and switches, associated support equipment such as snow melters, and component installation.

Maintenance Facilities

Maintenance and repair shops were estimated on a cost-per-square-foot basis for industrial or commercial buildings (depending upon scale), adjusted for the additional costs for structural support sufficient to house heavy locomotives, and for the cost of typical rail maintenance equipment (cranes, tables, lifts, etc.) that must be used to fit out such facilities.

Stations

Station costs were estimated on the basis of approximate square footage, at typical northeast commercial construction cost values. At this Tier 1 level of analysis, all alternatives were assumed to require the same station improvements and used identical costs for this element.

Property Acquisition

Both Alternatives 110 and 125 would involve more substantial property acquisitions, with the greatest number of acquisitions required for Alternative 125.[147] Alternative 90B also involves property acquisition on a much reduced scale than what is required for the additional track and right-of-way to be constructed as part of the higher speed alternatives. Alternative 110 would require additional land to augment the existing ROW on the south side for an extra track. Alternative 125 would require property acquisition for a new ROW at some distance from the existing alignment.

Since the exact position and routing of additional trackage necessary to improve curves to allow higher speed is not yet known for either alternative, it was difficult to estimate property acquisition costs for these higher speed alternatives. Property acquisition was therefore estimated based on apparent need to modify curves, add parallel main-line or passing tracks, install additional grade separations to meet safety requirements, or expand yards. Three indices of cost were then applied: prime city, suburban, and rural. Costs for each index were based on 2012 property values along the corridor. No correction has been made for inflation to 2017, as the real estate market was relatively flat over the previous five years, and future values cannot be reliably predicted on the basis of standard inflation drivers.

Upon completion of the Tier 1 process, and as the program moves into the next phase of work, more precise information will be developed, associated with the specific track, bridge, yard, station, and railroad signal system construction projects.

As set forth in the Agreements in Appendix J between CSXT and NYSDOT, CSXT is entitled to compensation for the use, acquisition, or diminishment in value of its property resulting from any project advanced as a result of the program. The development of the cost of alternatives will recognize this principle; however, negotiation of the actual value of any compensation to CSXT is not part of this Tier 1 EIS, but will be developed if and when necessary during detailed analysis (Tier 2).

[147] Alternative 90A does not require property acquisition.

5.2.2. Operating and Maintenance (O&M) Cost Estimating Methodology

Operating and maintenance (O&M) costs for Empire Corridor high-speed intercity rail services were based on unit costs for a variety of elements including but not limited to:

- Number of train crews needed to operate the prescribed number of trains – based on typical, industry standards;
- The number and size of train cleaning crews – based on hourly pay rate plus fringe and overhead costs;
- Track and railroad signal system maintenance costs – based on annualized cost/track-mile, an industry standard, adjusted by region;
- Propulsion costs – based on locomotive mileage standards (gallons/mile or gallons/hour) at pre-determined speeds, typical cost of fuel, projected to the target analysis year, based on accepted industry methods;
- Janitorial and landscaping services – estimate of annual contract values and number of locations;
- Dispatching functions for trains, personnel, equipment.

By applying industry standard costs for labor hours, fuels, maintenance tools and supplies, rents, and general custodial and cleaning contracts, an approximate operating cost could be estimated for each alternative. These costs were compared among the alternatives to better understand how the different elements of each alternative affect annual operating costs.

Estimates of future annual operating and maintenance (O&M) costs for the proposed passenger rail system improvements and for the existing system were based on Amtrak accounting conventions, developed in response to the state-supported service provisions of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). Costs were initially derived for 2015, the first year for which PRIIA-mandated state operating cost payments are required (see Section 2 of Appendix F; Exhibits F-1, F-3). These costs were then increased to account for the effects of inflation between 2015 and 2017, to permit their comparison with 2017 forecast revenues, and the derivation of 2017 subsidies for the alternatives. Annual operating expenses for the alternatives were based on a forecast of scheduled trains, train miles operated, per-train-mile O&M costs (for rolling stock), and per-track-mile infrastructure maintenance costs which generally increase due to greater wear rates associated with higher-speed operation. The methodologies by which operating costs were derived for the High Speed Rail Empire Corridor Program alternatives are detailed in Appendix F.

For all Build Alternatives except for Alternative 125, detailed operating plans require six additional train sets, each containing one diesel locomotive and five passenger coaches (including a 20 percent spare factor). Alternative 125 would involve electrification of the ROW west of Albany up to a proposed new Buffalo station, and its operating plan calls for 17 additional train sets, each containing one dual-mode locomotive and five coaches (including a 20 percent spare factor). Each alternative involves an operating schedule necessary to permit sufficient service to attract the forecast ridership, as described in Chapter 3. The proposed train schedules were proposed based on the following:

- The number of trains that could be accommodated on the corridor under the Base (No Action) Alternative and proposed higher-speed alternatives without creating unacceptable conflicts with freight operations;
- A level of service sufficient to produce the forecast ridership while also achieving the MAS and required average speed for each alternative.

5.2.3. Revenue Estimating Methodology

Annual ticket revenues are estimated based on ridership between station pairs multiplied by the Amtrak fare for travel between those pairs, assigned to the 2035 target year. This approach is consistent with the computation of the O&M costs for each alternative, which are also presented in 2017 dollars.

5.2.4. Deficit Estimating Methodology

Few public transportation services earn enough money in fare and non-fare revenue to cover their entire annual O&M cost. The operating deficits projected in this Tier 1 EIS are simply the difference between the estimated O&M costs and the estimated ticket revenues. Although ticket revenues are normally supplemented by lease, concession, rent, and advertising revenues ("non-ticket" revenues), these additional revenue streams are generally small compared with ticket revenues paid by passengers; ticket revenues alone are therefore sufficient to give a reasonable picture of the scale of the deficit for each alternative.

At the Tier 1 level of analysis, where increased train speed and shorter travel times would be the project benefits resulting in increased ridership, other factors that might influence travelers' mode choices – such as higher or lower gasoline prices, tolls, air fares, bus fares, etc. – were held constant at their 2017 values and applied to the 2035 analysis year. By holding all 2017 cost relationships constant, the effect of speed and time on ridership can be observed alone, independent of any other factors.

5.3. Capital Funding Needs, Requirements and Sources

In the public transportation sector, where the majority of costs are funded by federal, state, and local governments, capital funding is defined as sources provided to agencies for the purchase of assets with significant useful life, generally greater than five years. Assets such as buildings, rail yards and track, railroad signal systems, bridges and culverts, real property, rolling stock, and long-life maintenance equipment (cranes, drop tables, turntables, wheel true installations, fork lifts, etc.), are generally considered to have useful lives in excess of five years, and are therefore purchased with capital funds.

As the costs of rail infrastructure and equipment are substantial, major capital improvements are undertaken by the host Class 1 railroads, federal agencies, states, and major municipalities (and occasionally other private sector participants, typically for location-specific improvements). Federal capital grants for passenger rail systems typically require a local match of a minimum of 10 percent to 20 percent of the value of the purchase, and sometimes more, with the amount depending upon the apparent public benefit of the project and other factors. To qualify for federal capital funding in accordance with federal grant requirements, a state or municipal sponsor – NYSDOT or the individual municipalities along the route in the case of the High Speed Rail Empire Corridor Program – must also contribute capital funds in partnership with the federal agency funding the improvement.

For the High Speed Rail Empire Corridor Program, it is expected that capital funds would be provided primarily by FRA, the Federal Transit Administration (FTA), and NYSDOT. Where station upgrades are incorporated into the project, municipal governments and regional transportation authorities would provide capital funds as well. Capital funds would be used for the following:

- Purchase of property and equipment, such as locomotives and passenger coaches, or "rolling stock;"
- Upgrade and construction of facilities, such as stations, maintenance facilities at rail yards, and rail yard expansions;
- Improvement or expansion of railway infrastructure, such as tracks, railroad signals, switches, and bridge structures;
- Acquisition of additional ROW, as required to add tracks, expand yards, or straighten curves for higher speed operation; and
- Repayment of debt service and/or lease payments on long-term equipment purchases or construction costs where private sector investors have participated on a lease or debt basis. (Lease payments used to retire debt for rail construction or rolling stock are typically funded as capital costs during the lease term.)

5.3.1. The Capital Plan

The primary source of high-speed rail funding is anticipated to be FRA, using PRIIA and successor authorizations. For projects to be eligible for FRA funds, they must be advanced through the grant process, as described in Section 5.3.2. Projects are included in the New York State Rail Plan, which outlines all of the state's rail system needs for both passenger and freight service. NYSDOT also includes rail projects on its Statewide Transportation Improvement Program (STIP) for informational purposes. The STIP is a four-year forecast of capital needs across all federally-funded transportation services. The STIP is updated by NYSDOT every two years and includes projects intended to be implemented over the following five years. Where additional funding may be sought from FTA or other federal grant programs, a project must be included in the STIP.

5.3.2. Capital Funding Programs

High-Speed Rail Corridor Designations: The federal government first enacted laws and provided grant funding opportunities enabling states to invest in passenger rail service - particularly higher-speed operations – in the 1990s. Section 1010 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA, P.L. 102-240) directed the U.S. Secretary of Transportation to designate not more than five "high-speed" corridors where trains operating at speeds of 90 mph could be reasonably expected. Under this program, the 463-mile Empire Corridor from New York City-to-Albany-to-Buffalo was designated by the U.S. Secretary of Transportation as a High-Speed Rail Corridor on October 20, 1992. In 1998, Section 1103(c) of the Transportation Equity Act for the 21st Century (TEA 21, P.L. 105-178) directed the U.S. Secretary of Transportation to designate six additional corridors named in the law or based on criteria described in the law, for a total of 11 corridors, of which the Empire Corridor remains one. Beyond these two enactments, the specific federal and New York State funding laws supporting national high-speed rail programs are described below.

<u>Federal Capital Funding Programs</u>

There have been several significant federal funding programs supporting intercity/high-speed passenger rail beginning in 1992. Key federal legislation relevant to the development of high-speed passenger rail service on the Empire Corridor includes:

- The **Transportation Equity Act for the 21st Century (TEA-21) (PL 105-178, June 9, 1998)**, supplemented the nationwide list of five high-speed rail corridors authorized under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) (PL 102-240, December 18, 1991).[148] TEA-21 authorized the Empire Corridor, from New York City to Albany to Buffalo, New York, as a high-speed rail corridor. ISTEA defined "high-speed rail corridors" as corridors where trains operating at speeds of 90 miles per hours (mph) could be reasonably expected.
- The **Passenger Rail Investment and Improvement Act of 2008 (PRIIA) (Division B, Title III of Public Law 110-432, 122 Stat. 4907, October 16, 2008)**, as the first passenger rail authorization since 1997, called for significant improvements in the nation's intercity passenger rail, including the development of high-speed rail corridors. PRIIA authorized a high-speed grant program for FY 2009 through FY 2013 to improve intercity passenger rail service, operations, and facilities. PRIIA also directed the U.S. Secretary of Transportation to develop a long-range national rail plan that is consistent with approved state rail plans and the rail needs of the nation. This directive resulted in the publication of the *Preliminary National Rail Plan* in October 2009. PRIIA established three new competitive grant programs for funding intercity rail capital improvements:
    - **Intercity Passenger Rail Service Corridor Capital Assistance Program:** Section 301 of PRIIA established grants for capital improvements to benefit all types of intercity passenger rail service, including the capital costs of facilities, infrastructure, and equipment necessary to provide or improve intercity passenger rail transportation. Eligible applicants included states (including the District of Columbia), groups of states, interstate compacts, and public intercity passenger rail agencies.
    - **High-Speed Rail Corridor Development:** Similar to Section 301, Section 501 of PRIIA restricted eligibility for grants to the U.S. Department of Transportation (U.S. DOT) - designated high-speed rail corridors (including the Empire Corridor). Grants could be used for acquiring, constructing, or improving rail structures and equipment. High-speed rail was defined as passenger rail services that may reasonably be expected to reach speeds of at least 110 mph. Section 501 broadened Section 301 to include Amtrak as well.
    - **Congestion Grants:** Section 302 of PRIIA authorized grants to states or to Amtrak (in cooperation with states) for facilities, infrastructure, and equipment for high-priority rail corridor projects to reduce congestion or facilitate ridership growth in intercity rail passenger transportation.
- **FY 2008 Appropriations Act: Capital Assistance to States – Intercity Passenger Rail Service:** The FY 2008 U.S. Department of Transportation (U.S. DOT) Appropriations Act (P.L. 110-161) established a new pilot program for joint federal-state intercity passenger rail capital investment. Under this program, $30 million in federal funding was made available to states on a competitive basis to fund up to 50 percent of the capital cost of improving intercity passenger rail service. Up to 10 percent of the $30 million was available for rail corridor planning grants.
- The **American Recovery and Reinvestment Act (ARRA) of 2009 (PL 111-5) (February 17, 2009)** and the **Transportation, Housing and Urban Development and Related Agencies**

[148] The five high-speed rail corridors authorized under ISTEA were: the Midwest, providing 3 links from Chicago, IL to Detroit, MI and St. Louis, MO and Milwaukee, WI; Florida, linking Miami with Orlando and Tampa; California, linking San Diego and Los Angeles with the San Francisco Bay Area and Sacramento via the San Joaquin Valley; Southeast, connecting Charlotte, NC, Richmond, VA and Washington, D.C.; and Pacific Northwest, linking Eugene and Portland, OR with Seattle, WA and Vancouver, British Columbia, Canada.

Appropriations Act for 2010 (Division A of the Consolidated Appropriations Act, 2010 (PL 111-117)) appropriated a total of $787 billion, including $8 billion specifically for the grant programs established by PRIIA and $1.3 billion for Amtrak capital grants, providing funding for the formation of the federal High-Speed Intercity Passenger Rail program (HSIPR). The Empire Corridor was one of the high-speed rail corridors to receive funding in 2009, 2010, and 2011. ARRA sought from states "shovel ready" transportation projects, among them programs and projects to advance high-speed rail. The appropriation references the authorities included in Sections 301, 302, and 501 of PRIIA, but stated that the federal share of costs may be up to 100 percent.

- **A Vision for High-Speed Rail:** On April 16, 2009, President Obama announced a vision for high-speed rail in America. The U.S. DOT issued a *High-Speed Rail Strategic Plan* in April 2009, which included the Empire Corridor. On June 23, 2009, the FRA issued interim program guidance (74 CFR 29900) establishing the selection process, priorities, and evaluation criteria for grants made under financial assistance appropriated under ARRA: approximately $1.9 million in unobligated FY 2008 U.S. DOT appropriations (P.L. 110-161) funding and $90 million for intercity passenger rail grants in the FY 2009 U.S. DOT appropriations (P.L. 111-8) funding. FRA combined the three PRIIA grant programs into the HSIPR Program. On January 28, 2010, the first grant selections for the HSIPR program were announced. The State of New York has successfully competed for a total of $151 million in ARRA high-speed rail funding.
- **FY 2009 U.S. DOT Appropriations Act:** An additional $90 million was appropriated as part of the FY 2009 U.S. DOT Appropriations Act (P.L. 111-8), similar to the FY 2008 Capital Assistance to states' grants. Following awards made by U.S. DOT under the solicitation issued in June 2009, $65 million of the original $90 million of FY 2009 Appropriations Act funds remained unused. On April 1, 2010, U.S. DOT issued notice of funding availability for these FY 2009 U.S. DOT Appropriations Act funds, to be used for construction projects with a 50 percent non-federal match.
- **FY 2010 Transportation, Housing and Urban Development and Related Agencies Appropriations Act:** Division A of the Consolidated Appropriations Act, 2010 (PL 111-117) appropriated a total of $2.5 billion for the HSIPR program. Of that amount, $50 million was made available by the U.S. DOT for planning projects, including multi-state proposals, with a 20 percent non-federal match. In June 2010, the U.S. DOT announced funding availability of $2.37 billion in FY 2010 appropriations funding for final design/construction and/or preliminary engineering/NEPA projects for individual projects or corridor programs with a 20 percent non-federal match. Remaining FY 2010 U.S. DOT appropriations were allocated to the HSIPR program for administration and research.
- **Redistribution of ARRA Funds:** On December 9, 2010, the U.S. DOT announced a redistribution of some ARRA funds to other corridors after the incoming governors of Wisconsin and Ohio indicated that they would not move forward with $703 million designated for Wisconsin and $400 million designated for Ohio high-speed rail projects. In 2011, Florida cancelled its high-speed rail project, and approximately $2.3 billion was redistributed among New York and other states; New York State received an additional $354.4 million, plus $7.3 million in supporting funding.

President Obama's budget for FY 2014 included $6.4 billion to support passenger and freight rail projects across the country, under a new coordinated program called the National High-Performance Rail System (NHPRS). Over the subsequent five years, the President's total request for the NHPRS was $40 billion, of which $13 billion was to support existing services, and $27 billion was to be invested in improving and enhancing the Nation's rail network.

- **FAST Act:** President Obama signed into law on December 4, 2015 the Fixing America's Surface Transportation Act, or FAST Act (P.L. 114-94), the first long-term Federal transportation bill in more than 10 years. The FAST Act authorized $305 billion over fiscal years 2016 through 2020 for the Department of Transportation's rail, highway, motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, research, technology and statistics programs. The FAST Act also marked the first time intercity passenger rail programs were included in a comprehensive, multimodal surface transportation authorization bill, with more than $10 billion authorized for intercity passenger and freight rail grants.

Under the Biden Administration, it is expected that the federal government will continue its role in supporting high speed rail projects by providing a number of funding programs. The 2021 Infrastructure Investment and Jobs Act (IIJA) includes $89.9 billion of transit funding over the next five years and an additional $66 billion for passenger rail improvements.

State Capital Funding Programs

Section 14-d of the New York State Transportation Law authorizes the Commissioner to enter into contracts for the purpose of maintaining and improving rail transportation service. New York State has participated in capital funding for intercity rail services through a number of grant and bond programs, as follows:

- **Rail Service Preservation Program**: This $100 million, multi-year freight and passenger rail program was established in FY 2005-06 by the State Legislature, with portions of the funding being appropriated on an annual basis; some of these funds have been made available.
- **Transportation Capital Bonds:** New York State voters approved a *Rebuild and Renew New York Transportation Bond Act of 2005,* providing $2.9 billion for transportation funding, of which $27 million was allocated each year for rail and port projects. The Empire Corridor work is supported in part with a portion of these bond funds.
- **State of New York Awards:** The State of New York received $28.5 million in FY 2010 transportation appropriations funds. In the spring of 2011, FRA solicited grant applications under the HSIPR Program for Individual Projects (e.g., PE/NEPA and FD/Construction) and Service Development Programs. The application period closed on April 4, 2011.

The New York State FY 2012 budget included $26.6 million for passenger and freight rail projects, of which $10 million was divided between freight rail and high-speed passenger rail improvements. In addition, the Legislature and Governor agreed to a Memorandum of Understanding (MOU) that directed NYSDOT to develop a two-year capital plan for FY 2013 and FY 2014. The MOU defined a program of infrastructure capital projects covering all modes under NYSDOT jurisdiction, at a level $100 million over the levels originally proposed in the Governor's 2012-13 Executive Budget. Rail freight projects will be eligible for funding under a second round of Regional Economic Council Program funding.

5.3.3. Program Capital Funding Financial Roles

Federal Railroad Administration (FRA)

FRA is charged with promulgating and enforcing rail safety regulations, administering railroad assistance programs, and conducting research and development in support of improved railroad safety and national rail transportation policy. As noted above, through a number of legislative initiatives, FRA received Congressional authorization and funding in support of high-speed passenger and freight rail operations. In this capacity, FRA became responsible for implementing and ensuring compliance with PRIIA, which provides the regulatory framework by which HSR funding was to be distributed to states and railroad operators.

With HSIPR, FRA established a sequence of activities to facilitate the evaluation of various high-speed rail proposals across the nation. The first level of effort – Tier 1 – requires the identification and conceptualization of alternatives for implementing high-speed rail improvements in a defined corridor, the creation of a practical framework for evaluation and comparison among these alternatives, and the selection of a Preferred Alternative to be advanced for detailed analysis.

The next phase (Tier 2) requires that applicants develop details about the specific project elements proposed for investment, such as bridges, new track segments, grade separations, new stations, etc., and complete detailed environmental review for each as they approach implementation, to ensure that individual investments will not have unacceptable impacts. Upon receipt of NEPA clearance via Records of Decision (RODs), Categorical Exclusions (CEs), or Findings of No Significant Impact (FONSIs), and completion of preliminary engineering, these individual elements become eligible for FRA funding for final design, property acquisition, and construction.

NYSDOT is following the HSIPR process for this High Speed Rail Empire Corridor Program, and this Tier 1 Final EIS in part satisfies FRA's procedural requirements for service development programs and corridor investment plans.

New York State Department of Transportation (NYSDOT)

NYSDOT is responsible for coordinating and developing comprehensive transportation policy for the state; coordinating and assisting in the development and operation of transportation facilities and services for highways, railroads, mass transit systems, ports, waterways and aviation facilities; and formulating and maintaining a long-range, comprehensive statewide master plan for the balanced development of public and private commuter and general transportation facilities.

NYSDOT also administers a public safety program for railroads and motor carriers engaged in intrastate commerce, and provides oversight in matters relative to the safe operation of bus lines, commuter railroads and subway systems that are publicly subsidized.

Section 14-d(2)(d) of the State Transportation law authorizes the Commissioner to "*utilize federal monies*" to improve rail transportation service or rail transportation facilities. NYSDOT can also spend non-federal funds which are appropriated to the agency for these purposes. Pursuant to Section 209 of PRIIA, the states in which Amtrak operates intercity passenger rail services must work with Amtrak to establish a basis for allocating both direct project construction or capital replacement costs and a portion of general operating and maintenance costs of its services to each state in proportion to the service Amtrak provides. Effective April 2012, this element of PRIIA obligated NYSDOT to budget for and fund some portions of Empire Service that were previously paid for entirely by Amtrak.

Amtrak

As the current passenger rail service provider and the owner of many of the stations on the Empire Corridor, Amtrak may contribute financially to high-speed passenger rail operations. Participation could involve providing train service; covering operating deficits; participating in funding capital improvements; or providing construction, maintenance, or dispatching resources along the ROW.

This participation could be in part a function of Amtrak's annual budget and past practices regarding cost sharing, property and operating agreements with NYSDOT and CSXT. Future cost sharing arrangements would be governed by Section 209 of PRIIA, as previously discussed.

CSX Transportation, Inc.

CSXT, as the host railroad, owns 85 percent of the 463-mile Empire Corridor ROW from Poughkeepsie to Buffalo and Niagara Falls. Where CSXT owns the ROW, the company would, through its labor agreements, be involved in program construction and construction oversight. However, for the section of railroad from Poughkeepsie to Hoffmans, where Amtrak has entered into a lease agreement with CSXT, Amtrak, and NYSDOT will be responsible for program construction and oversight.

CSXT would be involved in the High Speed Rail Empire Corridor Program as necessary to ensure that construction projects along that portion of the corridor over which it operates would be implemented without adverse effects on its freight operations. CSXT is also a member of the program steering committee, the Empire Project Advisory Committee (EPAC) and, in that capacity, has provided technical and operational input and reviewed analyses and findings to ensure that its operating needs were addressed in formulating the Preferred Alternative.

Metro-North Railroad

Metro-North, the host railroad and owner of the 61-mile Empire Corridor South segment between Spuyten-Duyvil and a point just beyond Poughkeepsie station, would be involved in the High Speed Rail Empire Corridor Program as necessary to ensure that construction projects located along that portion of the corridor over which it operates would be implemented without adverse effects on its daily commuter rail services. Metro-North also could participate in funding capital improvements along its section of the corridor. Where Metro-North is responsible for the ROW, it would, through its labor agreements, be involved in program construction and construction oversight. Metro-North is also a member of the EPAC and, in that capacity, has provided technical and operational input and reviewed findings to ensure that its operating needs were addressed. Finally, it is likely that along portions of the Empire Corridor South over which it operates, Metro-North will participate in specific improvements that were a product of the Hudson Line Railroad Corridor Transportation Plan.

Regional Transportation Authorities and Municipalities

Transportation funding and services are frequently coordinated at the sub-regional and municipal level by regional transportation authorities (RTAs). The RTAs are active partners in project studies, advocacy and implementation, and frequently partner with NYSDOT on projects that will affect their jurisdictions. For the High Speed Rail Empire Corridor Program, the following RTAs are involved:

- Niagara Frontier Transportation Authority (Niagara Falls & Buffalo),
- Rochester-Genesee Regional Transportation Authority,
- Central New York Regional Transportation Authority,
- Capital District Transportation Authority.

These organizations could be involved in capital funding for station upgrades and/or parking improvements at stations. As federal funds provided to states and municipalities for rail system improvements are likely to require local match, in addition to state matching funds, some of the match could be provided by the state, municipality, or RTA.

Metropolitan Planning Organizations (MPOs)

Metropolitan Planning Organizations must approve any project in their jurisdictions receiving federal funding. By approving a project, the MPO is agreeing to incorporate the project into the State Transportation Improvement Program (STIP) and the Transportation Improvement Program (TIP). This ensures that political leaders and agency heads have acknowledged the funding requirement for the project and that the project has satisfied NEPA requirements, is eligible to receive federal funding, and is included in the formal five-year plan for that jurisdiction.

Private/Public Partnerships

Private/public partnerships are sometimes employed to gain coordinated benefits for complex and costly transportation projects. Private sector financing may be used for those elements of a project which are likely to generate a defined revenue stream that can be dedicated to debt repayment, such as a parking facility. In the case of the High Speed Rail Empire Corridor Program, private sector participation could also involve station rehabilitation or replacement, where food concessions and rental payments from tenants create a revenue stream for debt repayment. There are also ways to structure locomotive and coach purchases through a third party such that private financing can be made available to help defray the costs of rolling stock acquisition.

5.4. Operations and Maintenance Funding Requirements and Sources

Operating funds are used to pay the day-to-day costs of running a transportation service. Labor costs include salaries and benefits. Fuel and utility costs cover vehicle propulsion, either combustion fuels or electric power, and heating, lighting, air conditioning, phones, and data network fees. Custodial and janitorial fees include cleaners, custodians, trash removal, recycling apparatus and hauling agreements, rent, license and permit renewal fees (except where these are incurred in support of a capital project, on a one-time basis), gardeners and landscapers, and professional services (legal, accounting, etc.). Repair costs include the costs for facility and equipment upkeep and minor component replacement. Major component campaigns, as in the replacement of brakes across an entire fleet on a programmed basis, are typically funded out of capital sources.

As previously indicated in Section 5.2.2, operating costs are generally covered by a combination of ticket revenue and other non-ticket revenue sources. By comparing the operating costs with the annual anticipated revenues from both ticket and non-ticket revenues, the annual operating subsidy that the service will require is derived. These operating subsidies are typically provided by state or municipal governments.

Most public transportation in the U.S. requires subsidy; ticket revenues are rarely sufficient to cover the full cost of the service. Metro-North receives operating subsidies from the New York Metropolitan Transportation Authority (MTA). In New York, Amtrak receives operating subsidies from the U.S. DOT and NYSDOT. Except for payments to Amtrak, the federal government terminated its operating subsidy program in the 1970s.

Operating subsidies are generally likely to be available for the High Speed Rail Empire Corridor Program as follows:

- **Federal Operating Assistance:** Amtrak receives federal operating funds. Following implementation of PRIIA Section 209 on October 1, 2013, however, use of these funds was limited to the Northeast Corridor and long distance services. The Lake Shore Limited, which operates over the corridor en route to Chicago, will receive continuing federal operating support. The balance of the corridor operating subsidies will need to derive from state and local sources.

- **State Operating Assistance:** NYSDOT works collaboratively with Amtrak on a number of projects. NYSDOT has led the effort to transform the 94-mile-long Hudson Line from Schenectady to Poughkeepsie, currently a CSXT-freight controlled line, to an Amtrak-controlled line. Additionally, NYSDOT has entered into a long-term agreement with Amtrak on further developing the Hudson Line for passenger rail use, providing operating subsidies and other funding when necessary and available, thus ensuring Amtrak's continuing control over maintenance, operations, and dispatching.
- **Section 209 of PRIIA** establishes that Amtrak's operating losses be covered through a combination of ticket revenue and state support. Historically, New York State has provided support to the Adirondack Service, and with the implementation of PRIIA Section 209, NYSDOT has been providing financial support to the Empire Service, effective October 1, 2013. Although this new law created new funding responsibilities for NYSDOT, it offers an opportunity for the state to have greater control over the Amtrak service. Through the Hudson Line lease and the implementation of PRIIA Section 209, NYSDOT and Amtrak have developed a strong collaborative relationship that will be strengthened with the implementation of any of the Build Alternatives.
- **Regional Transportation Authorities or Municipal Operating Assistance**: Some costs associated with the operation of stations or parking areas at stations could be assumed by municipalities or RTAs, as previously discussed in Section 5.3.3.
- **Metropolitan Planning Organizations**: MPOs do not fund transportation projects (although they may fund regional studies that are used by agencies seeking funding). MPOs serve as a clearinghouse for necessary local and state project approvals, and are responsible for managing the regional transportation plan, of which any project from this program would have to be an approved component in order to be eligible for federal funding.

5.5. Financial Performance of Alternatives

Tier 1 concept level design and operations of the High Speed Rail Empire Corridor Program alternatives required the consideration of several operating scenarios and associated capital improvements. The goal of each scenario was to minimize passenger and freight train schedule conflicts, address critical congestion and delay locations, and sequence investments to yield continual improvement in corridor train service without unacceptably interfering with existing services. These operating scenarios considered the following:

- Upgrade tracks, railroad signals, switch and interlockings, and communication systems to gain speed and reliability;
- Provide sufficient additional track to segregate to the greatest degree practical passenger from freight services; and
- Reduce the number of at-grade crossings or provide controls to restrict vehicle interference with train operations and satisfy FRA safety requirements associated with higher-speed train operation.

For Alternative 90A, the investment primarily would involve improving existing track and railroad signal systems to gain speed and reliability. For Alternatives 90B, 110 and 125, the reduction in conflicts between freight and passenger trains would be achieved through the construction of longer passing sidings and/or new dedicated passenger track, allowing one train to bypass the other without delay to either.

