ES Executive Summary

ES-1. Introduction

The Federal Railroad Administration (FRA) and the New York State Department of Transportation (NYSDOT) are preparing a tiered Environmental Impact Statement (EIS) to evaluate proposed system improvements to intercity passenger rail services along the 463-mile Empire Corridor, connecting Pennsylvania (Penn) Station in New York City with Niagara Falls Station, 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, and Congress funded $8 billion through ARRA. Congress continued to fund annual appropriations totaling $2 billion for fiscal years 2009 and 2010, using the framework developed by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).

The 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 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).

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. Subsequent phases, or tiers, will analyze, at a greater level of detail, site-specific proposals based on the decisions made in Tier 1.

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 EIS to evaluate high-speed passenger rail service along the Empire Corridor. Each alternative analyzed in the EIS contains the same set of enhancements for the Empire Corridor South (south of Albany/Rensselaer). Those enhancements were developed and

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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.
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), the 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 Draft 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” (“Agreements”) (attached as Appendix J).

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

The Empire Corridor connects New York City with the largest cities in New York state, extending north through 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 Montgomery, Herkimer, Madison, Cayuga, Wayne, Monroe, and Genesee.

- **The Niagara Branch** extends 27 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 speedway between Albany and Buffalo carrying passenger and freight trains on express and local tracks.
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 CSX Transportation, Inc. (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 busiest commuter railroad in the United States based on ridership, operates the Hudson Line commuter rail service between Poughkeepsie and Grand Central Terminal, cross-town from Penn Station. Metro-North operates between roughly 50 (weekend) and 77 (weekday) daily roundtrips along the Hudson Line. Amtrak operates 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 (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.

Amtrak operates 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).

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, and delays resulting from pervasive conflicts with freight traffic. As a result, it is not viewed by travelers as a viable, 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 37 percent (387,304 passengers) over 10 years to total more than 1.4 million passengers in 2011. 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 2020 also indicate projected increases of 28 percent. 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.

Existing conditions limit Empire Corridor service. Simulated existing (2008, pre-recession) 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. Simulated existing freight 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.4

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. Currently, 13 weekday trips are available, with the earliest Albany arrival time of approximately 9:30 a.m.; this limited service does not accommodate business weekday schedules. Furthermore, although maximum authorized speeds 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 the majority 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

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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 of these alternatives are also considered, as presented in this Tier 1 Draft EIS, and will be an important factor in selecting the alternative to be advanced.

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,
- 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, in consultation with the Empire Project Advisory Committee, other agencies, and the public, will select an alternative which best meets the program needs.

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);
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• Develops criteria and screens alternatives to eliminate those that do not meet the purpose and need of the proposed action (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 (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).

If a Build Alternative is selected at the conclusion of the Tier 1 process, the follow-on Tier 2 NEPA documents will then explore in greater detail the component projects of the selected corridor-level alternative chosen in Tier 1. Tier 2 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 selected alternative. Input from the public and from reviewing agencies will be solicited during both tiers.

ES-3. Alternatives Considered

ES-3.1. Initial alternatives considered

NYSDOT considered alternatives relative to maximum passenger train speeds, service frequencies, and physical improvement projects. Initially, alternatives were developed according to FRA’s definitions of high-speed rail and intercity passenger rail service, labeled as Emerging, Regional, and Core Express:

• **Emerging**: Describes relatively frequent service to connect smaller communities, with speeds up to 90 mph, on tracks shared by freight, commuter, and intercity passenger rail;
• **Regional**: Describes relatively frequent service to connect mid-sized urban areas, with 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;
• **Core Express**: Describes frequent service to connect large urban areas, with speeds between 125 and 250 mph or more, on tracks dedicated for intercity passenger rail.

NYSDOT developed an initial range of possible alternatives within the framework of these categories and grouped according to six maximum authorized speed (MAS) groups. The six MAS groups are described below:

- **Using 79 mph** as the MAS represents what can be done with current track standards and in-cab signaling capacity. The program developed four alternatives in this category, including the Base (or "No Action") Alternative. The alternatives would use current vehicle technology with the possibility of integrated train sets, and would fall into FRA’s “Emerging” category.