While Empire Corridor South currently experiences relatively few conflicts between passenger and freight services, Empire Corridor West has significant freight and passenger train route sharing, with concomitant impacts on passenger service speed and reliability. For the western segment, Alternatives 90B, 110, and 125 would achieve greater or total separation of freight trains and passenger trains by using a new dedicated passenger track in the existing corridor (Alternatives 90B and 110) or by purchasing and constructing an entirely new, straighter and flatter, fully electrified ROW (Alternative 125). The Base Alternative and Alternative 90A would involve additional passing sidings and switches to permit passenger trains to pass freight trains entirely within the existing ROW. South of Albany, the High Speed Rail Empire Corridor Program would modify existing tracks, eliminate minor conflicts through some track improvements and better railroad signaling, and construct other upgrades to improve already good (110 mph) speed performance between New York and Albany. In its entirety, the Empire Corridor would realize the following improvements:

- South of Albany, create track connections, modify interlockings, and make additional operational improvements that would result in segments of track where freight and passenger train conflicts would be better managed without slowing passenger service;
- West of Albany, eliminate selected grade crossings to enable higher speeds while meeting FRA safety requirements;
- West of Albany, add double track segments (including property acquisition to permit expanded right-of-way) and some selected "fourth track" passing sidings to eliminate freight and passenger train conflicts; and
- Over the entire route, schedule the added, higher-speed services to avoid conflicts with freight operations.

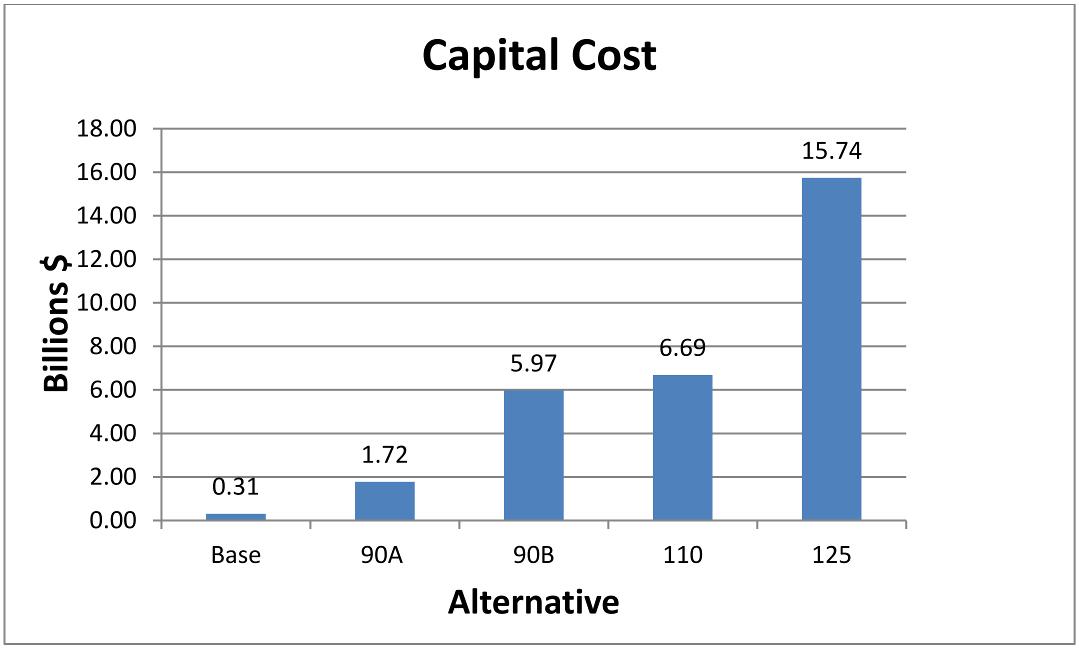
The various improvements proposed under each alternative would impose very different capital costs, ranging from $310 million for the Base Alternative to $15.74 billion for Alternative 125. Exhibit 5-1 shows these values graphically. The current status of Base Alternative improvements is reviewed in Chapters 2 and 3 (under the Base Alternative section).

5.5.1. Capacity of Empire Corridor Service to Absorb Infrastructure Improvements

There is a limit as to how much interference operating rail services can absorb before train schedules are adversely affected due to slow-orders at work sites, or the requirement to manage two-way traffic on a single track, while the other track (or passing siding) is improved. In the case of the High Speed Rail Empire Corridor Program, the potential for adverse effect would likely be most pronounced for Alternative 90A, in which additional parallel track and passing sidings, and associated switches and turnouts to and from the main freight line, would be constructed in close proximity to operating trains. Because the improvements proposed under Alternative 90A also would occur under Alternatives 90B and 110, operating rail service under those alternatives also would be affected by proposed infrastructure improvements. The improvements proposed for Alternative 90A along Empire Corridor South and Niagara Branch would occur in Alternative 125. Alternative 125, with a new, separate corridor, would therefore present the least impact to the existing Empire Service.

Specific corridor construction impacts upon train service operations will be further defined in Tier 2 as detailed engineering is advanced on the Preferred Alternative. During Tier 2, the rate at which capital funding will be provided and the ability of existing train operations to absorb the effects of nearby construction will be more precisely assessed.

Exhibit 5-1—Capital Costs

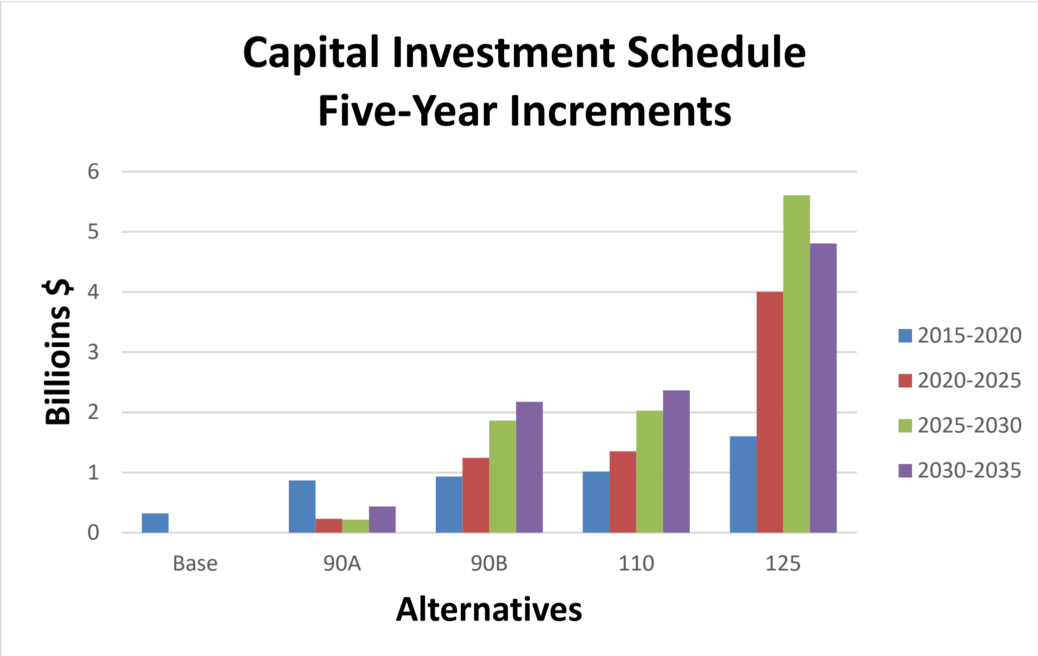


5.5.2. Sequence of Capital Investments

The High Speed Rail Empire Corridor Program would result in continuing investment over most or all of the 20-year program life, from 2015 through 2035.[149] The existing rail corridor would remain in service as the improvements are made. The program improvements would be constructed in a sequence that minimizes interference with daily service; as a result, service improvements would occur and the benefits would be realized incrementally over the entire implementation time frame. Exhibit 5-2 presents a proposed schedule of capital investments for each alternative. Capital costs are shown in 2017 dollars to enable comparison of total cost and overall benefit among alternatives. In subsequent phases of program evaluation (Tier 2), costs will be forecast with greater precision, based on the sequence of proposed improvements, which in turn will depend upon the level of available funding. The investments are shown beginning in 2015, because Base Alternative projects have already been started, as they were part of the "no action" condition implementing NYSDOT's intentions even if none of the Build Alternatives were funded. To date, approximately $150M has been spent on these initial improvements.

[149] Spending on Base Alternative improvements began in 2015. Other than for those elements common to both the Base and the Build Alternatives as described in Chapter 3, no spending on any Build Alternative will occur until the NEPA process is concluded.

Exhibit 5-2—Capital Expense Sequence for High-Speed Rail Alternatives



5.5.3. Estimates of Annual, Operating and Maintenance Costs, Ridership and Revenues

Operating and Maintenance Responsibilities and Costs

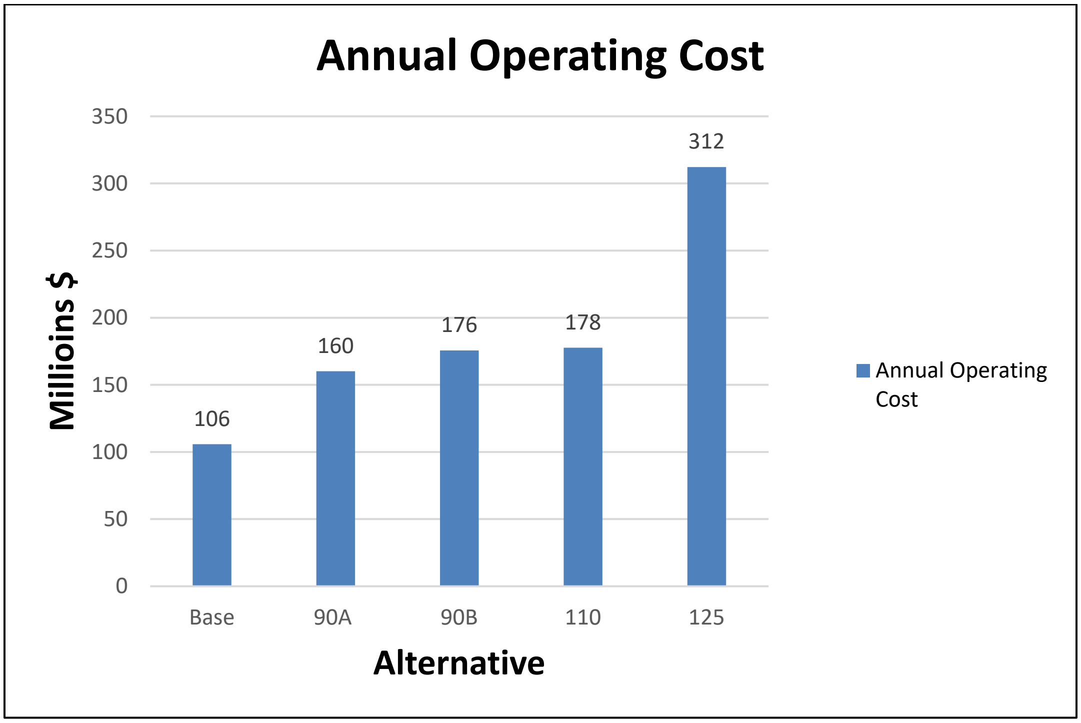
Amtrak is responsible for operation of intercity passenger rail service along the entire Empire Corridor. In the past, Amtrak and CSXT shared maintenance responsibilities between Poughkeepsie and Hoffmans. In 2012, NYSDOT facilitated a lease agreement between CSXT and Amtrak for portions of the Empire Corridor between Poughkeepsie, Albany-Rensselaer, and Hoffmans, NY, which transferred these CSXT maintenance and dispatching responsibilities to Amtrak. When combined with previous lease agreements for portions of the corridor within this 94-mile segment, Amtrak assumed full responsibility for dispatching and maintenance from the northern boundary of Metro-North control through Albany to Control Point (CP)[150] 169 at Hoffmans, where CSXT's freight-only Selkirk Branch joins the Empire Corridor. CSXT maintains responsibility for maintenance and dispatching on the portion of the corridor it owns between Hoffmans and Niagara Falls, and Amtrak continues these responsibilities on the portion of the corridor it owns between Penn Station and Spuyten-Duyvil. Metro-North is responsible for ownership, maintenance, and dispatching along the corridor between Spuyten-Duyvil and Poughkeepsie.

Exhibit 5-3 indicates the total annual operating cost for each Build Alternative as compared to the Base Alternative. Projected operating costs are based on existing Amtrak operating procedures and

[150] A control point is an interlocking, or the location of a track signal or other marker, the indications of which dispatchers can specify when controlling trains.

crew assignment protocols. The Base Alternative would include the existing four daily round-trips between Albany and Niagara Falls, while the higher-speed alternatives would presume a doubling, from four to eight daily round trips. For Alternative 125, there would be almost five times the service (from four to 19 daily round trips) provided by the Base Alternative. The costs are shown in constant 2017 dollars to allow comparison across the alternatives.

Exhibit 5-3—Estimated Annual Operating & Maintenance Costs



The higher operating costs for Alternatives 90B and 110 relative to Alternative 90A would be due to the addition of a dedicated passenger-only mainline track for the 294-mile-long Empire Corridor West. In comparison, Alternative 90A would implement only selected passing sidings to permit more fluid corridor dispatching. Alternative 125 would have the highest O&M costs, reflecting higher track maintenance standards and the costs of maintaining electric power distribution infrastructure (overhead catenary, substations, protection) for the dedicated high-speed track.

Ridership

The number of passengers carried, which determines the required number of trains, and, in turn, the number of crews, cleaning and maintenance staff, etc., drives both operating costs and ticket revenues. Forecasting ridership for transportation services is a complex statistical process, which predicts travelers' future behavior based on analysis of past behavior in similar circumstances. The forecasting methodology employed for this Tier 1 EIS presumes that travelers:

1. Determine trips by the most appealing travel mode available for each journey;

2. Choose among the various available options based on (in generally descending order): cost and time, reliability, convenience (accessibility), comfort, and amenity;

3. Consider the difficulty of accessing the transport service in choosing how to travel (e.g., traffic congestion to a station, lack of parking, long walks to get to bus or train platforms); and

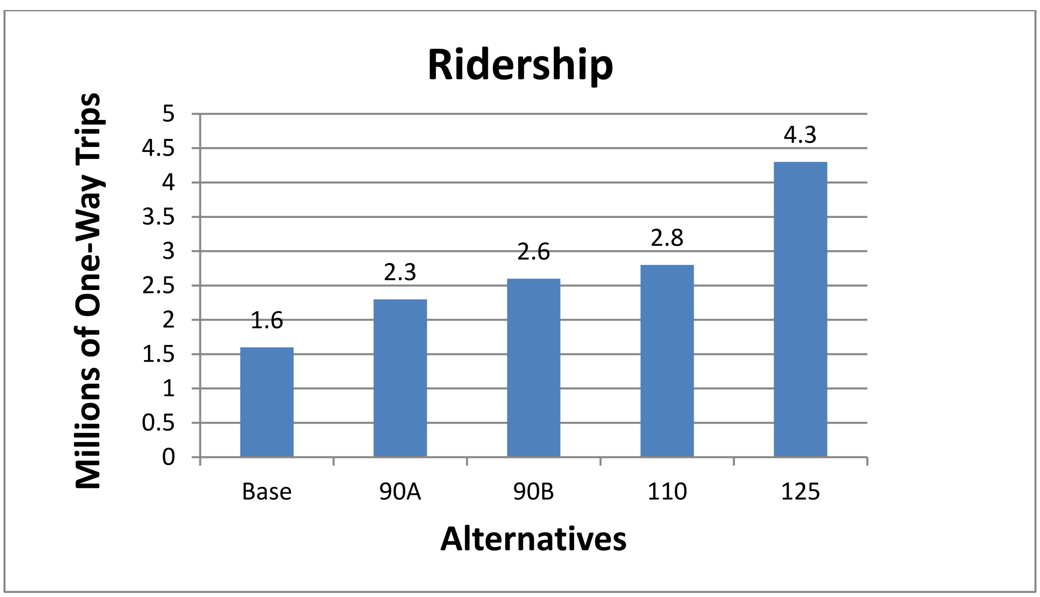
4. Act rationally – that is, in every case, they use the least costly or most efficient travel product (in terms of the above features) available.

Given the above "drivers" of travel mode choice (bus, car, plane, train, bicycle, walking), a computer model was used that recognizes the comparative speed, cost, accessibility, etc. of the travel modes between trip origins and destinations. For this program, the model assigned every trip in New York State that both begins and ends within the Empire Corridor. The model placed the Empire Corridor train service in competition with automobile, bus and airplane travel modes. Assessing comparative cost, time, convenience, etc., the model forecast for the various alternatives the number of people that would elect to ride the train over automobile, bus, or airplane.

Ridership forecasts are a function of market size and frequency of train service as well as speed, cost, and convenience (e.g., number of transfers required, ease of access to stations). While more frequent service might attract more riders, there is a point of diminishing returns, as the capital and operating costs of the additional train sets grow beyond the value of the additional ridership the increased service may attract. The alternatives were therefore structured to maximize ridership at practical levels of investment in rolling stock and maintenance costs given likely federal and state funding over the program's implementation period. Refer to Appendix B, *Ridership and Revenue Forecasting Report for the High Speed Rail Empire Corridor Program*, for additional details regarding the ridership forecasting methodology.

Exhibit 5-4 presents the 2035 annual ridership forecasts for the Empire Corridor under the five alternatives.

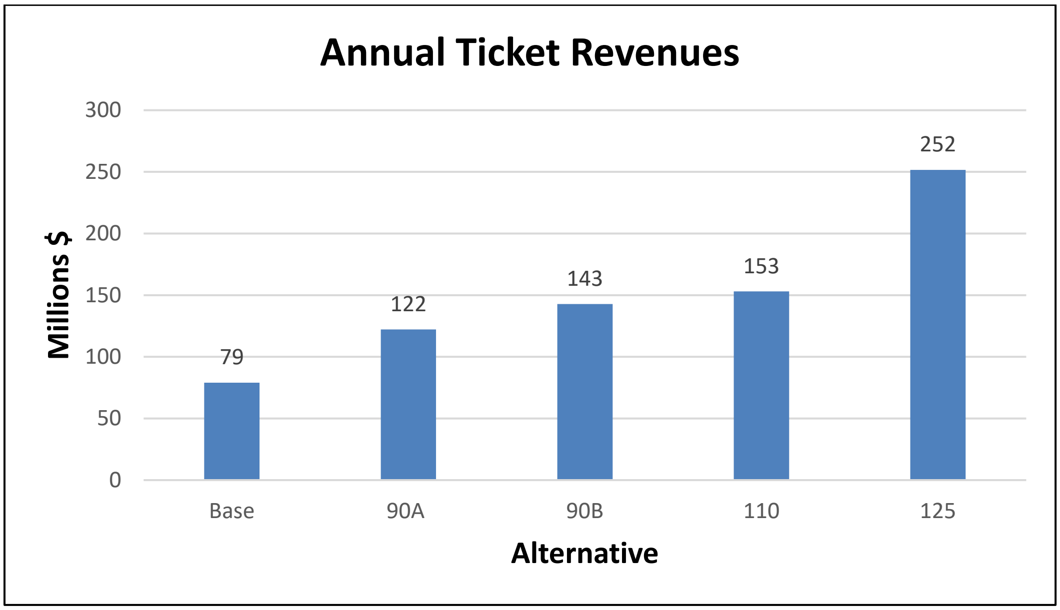
Exhibit 5-4—2035 Ridership Forecasts



Operating Revenue

Annual operating revenue forecasts are based on ridership forecasts between station pairs, multiplied by the current Amtrak travel fare between those pairs, assigned to the target comparison year. This allows comparison among the alternatives in terms of capital investments, annual O&M costs, and anticipated gross annual revenue and resulting required subsidy all in 2017 dollars. Exhibit 5-5 presents the estimated range of annual operating revenue in 2017 dollars for the five alternatives.

Exhibit 5-5—Estimated Annual Operating Ticket Revenue

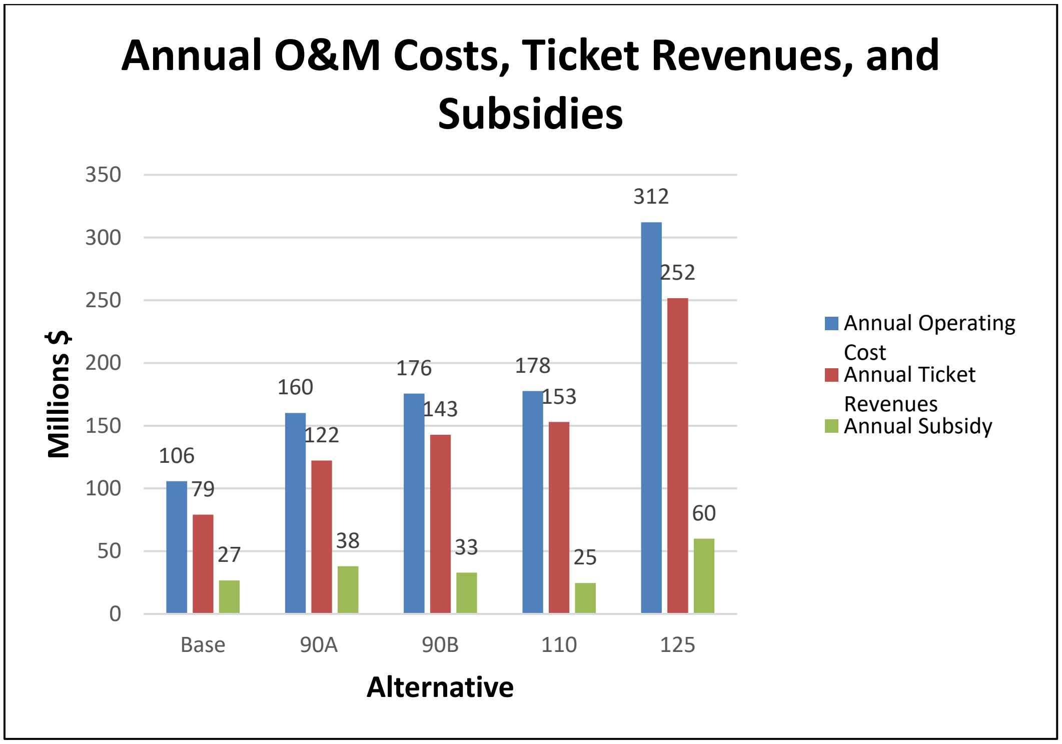


Annual Operating Deficits

Exhibit 5-6 summarizes the annual operating deficits for the five alternatives. These deficits account for the difference between total operating costs and combined anticipated ticket revenues. Non-ticket revenues derived from advertising, station concessions and leases, and utility leases along the ROW, while salutatory and contributory to the program, do not generally produce sufficient additional income that would alter the operating deficit. These additional revenues would likely be similar across all alternatives.

Exhibit 5-6 indicates that deficits, and corresponding subsidies, would be lowest for Alternative 110 and greatest for Alternative 125. In general, while faster trains incur lower labor costs, as hourly wage train crews spend fewer hours on each run, propulsion costs are higher at high speeds, as are the costs of track maintenance, since high-speed operations cause greater track wear. In addition, the greater number of daily trains intended to be operated under Alternative 125 would lead to higher crew and equipment maintenance costs.

Exhibit 5-6—Estimated Annual Operating Subsidy

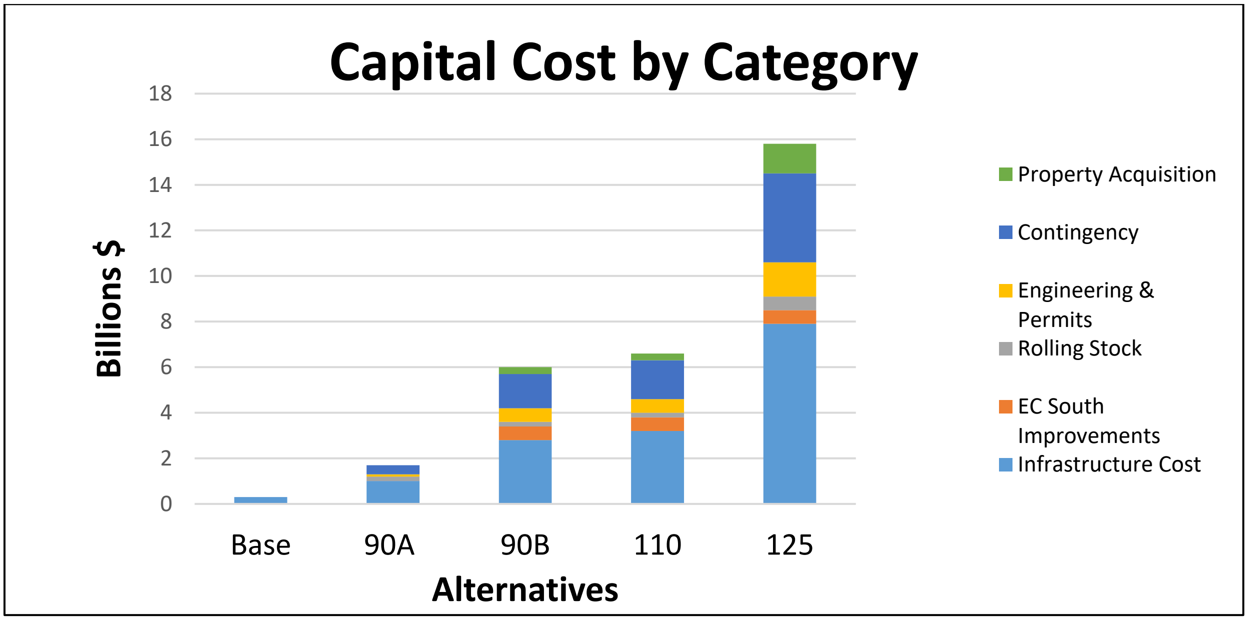


5.5.4. Financial Profiles of Alternatives

Exhibit 5-7 shows projected Tier 1 capital costs for the five alternatives by category: rolling stock purchases; planning, engineering design, and permitting; property acquisition costs; infrastructure construction costs; and Empire Corridor South Improvements costs. Capital cost estimates also include a 35 percent contingency factor to account for uncertainties at the Tier 1 program level of analysis for infrastructure improvements. As there are fewer uncertainties in rolling stock costs, equipment cost estimates include only a 5 percent contingency factor.

The capital costs for the five alternatives would range from $310 million for the Base Alternative, to $15.74 billion for Alternative 125. While the analysis shows all costs in 2017 dollars, actual investments would be made gradually over the 20-year project life. A staged implementation approach is based on two factors: first, federal and state governments have limited financial capacity in any single year; second, existing rail operations can only support a limited amount of infrastructure renewal or new construction along the ROW before construction activities interfere with daily service.

Exhibit 5-7—Capital Costs by Spending Category



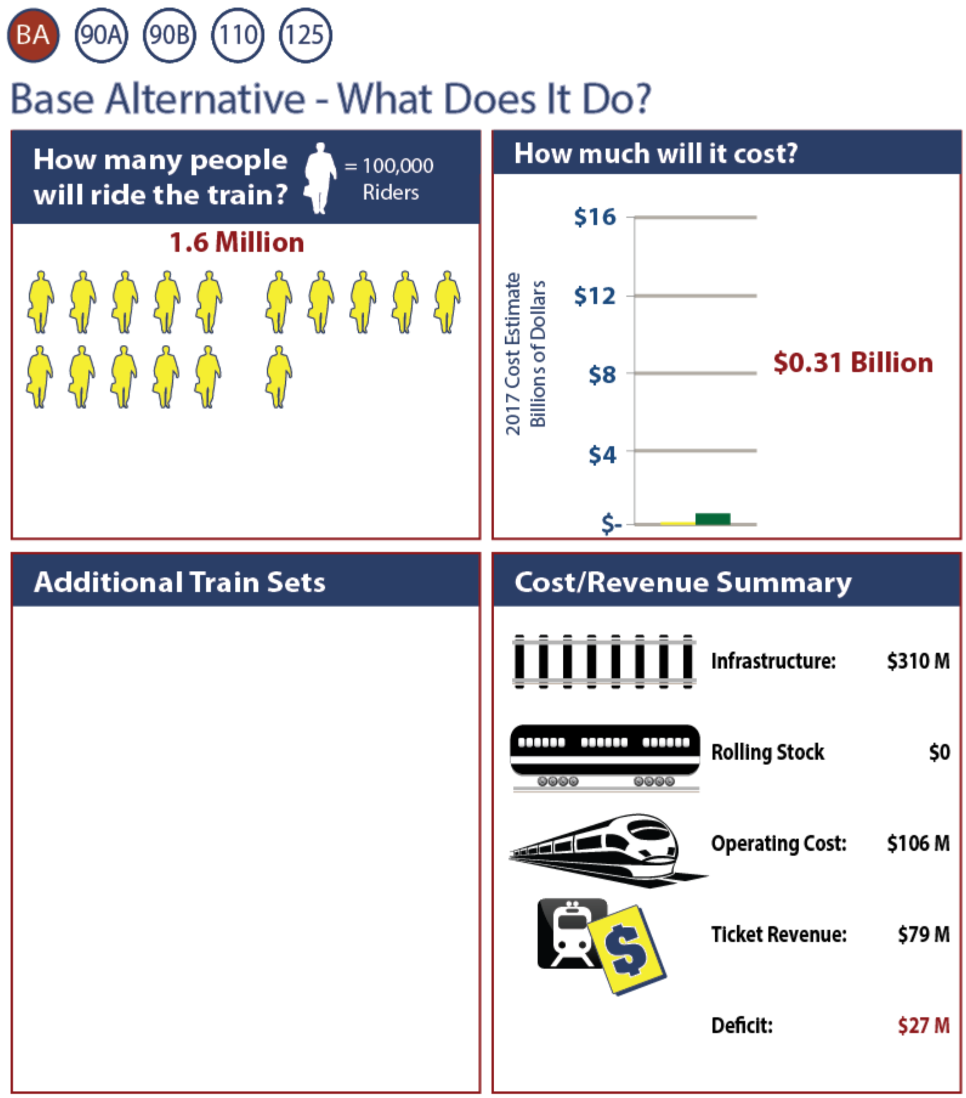
The anticipated financial performance of each of the five alternatives is as follows.

<u>Base Alternative</u>

Because there would be no change from the current operation, no additional rolling stock is required to implement the Base Alternative. Operating costs would continue as they are currently incurred by Amtrak, approximately $106 million annually. Ridership is forecast to be 1.6 million in 2035, generating ticket revenue of $79 million, and resulting in a deficit of $27 million. Infrastructure costs to implement the Base Alternative would be $310 million; no new property is required.

The Base Alternative was completed by 2021, and its benefits (reduced congestion) will accrue gradually over the construction period, with gradual improvements in reliability (on-time performance) and some modest increases in average speed.

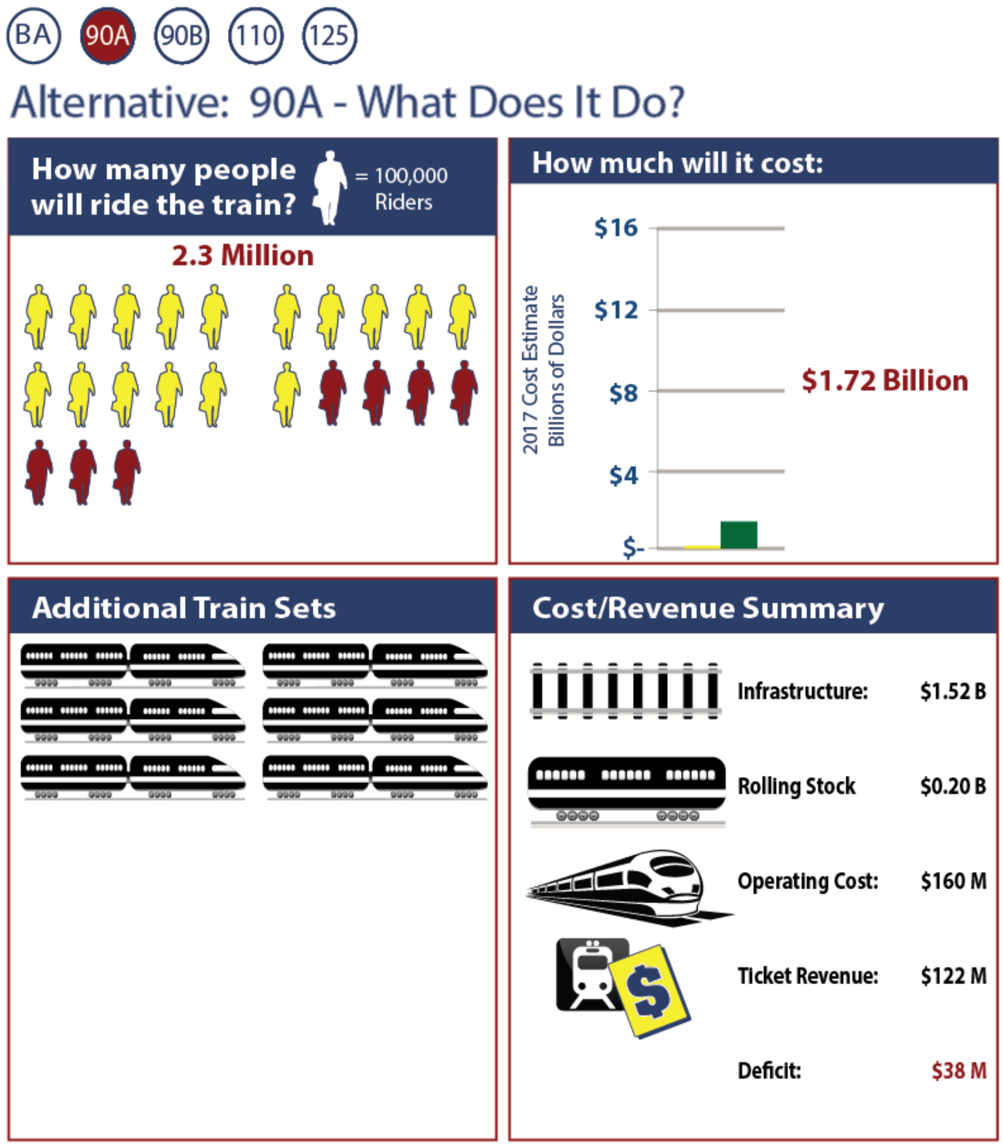
Exhibit 5-8—Characteristics of Base Alternative



Alternative 90A

The additional service would require purchase of six additional train sets, each with a locomotive and five passenger coaches to supplement the existing fleet. The acquisition of additional rolling stock would add $0.20 billion in capital costs. Alternative 90A would include $1.52 billion in infrastructure costs for additional passing track and various railroad signal, grade crossing and switch improvements to reduce freight/passenger train conflicts, increase permissible speeds through curves, improve system reliability, and secure the highest possible speed profile for the existing alignment. In total, capital costs would reach $1.72 billion for Alternative 90A; this alternative would not require that any property be acquired. The required additional train maintenance and additional service would increase operating costs to $160 million. Based on shorter travel times due to increased speed, ridership would grow to 2.3 million annual passengers by 2035. Ticket revenue would be $122 million, resulting in a deficit of $38 million, annually.

Exhibit 5-9—Characteristics of Alternative 90A



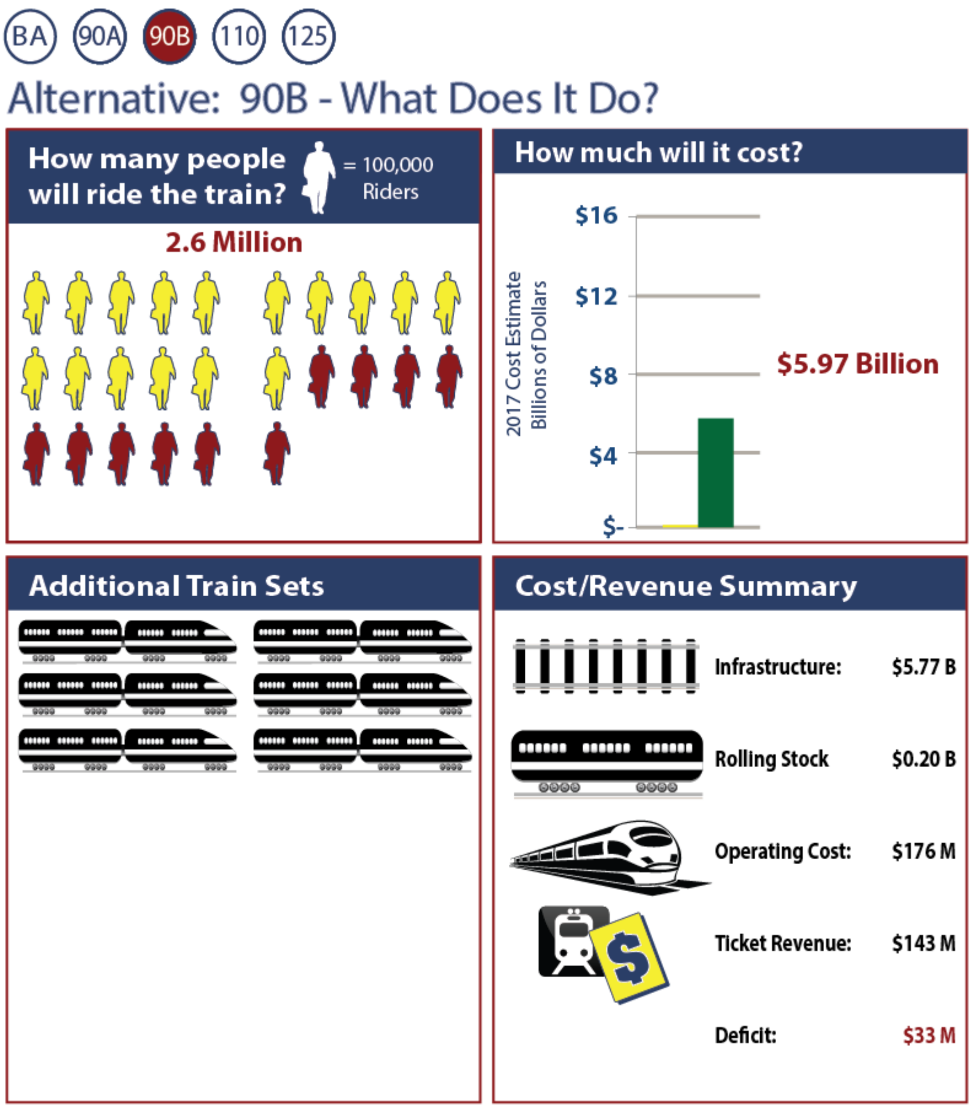
NYSDOT would expect to complete Alternative 90A by 2035, and its benefits would be expected to accrue in steps, with approximately 25 percent of the maximum and average speed benefit accruing at the end of each five-year interval, with the completion of each segment of segregated track.

Alternative 90B

Alternative 90B would accomplish its projected service improvements using the same fleet as required for Alternative 90A, involving six additional train sets and rolling stock costs of $0.20 billion. The central aspect of Alternative 90B would involve the provision of a third track west of Albany to be constructed within the existing CSXT ROW, giving significant separation between freight and passenger traffic. With the additional property required to grade separate the ROW and to reduce or eliminate curves to permit higher maximum speeds, infrastructure costs would be $5.77 billion. The total capital cost for Alternative 90B would be $5.97 billion in 2017 dollars. Operating costs would rise to $176 million, accounting for the additional daily round trip (compared to the Alternative 90A). Ridership is forecast at 2.6 million, generating ticket revenues of $143 million, and resulting in a deficit of $33 million.

Alternative 90B is projected to be completed by 2035, and its maximum and average speed benefits would accrue in steps, with approximately 25 percent of the benefit accruing at the end of each five-year interval, as each new segment of dedicated track is completed.

Exhibit 5-10—Characteristics of Alternative 90B

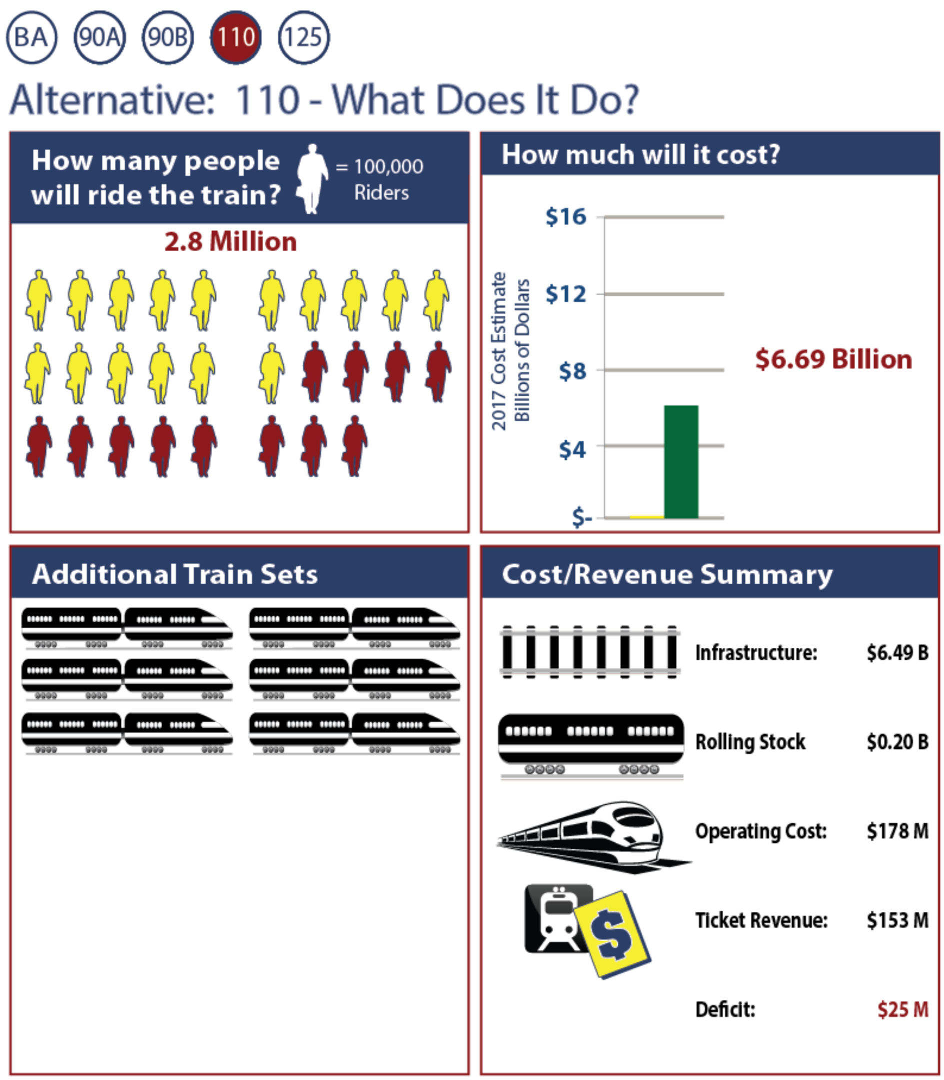


Alternative 110

The higher speed of Alternative 110 would require more property acquisition to support straighter track, more grade separations and flatter terrain. The number of trips would be unchanged from that of Alternative 90B. While rolling stock costs would remain at six additional sets and $0.20 billion, increasingly stringent track standards for the higher speed would involve $6.49 billion in additional infrastructure, resulting in total capital costs of $6.69 billion. Operating costs would increase only slightly, to $178 million. Ridership would grow to 2.8 million in response to the higher speed, generating ticket revenues of $153 million, and producing the smallest annual deficit among the five alternatives, $25 million.

Alternative 110 is projected to be completed by 2035, and its maximum and average speed benefits would be achieved in steps, with approximately 25 percent of the benefit accruing at the end of each five-year interval, as each new segment of segregated track is completed.

Exhibit 5-11—Characteristics of Alternative 110



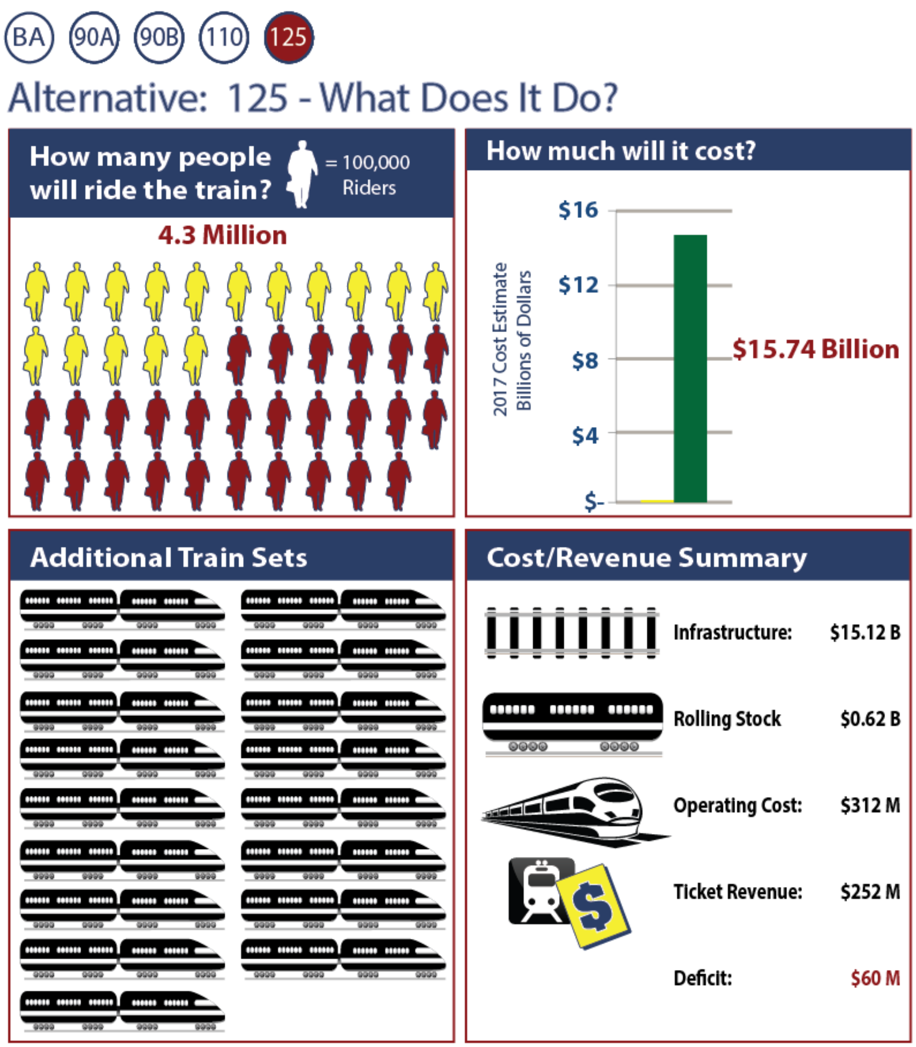
Alternative 125

Increased service frequency, and the electrified ROW would require more and different equipment:

"dual-mode" diesel and electric locomotives in place of diesel-only locomotives. Alternative 125 would have a substantial increase in fleet size: 17 additional train sets would be required. The dual-mode locomotive fleet would have substantial costs, $0.62 billion; and a new, fully segregated ROW would require an infrastructure investment of $15.12 billion, for a total capital cost of $15.74 billion. The increase in average speeds combined with increased service frequency on both segments and high-speed express service between major stops, would attract the highest additional ridership, forecast at 4.3 million and generating revenues of $252 million annually. Operating costs for this increased level of service would be the highest of all the alternatives at $312 million, producing an annual deficit of $60 million.

Alternative 125 would not be completed until 15 to 20 years after the start of construction. An entirely new ROW between Albany and Syracuse, therefore, would not be completed until halfway through the construction period, and the first 50 percent of service benefits would therefore not accrue until then. The next 25 percent service benefit would accrue about five years later with completion of the new ROW to Rochester. The remaining 25 percent benefit would accrue when the new corridor reaches Buffalo.

Exhibit 5-12—Characteristics of Alternative 125



5.6. Summary of Capital, Operating and Maintenance Costs, Revenues and Subsidies for Empire Corridor Alternatives

Exhibit 5-13 summarizes the capital and operating costs and revenues for each alternative to facilitate comparison.

Exhibit 5-13—Summary of Costs and Revenues for High Speed Rail Empire Corridor Alternatives

Metric \ Alternative	Base	90A	90B	110	125
Capital Costs*					
Additional train sets	0	6	6	6	17**
Equipment Cost	$0.00	$0.20	$0.20	$0.20	$0.62
Infrastructure Cost	$0.31	$1.52	$5.77	$6.49	$15.12
Total Capital Cost	$0.31	$1.72	$5.97	$6.69	$15.74
Operating & Maintenance Costs					
O&M Cost (millions, 2017)	$106	$160	$176	$178	$312
Revenue (millions)	$79	$122	$143	$153	$252
Surplus/(Deficit)	($27)	($38)	($33)	($25)	($60)
Benefits					
2035 Ridership (millions annual one-way trips)	1.6	2.3	2.6	2.8	4.3
Ridership Gain vs. Base		0.7	1.0	1.2	2.7
Average Speed	51	57	61	63	77
Time, NYC – Niagara Falls (hours: minutes)	9:06	8:08	7:36	7:22	6:02
Time Improvement vs. Base (hours: minutes)	n/a	58	1:30	1:44	3:04
Round Trips Albany – Buffalo	4	8	8	8	19
Round Trips Albany – Niagara Falls	3	7	7	7	6
Round Trips NYC – Albany	13	16	17	17	24

*Costs in billions of 2017 year US dollars except where noted.
**Dual Mode locomotives required for Alternative 125

5.7. Funding Assumptions, Risks and Requirements

For the High Speed Rail Empire Corridor Program, it is assumed that a combination of federal high-speed rail funds and state and local revenue sources would be used for various infrastructure improvements and/or equipment purchases, as appropriate to funding source requirements and restrictions. Some of these funding sources would require local match. It is assumed that the state's participation through some combination of local investments in stations or parking, the dedication of state bond funds, or direct subsidies from state general revenues could satisfy the local match requirements. At the Tier 1 level of analysis, and given the uncertainties associated with current high-speed rail funding, the rate at which federal funding will be provided for the program over the 20-year implementation period can only be estimated in broad terms, based on historical multi-year averages, adjusted for inflation.

All capital costs are shown as if they would be received in 2017. This allows for an appraisal of the relative capital costs of the program alternatives in total value, without regard for the rate at which funding would be available for the different alternatives.

5.7.1. Financial Capacity Analysis

NYSDOT's financial capacity to undertake major passenger rail improvement projects is constrained by limited resources and competing needs. Other NYSDOT major passenger rail improvement initiatives underway include participation in a wide range of capital investments required to maintain and improve rail transportation services in New York City and its Long Island and northern suburbs, as well as bus and rail rolling stock needs for other transit properties in the state's smaller municipalities. NYSDOT is also involved in improving statewide freight rail services in partnership with private freight rail owners. To a great degree, NYSDOT's capacity to advance high-speed rail improvements will depend on dedicated local funding sources and federal support.

5.7.2. Risk and Uncertainty and Risk Mitigation Strategies

Due to limitations associated with current funding sources, general budget pressures, and the need for continued maintenance of existing infrastructure, the pace of program implementation is difficult to project. Absent significant federal funding, NYSDOT currently has limited capacity to undertake major long-term investments in high-speed passenger rail projects. Moderate incremental investments are feasible within the context of existing and anticipated future funding. This Tier 1 financial analysis assumes substantial federal participation in the construction of any of the Build Alternatives. Furthermore, the federal programs outlined in Section 5.3.2 are primarily discretionary grants for capital improvements and related environmental and engineering studies, for which there is significant national competition.

NYSDOT has a history of providing operating support for inter-city and commuter rail transit, although there is no companion federal operating program. The financial analysis provided in Chapter 5 has defined a likely financial plan based on historic and potential future national funding trends. There are several operating and capital risks associated with the High Speed Rail Empire Corridor Program that would have to be addressed in formulating a detailed financial plan. Some additional fiscal capacity-related risks to NYSDOT and Amtrak are present as well. These risks are noted and described in the following subsections.

5.7.3. Capital Cost Risks

There remain considerable uncertainties in the capital cost estimates for the High Speed Rail Empire Corridor Program, due to the limitations noted earlier in this chapter. This uncertainty is not unusual at the Tier 1 conceptual planning level for a program of this magnitude. More refined cost estimates will be prepared during Tier 2, when the specific infrastructure improvements of the selected program alternative are advanced through detailed design. Exhibit 5-14 summarizes capital cost risks and Tier1–level mitigation strategies for the High Speed Rail Empire Corridor Program.

Exhibit 5-14—Summary of Tier 1 Capital Costs Risks and Mitigation

Risk	Mitigation
Negotiations with railroads. No provision is included for costs arising from negotiations with operating railroads regarding their potential contribution to capital, or potential costs involved in protecting freight crossings (necessary to permit high-speed passenger service) or the use of ROW based on sharing agreements.	*The uncertainty associated with costs of CSXT participation is a function of negotiations with CSXT. Subject to these negotiations, the broad 35% construction contingency factor accounts for this risk.*
Property costs. ROW acquisition costs are difficult to estimate in an uncertain commercial and residential real-estate market.	*As corridors are more precisely defined during Tier 2 work, it will be possible to sharpen the estimate for required property for the selected alternative.*
Broad unit costs (per ton, per cubic yard, per linear foot, etc.) have been applied for key elements rather than estimates based upon specific designs.	*During Tier 2 work on the selected alternative, as design detail is refined, costs specific to each element of infrastructure improvement will be more precisely defined.*
Mitigation costs. No allowances have been provided for utilities, wetlands mitigation, and preservation of historic structures, potential hazardous materials or other special site conditions.	*These uncertainties have been addressed to a considerable degree: the 35% contingency factor is applied to property acquisition as well as to construction; the engineering design/permitting cost category has been applied at 15%, rather than a more conservative 10-12% as is normally the case in standard construction. As the design becomes more refined, mitigation costs will be better defined and may be either more or less than the costs as accounted for in this Tier 1 analysis.*
Inflation rate. The rate of inflation is uncertain; moreover, inflation as represented in the consumer price index is not always representative of inflation for heavy construction or, more specifically, heavy rail construction, which tends to depend on competitive world-wide demand for concrete and steel at the time a project is designed and ready to bid.	*Application of a 35% contingency factor for both construction and property acquisition addresses this concern to a degree. It is virtually impossible, however, to forecast these factors beyond a 5-10 year time frame, so a 20-year program schedule is necessarily burdened with some additional risk.*
Financial market. Financial risks and interest rates may increase as capital markets respond to changes in the financial market and global economy. To the extent that project elements are funded by CSXT or through private-public partnerships involving debt, costs of debt service can vary dramatically.	*Government typically reserves low-interest debt programs through its economic development function. Where commercial debt becomes too costly, Government can sometimes guarantee debt, and thereby reduce its risk and associated costs, so that the debt-service costs can be maintained within reasonable ranges commensurate with these initial cost estimates.*
Federal participation. The level of federal participation may be lower than estimated.	*Because the High Speed Rail Empire Corridor Program constitutes a large number of individual infrastructure improvements, should federal funding be insufficient, the program could be implemented more slowly and over a longer time period, still delivering steady improvement in corridor rail service.*
Local participation. The level of local funding commitment may be lower than estimated.	*With sufficient public support, through referendum or bonding, it may be possible for NYSDOT to dedicate funding to the program to immunize it from the ebb and flow of local tax revenues and annual budgeting and legislative appropriations.*

At the Tier 1 planning level, it is difficult to anticipate and mitigate for these and other potential risks and uncertainties. During Tier 2, NYSDOT will further develop planning, analysis, and engineering design data for these alternatives. NYSDOT also will plan and conduct an appropriate public review process to generate support for the Preferred Alternative. The High Speed Rail Empire Corridor Program will then be positioned to compete effectively for federal, state, and private sector funding with which to initiate implementation.

5.7.4. Operating Cost Risks

As previously discussed, changes in fare structure affect ridership, with a resulting impact on fare revenue and cost recovery. Ridership affects service levels, which in turn affect maintenance and operating costs. Ridership and revenue are sensitive to on-time performance and to fare levels, which in turn affect the revenue forecasts and the operating ratio (the ratio of operating costs covered by fare revenues). Therefore, if the overall quality, speed, reliability, and availability of the new service would not meet customer demand, ridership could be lower than forecast, producing higher operating deficits and requiring additional state subsidies. Conversely, if the overall quality, speed, reliability, and availability of the new service would meet customer demand, ridership could be higher than forecast, resulting in lower operating deficits and requiring less state subsidies.

6. Comparison of Alternatives

6.1. Introduction

The Tier 1 Final EIS presents the final program of improvements selected by FRA and NYSDOT from the broad range of alternatives initially presented in the Tier 1 Draft EIS. This chapter summarizes and compares the five alternatives considered in this Tier 1 Final EIS and evaluates the alternatives' benefits, costs, and environmental and social impacts against the High Speed Rail Empire Corridor Program's purpose and need. Based on this evaluation, Alternative 90B has been identified as the Preferred Alternative that FRA and NYSDOT will advance towards implementation, following completion of the Tier 1 review process. The Preferred Alternative, Alternative 90B, will be advanced by the FRA and NYSDOT as a program of individual projects. Tier 2 environmental reviews will include more detailed analyses and design to identify site-specific environmental consequences, implementation plans, and mitigation measures.

6.2. Goals and Objectives

The FRA and NYSDOT developed program performance objectives and transportation-related goals based on the Program's purpose (to improve rail service) and needs (to reduce infrastructure constraints that impede service and to accommodate passenger and freight traffic demand), described in Chapter 1.

The environmental impacts of these alternatives are also more fully discussed in this Tier 1 Final EIS (in Chapter 4) and summarized below.

6.2.1. Performance Objectives

NYSDOT used the following six performance objectives to evaluate and rank the high-speed rail alternatives developed for the High Speed Empire Corridor Program.

- Improve system-wide on-time performance (OTP) to at least 90 percent;
- Reduce travel time along all segments of the Empire Corridor;
- Increase the frequency of service (number of daily round trips) along Empire Corridor West beyond the existing four daily round trips;
- Attract additional passengers;
- Reduce automobile trips, thereby reducing highway congestion; and
- Minimize passenger rail interference with freight rail operations.

6.2.2. Transportation-Related Goals

NYSDOT considered the following transportation-related goals important to the high-speed rail alternatives developed for the High Speed Rail Empire Corridor Program: increase travel choices and improve quality of life by providing additional commuting and travel options for residents and workers; contribute to economic revitalization by accommodating forecasted growth in population, employment, and corridor rail freight operations and by accommodating and attracting additional tourists; and improve environmental quality by facilitating rail use and reducing reliance on automobile travel, thereby reducing fuel use and greenhouse gas (GHG) emissions.

The Tier I Final EIS document also includes analysis to weigh environmental impacts and costs for each alternative. These factors were important in selecting the Preferred Alternative.

6.3. Alternatives Assessment

This section presents a comparative assessment of the five program alternatives NYSDOT advanced for study in this Tier 1 Final EIS: Base Alternative, Alternative 90A, Alternative 90B, Alternative 110, and Alternative 125. The purpose of the comparative analysis is to highlight the advantages and disadvantages of the alternatives, to identify important distinctions among them, and to recommend a Preferred Alternative.

6.3.1. Base Alternative Performance

The Base Alternative, is carried through the Tier 1 EIS as the basis for evaluating and comparing the costs and impacts of the program alternatives in relation to the benefits gained by the public. The Base Alternative's specific elements represent a series of rail improvement projects that address previously identified capacity and speed constraints hindering the Empire Corridor rail service. The Base Alternative's projects would occur whether or not improvements in the four "Build" Alternatives discussed in this Tier 1 EIS advance. Since publication of the Tier 1 Draft EIS, seven of these eight have been completed or are in design.

The projects constructed under the Base Alternative represent an improvement over existing conditions. However, when compared to the Build Alternatives, the Base Alternative does not provide service improvements sufficient to satisfy the High Speed Rail Empire Corridor Program purpose of introducing higher passenger train speeds on the Empire Corridor and improving reliability, travel times, service frequency, and passenger amenities. The following are the key characteristics of the Base Alternative, relative to the Empire Corridor program's performance objectives and goals:

- **The Base Alternative would result in the lowest annual ridership of all the alternatives**, at 1.6 million (year 2035). All Build Alternatives significantly exceed this value.

- **The Base Alternative would have the slowest average speed** (51 mph) and longest trip time of all the alternatives (9 hours and 6 minutes between New York City and Niagara Falls).

- **The Base Alternative would not result in improved service frequencies.** The Base Alternative does not add any scheduled service. All other alternatives increase the number of daily trains operated compared to the existing service.

- **The Base Alternative would be the least effective alternative in diverting auto users to passenger rail** and improving air quality by reducing vehicular emissions. Per the analysis contained in this document, auto diversions increase in direct response to increased average speed, improved reliability, and reduced trip times among major origin/destination pairs.