- **Using 90 mph** as the MAS represents the next step up in track standards and in-cab signaling train control. The program developed two alternatives in this category. They would use current vehicle technology with the possibility of integrated train sets, and would fall into FRA’s “Regional” category.

- **Using 110 mph** as the MAS represents another step up in track standards. The program developed one alternative in this category. It would use current vehicle technology with the possibility of integrated train sets, and would fall into FRA’s “Regional” category.

- **Using 125 mph** as the MAS represents another step up in track standards and advanced train control. The program developed one alternative in this category. It would be the first speed threshold for electrically powered trains and would fall into FRA’s “Core Express” category.

- **Using 160 mph** as the MAS represents the practical upper limit of electrified dynamic tilt trains, such as the Amtrak Acela, which provide faster operating speeds on curves. The program developed one alternative in this category, which would fall into FRA’s “Core Express” category.

- **Using 220 mph** as the MAS represents the practical upper limit of high-speed rail operations seen in France, Germany, Spain, Japan, and China. The program developed one alternative in this category, which would fall into FRA’s “Core Express” category.

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 for further evaluation. These included the lower-speed 79 mph MAS 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 and are the focus of this 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) 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;
- Add New CP82, 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 proposed Albany-Rensselaer Station Fourth-Track Capacity improvements were also included in the Hudson Line Transportation Plan, but would be constructed whether the Empire Corridor program is built or not. Therefore, these improvements are included with the Base Alternative analysis.

Exhibit ES-4, which follows these descriptions, presents a tabular summary of service levels, ridership, and costs for the Base and Build Alternatives.

**ES-3.2.1. Base (No Action) Alternative**

The Base (No Action) Alternative analysis required by NEPA/SEQR regulations, 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 some operational and service improvements and consists of eight planned rail improvement projects funded under FRA HSIPR and TIGER grants to address previously identified capacity constraints. These improvements have been previously cleared by FRA in a series of Categorical Exclusions though are considered in this document to the extent they intertwine with the alternatives considered below.

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 5

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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 is estimated to be $290 million. The annual operations and maintenance (O&M) cost would be $103 million. With annual revenue estimated at $77 million, the annual deficit would be $26 million. The Base Alternative's estimated operating ratio, or the percent of O&M costs covered by revenue, would be 75 percent. The estimated annual subsidy per rider for the Base Alternative would be $16.25.

**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 the previous section, these improvements include elements originally proposed along Empire Corridor South as part of the Hudson Line Transportation Plan. Trains would operate at 90 mph MAS between Schenectady and Buffalo Exchange Street, and would continue to operate at existing speeds between Penn Station 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 persons in 2035. This would be a gain of 700,000 persons above the ridership projected in 2035 for the Base Alternative.

The capital cost of Alternative 90A is estimated to be $1.66 billion. The annual O&M cost would be $156 million. With annual revenue estimated at $119 million, the annual deficit would be $37 million. Alternative 90A's estimated operating cost ratio would be 76 percent, slightly more 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 $16.09.

**ES-3.2.3. Alternative 90B**

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 tracks would be located 15 feet north of the dedicated third track and have been designated with a MAS of 90 mph. Alternative 90B improvements again include those Empire Corridor South Hudson Line Transportation Plan elements common among all of the Build Alternatives, noted in the previous section of this Executive Summary.

Additional infrastructure specific to Alternative 90B 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 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 MAS between Albany, 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.

Similar to 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 persons in 2035. This would be a gain of approximately 300,000 persons above projected ridership for Alternative 90A and a gain of approximately 1 million persons above projected ridership for the Base Alternative.