- **Delivering only 83 percent on-time performance (OTP), the Base Alternative would not meet program service reliability goals of 90 percent OTP.** All of the other Build Alternatives would exceed the 90 percent OTP target.

6.3.2. Build Alternatives Performance

This section summarizes the effectiveness of the Build Alternatives in meeting the Empire Corridor program's goals and performance objectives. Exhibit 6-1 presents the qualitative rating system used to compare the Build Alternatives. Exhibit 6-2 summarizes the effectiveness of the alternatives in meeting the program's performance objectives using a qualitative rating system. The Base Alternative is shown for comparison.

Exhibit 6-1—Alternative Rating Symbols

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

Exhibit 6-2—Effectiveness of Alternatives in Meeting Performance Objectives

Performance Objectives	Base	90A	90B – Preferred Alt.	110	125[1]	
Improve System-Wide On-Time Performance	X	★	★	★	★ (Express)	X (Regional)
Reduce Travel Time	–	+	+	+	★ (Express)	+ (Regional)
Increase Service Frequency	X	+	+	+	★ (Express)	+ (Regional)
Attract Ridership	–	★	★	★	★	
Reduce Automobile Trips	–	+	+	+	★	
Minimize Impact on Freight Rail Service	–	–	+	+	–	

Notes:
[1] Performance on the new express service and the legacy regional service will differ, as explained in the following subsections.

The findings regarding the performance of the Base and Build Alternatives reveal that:

- **Alternative 90A** strongly supports the performance objectives of improving system-wide on-time performance and attracting ridership. Alternative 90A also supports the objectives of reducing travel times, increasing service frequency, and reducing automobile trips. Alternative 90A is neutral with regard to the objective to minimize adverse effects on freight train operations.

- **Alternatives 90B and 110** would both create a segregated rail corridor, by providing exclusive third and fourth tracks for use generally by passenger trains.[151] These alternatives would both strongly support the goals of improving system-wide on-time performance and attracting ridership. These alternatives would also support the goals of reducing travel times, increasing service frequency, reducing automobile trips, and minimizing impacts on freight rail service.

- Benefits from **Alternatives 90A, 90B, and 110** all are realized soon after initiation of construction, with these benefits increasing steadily throughout the entire term of the program as track, signal, yard, and grade-crossing improvements continue to be implemented.

- **Alternatives 90A, 90B, and 110** all would enhance service for each station destination along the Empire Corridor West/Niagara Branch: Albany-Rensselaer, Schenectady, Amsterdam, Utica, Rome, Syracuse, Rochester, Buffalo-Depew, Buffalo Exchange Street, and Niagara Falls Stations.

- **Alternative 125** express service strongly supports the program performance objectives of improving system-wide on-time performance, reducing travel times, increasing service frequency, attracting ridership, and reducing automobile trips.

  The regional service (legacy service) maintained along the existing Empire Corridor for Alternative 125 would support the goals of increasing service frequency and reducing travel time, but would be contrary to the goal of improving system-wide on-time performance. This alternative would result in passenger and freight trains continuing to share tracks, each potentially delaying the other. Alternative 125 would be neutral in terms of minimizing impact on freight rail service (it would be no worse; neither would it be improved). Alternative 125 would have an extremely high capital and annual operating cost, requiring the highest public subsidies (after the Base Alternative), and has the greatest potential for environmental and community impacts.

- **Alternative 125** would not be completed until 15 to 20 years after the start of construction, due to the need to construct an entirely new right-of-way through undeveloped areas, so the mobility benefits associated with Alternative 125 would not occur until then. The public would receive no transportation benefits from Alternative 125 until the first major new segment of track – from Albany to Syracuse – is completed. Even then, for travelers destined for Rochester or Buffalo/Niagara Falls, true high-speed service would not be available until this time or possibly later. During nearly the entire 20-year period of its implementation of Alternative 125, travelers would receive only the benefits available from the Base Alternative.

- **Alternative 125** does not provide service enhancements to several existing station destinations on the Empire Corridor West including: Schenectady, Amsterdam, Utica, Rome, and Niagara Falls. Benefits at these destinations are limited to the benefits described in the Base Alternative as the existing regional legacy service would still be provided.

Additional details on this evaluation are presented in the following subsections.

[151] Passenger and freight trains will be able to use any track, depending upon dispatching priorities. It is anticipated, however, that normal schedules will tend to segregate freight and passenger trains on separate tracks as normal practice.

Improve System-Wide On-Time Performance

In 2019, Amtrak rated the on-time performance (OTP) for Empire Service between New York City and Albany as 91 percent of on-time customers (where customers arrive within 15 minutes), and the OTP for the full Empire Service operating between New York to Niagara Falls OTP was only 66 percent of on-time customers (a failing grade). Of the other routes operating on Empire Corridor, only the Ethan Allen Express received a passing OTP of 85 percent. The Adirondack had a 2019 customer OTP of 73 percent, and the Maple Leaf had an OTP of 67 percent. Exhibit 6-3 presents the estimated OTP for each alternative based on computer simulations of the year 2035 conditions (refer to Appendix D).

Exhibit 6-3—Estimated On-Time Performance, Albany – Niagara Falls, 2035

Alternative	Passenger Train OTP Percentage[1]	Qualitative Ranking
Base	83.0	X
90A	92.4	★
90B – Preferred Alt.	95.4	★
110	94.9	★
125 Express	100	★
125 Regional	83.0	X

Notes:
[1] Based on 10-minute lateness threshold, measured at terminal endpoints

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

All of the program Build Alternatives sustain or exceed the 90 percent OTP goal, even as both freight and passenger traffic grow over the implementation time frame. Only the Base Alternative fails to meet this objective. Computer simulation results for Empire Corridor West indicate that all four Build Alternatives would satisfy the 90 percent minimum OTP goal; these simulations accounted for CSXT traffic increases due to expanding future freight rail business in the corridor.[152]

The 2035 Base Alternative has a projected OTP of 83 percent, while Alternative 90A has a projected OTP of 92.4 percent. Alternatives 90B and 110 have similar projected OTPs ranging from 94.9 percent to 95.4 percent. Alternative 125, which would run predominantly on new dedicated passenger rail ROW between Albany and Buffalo, is projected to have the best average OTP for destinations it serves including Albany-Rensselaer, Syracuse, Rochester, and Buffalo, at or near 100

[152] As Amtrak's 2008 base numbers indicate, OTP south of Albany has been historically much better than OTP west of Albany, because of low freight traffic on Empire Corridor South.

percent. The legacy regional service continuing to serve destinations including Schenectady, Amsterdam, Utica, Rome, and Niagara Falls would continue to experience conflicts with freight operations in the Albany-Buffalo corridor, therefore remaining at the same OTP levels as the Base Alternative, 83 percent.

Reduce Travel Time Along all Segments of the Empire Corridor

NYSDOT evaluated the travel times between origins and destinations on the Empire Corridor associated with each alternative using a track and signal system computer simulation model. Simulated train runs were scheduled to avoid freight operations on shared tracks by the careful timing of passenger train arrivals at bypass tracks located to permit high-speed passenger trains to pass slower freight trains.

For Alternatives 90B and 110, NYSDOT added a second main track over longer segments between Albany and Buffalo to increase passenger track capacity and minimize track-sharing that mixed freight/passenger operations, thus increasing average speed. Exhibit 6-4 presents the estimated travel time for all alternatives.

Exhibit 6-4—Estimated Travel Times of the Alternatives, 2035

Alternative	Travel Time NYC	Estimated Time Savings	Percentage Time Savings over Base	Qualitative Ranking
Base	9:06	--	--	–
90A	8:08	0:58	11%	+
90B – Preferred Alt.	7:36	1:30	16%	+
110	7:22	1:44	19%	+
125 Express	6:02	3:04	34%	★
125 Regional	8:40	0:26	5%	+

Notes: Times presented in hours: minutes, based on westbound scheduled times

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

With respect to the Base Alternative, each of the Build Alternatives would result in a travel time savings of about 13 minutes between New York and Albany (Empire Corridor South). The Base travel time between these two points is assumed to remain constant because there are no committed capital improvements between New York and Albany that would result in significant scheduled travel time reductions. Alternative 90A would produce an overall corridor travel time savings of 58 minutes between New York City and Niagara Falls compared to the Base Alternative. The time savings between New York City and Albany remains constant for Alternative 90A (and each of the Build Alternatives) at about 13 minutes. Alternatives 90B and 110 would produce larger time savings of one and one-half hours or more (1:30 and 1:44, respectively) compared to the Base Alternative. Most of this time savings would occur on the segment between Albany and Buffalo, although time saving percentages in Exhibit 6-4 reflect the entire trip travel time.

The Alternative 125 express service on a new corridor, including a transfer at Buffalo to regional or shuttle service on the existing Empire Corridor for the final leg of the trip to Niagara Falls, would provide a significant improvement of the average total Empire Corridor travel time from 9 hours and six minutes (9:06) under the Base Alternative to 6 hours and 2 minutes (6:02). It would shorten the trip by just over three hours for passengers traveling between New York City and Niagara Falls. For Alternative 125, the New York-Niagara Falls legacy regional service (serving all intermediate stations, including Schenectady, Amsterdam, Utica, and Rome) would experience only modest improvements in travel time over the Base Alternative, due to improvements along Empire Corridor South and the Niagara Branch. Travelers from New York using legacy service to non-express-stop cities would experience somewhat shorter travel times (about 13 minutes faster) and slightly, though not significantly, faster speeds than those available under the Base Alternative, again due to the slight improvements in speed and travel time along Empire Corridor South that are to be achieved under all alternatives.[153]

The alternatives differ in terms of the range of train-by-train trip time improvements on the Empire Corridor. For the Base, 90B, 110, and 125 (both express and regional) Alternatives, most train trips have the same scheduled travel time over the course of the day. Alternative 90A differs in that it provides some limited stops service with faster trip times (3 round trips New York – Niagara Falls with one additional round trip Albany – Niagara Falls). Exhibit 6-4 presents average travel times between New York City and Niagara Falls. The trip times of Alternative 90A range from 7:50 to 8:30, with the overall average (Exhibit 6-4) of 8:08.

Increase Frequency of Service along Empire Corridor West

In 2019, there were four daily round trips provided between New York City and Niagara Falls. Eighty percent of New York State's 19.4 million residents live within 30 miles of the Empire Corridor. Recognizing the concentration of population and commerce along the Empire Corridor, the convenience of reliable and frequent rail service would contribute to the accessibility of communities along and near the corridor, enhancing their economic and cultural vitality and supporting local and regional economic development efforts. The proposed schedule enhancement for each alternative, including frequency of service and availability of express service trips, is presented in Exhibit 6-5.

Each of the Build Alternatives would enhance the service schedule that would be provided with the Base Alternative, which would continue to provide the same service as the existing Empire Service. Alternatives 90A and 125 would both offer some forms of express service, while Alternative 125 would also retain the existing regional service and service levels on the existing corridor. The average speeds and trip times achieved under Alternatives 90B and 110 are sufficiently improved such that all stations can be served by all trains.

[153] Due to the need to schedule regional services on the existing corridor to minimize conflicts with freight train services, it was not possible to design the Alternative 125 service to provide efficient "meets" between regional and express trains traveling the new 125 mph corridor at Albany, Rochester, Syracuse or Buffalo. Therefore, travelers on regional trains to/from Rome, Utica or Schenectady would not realize significant time savings by transferring at these "express" stations.

Exhibit 6-5—Schedule Enhancement by Alternative

Alternative	Frequency of Service		Available Express Service Trips (Included in total Albany – Buffalo trips)	Qualitative Ranking
	NYC – Albany	Albany – Buffalo		
Base	13	4	0	X
90A	16	8	4	+
90B – Preferred Alt.	17	8	0	+
110	17	8	0	+
125 Express	-	15	15	★
125 Regional	24	4	0	+

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

Alternative 90A would increase service between New York City and Albany to 16 round trips per day, a 23 percent gain above the current 13 trips in the Base Alternative. Service between Albany-Rensselaer Station and Buffalo would increase to 8 daily round trips, roughly doubling the current 4-trip service to Buffalo in the Base Alternative. With Alternatives 90B and 110, the frequency of service between New York City and Albany would increase to 17 round trips a day, representing a 30 percent gain as compared to the Base Alternative, and service between Albany and Buffalo, would double (to 8 round trips daily). With Alternative 125, service between New York City and Albany would increase to 24 round trips a day, approximately an 85 percent increase in service, and service between Albany and Buffalo would increase to 19 daily round trips, nearly four times the number of trips under the Base Alternative. Of those 19 daily trips, 15 would be added to the new 125 mph alignment, reconnecting with the existing alignment at Albany, Syracuse, Rochester, and Buffalo stations. As noted earlier, for Alternative 125, the existing 4 regional trains would continue on the existing alignment, serving all of the intermediate stations including Schenectady, Amsterdam, Utica, and Rome.

Increase Ridership

Over 1.4 million passengers rode on the Empire Corridor in FY 2011. Although rail ridership has grown in recent years (with 2019 recording 1.6 million riders), passenger rail has the lowest market share of trips when compared to other available modes of transportation (automobile, bus and air). Automobile travel, particularly on I-87/I-90 (the New York State Thruway), comprises the majority of trips (roughly 211 million single-person trips in 2009). Therefore, even small percentage losses from autos translate into sizeable increases in rail ridership. The ridership for each alternative is shown in Exhibit 6-6.

Exhibit 6-6—Ridership by Alternative, 2035

Alternative	Total	Percentage Increase from Base	Qualitative Ranking
Base	1.6 million	-	–
90A	2.3 million	44%	★
90B – Preferred Alt.	2.6 million	63%	★
110	2.8 million	75%	★
125	4.3 million	169%	★

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

Analysis in this document projects ridership will increase by 16% with the Base Alternative compared to 2009 levels, with proportionally greater ridership gains anticipated with Alternatives 90A, 90B, 110, and 125. The largest increase in ridership would be achieved under Alternative 125 to a 2035 projected ridership of 4.3 million. However, given the lengthy timeline to implement Alternative 125, the benefit of this ridership gain will be significantly delayed compared to the other alternatives. All of the alternatives support the program objective of attracting ridership, with the four Build Alternatives performing significantly better than the Base Alternative.

The majority of ridership gains would occur in the New York City to Empire Corridor West markets, particularly between Albany and Buffalo/Niagara Falls. These increases reflect the response of travelers to the significantly increased service levels and reduced travel time between New York City and Empire Corridor West markets. New York City to Albany rail ridership would increase modestly over current levels, reflecting the already robust ridership and faster and more frequent service.

Reduce Automobile Trips

Experience demonstrates the relatively inelasticity of automobile travel, in which auto drivers do not typically switch to public transit without significant gains in travel time or reductions in cost. As travelers' predominant concern is time, meaningful reductions in automobile travel are forecast due to the improved rail travel time resulting from higher average speeds (refer to Exhibit 6-4), increased flexibility in service (refer to Exhibit 6-5), and increased reliability of service (refer to Exhibit 6-3) that would result from the Build Alternatives. The anticipated diversion of automobile travelers to rail from the Base Alternative and corresponding reduction in automobile trips, is shown in Exhibit 6-7 based on the analysis performed for this document.

Exhibit 6-7—Annual Reduction in Auto Trips, 2035, Compared to Base Alternative

Alternatives	Diversion from Highways (one-way trips)		Qualitative Ranking[2]
	Autos	One-Way Person Trips[1]	
Base	---	---	–
90A	84,209	126,313	+
90B – Preferred Alt.	139,519	209,279	+
110	177,603	266,404	+
125	485,078	727,616	★

Notes:
[1] estimated at 1.5 passengers/car
[2] based on 2035 estimate of total trips

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

Reducing automobile trips may also reduce congestion along the New York State Thruway and other major highways. Each of the Build Alternatives would support the program's transportation-related goals of increasing travel choices, contributing to economic revitalization by accommodating population and employment growth forecasts, and improving air quality through the introduction of high-speed rail along the Empire Corridor.

Minimize Impact on Freight Rail Operations

Freight movements on Empire Corridor west, between Selkirk Yard in the Albany area and Buffalo, have historically been an impediment to the reliable operation of passenger rail services, and conversely, passenger service can also affect freight movements. Exhibit 6-8 presents an evaluation of the alternatives relative to their influence on freight train travel times. These travel times and delays were based on simulation of both passenger train and freight train movements (developed in conjunction with CSXT) in the rail simulation (presented in Appendix D). The table shows that, even with increased freight and passenger volumes, delays for freight services are generally held at or improved over current levels.

The freight train operations with the Build Alternatives would operate the same as or better than the Base Alternative. Alternatives 90B and 110 would perform the best of the Build Alternatives with respect to impact upon future freight train operations. With Alternative 90B, freight train delay-minutes would decrease the most among all alternatives, improving 10 percent over the Base Alternative and 6 percent over Alternative 110, the second best Build Alternative.

Exhibit 6-8—Impact on Freight Train Operations, 2035

Alternative	Delay-Minutes per 100 Train Miles Operated (minutes: seconds)	Average Speed with Dwell* (mph)	Trip Times, Selkirk Yard to Buffalo (hours: minutes)	Trip Time Variability (hours: minutes)	Qualitative Ranking
Base**	36:19	30.3	8:14	1:37	–
90A	42:06	29.4	8:23	2:04	–
90B – Preferred Alt.	32:47	31.1	8:09	1:51	+
110	34:57	30.8	8:04	1:39	+
125	36:19	30.3	8:14	1:37	–

* Average speed with dwell for freight trains is the total trip time between start and finish, including time for handling freight cars at yards and customer sidings.
** The freight operating statistics for the Base Alternative include the delay reduction, average speed improvement, and trip time benefits of the Rochester third track improvements, an 11-mile project that no longer has committed capital funding. Therefore, it is anticipated that freight performance measures for the Base Alternative will be worse than shown. Preliminary testing indicates that eliminating this physical improvement from the Base Alternative but retaining it in all other alternatives (consistent with their definition in the EIS) results in 90A, 90B and 110 Alternative freight operating statistics that are superior to the Base. The freight operating statistics for the 125 Alternative are the same as those for the Base.

Symbol	Rating
★	Strongly supports program performance objectives
+	Supports program performance objectives
–	Neutral regarding program performance objectives
X	Contrary to program performance objectives

Exhibit 6-8 also gives data on trip time variability, which is best explained by example. A train that is routinely 10 minutes late has very low trip time variability, while a train that may be on time one day and two hours late on another has very great trip time variability. Using this factor, it can be seen that the Base Alternative (as well as Alternative 125) would have the lowest trip time variability of all alternatives. Only a modest increase in trip time variability is projected for Alternative 110, while Alternatives 90A and 90B would have the highest trip time variability of the alternatives. Alternative 110 would have the most favorable combination of trip time and trip time variability of the alternatives.

6.3.3. Comparison of Operational Performance and Costs

To select the Preferred Alternative, NYSDOT weighed and balanced costs and impacts against operational and mobility benefits. Exhibit 6-9 presents a tabular summary of performance measures for each alternative: service frequency, average speeds, travel times, time savings, on-time performance, and ridership. This exhibit also presents cost considerations, such as capital and operating/maintenance costs, revenues, deficits, cost-effectiveness, and subsidies, for all five alternatives.

Mobility can be measured in terms of improved passenger and freight movement as expressed by higher speeds and schedule frequency (for rail services), and improved reliability. A significant additional factor in judging relative appeal among the alternatives is how quickly their benefits could be available to travelers as, all else being equal, alternatives that yield benefits sooner are preferable. A synopsis of strengths and weaknesses of the alternatives from a cost and operational standpoint is presented in this section. Key findings shown in Exhibit 6-9 include:

- **Alternative 110 produces the greatest transportation benefits at the lowest per-rider cost subsidy at approximately $9 per trip**, which would be 30 percent less than the next most cost-effective Alternative 90B ($13 per trip) and just over 47 percent less than the Base Alternative value ($17 per trip).
- **Alternative 110's relatively high ridership and moderate operating cost produces the highest recovery of costs through ticket sales**, 86 percent, compared to 81 percent for the next best alternatives (Alternatives 90B and 125) and a low of 75 percent for the Base Alternative.
- **Alternative 125 would produce the highest ridership; however, Alternative 125 would relegate travelers from Schenectady, Amsterdam, Utica, and Rome to the use of the existing regional train service on the existing corridor.** Moreover, because of limited train slots over Metro-North south of Poughkeepsie and schedule constraints on the Amtrak Empire Connector between Spuyten-Duyvil and New York City (on which both the high-speed and regional services would operate), there would be little value in transferring between regional and high-speed services at Albany-Rensselaer, Syracuse, Rochester or Buffalo. Therefore, the benefits of Alternative 125 would not be enjoyed by Schenectady, Amsterdam, Utica, and Rome passengers (even with a transfer), while the other Build Alternatives would confer benefits on all corridor rail riders.
- **Alternative 125 is the costliest alternative** at $15.74 billion, it would cost more than twice as much as the next most costly alternative (Alternative 110).
- **The Base and 90A Alternatives have the lowest capital cost, but results in the fewest transportation benefits**, and fails in significant terms to achieve the program goals.
- **Alternative 125 would take the longest time to confer travel benefits in the Empire Corridor.** Because a new right-of-way must be assembled, acquired, constructed, and placed into service, no benefits would be available until the first major Albany-Syracuse segment can be completed, in approximately 15 to 20 years. Other alternatives begin conferring benefits within 2 to 5 years of the start of construction, with benefits continually increasing as additional improvements – signals, track, switches, grade crossings, and separations, bridges – are introduced in succeeding construction phases.

- **Alternatives 90B and 110 would provide the best future performance for freight rail operation in the corridor**. The other Build Alternatives would allow freight trains to operate as well as or better than the Base Alternative. Alternatives 90B and 110 would provide segregated tracks and would provide the greatest relief from potential future congestion delay. With Alternatives 90B and 110, freight train delay would decrease and average speeds would increase the most among all alternatives. Freight train travel time variability, a measure of service reliability, is expected to be similar across all five alternatives.

6.4. Summary of Environmental Benefits and Impacts

This section summarizes the potential impacts of the five alternatives on social, cultural, and environmental resources, and highlights key distinctions among them. Evaluations are based on conceptual designs and Geographic Information System (GIS) and file-based resource mapping, suitable for making corridor-wide, service-level determinations for the Empire Corridor. The quantitative extent of impacts of the Preferred Alternative, Alternative 90B, will be determined during Tier 2 evaluations and NEPA documentation, as specific projects, e.g., bridges, grade crossings, signal and track improvements, are advanced through design. Mitigation strategies presented in Chapter 4 of this Tier 1 EIS will also be further defined during Tier 2 evaluations.

Exhibit 6-10 compares the potential impacts of the alternatives using a relative rating system to distinguish the lowest (designated L) to highest (designated H) impact potential among the alternatives. A summary of the findings for all the social, cultural and natural resource categories discussed in Chapter 4 of this document is presented in Exhibit 6-13, at the end of this chapter.

Each alternative would affect the societal, cultural and natural environment differently. The Base Alternative would have the lowest potential for impact. Alternative 90A, consisting of 20 projects conducted largely within existing rights-of-way, would also be expected to have minimal impacts. Alternative 90B, the Preferred Alternative, would involve work extending outside of the right-of-way, and impacts would be even greater for Alternative 110, with track construction extending further outside of the right-of-way. Overall, Alternative 125 has the highest potential for impact of all the alternatives, with construction of a new segregated corridor and sections of elevated tracks where the railroad would extend over the existing Empire Corridor. If Alternative 125 had been selected for further consideration, design in Tier 2 would need to consider ways to further avoid and minimize impacts associated with this alternative.

Exhibit 6-9—Comparative Analysis of Alternatives

Evaluation Criteria	Alternatives				
	Base	90A	90B Preferred Alternative	110	125
Service Levels (In round-trips/day)					
Frequency of Service NYC to Albany	13	16	17	17	24
Frequency of Service Albany to Buffalo	4	8	8	8	15 (express) 4 (regional)
Frequency of Service Albany to Niagara Falls	3	7	7	7	6
Average Speed NYC to Niagara Falls (mph)	51	57	61	63	77 (express) 53(regional)
Travel Time: (hrs.:min.) NYC to Niagara Falls	9:06	8:08	7:36	7:22	6:02 (express) 8:40 (regional)
Time Savings: Compared to Base Alternative (hrs.: min.)	-	0:58	1:30	1:44	3:04 (express) 0:26 (regional)
On-Time Performance	83.0%	92.4%	95.4%	94.9%	100% (express) 83.0% (regional)
Ridership (Annual One Way)					
Total (2035)	1.6 million	2.3 million	2.6 million	2.8 million	4.3 million
Increase as Compared to Base Alternative	-	0.7 million (44%)	1.0 million (63%)	1.2 million (75%)	2.7 million (169%)
Costs[1]					
Capital Costs (Billions)	$0.310	$1.72	$5.97	$6.69	$15.74
O&M Costs, Annual (Millions)	$106	$160	$176	$178	$312
Revenue, Annual (Millions)	$79	$122	$143	$153	$252
Total [Deficit]/Surplus (Millions)	[$27]	[$38]	[$33]	[$25]	[$60]
Operating Ratio (percent O&M costs covered by revenue)*	75%	76%	81%	86%	81%
Cost Effectiveness (Annualized O&M Cost per Rider)	$66.26	$69.57	$67.69	$63.57	$72.56
[Subsidy]/Surplus per Rider (rounded)	[$17]	[$17]	[$13]	[$9]	[$14]

[1]Capital Costs are in 2017 dollars

* Operating Ratio is the annual revenue as a percentage of the operating and maintenance costs. For Alternative 90B, the Preferred Alternative, this would be $143 million/$176 million = 81 %.

Exhibit 6-10—Comparison of Alternatives in Selected Impact Areas

Alternative/ Impact Area	Base	90A	90B – Preferred Alt.	110	125
Socioeconomic/ Land Use	L	L	M	M	H
Community	L	L	L	M	H
Historic	L	M	H	H	M[1]
Parks	L	L	L	M	H
Visual	L	L	M	M	H
Farmland	L	L	M	M	H
Waterbodies	L	M	M	M	H
Floodplains	L	L	M	M	H
Wetlands	L	L	M	M	H
Wildlife	L	L	M	M	H
Air Quality	L	B	B	B	B
Energy/ Greenhouse Gas	L	B-L	B-L	B-M	B-H
Noise/Vibration	L	M	M	M	H

L Potential for adverse effect is lowest among the alternatives
M Potential for adverse effect is moderate among the alternatives
H Potential for adverse effect is highest among the alternatives
B Long-term beneficial impact
[1] The undeveloped nature of the 125 Study Area may contribute to the lack of documented historic resources.

A brief overview of the environmental impacts of the alternatives is provided in the following section. Chapter 4 provides an environmental overview and comparison of the alternatives and details the social, cultural, and natural resource impacts of the Preferred Alternative, Alternative 90B. Appendix G provides more details on the environmental inventory and the social, cultural, and natural resource impacts of the other Build Alternatives. Exhibit 6-13 provides a more detailed summary on impacts of each alternative on each environmental resource category.

- **Socioeconomic Benefits:** The introduction of high-speed rail improvements is expected to generate considerable economic benefits as a result of improved passenger rail and freight operations. Major new infrastructure investments, such as improvements to high-speed rail service, could potentially change the population and employment outlook. For example, according to a U.S. Conference of Mayor's Report, which examined the impact of high-speed rail upon the City of Albany, the introduction of high-speed rail along the corridor can contribute substantially to economic growth by driving higher-density, mixed-use development at train stations; expanding visitor markets and generating additional spending; broadening regional labor markets; and supporting the growth of technology clusters.[154] This effect would be more pronounced with Alternative 125, but substantial economic benefits would also accrue under Alternative 110 and the Preferred Alternative, Alternative 90B.

The additional tracks segregating freight and passenger service will not only accrue economic benefits from increased ridership, but will also benefit freight rail and movement of goods. Empire Corridor West represents one of CSXT's highest volume freight routes nationwide. The economic benefits associated with the project will extend to freight rail users and shipping companies, and the additional tracks will result in faster travel times and less delays for freight. This major freight corridor connects to the border crossing at Niagara Falls, an economically important gateway for international trade.

- **Land Use Impacts:** Alternative 125 would require the assembly and acquisition of public and private lands along the 280-mile Albany-to-Buffalo corridor. An estimated two to three thousand acres of land would be needed. Notwithstanding efforts to minimize adverse effects, the construction of an essentially sealed corridor with limited opportunities for crossings could be expected to have an impact on community cohesion and large-scale land uses which may be bisected by the high-speed rail corridor. If Alternative 125 had been selected for further consideration, additional location analyses would need to include avoidance and minimization of property impacts and impacts on sensitive land uses. By comparison, property acquisition requirements of the other alternatives that follow the existing Empire Corridor would be considerably less than that for Alternative 125. Alternative 110 would involve the next greatest property displacements, affecting approximately 53 areas in 8 counties. Property displacements with the Base and Alternative 90A are anticipated to be minimal.

  The Preferred Alternative, Alternative 90B, would affect approximately 9 areas in 6 counties. Most of the land uses affected consist of agricultural, industrial, or wooded, undeveloped property, with limited residential or building impacts. The work may require relocation of Route 5 in Montgomery County, which could involve property impacts, and the addition of maintenance service roads could also involve property takings.

  Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (e.g., growth inducing effects related to changes in the pattern of land use, and population density or growth rate). Of the alternatives evaluated, the Base and 90A Alternatives would involve the least indirect, growth-inducing impacts. Alternatives 110 and 125 would involve the greatest indirect impacts, with larger transportation benefits, and a greater degree of secondary development impacts. The Preferred Alternative would involve growth-inducing indirect impacts that would be greater than the Base and 90A Alternatives but would be more moderate than Alternatives 110 and 125.

- **Environmental Justice/Title VI Impacts:** The program of improvements under any of the alternatives is unlikely to result in disproportionately high and adverse impacts to minority and low-income communities, as well as populations protected under Title VI (Limited English Proficiency populations, disabled, and elderly).[155] Unlike the Base Alternative, all the Build Alternatives would provide increased transit options that would provide a benefit for the minority, low-income, and other disadvantaged communities. Alternative 90A and Alternative 90B, the Preferred Alternative, require less displacements and property impacts compared to Alternatives 110 and 125. Therefore, Alternatives 110 and 125 have a greater potential for

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[154] Economic Development Research Group, Inc. *The Economic Impact of High Speed Rail and Cities and their Metropolitan Areas.* Prepared for the U.S. Conference of Mayors (undated), released June 2010.

[155] Due to the size of the program area, the identification of EJ/Title VI populations was performed at the county level, as well as identifying disadvantaged communities at the city level in the largest major metropolitan areas along the program area.

impacts on disadvantaged populations. The Tier 2 analysis will include a more detailed and refined evaluation of the environmental justice/Title VI impacts of the Preferred Alternative (Alternative 90B).

- **Community and Public Facility Impacts:** Alternative 125 has the potential to affect 13 community/publicly used facilities (including cemeteries, privately owned golf courses/golf clubs, and a school ballfield) in 8 counties largely where it extends on new right-of-way. If Alternative 125 had been advanced, additional location analyses would need to consider ways to avoid or minimize impacts on these publicly accessible facilities. By comparison, Alternative 110 is projected to have potential effects on 4 community facilities (e.g., fire stations, post office) in 1 county.

  The Preferred Alternative and Alternative 90A are not expected to have any direct impacts to community facilities. Alternative 90B would not incur direct impact on community facilities, although the proposed work will adjoin several sites, including minor league baseball stadiums in Syracuse and Rochester, a college and state offices in Schenectady, and a cemetery in Schenectady County. Increased frequency of service could have the potential to incur additional visual and noise impacts from train passbys, however the additional trips represent a minimal increase over current rail traffic that includes frequent CSXT freight rail traffic. Relocations of adjoining roadways may indirectly affect community facilities (e.g., through property acquisition or changes in access), and would be better defined in Tier 2 including measures to avoid or minimize any adverse effects.

- **Historic and Archaeological Resource Impacts/Section 4(f) Uses:** As part of the Tier 1 corridor-level screening, the historic impact assessment defined Areas of Potential Effects as the area extending 100 feet from the track centerline for direct effects, to encompass all locations where project construction could occur, and 600 feet for indirect effects. The APE is defined as: "*the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties*." Based on the defined Tier 1 APEs, Alternative 90B (the Preferred Alternative) could impact a greater number of identified archaeological/historic architectural resources compared to the Base Alternative, and Alternatives 90A and 125 (including NHLs, S/NR/listed and eligible individual resources and districts). Alternative 90B (the Preferred Alternative) could involve direct effects on approximately 154 archaeological/historic architectural resources, and indirect effects on an additional approximately 149 architectural resources due to construction-related activities. Notably, there are several rail bridges located within the right-of-way, which could be adversely affected by work proposed for this alternative. There could be additional adverse impacts to architectural resources because of the property acquisitions proposed for Alternative 90B.

  Impacts for Alternative 110 would be roughly comparable to that for the Preferred Alternative, which would indirectly or directly affect 302 archaeological and architectural resources. However, Alternative 110 would likely involve greater impacts, with the location of proposed tracks 15 feet further than Alternative 90B. Alternative 90A is likely to have moderate effects, with 48 resources in the direct APE and an additional 52 resources within the indirect APE.

  Alternative 125 would largely maintain elevated tracks within the existing ROW where it overlaps with the existing Empire Corridor, potentially affecting viewsheds that contain historic properties. Alternative 125 would therefore involve greater impacts than the Base or 90A Alternatives, potentially affecting 86 resources within the direct APE and an additional 36 resources within the indirect APE, depending on the footprint for the elevated structures that would carry the grade-separated tracks over the existing tracks. Alternative 125 would be developed along new right-of-way generally away from population centers where most historic structures are found. Due to the undeveloped nature of the areas bisected by Alternative 125, historic and archaeological resources may not be fully documented for these areas. Alternative 125 would also have the greatest potential interaction with and use of tribal land.

- **Parks and Recreational Facilities Impacts/Section 4(f) Uses:** Alternative 125 has the greatest potential effect on parks and recreational facilities, with 10 such facilities in 6 counties potentially affected (including an Oneida Nation-owned golf course). If Alternative 125 had been advanced, the additional location analyses in Tier 2 would need to avoid or minimize impacts on these facilities to the extent practicable. The Base Alternative, Alternative 90A, and Alternative 90B (the Preferred Alternative) would have minimal impacts to parklands. These alternatives would largely involve work within the right-of-way, with tracks being added in the location of the former track beds or existing access roads. With the possible exception of two crossings of the Mohawk River and Erie Canal for Alternatives 90B (the Preferred Alternative) and 110, only Alternative 110 would have any other potential effect on recreational facilities, potentially affecting one county park.

  The Preferred Alternative will involve adding tracks at two crossings over the Erie Canal. In Schenectady, trackwork would cross over the Mohawk River/Erie Canal on an existing bridge near a riverfront park and bike trail, but impacts to these recreational uses are not anticipated. The addition of additional tracks around Rochester Station will cross the Erie Canal and Erie Canalway Heritage Trail, but are not anticipated to directly affect parklands. The potential for impacts at the canal crossings will be evaluated as designs are advanced in the Tier 2 assessments.

- **Visual Impacts:** Alternative 125 would have the greatest potential for adverse visual impacts. Alternative 125 would create a new 100-foot-wide railroad right-of-way that would be electrified (with overhead catenary) in what are today largely open undeveloped and moderately developed areas. Alternative 125 would also create an elevated structure in densely populated urban centers (Syracuse, Rochester, and Buffalo), which would be more visible than the at-grade railroad. Alternative 90A would be entirely confined to the existing railroad right-of-way and is expected to have no such effects. Both Alternative 90B (the Preferred Alternative) and Alternative 110 would involve track construction extending outside of the right-of-way, which could result in additional clearing and property displacements, but which would otherwise result in minor visual effects.

  Alternative 90B would involve minor visual changes as a result of the proposed addition of railroad tracks. This alternative would add new station buildings at Amsterdam and Buffalo-Depew stations, which could be expected to improve the appearance of these stations. Portions of Route 5, a scenic byway, would need to be relocated, but this would be relatively minor in nature. Three new flyovers would be added, which would be more visible, but these would be located at least several hundred feet from the nearest residences in either rural agricultural, lightly forested, or industrialized areas.

- **Farmlands Impacts:** Alternative 125 would have the most disruptive impact on farmland, potentially bisecting and isolating sections of prime farmlands and "farmlands of statewide significance" in 12 counties. By comparison, Alternative 110 would affect prime farmlands in at least 4 counties and Alternative 90B (the Preferred Alternative) would affect prime farmland soils in at least 3 counties. Alternative 90A has only minor effects on farmland, potentially affecting agricultural districts in only 1 county. The Base Alternative would not affect prime farmland.

  The Preferred Alternative, Alternative 90B, would have minimal impacts to actively-farmed areas and little or no impacts to active farms. The proposed work will include the addition of track, as well as maintenance service roads in selected areas, which may affect areas of mapped prime farmland soils and has the potential for minor encroachments on two areas within Agricultural Districts and actively farmed fields in Herkimer and Genesee counties.

- **Impacts on Waterbodies/Rivers:** Alternative 125 would have the greatest potential for impacts on waterbodies, potentially affecting 361 such resources along Empire Corridor West. The Base Alternative would have the least potential for impact on surface water resources—the Tier 1 Draft EIS documented 68 crossings[156] potentially affected by the construction of eight component projects. The other alternatives are anticipated to have moderate potential for impact relative to the other alternatives, with between 107 to 219 surface water crossings potentially affected by Alternative 90A, Alternative 90B (the Preferred Alternative), and Alternative 110, respectively. Although Alternatives 90B and 110 would cross a similar number of waterway crossings, Alternative 110 is expected to involve greater impacts due to its location 15 feet further from the existing railroad than the Preferred Alternative (for a total of 30 feet of separation).
- **Wetlands and Floodplains Impacts:** Alternative 125 would have the greatest potential for impact on wetlands relative to the other alternatives, with 513 new wetland crossings. Alternative 90B (the Preferred Alternative) and Alternatives 110 would have a moderate potential for impact, potentially affecting 454 to 473 wetland crossings. Alternative 90A would have a relatively minor potential for impact, potentially affecting 54 wetland crossings, and the Tier 1 Draft EIS documented, for the Base Alternative, proximity to 84 wetland crossings potentially impacted by the construction of eight component projects. Both the 110 and 125 Alternatives would involve greater potential for floodplain encroachments than the Preferred Alternative, which would have the potential for encroachments in 11 counties. The Base Alternative would involve minimal potential for impacts, and Alternative 90A would also have a lower potential for impacts, potentially affecting floodplains in 7 counties.
- **Coastal Resources Impacts:** The coastal zone and coastal resources with the potential to be impacted are the same for all alternatives: Hudson River, Great Lakes/Irondequoit Bay and Creek, and Lake Erie/Niagara River. All the Build Alternatives will involve bridgework in coastal areas along both Empire Corridor South and all but Alternative 90A will involve bridgework in coastal resources along Empire Corridor West.

  The Empire Corridor crosses through 11 Significant Coastal Fish and Wildlife Habitats (SCFWHs) and 6 Scenic Areas of Statewide Significance (SASSs) in this area. Proposed work for the Base Alternative, Alternative 90A, and Alternative 90B within or adjoining these SCFWHs and SASSs along this corridor would not involve substantial impacts outside of the right-of-way and would not result in appreciable changes in visual quality, and no impacts to the scenic qualities of the SASSs are anticipated. The impacts of the other Build Alternatives are comparable to that of the Preferred Alternative.
- **Ecology and Wildlife Impacts:** Alternative 125 would have the potential to impact the greatest number protected resources/species, potentially affecting 87 federally or state-listed species, 92 significant natural communities, six bird conservation areas, two National Natural Landmarks (NNLs), and Essential Fish Habitat (EFH). Alternative 90B (the Preferred Alternative) and Alternative 110 would have a moderate potential for impact, potentially affecting more than 7 and 21 locations, respectively, but substantially fewer of these resources than Alternative 125. The 90/110 Study Area includes 72 listed species, 69 significant natural communities, six bird conservation areas, three NNLs, and EFH. Alternative 90A would have a relatively minor

[156] The Tier 1 Draft EIS analyzed the potential impacts of the eight component projects, seven of which have since been completed, and the eighth is under construction.

potential for impact, potentially impacting two locations, as well as EFH. The Base Alternative has the least potential for impact.

- **Air Quality Impacts:** Alternative 125 has the greatest potential benefit to air quality in some regions of the corridor (due to having the highest potential auto diversions), while it has the potential to adversely affect air quality in other regions of the corridor (the differences between the areas are a consequence of the distribution of on-road versus rail trips). The other alternatives would result in negligible changes in regional emissions, with the Base Alternative serving as the basis for comparison. While increased rail emissions would not adversely affect local air quality, some very minor local benefits may occur near roadways where trips are reduced. Some increases in pollutant concentrations may occur near rail stations as rail riders access stations by auto and bus, increasing as ridership increases from Alternative 90A to 90B, 110, and 125, which will be subject to further analysis in Tier 2.

  Alternative 90B (the Preferred Alternative) would result in a small net air quality benefit on a regional scale, with a reduction in all pollutants other than NOx.[157] The Preferred Alternative would result in a net reduction in 61 tons per year of carbon monoxide in the New York-Northern New Jersey-Long Island non-attainment area and 44 tons a year in the Syracuse area.

- **Energy and Greenhouse Gases Impacts:** The program would have beneficial impacts for greenhouse gas emissions (GHG) from permanently reduced annual on-road energy use and emissions as auto and bus riders switch to more energy-efficient and less polluting rail. This assessment compared these savings to energy and GHG emissions from construction. Alternative 125 is likely to require the greatest quantity of energy and materials for construction. Thus, it has the greatest potential to adversely affect net energy and greenhouse gases. Other alternatives have lesser adverse initial energy and emissions impacts in proportion to their lesser construction emissions impacts. The long-term impact of the alternatives on energy and emissions is ultimately always positive, as the on-road benefits persist year after year and eventually offset the initial construction impacts.

  Alternative 90B (the Preferred Alternative) would result in a reduction of approximately 33,000 metric tons per year of greenhouse gas emissions.

- **Noise/Vibration Impacts:** The program would increase the number of Amtrak trains by 8 trains (or 4 roundtrips) on Empire Corridor South (along which Metro-North operates 50 to 77 roundtrips daily) or 6 to 8 trains (or 3 to 4 roundtrips) on Empire Corridor West (along which CSXT operates 50 to 60 daily roundtrips). Due primarily to noise from these other sources, under all alternatives, including the Base Alternative, potential noise impacts along the Empire Corridor/Niagara Branch are expected to be moderate to severe in more urbanized areas, between New York City and Schenectady, between Syracuse and Rochester, and between Buffalo and Niagara Falls. Alternative 125 has the potential for noise impacts in areas where no railroads currently operate. In this respect, it is the only alternative to introduce railroad noise in areas that are not already experiencing it. Noise impacts are also predicted along the three new alignment segments of Alternative 125. There is also a potential for vibration impacts along new corridor segments for Alternative 125.

  The Preferred Alternative, Alternative 90B, will not increase noise levels over the Base Alternative between New York City and Schenectady, and the increases west of this point would be imperceptible (0 to 2 decibels).

- **Contaminated and Hazardous Materials Impacts:** The Base Alternative and Alternative 90A would incur the least amount of potential impacts, with risks primarily associated with the

[157] Even this increase in NOx would be lower than the *de minimis* levels in the conformity regulations.

presence of contamination within the existing railroad right-of-way and nearby sites. Alternative 90B (the Preferred Alternative) and Alternative 110 would have a greater potential to encounter contaminated materials than the Base and 90A Alternatives, especially where new third and fourth track subsurface work would occur within highly developed urbanized areas. However, the Preferred Alternative would involve substantially less work extending outside of the right-of-way and less property acquisitions than Alternatives 110 or Alternative 125. Alternative 125 would incur the greatest risk of impacts as work includes all the improvements considered under Alternative 90A, as well as the extension of 236 miles of new track and alignment through rural, suburban, and urban areas. The new rail alignment would require numerous property acquisitions, increasing the potential for encountering contamination.

6.5. Identification of a Preferred Alternative—Alternative 90B

In the selection of Alternative 90B as the Preferred Alternative, NYSDOT considered the ability of each alternative to meet nine program performance objectives and transportation-related goals. The nine performance objectives and transportation-related goals were qualitatively rated and then scored using the numeric scoring shown in Exhibit 6-12. Applying this scoring to these nine objectives and goals yields the scores shown in Exhibit 6-11.

NYSDOT balanced the performance goals and transportation-related objectives against costs and environmental impacts and also considered the comments received on the Tier 1 Draft EIS.

The Base Alternative and Alternative 90A, while minimizing both costs and environmental impacts, do not meet project performance goals and objectives to the extent that the other Build Alternatives do. Total westbound travel times between New York City and Niagara Falls would be 9:06 and 8:08, respectively. For the most part, property takings for these alternatives would be minimal, with work confined to the existing right-of-way, but these alternatives would not provide the same increases in ridership, reductions in travel time, and improvements in on-time performance (OTP) as the other Build Alternatives. The other alternatives, Alternatives 110 and 125, would involve substantially greater costs and impacts compared to the Preferred Alternative.

6.5.1. Base Alternative

Overall, the Base Alternative would result in substantially lower ridership than the Build Alternatives at 1.6 million passengers (year 2035). The Base Alternative would have the slowest average speed (51 mph) and longest trip time of all the alternatives (9 hours and 6 minutes between New York City and Niagara Falls). While all other Build Alternatives would exceed the program service reliability goal of 90 percent OTP, the Base Alternative would deliver only 83 percent OTP. Unlike the Build Alternatives, the Base Alternative would not add any scheduled service and, therefore, would not result in improved service frequencies. The Base Alternative would be the least effective of all alternatives in diverting drivers to passenger rail and subsequently improving air quality by reducing vehicular emissions.

Exhibit 6-11—Scoring of Alternatives

Program Performance Objective/Transportation-Related Goal	Alternative									
	Base		90A		90B – Preferred Alt.		110		125	
	Qualitative Rating	Score	Qualitative Rating	Score	Qualitative Rating	Score	Qualitative Rating	Score	Qualitative Rating	Score
Improve System-Wide OTP to at Least 90%	X	-1	★	2	★	2	★	2	★	2
Reduce Travel Time	–	0	+	1	+	1	+	1	★	2
Increase Service Frequency of Service	X	-1	+	1	+	1	+	1	★	2
Attract Additional Passengers	–	0	★	2	★	2	★	2	★	2
Reduce Automobile Trips	–	0	+	1	+	1	+	1	★	2
Minimize Interference with Freight Rail Service	–	0	–	0	+	1	+	1	–	0
Increase Travel Choices and Improve Quality of Life	X	-1	+	1	★	2	★	2	+	1
Contribute to Economic Revitalization	X	-1	+	1	★	2	★	2	+	1
Improve Environmental Quality	–	0	+	1	★	2	+	1	X	-1
TOTAL	**-4**		**10**		**14**		**13**		**11**	

Exhibit 6-12—Alternative Scoring

Assessment	Symbol	Numerical Factor
Strongly supports program performance objectives	★	**2**
Supports program performance objectives	+	**1**
Neutral regarding program performance objectives	–	**0**
Contrary to program performance objectives	X	**-1**

6.5.2. Alternative 90A

Alternative 90A would result in an increase of 700,000 passengers annually over the Base Alternative, accommodating 2.3 million riders, with a travel time savings of 58 minutes between New York City and Niagara Falls. OTP would be 83 percent for the Base Alternative and 92.4 percent for 90A. Although costs would be lower for the Base and 90A Alternatives, at $310 million and $1.72 billion (in 2017 dollars), respectively, these alternatives have the poorest operating ratios (75%-76%) and cost-effectiveness of the alternatives considered, both requiring an annual subsidy per rider of $17.

6.5.3. Alternative 125

Alternative 125 would attract the most passengers (4.3 million by 2035) and would perform the best in terms of travel times and frequency for the express service only (serving New York City, Albany, Syracuse, Rochester, and Buffalo). However, it would be the costliest and would have much larger property and environmental impacts. Although it would run on an exclusive corridor along Empire Corridor West, thereby minimizing direct interference with CSXT's heavily used freight corridor, it would not involve any improvements of the freight rail track system and would not result in reduced freight travel times, and, in this regard, would therefore be comparable to the Base Alternative. It would also not improve service to Schenectady, Amsterdam, Utica, Rome, and Niagara Falls, which would only be served by the existing regional, rather than express, service. Travelers on the express service destined for Niagara Falls would need to transfer at Buffalo/Depew Station for the last leg of the trip.

Alternative 125 is the costliest alternative, at $15.74 billion (in 2017 dollars), it would cost more than twice as much as the next most costly alternative (Alternative 110). Alternative 125 would also take the longest time to confer travel benefits, due to the time required to assemble, acquire, and construct a new right-of-way. Other alternatives begin conferring benefits within 2 to 5 years of the start of construction, with benefits continually increasing as additional improvements – signals, track, switches, grade crossings, and separations, bridges – are introduced in succeeding construction phases. Two to three thousand acres of land would be needed to construct a sealed high-speed rail corridor between Albany and Buffalo, affecting properties, farms, wetlands, and, potentially, tribal lands (none of the other alternatives have the potential to affect tribal lands).

For Alternative 125, the annual subsidy per passenger would be lower than the Base Alternative's at $14, but higher than that required for both the 90B and 110 Alternatives. More importantly, the estimated $60 million additional operating and maintenance deficit that is required annually to support Alternative 125 is more than double the amount required for operating the Base Alternative. The total operating and maintenance costs for this increased level of service would be the highest of all the alternatives, at $312 million, producing an annual deficit of $60 million. By comparison, the annual deficit required to operate Alternative 90B is $33 million.

6.5.4. Alternative 110

Alternative 110 would result in a westbound travel time between New York City and Niagara Falls that is approximately 1:44 minutes faster than the Base Alternative, and 14 minutes faster than Alternative 90B. Alternative 110 is projected to attract 2.8 million passengers in 2035, or 200,000 more passengers than Alternative 90B. This would be a gain of approximately 1.2 million passengers above projected ridership for the Base Alternative for Alternative 110. Alternative 110 would add approximately 384 miles of additional trackage, but the location of the new tracks 15 feet further from the existing tracks than Alternative 90B would result in considerably greater property impacts. Alternative 110 would involve the next greatest property displacements, affecting approximately 53 areas in eight counties.

While Alternative 110 would improve frequencies, travel times, and attract more passengers than Alternative 90B, the differences are relatively minor. When considering cost, however, at $6.69 billion (in 2017 dollars), the capital cost of Alternative 110 would be 12 percent, or $720 million, higher than Alternative 90B. Furthermore, the annual operating and maintenance (O&M) cost for Alternative 110 would be $178 million; annual O&M costs for Alternative 90B would be $2 million less. However, Alternative 110 would have the lowest annual subsidy at $9 per passenger, $4 less than Alternative 90B.

Alternative 110 would not fully meet the goal of minimizing impacts to freight rail service because the passenger trains operating at a higher maximum speed would increase the potential for interference with freight trains. This is apparent in an estimated OTP for Alternative 110 (94.5%) that is below that of Alternative 90B. Alternative 110 also would have a higher level of freight delay than Alternative 90B.

6.5.5. Alternative 90B

The installation of approximately 370 miles of trackage, including additional third and fourth tracks, under Alternative 90B would add capacity and provide the ability to route passenger trains around freight trains even while passenger trains operate at higher speeds. Alternatives 90B and 110 would result in the lowest trip times for freight between Selkirk Yard, outside Albany, and Buffalo, with time savings of 5 and 10 minutes, respectively.

Moreover, Alternative 90B would have fewer environmental impacts than Alterative 110 (see summary of impacts in Exhibit 6-13). Alternative 90B would have land use impacts in nine areas in six counties, compared to 53 areas in eight counties with Alternative 110. For reasons of safety, CSXT, the owner of the right-of-way, requires a 30-foot separation between freight and passenger tracks when passenger trains operate at 110 mph. In many places on the route, this is only possible by acquiring significant additional property. Because of the required property acquisition, Alternative 110 has significantly higher costs and greater potential for environmental impacts than Alternative 90B, while only achieving a modest improvement in overall performance.

6.5.6. Preferred Alternative

Considering all the factors described in this chapter, Alternative 90B best meets the program purpose and need and best balances the program's benefits and effects. Therefore, NYSDOT has selected Alternative 90B as the Preferred Alternative. Alternative 90B:

- Attracts 2.6 million riders annually by 2035, a gain of 1 million passengers over the Base Alternative.
- Costs $5.97 billion (in 2017 dollars), with annual O&M costs at $176 million.
- Includes annual subsidy per rider of $13, compared with $17 for the Base Alternative.
- Reduces travel time to 7 hours and 36 minutes westbound between New York City and Niagara Falls; a time savings compared to Base Alternative of 1 hour and 30 minutes.
- Doubles service frequency, with 17 roundtrips per day to Albany and 8 roundtrips to Buffalo (an increase of four roundtrips for each leg over the Base Alternative)
- Includes the best OTP, at 95.4%.
- Involves the least delay-minutes per 100 train miles operated for freight trains of all of the alternatives considered.

NYSDOT also considered public and agency inputs in the selection of the Preferred Alternative. NYSDOT received 1,754 comments from 932 commenters during the public comment period for the Tier 1 Draft EIS. There was broad support for a high-speed rail improvement program within the

Empire Corridor, with the overwhelming majority of commenters (83%) voicing their support. While federal agency comments focused on technical aspects of the program, the majority of elected officials, state, regional, local agencies, and tribes supported improvements to high-speed rail within the Empire Corridor. Approximately 95 percent of businesses and organizations and 80 percent of individuals supported the program improvements. Individuals and organizations tended to favor the higher speed alternatives (Alternatives 110 and 125) over the other Build Alternatives. Comments from railroads, including CSXT, the owner/operator of portions of the right-of-way (particularly Empire Corridor West), expressed concerns that the program might adversely impact freight operations. The railroads therefore favored the Base Alternative. The selection of Alternative 90B balances the preferences of these different constituencies.

Exhibit 6-13—Tier 1 Environmental Impact Assessment by Alternative

Area of Evaluation	Alternatives				
	Base	90A	90B – Preferred Alternative	110	125
Land Use	No impacts.	No impacts.	EC South: No impacts. EC West: Potential for 9 areas of land use impact in 6 counties.	EC South: No impacts. EC West: Potential for 53 areas of land use impact in 8 counties.	Existing Alignment: No impacts. New Alignment: Potential for 1 land use conversion required in EC South. Potential for extensive land use conversions of two to three thousand acres, including acquisition of structures, in 14 counties in EC West.
Regional Population, Employment and Business Districts	Little or no effect on population, employment and business activity.	Potential for minor increases in population, employment and business activity over the Base Alternative associated with passenger and freight service improvements.	Potential for greater increases in population, employment and business activity over Alternative 90A, especially in vicinity of station sites.	Potential for greater increases in population, employment and business activity over Alternative 90B, especially in vicinity of station sites.	Potential for greatest increases in population, employment and business activity over all other alternatives, especially in vicinity of Albany-Rensselaer, Syracuse, Rochester and Buffalo stations, and some stations in EC South. Because existing service with stops in Schenectady, Amsterdam, Utica, and Rome would be retained, little or no effect on regional population, employment and business districts would be expected.
Environmental Justice/Title VI **(Analysis at county and major city levels)**	Disproportionate adverse impacts unlikely.	Disproportionate adverse impacts unlikely. Long term benefit to urban areas anticipated.	Disproportionate adverse impacts unlikely. Long term benefit to urban areas anticipated.	Disproportionate adverse impacts unlikely. Long term benefit to urban areas anticipated.	Existing Alignment: Disproportionate adverse impacts unlikely. New Alignment: Disproportionate adverse impacts unlikely. Long term benefit to urban areas anticipated.

Exhibit 6-13—Tier 1 Environmental Impact Assessment by Alternative

Area of Evaluation	Alternatives				
	Base	90A	90B – Preferred Alternative	110	125
Community and Public Facilities	No impacts.	No impacts.	No impacts.	EC South: No impacts. EC West: Potential for impacts to 4 facilities in 1 county.	Existing Alignment: No impacts. New Alignment: No impacts in EC South. Potential for impacts to 13 facilities in 8 counties in EC West.
Historic and Cultural Resources/ Section 4(f) **(Analysis of previously-identified resources)**	Potential for effects on 24 archaeological and architectural resources within the direct/indirect Area of Potential Effect (APE).	Potential for effects to 100 resources located in direct/indirect APE.	Potential for effects to 303 resources located in direct/indirect APE.	Potential for effects to 302 resources located in direct/indirect APE.	New Alignment: Potential for effects to 122 resources located in direct/indirect APE.
Parks and Recreational Areas/Section 4(f)	No impacts.	No impacts.	Potential for impacts at crossings of the Mohawk River and Erie Canal will be evaluated in Tier 2.	EC South: No impacts. EC West: Potential for impacts at crossings of the Mohawk River and Erie Canal will be evaluated in Tier 2. Potential for impacts to 1 county park.	Existing Alignment: No impacts. New Alignment: No impacts in EC South. Potential for impacts to 10 parks in 6 counties in EC West.
Visual Resources	No impacts.	No impacts.	Potential for impacts associated with some forest clearing, land conversions, bridge modifications, proximity to adjoining properties.	Potential for impacts associated with some forest clearing, land conversions, bridge modifications, proximity to adjoining properties.	Existing Alignment: No impacts. New Alignment: Potential for impacts associated with new visual element, including new river/canal crossings, forest clearings, elevated track sections, and overhead catenaries. Potential for impacts associated with new corridor, including forest clearing, land conversions, proximity to adjoining properties.
Farmlands	No impacts.	EC South: No impacts.	EC South: No impacts.	EC South: No impacts.	Existing Alignment: No impacts.

Exhibit 6-13—Tier 1 Environmental Impact Assessment by Alternative

Area of Evaluation	Alternatives				
	Base	90A	90B – Preferred Alternative	110	125
		EC West: Potential for impacts to Agricultural Districts in 1 county.	EC West: Potential for impacts to prime farmland soils/ Agricultural Districts in at least 3 counties.[158]	EC West: Potential for impacts to prime farmland soils/ Agricultural Districts in 4 counties.[8]	New Alignment: No impacts in EC South. Potential for impacts to multiple prime farmland soils, farmland soils of statewide significance and Agricultural Districts in 12 counties in EC West.[159]
Surface Waterbodies and Watercourses	Approximately 68 existing surface water crossings could be modified.	Approximately 107 existing surface water crossings could occur.	Approximately 219 existing surface water crossings could occur.	Approximately 218 existing surface water crossings could occur.	New Alignment: Approximately 248 new surface water crossings on new alignment and 113 crossings on existing rail (361 total) could occur.
Designated Wild, Scenic and Recreational Rivers	Three segments of the Hudson River are listed on the Nationwide Rivers Inventory (NRI), but no impacts are anticipated.	Three segments of the Hudson River are listed on the NRI, but no impacts are anticipated. A NRI-listed segment of the Black Creek crosses where a third track will be added, with potential for impact.	Three segments of the Hudson River are listed on the NRI, but no impacts are anticipated. A NRI-listed segment of the Black Creek crosses where a third track will be added, with potential for impact.	Three segments of the Hudson River are listed on the NRI, but no impacts are anticipated. Two NRI-listed segments of the Black Creek crosses where a third and fourth track will be added, with potential for impact.	Three segments of the Hudson River are listed on the NRI, but no impacts are anticipated.
Navigable Waters	EC South: No impacts. EC West: 2 existing crossings over navigable waters could be modified, with potential for impacts.	EC South: 4 existing crossings over navigable waters could be modified, with potential for impacts. EC West: 1 existing crossing over a navigable water could be modified, with potential for impacts.	EC South: 4 existing crossings over navigable waters could be modified, with potential for impacts. EC West: 11 existing crossings over navigable waters could be modified, with potential for impacts.	EC South: 4 existing crossings over navigable waters could be modified, with potential for impacts. EC West: 11 existing crossings over navigable waters could be modified, with potential for impacts.	New Alignment: new Hudson River crossing over navigable waters would occur in EC South, with potential for impacts. 4 new crossings over navigable waters would occur in EC West, with potential for impacts.
Floodplains	EC South: Minimal potential for impacts.	EC South: Potential for impacts to flood prone areas. EC West: Potential for floodplain	EC South: Potential for impacts to flood prone areas. EC West: Potential for floodplain	EC South: Potential for impacts to flood prone areas. EC West: Potential for floodplain	New Alignment: Potential for impacts to flood prone areas in EC South. Potential for floodplain impacts

[158] This is in addition to Alternative 90A impacts.