The capital cost of Alternative 90B is estimated to be $5.58 billion. The annual O&M cost would be $171 million. With annual revenue estimated at $139 million, the annual deficit would be $32 million. Alternative 90B’s estimated operating ratio would be 81 percent, higher than both the Base Alternative and Alternative 90A. The estimated annual subsidy per rider for Alternative 90B would be $12.31, approximately 24 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 MAS. 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 MAS would be reduced to 90 mph. 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. Alternative 110 improvements again include those Empire Corridor South Hudson Line Transportation Plan elements common among all of the Build Alternatives, noted in the previous section of this Executive Summary.

Additional infrastructure specific to Alternative 110 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 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. Similar to 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 persons in 2035. This would be a gain of approximately 1.2 million persons above projected ridership for the Base Alternative and an increase of 200,000 persons over the projected ridership for Alternative 90B.

The capital cost of Alternative 110 is estimated to be $6.25 billion. The annual O&M cost would be $173 million. With annual revenue estimated at $149 million, the annual deficit would be $24 million, the lowest of all alternatives. Alternative 110’s estimated operating ratio would be 86 percent, the highest of all alternatives. The estimated annual subsidy per rider for Alternative 110 would be $8.57, 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 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 average speed along the new corridor’s express high-speed service only (including Hudson Line/Empire Corridor South and not including the existing Amtrak service which would be maintained) would be 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 MAS 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 persons 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 $14.71 billion. The annual O&M cost would be $304 million. With annual revenue estimated at $245 million, the annual deficit would be $59 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 $13.72, approximately 11 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 graphic comparison of the five alternatives, and Exhibit ES-4 presents a comparative analysis of service levels, ridership, and costs of the alternatives.

**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.

**ES-4.1. Meeting the Program’s Performance Objectives**

Exhibit ES-5 summarizes the effectiveness of the alternatives in meeting the program’s performance objectives using the qualitative rating system. The Base Alternative is shown for comparison.
The projects constructed under the Base Alternative will represent an improvement over existing conditions. However, when compared to the Build Alternatives, the Base Alternative will not provide service levels sufficient to meet the purpose and need of the High Speed Rail Empire Corridor Program 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 High Speed Rail Empire Corridor Program’s performance objectives and goals:

### Exhibit ES-4—Comparative Analysis of Alternatives

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Base</th>
<th>90A</th>
<th>90B</th>
<th>110</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service Levels</strong> (In round-trips/day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NYC to Albany</td>
<td>13</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>Albany to Buffalo</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>15 (express) 4 (regional)</td>
</tr>
<tr>
<td>Albany to Niagara Falls</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Average Speed NYC to Niagara Falls (mph)</td>
<td>51</td>
<td>57</td>
<td>61</td>
<td>63</td>
<td>77 (express) 53 (regional)</td>
</tr>
<tr>
<td>Travel Time: NYC to Niagara Falls (hours: minutes)</td>
<td>9:06</td>
<td>8:08</td>
<td>7:36</td>
<td>7:22</td>
<td>6:02 (express) 8:40 (regional)</td>
</tr>
<tr>
<td>Time Savings Compared to Base Alternative</td>
<td>-</td>
<td>58</td>
<td>1:30</td>
<td>1:44</td>
<td>3:04 (express) 2:6 (regional)</td>
</tr>
<tr>
<td>On-Time Performance</td>
<td>83.0%</td>
<td>92.4%</td>
<td>95.4%</td>
<td>94.9%</td>
<td>100% (express) 83.0% (regional)</td>
</tr>
<tr>
<td><strong>Ridership (Annual One Way)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (2035)</td>
<td>1.6 million</td>
<td>2.3 million</td>
<td>2.6 million</td>
<td>2.8 million</td>
<td>4.3 million</td>
</tr>
<tr>
<td>Increase as Compared to Base Alternative</td>
<td>-</td>
<td>0.7 million (44%)</td>
<td>1.0 million (63%)</td>
<td>1.2 million (75%)</td>
<td>2.7 million (169%)</td>
</tr>
<tr>
<td><strong>Costs</strong>¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Costs (Billions)</td>
<td>$0.290</td>
<td>$1.66</td>
<td>$5.58</td>
<td>$6.25</td>
<td>$14.71</td>
</tr>
<tr>
<td>O&amp;M Costs, Annual (Millions)</td>
<td>$103</td>
<td>$156</td>
<td>$171</td>
<td>$173</td>
<td>$304</td>
</tr>
<tr>
<td>Revenue, Annual (Millions)</td>
<td>$77</td>
<td>$119</td>
<td>$139</td>
<td>$149</td>
<td>$245</td>
</tr>
<tr>
<td>Total Annual [Deficit]/Surplus (Millions)</td>
<td>[$26]</td>
<td>[$37]</td>
<td>[$32]</td>
<td>[$24]</td>
<td>[$59]</td>
</tr>
<tr>
<td>Operating Ratio (% of O&amp;M costs covered by revenue)</td>
<td>75%</td>
<td>76%</td>
<td>81%</td>
<td>86%</td>
<td>81%</td>
</tr>
<tr>
<td>Cost Effectiveness (Annualized O&amp;M Cost per Rider)</td>
<td>$64.38</td>
<td>$67.83</td>
<td>$65.77</td>
<td>$61.79</td>
<td>$70.70</td>
</tr>
<tr>
<td>[Subsidy]/Surplus per Rider (rounded)</td>
<td>[$16]</td>
<td>[$16.]</td>
<td>[$12.]</td>
<td>[$9]</td>
<td>[$14]</td>
</tr>
</tbody>
</table>

¹ Capital Costs are in 2015 dollars
### Exhibit ES-5—Effectiveness of Alternatives in Meeting Performance Objectives

<table>
<thead>
<tr>
<th>Objective/Alternative</th>
<th>Base</th>
<th>90A</th>
<th>90B</th>
<th>110</th>
<th>125&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve System-Wide On-Time Performance</td>
<td>X</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★/X (Express/Regional)</td>
</tr>
<tr>
<td>Reduce Travel Time</td>
<td>O</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>★/+ (Express/Regional)</td>
</tr>
<tr>
<td>Increase Service Frequency</td>
<td>X</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>★/+ (Express/Regional)</td>
</tr>
<tr>
<td>Attract Ridership</td>
<td>O</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Reduce Automobile Trips</td>
<td>O</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>★</td>
</tr>
<tr>
<td>Minimize Impact on Freight Rail Service</td>
<td>O</td>
<td>O</td>
<td>+</td>
<td>+</td>
<td>O</td>
</tr>
</tbody>
</table>

Notes:

<sup>1</sup> Performance on the new express service and the legacy regional service will differ, as explained in Chapter 6.

Rating System: ★ Strongly supports program goals and objectives; + Supports program goals and objectives; O Neutral regarding program goals or objectives; X Contrary to program goals or objectives

- The **Base Alternative** would result in the lowest annual ridership of all the alternatives, at 1.6 million (year 2035). All Build Alternatives would 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: 06 minutes between New York City and Niagara Falls).

- The **Base Alternative** would not result in improved service frequencies. The Base Alternative would not provide any improvement in scheduled service. All other alternatives would increase the number of daily trains operated as 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. Auto diversions increase in direct response to increasing average speed and reduced trip times among major origin/destination pairs.

- Delivering only 83 percent 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.
The following summarizes the effectiveness of the **Build Alternatives** in meeting the program’s stated goals and performance objectives.

- **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 by passenger trains. 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 many important track, signal, yard, and grade-crossing improvements are 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 and would be contrary to the goal of improving system-wide on-time performance. Alternative 125 would be neutral in terms of minimizing impact on freight rail service. 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 2035, 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, around 2025. Even then, for travelers destined for Rochester or Buffalo/Niagara Falls, true high-speed service would not be available until 2030 or possibly later. During the period of its construction, travelers would continue to 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.
ES-4.2. **Comparison of Operational Performance and Costs**

Selecting a preferred alternative among several options involves weighing and balancing costs and impacts against operational and mobility benefits. Exhibit ES-4 presents a tabular summary of performance measures for each alternative, such as 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: 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 ES-4 include:

- **Alternative 110 produces the greatest transportation benefits at the lowest per-rider cost subsidy; at approximately $9 per trip**, which would be 25 percent less than the next most cost-effective Alternative 90B ($12 per trip) and just over 43 percent less than the Base Alternative value ($16.25 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 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 their benefits on the entire rail traveling population.