[159] This is in addition to Alternative 90A impacts along Empire Corridor South and Niagara Branch.

Exhibit 6-13—Tier 1 Environmental Impact Assessment by Alternative

Area of Evaluation	Alternatives				
	Base	90A	90B – Preferred Alternative	110	125
	EC West: Potential for impacts to 11 areas.	impacts in 7 counties.	impacts in 11 counties.	impacts in 11 counties, including more encroachment than Alternative 90B.	in 11 counties and additional areas in 3 counties in EC West.
Wetlands	EC South: Potential for impacts involving 78 existing crossings. EC West: Potential for impacts involving 6 crossings.	EC South: Potential for impacts involving 39 new and existing crossings. EC West: Potential for impacts involving 15 existing crossings.	EC South: Potential for impacts involving 39 new and existing crossings. EC West: Potential for impacts involving track addition at 454 crossings.	EC South: Potential for impacts involving 39 new and existing crossings. EC West: Potential for impacts involving track addition at 473 crossings.	New Alignment: Potential for impacts involving 513 new crossings.
Coastal Resources	EC South: Work will occur within the coastal zone. Of the six SASSs and 11 SCFWHs, no impacts are anticipated. EC West: Limited work within coastal zone.	EC South: Work will occur within the coastal zone. Potential for impacts in EC South associated with new bridge construction in coastal zone. Of the six SASSs and 11 SCFWHs, no impacts are anticipated. EC West: Limited work within coastal zone.	EC South: Work will occur within the coastal zone. Potential for impacts in EC South associated with new bridge construction in coastal zone. Of the six SASSs and 11 SCFWHs, no impacts are anticipated. EC West: Bridgework has potential to affect one coastal area and SCFWH.	EC South: Work will occur within the coastal zone. Potential for impacts in EC South associated with new bridge construction in coastal zone. Of the six SASSs and 11 SCFWHs, no impacts are anticipated. EC West: Bridgework has potential to affect one coastal area and SCFWH.	Existing Alignment: No impacts. New Alignment: Potential for impacts in EC South associated with new bridge construction in coastal zone. EC West: Bridgework has potential to affect one coastal area and SCFWH.
Aquifers	No impacts.	EC South: No impacts. EC West: Potential for minimal impacts to primary aquifer depending upon construction and excavation depths.	EC South: No impacts. EC West: Potential for impacts to primary and/or principal aquifers underlying 9 counties.	EC South: No impacts. EC West: Potential for impacts to primary and/or principal aquifers underlying 9 counties.	Existing Alignment: No impacts. New Alignment: Potential for impacts to principal aquifer in EC South depending on new bridge construction and excavation depths. Potential for impacts in EC West to primary and/or principal aquifers underlying 13 counties.
General Ecology and Wildlife Resources/ Threatened	EC South: No impacts. EC West: Potential for impacts to 1 conservation area	EC South: Potential for impacts to essential fish habitat (EFH), aquatic species and habitat associated	EC South: Potential for impacts to EFH, aquatic species and habitat associated with Livingston	EC South: Potential for impacts to EFH, aquatic species and habitat associated with Livingston	New Alignment: Potential for impacts to EFH in EC South. Potential for impacts to 87 species, 92

Exhibit 6-13—Tier 1 Environmental Impact Assessment by Alternative

Area of Evaluation	Alternatives				
	Base	90A	90B – Preferred Alternative	110	125
and Endangered Species	and protected resources/species.	with Livingston Avenue Bridge replacement. EC West: Potential for impacts at 2 locations associated with vegetation removal.	Avenue Bridge replacement. EC West: Potential for impacts at 7+ locations, including National Natural Landmarks (NNL)/ bird conservation area, 8 significant natural communities, 46+ protected resources/species.	Avenue Bridge replacement. EC West: Potential for impacts at 21+ locations, including 2 NNLs, bird conservation area, 8 significant natural communities, 46+ protected resources/ species.	significant natural communities, 6 bird conservation areas, and 2 NNLs in EC West associated with habitat conversion and fragmentation.
Critical Environmental Areas	No impacts anticipated.	No impacts anticipated.	No impacts anticipated.	No impacts anticipated.	Existing Alignment: No impacts anticipated. New Alignment: No impacts anticipated.
Air Quality	Baseline condition.	Potential for reduction in all pollutants other than NO_x. The minor increase in NO_x would conform to regulations.	Potential for greater reduction in all pollutants other than NO_x over Alternative 90A. The minor increase in NO_x would conform to regulations.	Potential for greater reduction in all pollutants other than NO_x over Alternative 90B. The minor increase in NO_x would conform to regulations.	Existing Alignment: No effect. New Alignment: Potential for greater reduction in all pollutants other than NO_x over Alternative 110. The minor increase in NO_x would conform to regulations.
Energy and Climate Change	Baseline condition.	Potential for net decrease in annual energy use and greenhouse gas (GHG) emissions over Base Alternative. Requires smallest quantity of energy and materials for construction.	Potential for greater decrease in annual energy use and GHG emissions over Alternative 90A by approximately 20%. Requires relatively small quantity of energy and materials for construction.	Potential for greater decrease in annual energy use and GHG emissions over Alternative 90B by approximately 2%. Requires second largest quantity of energy and materials for construction.	Potential for greater decrease over 110 in annual energy use (by 42%) and GHG emissions (by 27%). Requires greatest quantity of energy and materials for construction.
Noise and Vibration	Potential noise impacts from existing rail traffic (including freight and commuter rail) in more urbanized areas, between New York City and Schenectady, between Syracuse	Potential noise impacts from existing rail traffic (including freight and commuter rail) in more urbanized areas, between New York City and Schenectady, between Syracuse	Potential noise impacts from existing rail traffic (including freight and commuter rail) in more urbanized areas, between New York City and Schenectady, between Syracuse	Potential noise impacts from existing rail traffic (including freight and commuter rail) in more urbanized areas, between New York City and Schenectady, between Syracuse	Existing Alignment: Potential noise impacts from existing rail traffic (including freight and commuter rail) in more urbanized areas, between New York City and Schenectady,

Exhibit 6-13—Tier 1 Environmental Impact Assessment by Alternative

Area of Evaluation	Alternatives				
	Base	90A	90B – Preferred Alternative	110	125
	and Rochester, and between Buffalo and Niagara Falls. Potential for vibration impacts from these existing sources.	and Rochester, and between Buffalo and Niagara Falls Potential for vibration impacts from these existing sources.	and Rochester, and between Buffalo and Niagara Falls Potential for vibration impacts from these existing sources.	and Rochester, and between Buffalo and Niagara Falls Potential for vibration impacts from these existing sources.	between Syracuse and Rochester, and between Buffalo and Niagara Falls New Alignment: Potential for noise impacts on new alignment segments and elevated sections. Potential for vibration impacts along length of new alignment.
Contaminated and Hazardous Materials	No impacts anticipated for track improvements. Potential for impacts associated with station improvements.	No impacts anticipated for track improvements. Potential for impacts associated with station improvements and bridge replacement.	No impacts anticipated for track improvements. Potential for impacts associated with station improvements, bridge replacement, new ROW in 7 locations, and new structures in urban areas.	No impacts anticipated for track improvements. Potential for impacts associated with station improvements, bridge replacement, new ROW in 18 locations, and new and existing structures in urban areas.	Existing Alignment: No impacts anticipated for track improvements. Potential for impact associated with station improvements. New Alignment: Potential for impacts associated with new bridge construction in EC South and extensive property acquisitions in EC West, including numerous structures.

Notes: 1. EC South – Empire Corridor South; EC West – Empire Corridor West
2. The potential areas of impact described in this Tier 1 EIS are preliminary and are based on GIS resource data. The actual extent of impact will be determined during Tier 2, following more detailed investigation and design.

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7. Comments and Coordination

7.1. Introduction

This chapter provides an overview of the public involvement and agency coordination activities that have been completed to date as well as the process in which all activities have been carried out. The public involvement and agency coordination task of the program is to invite participation by, and coordination with, the appropriate federal, state, and local agencies as well as the public in an effort to engage and inform these stakeholders throughout the environmental review process. NYSDOT designed the public involvement program to be an inclusive and transparent process that adheres to the requirements of the National Environmental Policy Act (NEPA).

The selection of the Preferred Alternative and the alternatives analysis performed for the Tier 1 Final EIS incorporated inputs from the public, agencies, and stakeholders. The program's multifaceted public involvement plan utilizes several mediums to engage and inform the public and other key stakeholders. NYSDOT developed a Public Involvement Plan (PIP) for the program, and it outlines the public involvement activities and identifies key contacts from targeted groups such as government agencies and organizations, public offices, non-government organizations, special interest groups, civic and business groups, present and potential riders/users, the media and the general public. In addition, the PIP identified NEPA cooperating and participating agencies (refer to Exhibit 7-6) that were invited. The PIP also outlines how public involvement activities are linked to key program milestones and identifies the mediums to be used in engaging program stakeholders.

NYSDOT has planned and developed the public involvement activities outlined in the PIP and carried out at key program milestones in close collaboration with program partners, including staff from the lead agencies, as well as with input from cooperating and participating agencies.

7.2. Program Identifier

At the program's commencement, NYSDOT created a logo to give the program a unique and consistent identity. The logo (refer to Exhibit 7-1) is prominently featured on all forms of program communication with the public and at public meetings. The logo incorporates the official program name along with the name of the program sponsor, the New York State Department of Transportation.

Exhibit 7-1—Program Logo

7.3. Public Outreach

7.3.1. Stakeholder Mailing List

NYSDOT developed and maintains a stakeholder database for the program. The stakeholder database includes contact information of all interested stakeholders as well as representatives from all the agencies and organizations involved in the program. NYSDOT updates the database regularly as the program progresses and as additional interested parties request to be added to the mailing list. Currently, the stakeholder database contains approximately 500 contacts.

7.3.2. Media Outreach

The program includes a media outreach plan which includes preparing press releases, meeting notices, and general program-related outreach releases for dissemination by local media channels in each of the six major population centers along the Empire Corridor. In addition, NYSDOT held press briefings prior to each of the public scoping meetings in an effort to promote public awareness of the program and encourage public participation and input. The press briefings also provided the media with the opportunity to interview members of the program team.

7.3.3. Newsletters

Since the onset of the program, NYSDOT has produced and distributed three informational newsletters to stakeholders at key program milestones. The first newsletter (October 2010) provided a general overview of the program's purpose and advertised the public scoping meetings in an effort to promote attendance at the scoping meetings. The second newsletter (May 2011) provided an overview of the comments received at the public scoping meetings and throughout the duration of the scoping period and presented initial analysis and findings from the scoping period. The third newsletter (March 2012) provided an overview of the alternatives development and screening process and identified the alternatives being advanced for detailed evaluation.

Program newsletters were uploaded to the program website at **www.dot.ny.gov/empire-corridor/** and were distributed to all contacts listed in the stakeholder mailing list. The stakeholder database is comprised of over 500 participants representing a variety of businesses, and governmental and non-governmental organizations. Represented entities included, among others, federal, state, regional, and local government officials and legislators (including a member of U.S. Congress, New York State Senate and Assembly, Monroe County Legislature, etc.); transit agencies and metropolitan planning organizations (Metro-North Railroad, Amtrak, Canadian Pacific Railway, Capital District Transportation Authority, Central New York Regional Transportation Authority, etc.); and development agencies and organizations (Greater Syracuse Economic Growth Council, Empire State Development Corporation, Saratoga Economic Development Corporation, etc.).

7.3.4. Program Website

NYSDOT developed the program website (refer to Exhibit 7-2) at the onset of the program to provide interested parties continuous access to information about the program. The website is accessed at:

https://www.dot.ny.gov/empire-corridor. Throughout the course of the program, NYSDOT has encouraged interested parties to visit the program website to learn more about the program and receive the latest information and updates.

Exhibit 7-2—Program Web Site Home Page

The program website includes a general overview of the program, the process in which the program is being carried out, and an explanation of the program's purpose and need and goals and objectives. The website contains several links where interested parties can learn more about the program by reading the latest issue of the program newsletter, reviewing an online briefing about the program and the alternatives under analysis, watching an informational video about the program and exploring the interactive alternatives table. The program website also contains information pertaining to schedule, upcoming and past public outreach activities, and frequently asked questions about the program. In addition, several program reports and documents as well as past issues of the program newsletter have been archived on the website and are available for download. The program website also has a page dedicated to informing interested parties how they may contact a member of the program team, submit a comment or question and sign up on the program mailing list to receive upcoming program information.

The public involvement materials posted on the program website were specifically developed to engage and inform as many stakeholders and members of the public as possible, given that the Empire Corridor stretches across New York State, a distance of 464 miles. The website allows for stakeholders to receive the latest program related information even if they are unable to travel to attend a live meeting in person. The website received over 3,000 unique hits within the first couple of months of being launched. To date, the website has been viewed by nearly 14,231 unique visitors.

7.4. Public Scoping Process

7.4.1. Public Scoping Meetings

Given the length of the Empire Corridor, six public scoping meetings were held in major population centers located along the corridor: New York City, Albany, Utica, Syracuse, Rochester and Buffalo (see Exhibit 7-3). The public scoping meetings were advertised to the general public in accordance with the program's media outreach plan. Meeting notices and press releases were produced and sent to various media outlets in each of the six locations along the length of the corridor where public scoping meetings were held. These media announcements were published in each of the six areas in advance of the scoping sessions in October and November of 2010. In addition, the first newsletter for the program announced the holding of the scoping meetings and was forwarded to the entire program mailing list. The program website also advertised the scoping meetings.

Invitations to public scoping meetings were included in letters sent to potential cooperating agencies. Exhibit 7-6 identifies the 13 agencies at the federal and state level that were invited to attend.

Invitations to the public scoping meeting were included in letters sent to potential participating agencies Exhibit 7-6 identifies the 21 agencies at the federal, state, and regional level invited to attend.

Invitations to the public scoping meetings were also included in letters sent to potential members of the Empire Project Advisory Committee (EPAC). Over 50 individuals were invited from federal, state, and local agencies and organizations, and railroads/transportation agencies and groups (see Exhibit 7-7).

The public scoping meetings were conducted in an open house format from 5:30-7:30 p.m. at each location. NYSDOT asked attendees to sign-in, distributed copies of the program newsletter and a comment form, and encouraged attendees to view an informational video on the program. At the end of the video, attendees were encouraged to view easel mounted display boards that presented program information and to interact with members of the program team. NYSDOT encouraged meeting attendees to fill out a comment card and leave it in one of the many drop boxes located at each public meeting.

In addition to the six public scoping meetings, an online scoping briefing was created and posted on the program website for the benefit of interested parties unable to attend a public scoping meeting in person. The online scoping briefing contained the same information presented at the public scoping meetings in a downloadable electronic format. The online scoping briefing was a very successful public outreach tool that was visited by 231 unique individuals during the scoping period.

Exhibit 7-3—Scoping Meetings

Meeting Date	Meeting Location	Estimated Attendance
Tuesday, October 19, 2010	Connecticut Street Armory 184 Connecticut Street Buffalo, New York 14213	81
Wednesday, October 20, 2010	Empire Expo Center (Syracuse Fairgrounds) 581 Fair Boulevard Syracuse, New York 13209	28
Tuesday, October 26, 2010	Sand Creek Middle School 329 Sand Creek Road Albany, New York 12205	86
Wednesday, October 27, 2010	Moynihan Station 380 West 33rd Street New York, New York 10001	34
Tuesday, November 9, 2010	Hotel Utica 102 Lafayette Street Utica, New York 13502	23
Wednesday, November 10, 2010	Monroe Community College 1000 East Henrietta Road Rochester, New York 14623	87
	TOTAL:	339

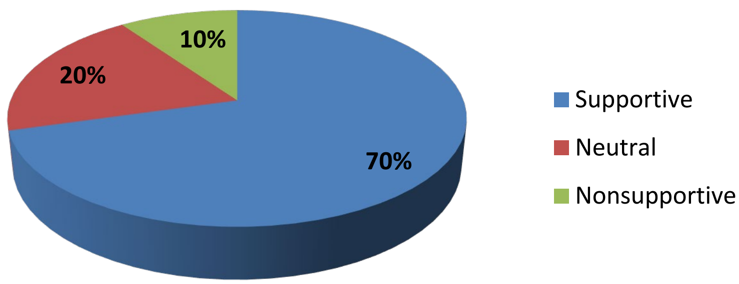
During the program scoping process in 2010, the public and other program stakeholders expressed interest in the potential for higher speed alternatives. These included a 160 mph alternative representing the practical upper limit of electrified dynamic tilt trains, such as the Amtrak Acela; and a 220 mph alternative representing the practical upper limit of high-speed rail operations seen in France, Germany, Spain, Japan, and China. In response to this, NYSDOT examined a range of higher speed alternatives according to the same metrics as the other alternatives.

7.4.2. Public Scoping Comments

The public scoping meetings held during the fall of 2010 solicited a total of 102 public comments that were collected and recorded during the scoping period. Several options for submitting comments were available to the public, which included: direct submission at the public scoping meetings, standard mail, e-mail, through the program website and via telephone.

Based on the public comments received during the scoping period, the majority (70%) of commenters expressed support for the program, as illustrated in Exhibit 7-4.

Exhibit 7-4—Nature of Public Comments

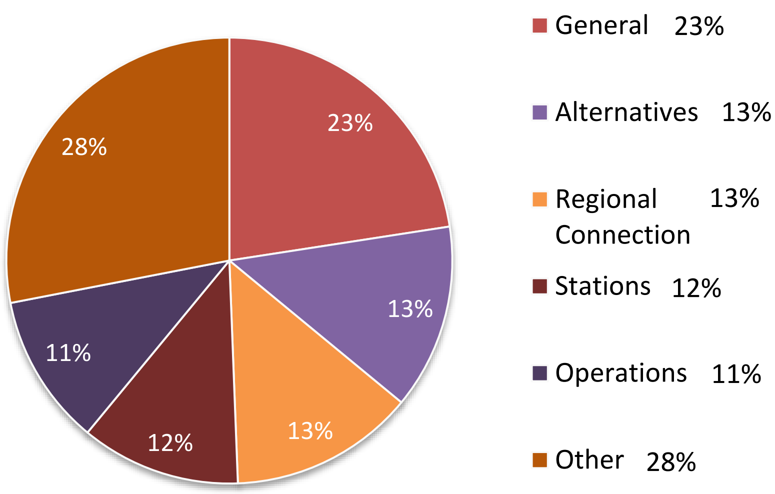


NYSDOT documented and categorized public comments received at the public scoping meetings as well as from email, standard mail and phone, to provide a general summary of the comments received during the public scoping process. NYSDOT grouped the comments into 12 different categories based on the subject of the comment. The 12 categories include: general, alternatives, regional connections, stations, operations, alignment, speed, intermodal, vehicles, scoping meetings, safety and ridership. It is important to note that a comment made by one individual may be broken out into multiple categories; numerous comments addressed more than one subject category. Exhibit 7-5 illustrates the breakdown of comments received by category from public scoping efforts conducted throughout the corridor.

The majority of comments received were categorized as the following: general, alternatives, regional connection, stations and operations. The remaining comment categories of alignment, speed, intermodal, vehicles, scoping meetings, safety and ridership each accounted for a much lower percentage (generally less that 5 percent) of comments received from public outreach efforts and thus were combined to form the "other" category in Exhibit 7-5, for the purpose of clarity. The general comment category is the single largest category of comments received from public outreach efforts at 23 percent. Comments categorized as general do not pertain to any of the other comment categories and are broad in nature. An example of a general comment may include a personal position statement regarding the program such as an individual's declaration of support toward the program's goals and objectives.

The alternatives and regional connection comment categories accounted for the second largest categories of comments received with each representing 13 percent of the total at the corridor level. In general, these comments centered around the proposed alignment alternatives or the desire for increased regional connections. The stations category represented the next largest category of comments followed by operations at 12 and 11 percent respectively. The majority of these comments highlighted the desire for local station improvements with multimodal linkages.

Exhibit 7-5—Summary of Public Comments by Category



The public scoping period solicited public comments at the beginning of the Tier 1 EIS process. NYSDOT has and will continue to collect, record and consider public comments throughout the duration of the Tier 1 EIS.

7.5. Stakeholder Coordination

7.5.1. Agency Coordination

At the onset of the program, the NYSDOT identified the appropriate federal, state, regional and local agencies as having a role and/or interest in the program. NYSDOT and FRA sent more than 37 formal letters of invitation to agencies identified as NEPA cooperating and/or participating agencies. The environmental review provisions of Section 6002 of SAFETEA-LU, MAP-21 in 2012, the FAST Act in 2015, the New York State Environmental Quality Review Act (SEQR) and the Council on Environmental Quality (CEQ) regulations (40 CFR 1508.5) set forth the role and responsibilities of cooperating and/or participating agencies. Given the magnitude and complexity of the program, the lead agencies, FRA and NYSDOT, are using a tiered process, as provided for in 40 CFR 1508.28, in completing the environmental review of the program. The initial phase of the program, Tier 1, addresses broad service-level issues and proposals for improving intercity passenger rail service along the corridor.

CEQ 40 CFR 1508.5 outlines the role of the cooperating agencies, whereby a cooperating agency is any federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. A state or local agency of similar qualifications or, when the effects are on lands of tribal interest, a Native American tribe, may also become a cooperating agency. The responsibilities of cooperating agencies include providing input throughout the duration of the program, participating in meetings, reviewing and providing comments on program progress and reviewing and commenting on the Tier 1 Draft

EIS and the Tier 1 Final EIS. The actions proposed by the program may require a permit or approval from a cooperating agency. Cooperating agencies are also participating agencies, and all references to participating agencies include cooperating agencies.

The role of participating agencies, a federal, state, tribal or local government agency that may have an interest in the program, includes participation in the NEPA process, providing input throughout the duration of the program and identifying any issues or concerns regarding the program. According to Section 6002 of SAFETEA-LU, it is the responsibility of participating agencies to identify, as early as practicable, any issues of concern regarding the program's potential impacts. The program may impact resources that participating agencies are involved in managing. Exhibit 7-6 lists the cooperating and participating agencies invited to be involved in the program.

Cooperating and participating agencies have similar roles and responsibilities, but cooperating agencies have a higher degree of authority, responsibility, and involvement in the environmental review process. A distinguishing feature of a cooperating agency is that the CEQ regulations (40 CFR Section 1501.6) permit a cooperating agency to "*assume on request of the lead agency responsibility for developing information and preparing environmental analyses including portions of the environmental impact statement concerning which the cooperating agency has special expertise*." An additional distinction is that, pursuant to 40 CFR 1506.3, "*a cooperating agency may adopt without recirculation the environmental impact statement of a lead agency when, after an independent review of the statement, the cooperating agency concludes that its comments and suggestions have been satisfied*." This provision is particularly important to permitting agencies, such as the U.S. Army Corps of Engineers, who, as cooperating agencies, routinely adopt U.S. DOT environmental documents.

7.5.2. Empire Project Advisory Committee (EPAC)

NYSDOT formed a project advisory committee, the Empire Project Advisory Committee (EPAC) to help shape and guide decision making throughout the environmental review process. The purpose of the EPAC is to create a forum to hold meetings with representatives from key agencies, statewide government organizations, major railroads, metropolitan planning organizations and other key stakeholders. NYSDOT sent an invitation letter to key stakeholders identified as having a potential interest or role in the program. The letter formally invited involvement in the program, membership in the program's advisory committee and attendance at the first agency scoping meeting. The EPAC also serves as a communication conduit whereby members can share the program's progress with their constituents. The EPAC was comprised of 47 unique agencies, as listed in Exhibit 7-7.

To date, NYSDOT has held four EPAC meetings in an effort to seek input and feedback as the program progresses through the environmental review process. The first EPAC meeting presented an overview of the program along with the program's goals and objectives. The meeting took place on October 18, 2010 at the Capital District Transportation Committee (CDTC) Office in Albany, New York with approximately 40 persons in attendance. The second EPAC meeting presented preliminary findings and gathered input from EPAC members and addressed questions and comments.

Exhibit 7-6—Cooperating and Participating Agency Engagement

Agency	Reason for Involvement	Responsibility
Amtrak – National Railroad Passenger Corporation	Operates passenger service along the Empire Corridor	Invited Cooperating
United States (U.S.) Fish & Wildlife Service	Consultation regarding effects on aquatic and terrestrial wildlife as well as coordination with threatened and endangered species under Section 7 of the U.S. Endangered Species Act	Invited Cooperating
U.S. Environmental Protection Agency, Region II	Regulatory concerns include General Conformity under the U.S. Clean Air Act and Section 404 of the U.S. Clean Water Act	Accepted Cooperating
Federal Highway Administration	Oversight of the Federal Highway system in the U.S.	Accepted Cooperating
Federal Transit Administration	Oversight of passenger railroads in the U.S.	Accepted Cooperating
U.S. Army Corps of Engineers	Permitting responsibility under Section 404 of the U.S. Clean Water Act and permitting responsibility under Section 10 of the U.S. Rivers and Harbors Act	Invited Cooperating
National Marine Fisheries Service	Consultation regarding proposed alternatives relative to ecological effects on coastal waters	Invited Cooperating
U.S. Coast Guard	Permitting administration of Section 9 of the U.S. Rivers and Harbors Act	Accepted Cooperating
New York State (NYS) Department of Environmental Conservation	Permitting responsibility under Section 401 Water Quality Certification, and the State's Article 24 Freshwater Wetlands regulatory program and Article 15 Protection of Waters regulatory program	Invited Cooperating
NYS Department of State	Consistency with the State's Coastal Zone Management Plan	Invited Cooperating
NYS Office of Parks, Recreation & Historic Preservation	Oversight office for resources including Section 4(f) and Section 106 resources	Accepted Cooperating
National Park Service	Responsible for oversight of National Parks	Invited Cooperating
NYS Historic Preservation Office	Coordinating effects determination for Section 106 of the National Historic Preservation Act	Invited Cooperating
Federal Emergency Management Agency	Consultation regarding floodplains and modifications to existing floodplains	Invited Participating
Metro-North Railroad	Major railroad owner/operator in the Empire Corridor	Invited Participating
NYS Canal Corporation	Responsible for the operation of the canal system	Invited Participating

Exhibit 7-6—Cooperating and Participating Agency Engagement (cont'd.)

Agency	Reason for Involvement	Responsibility
Capital District Transportation Committee	Transportation planning organization for the Albany-Schenectady-Troy metropolitan area	Accepted Participating
Genesee Transportation Council	Transportation planning organization for the Genesee-Finger Lakes Region	Accepted Participating
Greater Buffalo-Niagara Regional Transportation Council	Transportation planning organization for the Erie and Niagara counties	Invited Participating
Herkimer-Oneida Counties Transportation Study	Transportation planning organization for the Herkimer and Oneida counties	Invited Participating
Orange County Transportation Council	Transportation planning organization for Orange County	Invited Participating
New York Metropolitan Transportation Council	Transportation planning organization for New York City, Long Island and the lower Hudson Valley	Invited Participating
Poughkeepsie-Dutchess County Transportation Council	Transportation planning organization for Dutchess County	Invited Participating
Syracuse Metropolitan Transportation Council	Transportation planning organization for Onondaga County and small portions of Madison and Oswego Counties	Invited Participating
Ulster County Transportation Council	Transportation planning organization for the Kingston Urbanized area as well as a portion of the Poughkeepsie-Newburgh Urbanized Transportation Management Area	Invited Participating
Capital District Transportation Authority (CDTA)	Responsible for transportation connections in the Albany-Schenectady-Troy metropolitan area	Accepted Participating
Metropolitan Transportation Authority (MTA)	Responsible for transportation connections in the New York City, Long Island and lower Hudson Valley	Invited Participating
Niagara Frontier Transportation Authority (NFTA)	Responsible for transportation connections in the Buffalo Niagara region	Invited Participating
Central New York Regional Transportation Authority (CENTRO)	Responsible for transportation connections in the central New York community	Invited Participating
Rochester Genesee Regional Transportation Authority (RGRTA)	Responsible for transportation connections in Monroe, Genesee, Livingston, Orleans, Wayne, Wyoming and Seneca Counties	Invited Participating
Erie County Department of Environment and Planning	Responsible for environmental oversight in Erie County	Accepted Participating
NYC Mayor's Office of Environmental Coordination	Responsible for environmental oversight in New York City	Invited Participating
NYC Parks and Recreation	Responsible for parks and recreation areas in New York City	Invited Participating
NYC Department of Environmental Protection	Responsible for environmental oversight in New York City	Invited Participating

Exhibit 7-7—EPAC Member Agencies

TYPE OF AGENCY	AGENCY
Federal Agencies	• Federal Railroad Administration • Federal Highway Administration • United States Environmental Protection Agency • U.S. Army Corps of Engineers • Federal Transit Administration • National Park Service • National Marine Fisheries Service • U.S. Fish & Wildlife Service • U.S. Department of Interior • U.S. Coast Guard • Federal Emergency Management Agency
State Agencies	• NYS Department of Transportation • NYS Department of Environmental Conservation • NYS Department of State • NYS Empire State Development Corporation • NYS Office of Parks, Recreation & Historic Preservation • State of New York, Office of the Governor • NYS Thruway Authority • NYS Canal Corporation • NYS Historic Preservation Office
Local Agencies	• Erie County Department of Environmental Planning • New York City Mayors Office of Environmental Coordination • New York City Department of Parks and Recreation • NYC Department of Environmental Protection
Transportation Agencies/MPOs	• NYS Metropolitan Planning Organizations • Metropolitan Transportation Authority • Capital District Transportation Committee • Genesee Transportation Council • Greater Buffalo-Niagara Regional Transportation Council • Herkimer-Oneida Counties Transportation Study • Orange County Transportation Council • New York Metropolitan Transportation Council • Poughkeepsie-Dutchess County Transportation Council • Syracuse Metropolitan Transportation Council • Ulster County Transportation Council • Capital District Transportation Authority • Niagara Frontier Transportation Authority • Rochester Genesee Regional Transportation Authority • Central New York Regional Transportation Authority
Railroads	• CSX Transportation, Inc. • Amtrak – National Railroad Passenger Corporation • Metro-North Railroad • Canadian Pacific Railroad • Finger Lakes Railroad
Rail Transportation Groups	• High Speed Rail Coalition • Empire State Passengers Association • Railroads of New York

The second EPAC meeting was held on March 21, 2011 at the NYSDOT Main Office in Albany, New York. Approximately 30 EPAC members participated in the second meeting. The third EPAC meeting was held on March 8, 2012 at the NYSDOT main office in Albany, New York. Approximately 37 EPAC members participated in the third meeting, which provided an update on the program's progress, including an overview of the alternatives development and screening process. The fourth EPAC meeting was held on March 4, 2013. The focus of this meeting was on the alternatives evaluations and the economic benefits of the program. All four EPAC meetings included a webinar option for EPAC members to participate in the meeting remotely if they were unable to travel to attend the meetings in person.