- **Alternative 125 is the most costly alternative:** at $14.71 billion, it would cost more than twice as much as the next most costly alternative (Alternative 110).

- **The Base Alternative has 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, around 2025. Other alternatives begin conferring benefits within 2 to 5 years of the start of construction, likely in the 2015 to 2020 time period, 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. Average trip times would show the greatest improvement under Alternative 110. Freight train travel time variability, a measure of service reliability, is expected to be similar across all five alternatives.

**ES-4.3. Potential Environmental Impacts**

This Tier 1 EIS identifies a broad, corridor-level overview of potential 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. Upon selection of an alternative at the conclusion of this Tier 1 evaluation, the quantitative extent of impacts 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. Alternatives 90B would involve work extending outside of the right-of-way, and impacts would be even greater with track construction extending further outside of the right-of-way with Alternative 110. 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 extends over the existing Empire Corridor. If Alternative 125 is selected for further consideration, design in Tier 2 will be advanced and will consider ways to further avoid and minimize impacts associated with this alternative.

Details of the social, cultural, and natural resource impacts of each alternative are discussed in Chapter 4 of this document, and a brief overview of the environmental impacts of the alternatives is provided in the following section. Exhibit 6-11 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

<table>
<thead>
<tr>
<th>Alternative/Impact Area</th>
<th>Base</th>
<th>90A</th>
<th>90B</th>
<th>110</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>Community</td>
<td>L</td>
<td>L</td>
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<td>H</td>
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<td>H</td>
<td>M¹</td>
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<td>L</td>
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<td>M</td>
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<td>M</td>
<td>M</td>
<td>H</td>
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<tr>
<td>Floodplains</td>
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<td>L</td>
<td>M</td>
<td>M</td>
<td>H</td>
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<tr>
<td>Wetlands</td>
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<td>L</td>
<td>M</td>
<td>M</td>
<td>H</td>
</tr>
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<td>Wildlife</td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>Air Quality</td>
<td>L</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Noise/Vibration</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>H</td>
</tr>
</tbody>
</table>

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.

- **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 is selected for further consideration, additional location analyses will 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. Alternative 90B would affect approximately 9 areas in 6 counties. Property displacements with the Base and Alternative 90A are anticipated to be minimal.
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 is advanced, additional location analyses will 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 other alternatives are not expected to have any direct impacts to community facilities.

Historic and Archaeological Resource Impacts/Section 4(f) Uses: Alternatives 90B and 110 would have the greatest potential to affect historic and cultural resources, with 302 to 292 archaeological/architectural resources within the Area of Potential Effect (APE) for both direct and indirect impacts. Alternative 90A is likely to have moderate effects, with 100 resources within the APE. The Base Alternative would likely have only minor effects, with 26 resources within the APE. Alternative 125 would largely maintain elevated tracks within the existing ROW where it overlaps with the existing Empire Corridor. However, Alternative 125 would involve greater impacts than the Base Alternative, potentially affecting 123 resources within the APE, depending on the footprint for elevated structures that will carry the grade-separated tracks over the existing tracks. Alternative 125 will 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. Alternative 125 would also have the greatest potential interaction with and use of tribal land. The Programmatic Agreement (included as Appendix H) addresses the process by which FRA and NYSDOT intend to comply with Section 106 for undertakings occurring on tribal lands or where adverse effects to historic properties of a religious or cultural significance to a tribe occur off tribal land. If this alternative is advanced for further consideration in Tier 2, efforts will be made to avoid impacts on historic resources in locating the new rail corridor.