7.5.3. Program Partners Involvement

In addition to the EPAC, the program team has provided two of the program's key partners, Amtrak (National Railroad Passenger Corporation) and CSX Transportation, Inc. (CSXT) with briefings on the status of the alternatives development phase of the program. These briefings provided both Amtrak and CSXT with an opportunity to individually view a presentation on the range of alternatives under consideration and provide feedback. NYSDOT is taking feedback from these key program partners into consideration as the program progresses.

7.5.4. Consultation with Federally Recognized Tribes and Consulting Parties Pursuant to the National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) 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) and afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. Section 101(d)(6)(B) of the NHPA requires the lead federal agency to consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to historic properties that may be affected by the undertaking. The lead federal agency shall ensure that consultation in the Section 106 process provides the Indian tribe or Native Hawaiian organization a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of properties, including those of traditional religious and cultural importance, articulate its views on the undertaking's effects on such properties, and participate in the resolution of adverse effects. Section 106 also requires consultation with consulting parties, which include SHPO and/or ACHP, and federally recognized Indian tribes/Tribal Historic Preservation Officers (THPOs) or Native Hawaiian organizations. Consulting parties also include local governments and other individuals and organizations with a demonstrated interest in the program, whose participation is subject to approval by the responsible federal agency, as described in 36 CFR 800.2. The lead federal agency, in consultation with the State Historic Preservation Office (SHPO) and appropriate consulting parties must determine whether a proposed action would have any adverse effects on the characteristics of a property that qualify it for the NR.

Federally Recognized Tribes

Pursuant to 36 CFR 800.3(f)(2), the lead federal agency, FRA, in consultation with NYSDOT and SHPO, identified federally-recognized Indian tribes (tribal nations) under Section 106 of NHPA. FRA identified the tribes on the basis of previously recognized geographic areas of interest for Section 106 consultation commonly used by NYSDOT and SHPO. FRA utilized the tribal status and contact information on file with the U.S. Bureau of Indian Affairs as part of the identification process. On May 3, 2011, FRA sent letters to the following federally recognized tribes inviting them to participate as consulting parties per 36 CFR Part 800.2(c)(2):

- Cayuga Nation,
- Seneca Nation of Indians,
- Tonawanda Seneca Nation,
- Onondaga Nation,
- Oneida Indian Nation,
- Tuscarora Indian Nation,
- Stockbridge-Munsee Community Band of the Mohican Nation,
- Delaware Nation,
- Shinnecock Nation,
- St. Regis Mohawk Tribe,
- Seneca-Cayuga Tribe of Oklahoma.

The Mohican Nation, the Oneida Nation, and the Seneca Nation replied. These three tribal nations expressed their interest in the program and their desire to participate in consultation on the program in accordance with Section 106 of NHPA.

On May 4, 2012**,** NYSDOT invited all of the federally-recognized tribal nations listed above (and one additional federally-recognized tribe, the Delaware Tribe of Indians) to an information-gathering meeting in Rochester, New York, on May 30, 2012. At the meeting, the program sponsors presented an overview of the program, the proposed Section 106 methodology and the preliminary program APE, and took comments from the tribal nations. At the request of several of the tribes that participated in the May 30, 2012 meeting, NYSDOT sent maps of the alternative alignments showing the approximate locations of identified archaeological sites to the tribal nations. On November 21, 2012, NYSDOT on behalf of FRA sent letters to each of the tribal nations and SHPO describing and illustrating the boundaries of the proposed APE for their review and comment. In response to comments provided by the Oneida Nation to FRA and NYSDOT in a letter dated December 14, 2012, FRA and NYSDOT engaged in additional correspondence and a face-to-face meeting (April 18, 2013) with the Oneida Nation.

On May 2, 2013, FRA and NYSDOT held a meeting to provide project information to the federally-recognized tribes and give them an opportunity to provide comments. On May 2, 2013, FRA and NYSDOT met with SHPO to discuss utilizing a Draft Programmatic Agreement (PA) to govern future requirements under Section 106 of the NHPA. Preemptively, a Draft PA was provided as part of the Tier 1 Draft EIS for review and comment. The Draft Section 106 Programmatic Agreement (included as Appendix H of the Tier 1 Draft EIS) intended to address the process by which FRA and NYSDOT could continue to phase Section 106 activities and comply with Section 106 once Tier 2 undertakings were defined. This Draft PA could govern the future identification of historic properties as well as the assessment of and resolution of adverse effects to historic properties, as appropriate. In advancing individual projects in the Tier 2 assessments, railroad exemptions under Section 11504 of the FAST Act (which directed U.S. DOT in concert with ACHP to develop certain Section 106 exemptions for railroad rights-of-way) will also be assessed. FRA transmitted the Draft PA to the federally recognized Indian tribes and consulting parties for review and comment. FRA received comments from the Oneida Indian Nation.

Other Consulting Parties

In addition to consultation with federally-recognized Indian tribal nations, FRA and NYSDOT identified and engaged with consulting parties, including state recognized tribal nations, in accordance with 36 CFR 800.2(c)(3) through (5) and 800.3(f). FRA and NYSDOT, in consultation with SHPO, identified potential consulting parties for the Tier 1 based on a demonstrated interest in broad, corridor-wide, or regional-level aspects of the proposed undertaking. In addition to the SHPO and ACHP, the list of potential consulting parties included the following non-federally recognized tribes and state or region-wide preservation organizations:

- Mohawk Nation Council of Chiefs,
- Unkechaug Nation,
- Preservation League of New York State,
- Hudson River Valley Greenway,
- Erie Canal National Heritage Corridor,
- Preservation Buffalo Niagara,
- Landmark Society of Western New York,
- Preservation Association of Western New York.

Three parties responded expressing interest in participating as consulting parties: the Preservation League of New York State, the National Park Service Erie Canal National Heritage Corridor, and Preservation Buffalo Niagara. FRA subsequently approved the consulting party status of these three entities. On May 2, 2013, FRA and NYSDOT held a meeting to provide program information to the consulting parties and give them an opportunity to provide comments. Representatives from the Preservation League of New York State and the Erie Canal National Heritage Corridor attended.

On August 6, 2018, FRA notified the SHPO and consulting parties that the Section 106 process for the Tier 1 phase of the program is considered complete. FRA concluded that the Tier 1 EIS represents non-destructive program planning activities, allowed for under 36 CFR Part 800(1)(c), which have no potential to cause effects to historic properties. FRA and NYSDOT remain committed to following the requirements of 36 CFR 800 for Tier 2 projects that receive federal funding, as well as determining the applicability of changes under the FAST Act. Section 11504 of the FAST Act (49 U.S.C. 2402), enacted on December 4, 2015, mandated the development of a Section 106 exemption for "railroad rights-of-way."

7.6. Publication and Comment Period for the Tier 1 Draft EIS

The Tier 1 Draft EIS for the High Speed Rail Empire Corridor Program appeared in the Federal Register on January 31, 2014. Publication of the Tier 1 Draft EIS included mailing notification letters to regulatory agencies; federal, state, local, and elected officials; and the public. Legal notices announcing the availability of the Tier 1 Draft EIS and advertising the public hearing schedule were published in 11 newspapers. The Tier 1 Draft EIS was made available in 24 repositories/libraries in study area counties. NYSDOT held six public hearings at the following locations:

1. **Albany, NY,** Tuesday, March 4, 2014, Albany Nanotech Complex, 257 Fuller Road, Albany, NY;

2. **Syracuse, NY**, Wednesday, March 5, 2014, NBT Bank Stadium, 1 Tex Simone Drive, Syracuse, NY;
3. **Buffalo, NY**, Thursday, March 6, 2014, The Buffalo Transportation Pierce Arrow Museum, 263 Michigan Avenue, Buffalo, NY;
4. **Rochester, NY**, Friday, March 7, 2014, National Museum of Play at the Strong, One Manhattan Square, Rochester, NY;
5. **Utica, NY,** Tuesday, March 11, 2014, Utica Train Station, 321 Main Street, Utica, NY;
6. **Poughkeepsie, NY,** Wednesday, March 12, 2014, Cunneen-Hackett Arts Center, 12 Vassar Street, Poughkeepsie, NY

Approximately 300 persons attended the public hearings, with the largest attendance at Buffalo (138), Albany (129), Syracuse (103), and Rochester (102). Each meeting consisted of an open house at 4 p.m., followed by the public hearing with presentations commenced at 6 p.m. The public hearings included a video presentation providing an overview of the program and the Tier 1 Draft EIS and the review process, and provided opportunity for public and private oral testimony and written comment.

The public comment period, originally scheduled to close on March 24, 2014, was extended to April 30, 2014. NYSDOT held three additional public meetings in April after the public hearings, but prior to the close of the public comment period. NYSDOT held two of these meetings in the Niagara region and one meeting in the Albany region.

7.7. Comments on the Tier 1 Draft EIS

A total of 932 persons commented, including 23 agencies, 17 elected officials, 14 railroads, 16 organizations and businesses, three Native American tribes, and 727 individuals. These comments indicated overwhelming support for the program, with 770 commenters, or 83 percent, in favor of improvements for rail within the corridor. Approximately 6 percent (or 60) were not supportive of the program, and 11 percent (or 102) were neutral (refer to Exhibit 7-8).

The majority of elected officials, state, regional, local agencies, and tribes supported improvements to high-speed rail within the Empire Corridor. The majority of private railroads, shippers, and companies reliant on freight rail indicated the strongest support for the Base Alternative.

Approximately 95 percent of businesses and organizations and 80 percent of individuals supported program improvements. Among businesses and organizations, Alternative 110 had the highest level of support, and both Alternatives 110 and 125 had the highest level of support among individuals.

Of the various types of individual comments received from these individuals and organizations, NYSDOT received a total of 1,754 comments, of which 19 percent (329) were mail, 39 percent (679) were email, 27 percent (478) were submitted through the website form, and 15 percent (268) were received at public hearing/meetings.

Exhibit 7-9 shows a summary of the topics from comments received. These include more than one topic per commenter/letter and exclude those letters that had no comments. NYSDOT received comments on topics addressing the project purpose and need: on-time performance, ridership, travel times, frequency, capacity, higher speeds, and dedicated track. Other topics voiced general

Exhibit 7-8—Nature of Tier 1 Draft Comments

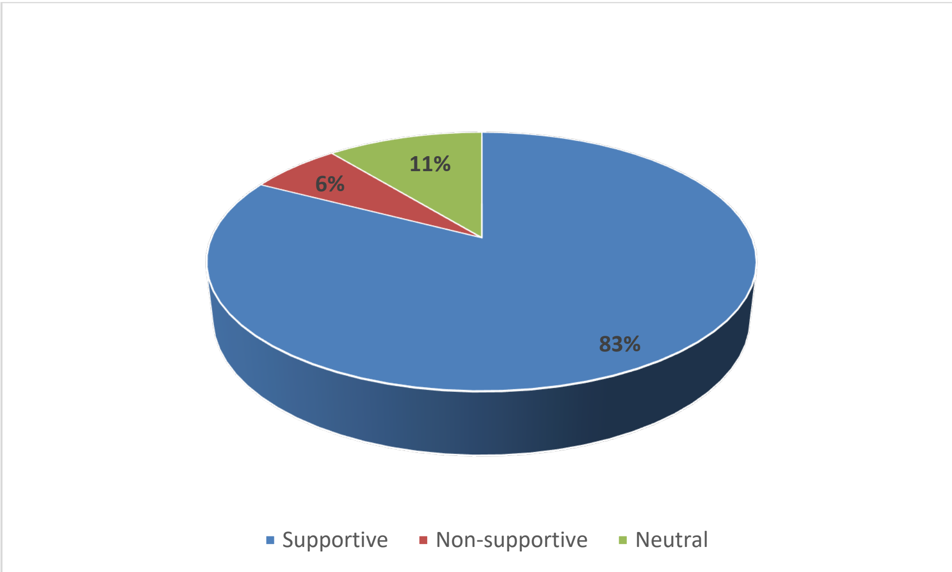
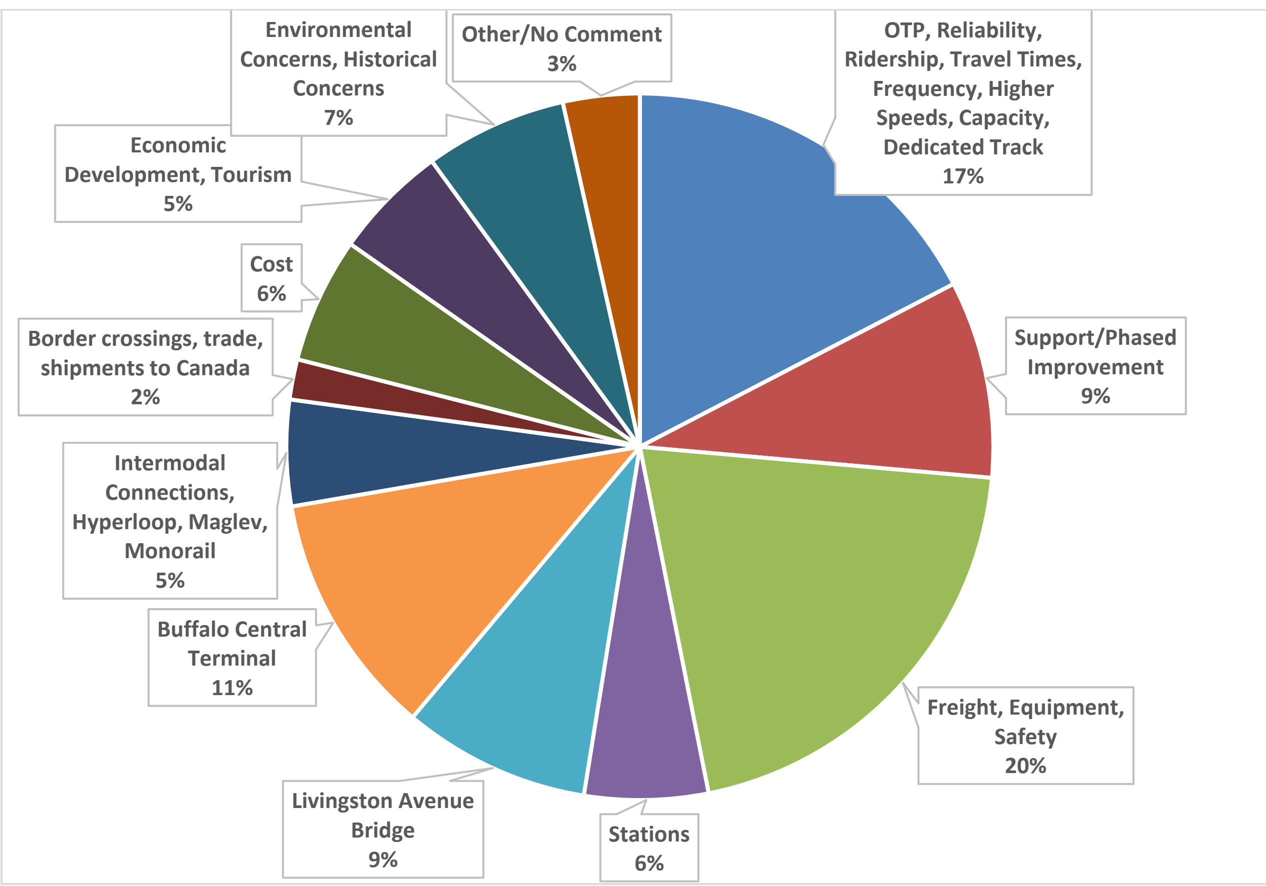


Exhibit 7-9—Comment Categories



support (or opposition) to the project or commented on freight, equipment, and safety, costs, and stations. Commenters also expressed concerns regarding the Livingston Avenue Bridge improvements and the historic Buffalo Central Terminal. Other topics covered included environmental/historic concerns, economic development/tourism, and comments regarding intermodal connections and use of alternative technologies such as maglev, hyperloop, or monorail.

Although the comments covered a wide range of issues, as shown in Exhibit 7-9, three recurring groups of comments emerged. The following summarizes the resolution of these three recurring comments:

1. **Potential for Freight Impacts:** Private railroads, freight companies, shippers, and businesses heavily reliant on rail freight expressed concerns that the High Speed Rail Empire Corridor Program may impact freight movements that could have an adverse impact on their businesses. Alternative 90B would result in better segregation of passenger trains from freight trains than the Base Alternative, with the installation of additional third and fourth tracks that would add capacity and provide the ability to route passenger trains around freight trains even while passenger trains operate at higher speeds. In 2035, Alternative 90B would involve the least delay-minutes per 100 train miles operated for freight trains of the alternatives considered, as well as the second lowest trip time for freight trains between Selkirk Yard, outside Albany, and Buffalo (based on the results of the rail simulation, presented in Appendix D and discussed in Chapter 6). The selection of Alternative 90B as the Preferred Alternative would result in the best on-time performance for Amtrak service in 2035.
2. **Buffalo Central Terminal Reuse:** A number of commenters indicated that reuse and restoration of historic Central Terminal in east Buffalo as an Amtrak Station should be considered and incorporated into the High Speed Rail Empire Corridor Program's station improvements. As part of a separate study of relocation of the Amtrak Buffalo-Exchange Street Station, the Train Station Siting Study Committee considered station relocation to the historic Central Terminal, in addition to other prospective sites. In April 2017, the Governor of New York State and the Mayor of Buffalo announced that the $1 million station siting study funded by the state culminated in a committee selection of a future downtown location for a combined Amtrak and bus station. The committee, composed of the governor, the mayor, federal and state legislators, county and local officials, Amtrak, Trailways, and NYSDOT, voted in favor of a station site collocated near the existing Buffalo-Exchange Street Station, not the Central Terminal site.[160] Some of the primary reasons for the selection of the downtown site included economic benefits to the downtown business district, as well as population densities that support the transit use.
3. **Incorporation of Pedestrian Access on the Livingston Avenue Bridge:** A number of legislators, city officials, and commenters indicated that future redesign of the Livingston Avenue Bridge should incorporate pedestrian access and that other issues should also be considered. The Livingston Avenue Bridge Project involves upgrades to the Empire Corridor railroad bridge over the Hudson River connecting Albany and Rensselaer. Although a component project of the High Speed Rail Empire Corridor Program, NYSDOT will study and advance the improvements to this bridge as part of a separate project. The deteriorated condition of the rotating swing-span bridge, which was built in approximately 1902, requires that trains cross at 15 miles per hour, one train at a time. The bridge opens approximately 400 times a year, but NYSDOT considers the opening

[160] / Submitted by Dean Robert Shibley, Facilitator, "On Track: Resolution of Stakeholders on a Decision for a New Train Station Location in the City of Buffalo," April 20, 2017. Accessed August 3, 2017: <**https://www.city-buffalo.com/files/New%20Site%20Images%20Aug%202016/Train%20Page/OnTrack-Results.pdf**>

mechanism unreliable and the bridge design deficient for current standards. Amtrak now controls and operates the bridge, owned by CSXT, through a lease signed in 2012. Comments from the public and elected and city officials advocate for provision of pedestrian access across the bridge, although CSXT (the bridge owner) has cited safety concerns regarding providing pedestrian access close to operating trains. The decision regarding the design and configuration of the bridge, and whether it will be rehabilitated or replaced, will be made as part of this separate NYSDOT project.

Appendix K presents individual responses to each specific comment received.

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Acronyms

AC	–	Alternating Current
ACHP	–	Advisory Council on Historic Preservation
ACMs	–	Asbestos Containing Materials
ADA	–	Americans with Disabilities Act
Amtrak	–	National Railroad Passenger Corporation
APE	–	Area of Potential Effect
ARRA	–	American Recovery and Reinvestment Act of 2009
AST	–	Aboveground Storage Tanks
ASTM	–	American Society for Testing and Materials
BA	–	Base Alternative
BCA	–	Bird Conservation Area
BEA	–	Bureau of Economic Analysis
BMPs	–	Best Management Practices
BSPS	–	Bergen Swamp Preservation Society
CAA	–	U.S. Clean Air Act
CAAA	–	Clean Air Act Amendments
CAFE	–	Combined Corporate Average Fuel Economy
CBRS	–	Coastal Barrier Resources System
CBS	–	NYS Chemical Bulk Storage System
CDTA	–	Capital District Transportation Authority
CDTC	–	Capital District Transportation Committee
CE	–	Categorical Exclusion
CEA	–	Critical Environmental Areas
CENTRO	–	Central New York Regional Transportation Authority
CEQ	–	Council on Environmental Quality
CERCLA	–	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	–	Comprehensive Environmental Response, Compensation, and Liability Information Systems (also known as Superfund)
CFR	–	Code of Federal Regulations
CLG	–	Certified Local Government
CLOMR	–	Conditional Letter of Map Revision
CO	–	Carbon monoxide
CO_2		Carbon dioxide
CO_2e		Carbon dioxide equivalent

CP	–	Control Point
CPP	–	Construction Protection Plan
CSXT	–	CSX Transportation, Inc.
CWA	–	U.S. Clean Water Act
CZM	–	Coastal Zone Management
CZMA	–	Coastal Zone Management Act
dB	–	Decibel
dBA	–	A-weighted decibels
DC	–	Direct Current
DOI	–	U.S. Department of the Interior
DPM	–	Diesel Particulate Matter
DPW	–	Department of Public Works
EA	–	Environmental Assessment
ECL	–	Environmental Conservation Law
EFH	–	Essential Fish Habitat
EIS	–	Environmental Impact Statement
EO	–	Executive Order
EPAC	–	Empire Project Advisory Committee
EPCRA	–	Emergency Planning and Community Right-to-Know Act of 1986
ESA	–	Environmental Site Assessment
ESC	–	Erosion and Sediment Control Plan
ESPA	–	Empire State Passenger Association
FAA	–	Federal Aviation Administration
FE	–	Federal Endangered Species
FEMA	–	Federal Emergency Management Agency
FHWA	–	Federal Highway Administration
FIRM	–	Flood Insurance Rate Map
FNOI	–	Final Notice of Intent
FPA	–	Floodplain Administrator
FPPA	–	Farmland Protection Policy Act of 1981
FR	–	Federal Register
FRA	–	Federal Railroad Administration
FT	–	Federal Threatened Species
FTA	–	Federal Transit Administration
FY	–	Fiscal Year
GBNRTC	–	Greater Buffalo-Niagara Regional Transportation Council

GCT	–	Grand Central Terminal
GE	–	General Electric Company
GHG	–	Greenhouse Gas
GIS	–	Geographic Information System
GTC	–	Genesee Transportation Council
GWP	–	Global Warming Potential
HABS	–	Historic American Buildings Survey
HAER	–	Historic American Engineering Record
HAPs	–	Hazardous Air Pollutants
HFC	–	Hydrofluorocarbons
HOCTS	–	Herkimer-Oneida Counties Transportation Study
HSIPR	–	High Speed Intercity Passenger Rail
HSR	–	High Speed Rail
HST	–	High Speed Train
Hz	–	Hertz
ISTEA	–	Intermodal Surface Transportation Efficiency Act
kV	–	Kilovolts
LEED	–	Leadership in Energy and Environmental Design
$L_{eq\,(h)}$	–	Hourly equivalent noise level (typically the worst-case, peak hour noise level)
LOCMA	–	Lower Orange County Metropolitan Area
LOMR	–	Letter of Map Revision
LRTP	–	Long Range Transportation Improvement Plan
LWCF	–	United States Land and Water Conservation Fund Act
LWRP	–	Local Waterfront Revitalization Plan
MAS	–	Maximum Authorized Speed
mgt	–	Million Gross Tons
MMPs	–	Materials Management Plans
MNR	–	Metro-North Railroad
MOSF	–	Major Oil Storage Facility
MOA	–	Memorandum of Agreement
MOU	–	Memorandum of Understanding
MP	–	Milepost
MPO	–	Metropolitan Planning Organization
mph	–	Miles per Hour
MSA	–	Metropolitan Statistical Area
MSAT	–	Mobile Source Air Toxics

MS4	–	Municipal Separate Storm Sewer
MTA	–	Metropolitan Transportation Authority
MTC	–	New York Metropolitan Transportation Council
NAA	–	Non-Attainment Area
NAAQS	–	National Ambient Air Quality Standards
NEPA	–	National Environmental Policy Act of 1969
NERRS	–	National Estuarine Research Reserve System
NFIP	–	National Flood Insurance Program
NFTA	–	Niagara Frontier Transportation Authority
NHL	–	National Historic Landmark
NHPA	–	National Historic Preservation Act
NJ	–	New Jersey
NMFS	–	National Marine Fisheries Service
NNL	–	National Natural Landmark
NO	–	Nitric Oxide
NO_2	–	Nitrogen Dioxide
NOAA	–	National Oceanic and Atmospheric Administration
NOI	–	Notice of Intent
NORAC	–	Northeast Operating Rules Advisory Committee
NO_x	–	Nitrogen Oxides
NPDES	–	National Pollutant Discharge Elimination System
NPS	–	National Park Service
NR	–	National Register of Historic Places
NRCS	–	Natural Resources Conservation Service
NRI	–	Nationwide Rivers Inventory
NWI	–	National Wetlands Inventory
NWP	–	Nationwide Permit
NWR	–	National Wildlife Refuge
NYAC	–	New York Archaeological Council
NYC	–	New York City
NYCRR	–	New York Code of Rules and Regulations
NYMA	–	New York Metropolitan Area
NYMTC	–	New York Metropolitan Transportation Council
NYNHP	–	New York Natural Heritage Program
NYS	–	New York State
NYSDEC	–	New York State Department of Environmental Conservation

NYSDOL	–	New York State Department of Labor
NYSDOS	–	New York State Department of State
NYSDOT	–	New York State Department of Transportation
NYSESD	–	New York State Empire State Development Corporation
NYSGIS	–	New York State Geographic Information System
NYSM	–	New York State Museum
NYSMPO	–	New York State Metropolitan Planning Organizations
NYSOPRHP	–	New York State Office of Parks, Recreation, and Historic Preservation
O&M	–	Operating and Maintenance
OCTC	–	Orange County Transportation Council
OMB	–	United States Office of Management and Budget
OTP	–	On-time performance
PA	–	Programmatic Agreement
PBS	–	New York State Petroleum Bulk Storage
PCB	–	Polychlorinated Biphenyl
PDCTC	–	Poughkeepsie-Dutchess County Transportation Council
PFC	–	Perfluorocarbons
PIP	–	Public Involvement Plan
PM	–	Particulate Matter
$PM_{2.5}$	–	Particulate Matter under 2.5 microns in size
PM_{10}	–	Particulate Matter under 10 microns in size
PPA	–	Pollution Prevention Act of 1990
ppm	–	Parts per Million
PRIIA	–	Passenger Rail Investment and Improvement Act of 2008
PTC	–	Positive Train Control
QDN	–	Milepost designation, Niagara Branch
QH	–	Milepost designation, 125 high speed corridor, Empire Corridor West
RCRA	–	U.S. Resource Conservation and Recovery Act
RCRIS	–	Resource Conservation and Recovery Information System
RECs	–	Recognized Environmental Conditions
RGRTA	–	Rochester Genesee Regional Transportation Authority
ROD	–	Record of Decision
RONY	–	Railroads of New York
ROW	–	Right-of-Way
RSIA	–	U.S. Rail Safety Improvement Act of 2008
RTA	–	Regional Transportation Authority

SAFETEA-LU	–	U.S. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SASS	–	Scenic Areas of Statewide Significance
SCFWH	–	Significant Coastal Fish and Wildlife Habitats
SE	–	State Endangered Species
SED	–	New York State Education Department
SEQR	–	New York State Environmental Quality Review Act
SF_6	–	Sulfur Hexafluoride
SHPA	–	New York State Historic Preservation Act of 1980
SHPO	–	State Historic Preservation Officer
SIP	–	State Implementation Plan
SMTC	–	Syracuse Metropolitan Transportation Council
S/NR	–	State/National Register of Historic Places
SO_2	–	Sulfur Dioxide
SPCC	–	Spill Prevention Control Plan
SPDES	–	State Pollutant Discharge Elimination System
SR	–	State Register of Historic Places
SSA	–	Sole Source Aquifer
ST	–	State Threatened Species
STB	–	Surface Transportation Board
STIP	–	Statewide Transportation Improvement Program
SWMP	–	Stormwater Management Plan
SWPPP	–	Stormwater Pollution Prevention Plan
TAP	–	Toxic Air Pollutant
TEA-21	–	Transportation Equity Act for the 21st Century
TEM	–	NYSDOT Environmental Manual
Tg CO_2e	–	Teragrams of Carbon Dioxide Equivalent
THPO	–	Tribal Historic Preservation Officer
TIGER	–	Transportation Investment Generating Economic Recovery
TIP	–	Transportation Improvement Program
TMDL	–	Total Maximum Daily Load
TOD	–	Transit Oriented Development
TRIS	–	Toxic Release Inventory System
UCTC	–	Ulster County Transportation Council
U.S.	–	United States
U.S. ACE	–	United States Army Corp of Engineers

U.S.C.	–	United States Code
USCG	–	United States Coast Guard
USDA	–	United States Department of Agriculture
U.S. DOT	–	United States Department of Transportation
U.S. EPA	–	United States Environmental Protection Agency
U.S. FWS	–	United States Fish and Wildlife Service
USGBC	–	United States Green Building Council
USGS	–	United States Geological Survey
UST	–	Underground Storage Tank
VHS	–	Very High Speed
VMT	–	Vehicle Miles Traveled
VOC	–	Volatile Organic Compound
WMA	–	Wildlife Management Area

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Glossary of Terms

100-Year Floodplain – The portion of the floodplain submerged by the statistical flood event with a 1 percent probability of occurring in any year.

Alightings – The number of passengers leaving a passenger vehicle at a station.

Aquifer – Rock or sediment that is saturated with water and sufficiently permeable to transmit economically significant quantities of water to wells and springs.