Parks and Recreational Facilities Impacts/Section 4(f) Uses: Alternative 125 has the greatest potential effect on parks and recreational facilities, with 9 such facilities in 5 counties potentially affected (including an Oneida Nation-owned golf course). If Alternative 125 is advanced, the additional location analyses in Tier 2 will avoid or minimize impacts on these facilities to the extent practicable. 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.

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. Both Alternatives 90B and 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. The Base Alternative is entirely confined to the existing railroad right-of-way, and is expected to have no such effects.
• **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 in at least 3 counties. Alternative 90A has only minor effects on farmland, potentially affecting agricultural districts in only 1 county. The Base Alternative is confined entirely to the existing railroad right-of-way, and is expected to have no such effects.

• **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, potentially affecting 68 crossings. The other alternatives are anticipated to have moderate potential for impact relative to the other alternatives, with between 107 to 218 surface water crossings potentially affected.

• **Wetlands Impacts:** Alternative 125 would have the greatest potential for impact on wetlands, relative to the other alternatives, with 177 new wetland crossings. Alternatives 110 and 90B would have a moderate potential for impact, potentially affecting 118 to 137 wetland crossings. Alternative 90A and the Base Alternative would have a relatively minor potential for impact, potentially affecting 54 to 84 wetland crossings.

• **Air Quality Impacts.** Alternative 125 has the greatest potential benefit to air quality in some regions of the corridor, 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 alternative 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, increasing from Alternative 90A to 90B, 110, and 125, which will be subject to further analysis in Tier 2.

• **Energy and Greenhouse Gases Impacts:** 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 (accounting for the energy and GHG emissions from construction and reduced on-road emissions). Other alternatives have successively lesser adverse impacts. Alternative 90A would have a potential beneficial impact starting approximately 20 years after construction.

• **Noise/Vibration Impacts:** 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. With 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. 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.
ES-5. **How will impacts be mitigated?**

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, which will include thorough inventories of resources to determine effects, and refinements in design 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-6. **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. For projects to be eligible for FRA funds, they must be advanced through the FRA’s process. This Tier 1 Draft EIS satisfies FRA’s procedural requirements, including documentation required under NEPA.

Where additional funding may be sought from FTA or other federal grant programs, projects must be included in the Statewide Transportation Improvement Program (STIP). Projects also would be included in the New York State Rail Plan, which outlines all of the state’s rail system needs for both passenger and freight service. During Tier 2, financial analysis will be refined for the selected 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 selected alternative will be incorporated into the New York State Rail Plan and the STIP.

ES-7. **What is the program schedule?**

The program schedule will vary depending on which alternative is selected. For the Base Alternative, construction is anticipated to start as early as 2013, with a scheduled completion of 2020. The Build Alternatives would be completed in 2035. Improvements in maximum and average speed (benefits) would accrue in steps. For Alternatives 90A, 90B, and 110, approximately 25 percent of the benefit would accrue at the end of each five-year construction interval, with the completion of each new segment of segregated track. While Alternative 125 also would be completed in 2035, due to the extensive new construction, maximum and average speed benefits would not begin accruing until 2025.
ES-8. Who will decide which alternative is selected and how can I be involved in this decision?

NYSDOT and FRA will determine the preferred alternative following extensive public involvement and agency coordination programs. This will include opportunities for comment on the Tier 1 Draft EIS in writing and during public hearings that will be held. The program’s public involvement program is a multifaceted program that utilizes several 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 offices, 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 selection of an alternative at the end of the Tier 1 process will be made by FRA based upon a recommendation from NYSDOT. The FRA’s decision will be articulated in a Record of Decision that the FRA will issue.

ES-8.1. Public Outreach 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. These efforts will continue throughout the environmental review of the program. 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.

ES-8.2. Agency Coordination

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 37 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 has 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 will continue to be involved in the High Speed Rail Empire Corridor Program as it proceeds through the Tier 1 EIS process and continues into 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. 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:

- Michelle Fishburne, Federal Railroad Administration
  202-493-0398 or michelle.fishburne@dot.gov

- David Chan, New York State Department of Transportation
  518-485-1918 or david.chan@dot.ny.gov