American Recovery and Reinvestment Act of 2009 (ARRA) – The American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5), enacted on February 17, 2009, appropriated a total of $787 billion, including $8 billion specifically for HSIPR and $1.3 billion for Amtrak capital grants. ARRA sought from states “shovel ready” transportation projects, among them programs and projects to advance high-speed rail.

Archaeological resources – Materials and objects that remain below the ground surface as evidence of the life and culture of historic, prehistoric, or ancient people, such as artifacts, structures, or settlements. Resources of concern are located in areas known or suspected to contain subsurface artifacts of pre-European or post-European settlement populations. Areas of expected moderate to high archaeological sensitivity according to various factors including present and past topography, exposure, slope, distance to water, and availability of food.

At-grade – The intersection of two roads, or a road and a railway, that cross at the same elevation.

Attainment area – A geographic area in which levels of a criteria air pollutant meet the health-based primary standard (National Ambient Air Quality Standard) for the pollutant. Attainment areas are defined using federal pollutant limits set by the U.S. Environmental Protection Agency.

Automatic Block Signaling (ABS) – A block system that consists of a series of signals that divides a railway line into a series of blocks and then functions to control the movement of trains between them through automatic signals. ABS operation is designed to allow trains operating in the same direction to follow each other in a safe manner with greatly reduced risk of rear end collision while reducing costs and increasing capacity from previous manual block systems that require human operators.

Best Management Practice (BMP) – A structural and/or management practice employed before, during and after construction to protect receiving water quality. These practices either provide techniques to reduce soil erosion or remove sediment and pollutants from surface runoff.

Biodiversity – The diversity of genes, species, and ecosystems. This term includes the entire hierarchy of ecological organization, and encompasses regional ecosystem diversity (landscape diversity), local ecosystem diversity (community diversity), species diversity, and genetic diversity within populations of a species.

Block – A block is a group of rail cars all destined to a specific location or yard. A through freight train that is not a unit train typically has several blocks of cars. At Dewitt, the many intermodal trains that run on this line from distant points often add or drop blocks of cars that match the train’s destination. Essentially, the trains are swapping blocks with each other – block swapping.

Boardings – The number of passengers entering a passenger vehicle at a station.

Cab Signaling – A system of signaling devices located in a train operator's compartment or cab, indicating a condition affecting the movement of a train or engine and used in conjunction with interlocking signals and either in conjunction with or in lieu of wayside block signals.

Canadian Pacific Railway – A major freight rail carrier that operates in New York State, and is the host railroad for Amtrak trains between Schenectady and Rouses Point.

Car Mile – A single vehicle, such as a railroad car, moved one mile (also see "Train Mile").

Carbon Dioxide – Carbon dioxide (CO_2) is the primary greenhouse gas (GHG) pollutant of concern from anthropogenic (man-made) sources. Although not the GHG with the strongest effect per molecule, 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 anthropogenic), 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.

Carbon Dioxide Equivalent (CO_2e) – To present a complete inventory of all GHGs, component emissions are added together and presented as CO_2 equivalent (CO_2e)—a unit representing the quantity of each GHG weighted by its effectiveness using CO_2 as a reference. This is achieved by multiplying the quantity of each GHG emitted by a factor called global warming potential (GWP). GWPs account for the lifetime and the radiative forcing of each chemical over a period of 100 years (e.g., CO_2 has a much shorter atmospheric lifetime than SF_6, and therefore has a much lower GWP).

Carbon Monoxide (CO) – A colorless, odorless, tasteless gas formed in large part by incomplete combustion of fuel. Full combustion activities (i.e. transportation, industrial processes, space heating, etc.) are the major sources of CO.

Center Island Platform – A passenger platform located between two tracks so that it can serve them both.

Centerline – The midpoint in a cross-sectional view of a right-of-way, roadway, or railroad track, see also "Track Centers, Distance Between."

Class I Railroad – The Surface Transportation Board (STB) defines a Class I railroad in the United States as "having annual carrier operating revenues of $250 million or more" after adjusting for inflation using a Railroad Freight Price Index developed by the Bureau of Labor Statistics (BLS). According to the Association of American Railroads (AAR), Class I railroads had minimum carrier operating revenues of $378.8 million (USD) in 2009. Smaller railroads are assigned to Class II or III.

Classification Yard – A rail terminal facility, usually consisting of a system of turnouts (which see) and parallel tracks, used for sorting freight cars by destination and for assembling trains.

Combined Statistical Area (CSA) – A grouping of adjacent metropolitan and/or micropolitan statistical areas (MSAs) in the United States and Puerto Rico. The United States Office of Management and Budget (OMB) defines combined statistical areas based on social and economic ties measured by commuting patterns between adjacent MSAs. The areas that combine retain their own designations as metropolitan or micropolitan statistical areas within the larger combined statistical area. The primary distinguishing factor between a CSA and an MSA is that the social and economic ties between the individual MSAs within a CSA are at lower levels than between the counties within an MSA.

Coniferous – Any of various mostly needle-leaved or scale-leaved, chiefly evergreen, cone-bearing gymnospermous trees or shrubs such as pines, spruces, and firs.

Container on Flat Car – A form of intermodal freight transportation (which see) in which freight containers are carried on railroad cars equipped for that purpose; may be arranged to handle a single level of containers or double-stacked containers (see "Double-Stack Car").

Control Point – An interlocking, or the location of a track signal or other marker, the indications of which dispatchers can specify when controlling trains.

Cooperating Agency – Any federal, state or local agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative.

Critical Environmental Area (CEA) – An area designated as a CEA under the New York State Environmental Quality Act by state and local agencies must have one or more of the following exceptional or unique characteristics: 1) A benefit or threat to human health; 2) A natural setting; 3) Agricultural, social, cultural, historic, archaeological, recreational, or educational values; or 4) An inherent ecological, geological or hydrological sensitivity to change that may be adversely affected by any change.

CSX Transportation, Inc. (CSXT) – A major rail freight carrier with largest market share in New York State, and host railroad for Amtrak trains between Poughkeepsie and Niagara Falls.

Daily Trains per Route – The number of trains traversing a defined railroad line or section of line during a specified 24-hour period.

dBA – An abbreviation for A-weighted decibel. The decibel is a unit used to describe sound pressure levels on a logarithmic scale. For community noise impact assessment, an A-weighted frequency filter is used to approximate the way humans hear sound.

Deciduous – Refers to woody vegetation, such as oak or maple trees, that shed their leaves after the growing season.

Double-Ended Rail Yard – A rail yard in which a train can enter at one end and exit at the other.

Double-Stack Car – A railroad freight car that provides a frame in which a freight container can be placed and secured, with provisions and clearances to allow a second container to be placed and secured on top of the first container.

Draft Environmental Impact Statement (Draft EIS) – The document prepared by the Federal Railroad Administration (FRA) in accordance with the National Environmental Policy Act (NEPA) regulations. These regulations require that the EIS evaluate all reasonable alternatives considered, discuss the reasons that alternatives have been eliminated from detailed study, summarize the studies, reviews, consultations, and coordination required by environmental laws and Executive Orders.

Dual Mode Locomotive – Railroad locomotive that can switch from electric to diesel operation for power generation.

Empire Project Advisory Committee (EPAC) – Advisory Committee consisting of representatives from key federal/state agencies, key railroads, and statewide organizations representing regional governments.

Endangered Species – Any species which is in danger of extinction throughout all or a significant portion of its range.

Environmental Justice – Executive Order 12898 requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing… disproportionately high and adverse human health or environmental impacts on minority populations and low-income populations."

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity**,** as defined by the regional Fishery Management Council.

Excepted track – In addition to nine numbered classes, FRA track standards also provide for "excepted" track, which carries a 10 miles per hour speed limit for freight but cannot be used by revenue passenger trains. FRA permits excepted track under very narrowly defined conditions.

Farmland of Statewide Importance – Land other than prime farmland but that is also highly productive. This is land, in addition to prime farmland, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops.

Farmland Protection Policy Act (FPPA) – A statute enacted in 1981 by the United States Congress to ensure that significant agricultural lands are protected from conversion to non-agricultural uses. For highway projects receiving federal aid, the regulations promulgated under the FPPA (7 CFR Part 658, 1984) require a state highway authority (NYSDOT) to coordinate with the USDA Natural Resources Conservation Service. The FPPA regulates four types of farmland soils; prime farmland, unique farmland, farmland of state-wide importance, and farmland of local importance.

Farmland Soils – Soils suited to producing crops; those with soil quality, growing season and moisture supply needed to produce a sustainable yield when treated and managed using acceptable methods. Specifically, farmland soils are those soil types designated by the Natural Resources Conservation Service (NRCS) in accordance with the Farmland Protection Policy Act (FPPA) of 1981 and the implementing regulations of the United States Department of Agriculture (USDA).

Federal Emergency Management Agency (FEMA) – A federal agency that regulates federal actions in floodplains.

Federal Highway Administration (FHWA) – The branch of the U.S. Department of Transportation responsible for administering the funding of federal-aid highway projects.

Federal Railroad Administration (FRA) – The FRA was created by the Department of Transportation Act of 1966 (49 U.S.C. 103, Section 3(e)(1)). The purpose of the FRA is to: promulgate and enforce rail safety regulations; administer railroad assistance programs; conduct research and development in support of improved railroad safety and national rail transportation policy; provide for the rehabilitation of Northeast Corridor rail passenger service; and consolidate government support of rail transportation activities.

Filleting – On double-stack container trains, taking off the top row of containers for intermodal freight rail.

Final Environmental Impact Statement (Final EIS) – The document prepared after circulation of a draft EIS and consideration of comments received. FRA NEPA regulations require that the FEIS identify a preferred alternative, evaluate all reasonable alternatives considered, discuss and respond to substantive comments on the draft EIS, summarize public involvement, and describe the mitigation measures that will be incorporated into the proposed action.

Floodplain – The level area adjoining a river channel that is inundated during periods of high flow.

Freight Train Mile – A freight train operating one mile (also see "Train Mile").

Geographic Information System (GIS) – A computer-based application used to perform spatial analysis.

Grade – The slope of a railway or road along the direction of travel, normally characterized by the vertical rise per unit of longitudinal distance.

Grade Crossing – A crossing or intersection of highways, railroad tracks, other guideways, or pedestrian walks, or combinations of these at the same level or grade.

Grade separation – The intersection of two roads, or a road and a railway, that cross at different elevations. One roadway passes above or under the other roadway with an overpass or underpass structure.

Greenhouse Gas (GHG) Emissions – Any or all of several gases that negatively affect ambient air quality when released into the atmosphere as part of the exhaust gases and smoke thrown off by internal combustion engines used to propel transportation vehicles. Water vapor, carbon dioxide (CO_2), nitrous oxide, methane, and ozone are the primary greenhouse gases in the Earth's atmosphere.

Gross Domestic Product (GDP) – Gross Domestic Product is one of the major economic indices of the socio-economic development of a region. GDP is equal to the total of added values in the regional economic industries, estimated as a difference between production and intermediate consumption.

Gross Tons – The total weight of a vehicle and the lading, if any, that it is carrying, i.e., the sum of Tare Weight and Revenue Tons (which see).

Gross Tons per Year – The total weight of lading and vehicles carried over a roadway or railroad line of track during a one-year period.

Groundwater Protection Areas – Areas of land designated by water resource agencies through which rainwater or snowmelt percolates to replenish the underlying aquifer in the area of a public well. These areas require special protection because they directly affect the quality and safety of the public drinking water supply.

High-Level Platform – A passenger station platform whose surface is at the same elevation above the rail as the floor of conventional railroad passenger cars, typically 51 inches, to enable stepless boarding and alighting in conformance with ADA requirements.

High Speed Intercity Passenger Rail (HSIPR) Program – The Federal Railroad Administration (FRA) launched the HSIPR Program in June 2009. The HSIPR Program supports a series of strategic transportation goals: building a foundation for economic competitiveness; ensuring safe and efficient transportation choices; promoting energy efficiency and environmental quality; and supporting interconnected livable communities. In the long-term, HSIPR Program funding is intended to build an efficient, high-speed passenger rail network connecting major population centers 100 to 600 miles apart. In the near-term, the program will aid in economic recovery efforts and lay the foundation for this high-speed passenger rail network through planning studies and targeted investments in existing intercity passenger rail infrastructure, equipment, and intermodal connections.

Historic resources – Properties, structures and districts that are listed in or have been determined to be eligible for listing in the National Register of Historic Places.

Interlocking – In rail systems, an arrangement of switch, lock, and signal devices that is located where rail tracks cross, join and/or separate. The devices are interconnected in such a way that their movements must succeed each other in a predetermined order, thereby preventing opposing or conflicting train movements.

Intermodal Freight Transportation – Goods that are loaded into a highway trailer or container, then shipped from origin to destination by moving the trailer or container via some combination of road, rail marine and/or (rarely) air transport.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) – The Intermodal Surface Transportation Efficiency Act of 1991 (Public Law 102-240; ISTEA, pronounced *Ice-Tea*) is a **United States federal law** that posed a major change to **transportation planning** and **policy**, as the first U.S. federal legislation on the subject in the post-**Interstate Highway System** era. It presented an overall intermodal approach to highway and transit funding with collaborative **planning**

requirements, giving significant additional powers to **metropolitan planning organizations**. Signed into law on December 18, 1991 by President George H. W. Bush, it expired in 1997. It was preceded by the **Surface Transportation and Uniform Relocation Assistance Act of 1987** and followed by the **Transportation Equity Act for the 21st Century** (**TEA-21**) and most recently in 2005, the **Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)**

Interstate – A limited access highway that is part of the National System of Interstate and Defense Highways ("Interstate Highway System").

Interstate Highway System – The network of Interstate Highways established by the Federal-Aid Highway Act of 1956. The statute established a 41,000-mile network of controlled-access highways (expanded to 42,000 miles by legislation in 1968) intended to connect all metropolitan areas with populations greater than 50,000 and all state capitals.

Land and Water Conservation Fund – A system for funding Federal, State and local parks and conservation areas, created by the Land and Water Conservation Fund Act of 1964.

Magnuson-Stevens Fisheries Conservation and Management Act – Legislation (16 U.S.C. 1855(b)) governing all fisheries resources within 320 kilometers (200 miles) of the U.S. coast that established regional Fishery Management Councils and required the preparation of Fisheries Management Plans.

Main Track – A principal track over which all or most of a railroad line's train traffic moves. Depending on traffic volume, railroad lines may have a single main track, or two or multiple main tracks.

Maintenance of way – The upkeep and repair of a railroad's fixed property (such as tracks and bridges); the process of maintaining railroad roadbed (such as rail, ties, ballast, bridges, etc.).

Maximum Authorized Speed (MAS) – The top speed (mph) at which trains are allowed to operate in a particular section of track; generally specified in the employees' timetable.

Meet – An operating event wherein two trains, one running in each direction, pass each other; can occur without restriction on a line with two or more main tracks, but must occur at a passing siding on a line with a single main track.

Metro North Railroad (Metro-North) – The unit of the New York Metropolitan Transportation Authority that operates commuter rail lines serving Grand Central Terminal. Metro-North is the host railroad for Amtrak trains between Spuyten Duyvil and Poughkeepsie.

Metropolitan Statistical Area (MSA) – As defined by the United States Office of Management and Budget, a MSA includes at least one city with 50,000 or more inhabitants, or an urbanized area (of at least 50,000 inhabitants), and a total metropolitan population of at least 100,000. Each MSA has its own metropolitan planning organization as decreed by federal law.

Mitigation – Actions that avoid, minimize, or compensate for potential adverse impacts.

Multi-modal – The act of providing alternative modes or choices of transportation service, such as automobile, bus, rail, taxi, etc.

National Ambient Air Quality Standards (NAAQS) – The prescribed level of pollutants in the outside air that cannot be exceeded during a specified time in a specified geographic area.

National Environmental Policy Act of 1969, as amended (NEPA) – The federal legislation that requires an interdisciplinary approach in planning and decision-making for federal-aid actions. The Act includes requirements for the contents of environmental impact statements that are to accompany every recommendation for major federal actions significantly affecting the quality of the human environment. The interdisciplinary study approach includes the analysis of potential impacts to the natural, social and economic environment.

National Heritage Area – Established by Congress to promote historic preservation and an appreciation of the history and heritage of designated sites. National Heritage Areas are administered by state or local governments or non-profit or private corporations and are not federally owned and managed.

National Historic Landmark (NHL) – A historic building, site, structure, object, or district that represents an outstanding aspect of American history and culture.

National Historic Site – Usually, a national historic site contains a single historical feature that was directly associated with a person or family of historical significance. These areas may also be associated with specific historic periods that are important in American history.

National Memorial – A place designated by the U.S. Congress for protection as a memorial to a historic person or event.

National Natural Landmark (NNL) – The National Registry of Natural Landmarks includes nationally significant geological and biological features.

National Priority List (NPL) – The "Superfund" statute (42 U.S.C. Sect. 9601) requires the EPA to establish a National Priorities List of sites which are to be given top priority consideration for removal of hazardous substances and remedial action.

National Register of Historic Places – A list of structures, sites and districts of national historical significance as determined by the Advisory Council on Historic Preservation under the National Historic Preservation Act.

National Wetlands Inventory (NWI) – A program administered by the U.S. Fish and Wildlife Service for mapping and classifying wetland resources in the United States.

National Wildlife Refuge – The National Wildlife Refuge System, managed by the U.S. Fish and Wildlife Service, is the nation's system of public lands and waters set aside to conserve fish, wildlife and plants.

Natural Resources Conservation Service (NRCS) – Formerly the Soil Conservation Service, NRCS is a unit within the United State Department of Agriculture that is responsible for administering the Farmland Protection Policy Act.

Nitrogen Oxides (NO_x) – Nitric oxide (NO) and Nitrogen dioxide (NO_2) are collectively referred to as oxides of nitrogen (NOx). NO forms during high temperature combustion processes. NO2 forms when NO further reacts in the atmosphere. NOx reacts with the sunlight to form ozone, a colorless gas associated with smog or haze conditions. Ozone is a pollutant regulated by the Clean Air Act Amendments of 1990.

Noise receptor – Locations that may be affected by noise: sensitive receptors include residences, parks, schools, churches, libraries, hotels, and other public buildings.

Non-Attainment Area – A geographic area in which levels of a criteria air pollutant fail to meet the health-based primary standard (National Ambient Air Quality Standard) for the pollutant. Non-Attainment areas are defined using federal pollutant limits set by the U.S. Environmental Protection Agency.

On-Time Performance – Arrival time of a public transportation vehicle at an intermediate or final destination station at the time designated in the operating timetable for that event. For contract enforcement purposes, usually taken to mean arrival at the trip's final destination station at or no more than a specified number of minutes after the published arrival time.

Overhead Bridges – With reference to the railroad tracks, overhead bridges are bridges that carry another feature, such as a road, over the referenced tracks.

Overtake – An operating event wherein a faster train passes a slower train running in the same direction; can occur between appropriately placed crossovers on a line with two or more main tracks, but must occur at a passing siding on a line with a single main track.

Ozone – A gas which is a variety of oxygen. Ozone is a pollutant regulated by the Clean Air Act Amendments of 1990. Ground-level ozone is the main component of smog. Ozone is not directly emitted by motor vehicles, but is formed when oxides of nitrogen react with sunlight.

Participating Agency – A federal, state, tribal, or local government agency that may have an interest in the project.

Passenger Mile (PM) – A basic unit of productivity defined as one passenger riding one mile.

Passenger Miles Traveled (PMT) – PMT is a measure of passenger demand and trip length. One passenger traveling one mile constitutes one passenger-mile. One passenger riding ten miles = 10 PMT; 50 passengers each riding 100 miles = 5,000 PMT.

Passenger Rail Investment and Improvement Act of 2008 (PRIIA) – PRIIA was enacted in 2008 as Public Law 110-432. PRIIA authorized a high-speed grant program for FY 2009 through FY 2013 to improve intercity passenger rail service, operations and facilities. PRIIA also directed the U.S. Secretary of Transportation to develop a long-range national rail plan that is consistent with approved State rail plans and the rail plans of the nation.

Passing Track – A track adjacent to a main or secondary track used primarily for trains to execute meet or overtake movements.

Peak hour – The hour of the day when traffic volume on a given roadway is highest. A separate peak hour can be defined for morning and evening periods. On a public transportation facility, peak hour usually refers to the most heavily patronized hour of the operating day.

Pervious Surface – Relating to hydrology, a surface through which precipitation can penetrate into the ground, reducing direct runoff or perching (as compared to an impervious surface where no precipitation is able to penetrate into the ground, thereby making it necessary to collect more runoff into drainage systems). Some newer road surfacing mixes are designed to be pervious.

Positive Train Control (PTC) – A system that prevents train accidents due to operator errors. PTC consists of locomotive-borne electronic equipment linked to central office dispatching systems via wireless data networks. If a train operator exceeds his/her movement authority, the train is sent a wireless signal and is automatically stopped.

Prime Farmland – As defined by the USDA, land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.

Prime Farmland Soil – Soil map units that are designated by the Natural Resources Conservation Service as having the properties needed to produce sustained high yield crops when managed with modern farming techniques.

Protected Stream – A stream or small water body along a stream that has a water quality classification of C(T) (trout supporting waters) or higher and is subjected to the stream protection provisions of the NYSDEC Protection of Waters regulations.

Record of Decision (ROD) – The document, prepared by the Federal Highway Administration or Federal Railroad Administration, that presents the basis for the Federal agency action, summarizes any mitigation measures to be incorporated, and documents any required Section 4(f) approvals. No

Federal agency action may be undertaken until a Record of Decision has been signed. A Record of Decision is prepared no sooner than 30 days after the public release of the FEIS.

Revenue Tons – The portion a total vehicle weight represented by the weight of the lading the vehicle is carrying.

Ridership – The number of passengers using a vehicle (e.g., a train) or group of scheduled vehicles (e.g., several trains providing a complete schedule such as the *Empire Service*); may be measured for various units of time: per hour, day, week, month or year, depending on the intended use of the data.

Rolling Stock – The wheeled vehicles, both powered and unpowered, collectively used on a railway, including locomotives, passenger coaches, freight wagons and guard's vans.

Section 106 of the Historic Preservation Act (Section 106) – The National Historic Preservation Act of 1966 (16 U.S.C. 470f), Section 106, requires Federal agencies to take into account the effects of their undertakings on properties included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council on Historic Preservation the opportunity to comment on such undertakings.

Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C., Section 303) (Section 4(f)) – Legislation protecting publicly owned parks, public recreation areas, historic properties or wildlife and waterfowl refuges. The statute states that no Department of Transportation project may use land from these areas unless there is demonstrated to be no prudent and feasible alternative to using the land, and the project includes all possible planning to minimize harm resulting from the use.

Section 404 of the U.S. Clean Water Act (Section 404) – The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 401 et seq.) is the enabling legislation for protection of waters of the United States by the Army Corps of Engineers and the U.S. Environmental Protection Agency.

Section 6(f) of the U.S. Land and Water Conservation Fund Act (Section 6(f)) – Legislation that provides for the public purchase and preservation of tracts of land.

Service Road – A roadway, often a minimally graded and improved single lane, providing access to rubber-tired maintenance of way vehicles along a length of otherwise inaccessible railroad line.

Service Yard – A rail terminal facility, usually consisting of system of turnouts (which see) and parallel tracks, as well as driveways placed between the tracks for rubber-tired maintenance vehicles; used to store passenger trains between revenue runs, restock their supplies, and perform cleaning and other light servicing tasks.

Side Platform – A passenger platform located to the outside of the tracks, and normally serving only the track immediately adjacent to the platform.

Siding – A track adjacent to a main or secondary track, for meeting, passing, or storing cars or trains.

Significant Wildlife Habitat – Wildlife habitats, including deer wintering yards, waterfowl and wading bird habitat, seabird nesting habitat, and significant vernal pools, that are protected under 38 M.R.S.A. § 480-B.

Sole Source Aquifer (SSA) – An aquifer designated by EPA as the "sole or principal source" of drinking water for a given aquifer service area; that is, an aquifer that is needed to supply 50% or more of the drinking water for that area and for which there are no reasonably available alternative sources should the aquifer become contaminated.

Stakeholder – All parties with a vested interest in the project. Such parties include the general public, federal and state agencies, Amtrak, CSX, Metro-North Railroad and other railroads, transportation agencies/metropolitan planning organizations, elected officials, corridor municipalities, business and interested non-governmental organizations.

State Environmental Quality Review Act (SEQR) – A project review process that requires the sponsoring or approving governmental body to identify and mitigate the significant environmental impacts of the activity it is proposing or permitting.

State Implementation Plan (SIP) – A plan created under The 1990 Clean Air Act Amendments (CAAA) that establishes emission reduction requirements for ozone and carbon monoxide non-attainment areas. Proposed projects must demonstrate that the impacts of their emissions are consistent with the appropriate SIP.

Stormwater Pollution Prevention Plan (SWPPP) – A plan required for major construction projects under the EPA's National Pollutant Discharge Elimination System (NPDES) general permit for construction activities. The SWPPP is required to address measures to prevent erosion, sedimentation, and other potential discharges of pollutants to water bodies and wetlands.

Study Area – The area within and surrounding the project corridor that was studied for the purposes of determining project-related impacts to resources resulting from implementing any of the studied alternatives. The study area is centered about the existing or prospective rail line centerlines and varies from 300 feet to ½ mile in width, depending on the resource. The study area follows the existing railroad corridor for the 90 mph and 110 mph alternatives; while for the 125 mph alternative, the prospective railroad corridor follows a markedly different alignment through the Empire Corridor West.

Teragrams of Carbon Dioxide Equivalent – Equivalent to one million metric tons of carbon dioxide equivalent, unit used in greenhouse gas analysis.

Terminal Facility – The station, platforms and associated tracks, and Service Facility (which see) provided at or in the vicinity of the end station on a railroad or other public transportation route.

Threatened Species – Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Tiering – Staged environmental review process applied to the environmental review of complex projects.

Tier 1 EIS – Intent in the Tier 1 EIS is to make corridor-level decisions regarding the level of intercity passenger rail service provided in the corridor and evaluate and identify conceptual alternatives to be further considered in the Tier 2 NEPA document(s).

Tier 2 – The Tier 2 NEPA document(s) would explore in greater detail the component projects of the preferred corridor-level alternatives chosen in Tier 1. Tier 2 would include analysis based on engineering designs, identification of site-specific environmental consequences, and development of site-specific mitigation measures for the preferred alternative.

Tonnage – Weight, as measured in short tons (1 short ton = 2,000 pounds).

Track Centers, Distance Between – Measured distance in feet or meters between the centerlines of two adjacent and parallel railroad tracks.

Track Class – The track safety standards of the FRA establish nine specific classes of track (Class 1 to Class 9), plus a category known as Excepted Track. The difference between each Class of Track is based on progressively more exacting standards for track structure, geometry, and inspection frequency. Railroads determine the Class of Track to which each segment of track belongs based on business and operational considerations. Once the designation is made, FRA holds railroads accountable for maintaining the track to the corresponding standards for that particular class.

Train Mile – A consist of a locomotive with or without coupled railroad cars moved together one train mile. A train of one locomotive and five cars moved one mile will generate one train mile, one locomotive mile, five car miles, and six vehicle miles (also see "Car Mile").

Transportation Equity Act for the 21st Century (TEA-21) – The Transportation Equity Act for the 21st Century was enacted June 9, 1998 as Public Law 105-178. TEA-21 authorizes the Federal surface transportation programs for highways, highway safety, and transit (including intercity rail passenger projects) for the 6-year period 1998-2003. The TEA 21 Restoration Act, enacted July 22, 1998, provided technical corrections to the original law.

Transportation Improvement Program (TIP) – A staged multiyear program of transportation projects funded by the Federal Highway Administration and Federal Transit Administration.

Travel Time – The elapsed time for a passenger or a vehicle to move between two defined points; an "origin" and a "destination." May be broken down into sub-units describing portions of a trip, e.g.:

- Trains: Running times between each pair of passenger stations.
- Passengers: Sub-parts of an origin-to-destination trip, e.g.: Origin Access Time (origin to bus stop); Feeder (bus to railroad station); Line Haul (train to destination city); Destination Access (walk or taxi or bus from railroad station to destination).

Turnout – A track switch allowing movement of a railroad train from one track to another.

Undergrade Bridges – With reference to the railroad tracks, undergrade bridges are bridges that carry the referenced tracks over another feature such as a road, water bodies, other railroad tracks, etc.

Unit Train – A railroad freight train of uniform consistency that remains coupled, and that transports a single commodity directly from producer to a specific destination and that, after unloading, returns to the point of origin ready for another load.

United States Army Corps of Engineers (U.S. ACE) – A federal agency that administers Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act; its regulatory programs address wetlands and waterways protection.

United States Department of Agriculture (USDA) – A federal agency responsible for administering programs that address farming issues

United States Environmental Protection Agency (U.S. EPA) – A federal agency responsible for administering programs that address environmental issues.

United States Fish and Wildlife Service (U.S. FWS) – A federal agency responsible for addressing the protection of fish and wildlife including rare, threatened, or endangered species. The USFWS plays an advisory role in the Section 404 regulatory program administered by the U.S. Army Corps of Engineers.

United States Geological Survey (USGS) – A scientific agency of the United States Government tasked with studying the landscape of the United States, its natural resources, and the natural hazards that threaten it. The USGS is a fact-finding research organization with no regulatory responsibility.

Vehicle miles traveled) – The number of vehicle miles of travel (VMT) is an indicator of the travel levels on the roadway system by motor vehicles. VMT is estimated for the given time period. This estimate is based upon traffic volume counts and roadway length.

Vernal pool – A naturally occurring temporary pool of surface water that provides breeding habitat for certain amphibian and invertebrate species.

Volatile Organic Compounds (VOCs) – Colorless gaseous compounds originating, in part, from the evaporation and incomplete combustion of fuels. In the presence of sunlight VOCs react to form ozone, a pollutant regulated by the Clean Air Act Amendments.

Watershed – A region or area that contains all land ultimately draining to a water course, body of water, or aquifer.

Wetland – Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wildlife Management Area (WMA) – Lands owned by New York State under the control and management of the New York State Department of Environmental Conservation’s Division of Fish, Wildlife and Marine Resources. These lands have been acquired primarily for the production and use of wildlife although most WMA’s also provide good opportunities for hiking, cross-country skiing, bird watching, or quiet enjoyment of nature.

Wild and Scenic River – A river or river segment, designated by the National Park Service, because of the outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values (16 U.S.C. 1271-1287).

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