Northern New England Intercity Rail Initiative

Study Summary

INTRODUCTION

The Northern New England Intercity Rail Initiative (NNEIRI) is a conceptual planning study that was conducted to examine the benefits, opportunities and impacts of adding more frequent and higher speed intercity passenger rail service on two rail corridors, the Inland Route and the Boston-to-Montreal Route.

The Inland Route would run between Boston, Massachusetts and New Haven, Connecticut via Springfield, Massachusetts. The Boston-to-Montreal Route would run between Boston and Montreal, Quebec via Springfield (see figure 1). The two routes would share the trackage between Boston and Springfield, MA. The combination of these two rail routes defines the total trackage included in the study area that is collectively identified as the NNEIRI Corridor (Corridor).

This study came about as part of a larger effort to explore improved intercity rail connections throughout New England in response to the U.S. Department of Transportation's (USDOT) 2000 designation of the Northern New England High Speed Rail Corridor, as part of the national High Speed Rail Corridor system. This designation was later expanded to include the Inland Route.

Two separate Federal grants for each of the respective NNEIRI routes were awarded to assess the feasibility of expanded service in the region and to develop a plan for potential implementation. Because the two routes would share the trackage between Boston and Springfield, the study of the two routes was combined to be progressed under a single study.

To maximize resources and efforts for the study, the Massachusetts Department of Transportation (MassDOT) and the Vermont Department of Transportation (VTrans) formed a partnership along with the Federal Railroad Administration (FRA) and the Connecticut Department of Transportation (CTDOT) to create a coordinated effort for a conceptual planning study of the 470-mile-long NNEIRI Corridor. The goal of the partnership was to evaluate in concept how rail could better connect the states and link to other rail services in Connecticut, New Hampshire, Quebec, and New York.

REGIONAL NEED FOR MORE SERVICE

While New England has a diverse transportation network with rail, aviation, highway, and bus services to most of the major cities, travel between New England communities is dominated by highway-based systems that are at or nearing capacity at critical locations. The focus of the NNEIRI Study was to explore the feasibility of expanded intercity passenger rail services in order to improve alternative travel modes in the study area. The expansion of these services would be to accommodate travel demand between communities within New England and provide additional connections to rail services with destinations outside of the Corridor.



Figure 1. NNEIRI Corridor Study Area

Currently, the following Amtrak services are provided along segments of the NNEIRI Corridor:

- The Lake Shore Limited provides once daily round-trip service between Boston and Chicago, Illinois via Springfield, Massachusetts.
- The Vermonter runs once daily round-trip service between Washington, D.C. and St. Albans, Vermont, via New Haven and Springfield, Massachusetts.

- The Northeast Regional Shuttle operates four daily round-trip trains between Springfield and New Haven. An additional Northeast Regional train runs daily round-trip service between Springfield, New Haven, New York City, and points south.

Other passenger rail services connect to points along the NNEIRI Corridor. Amtrak operates additional Northeast Regional Shuttle and Acela Express service along the Northeast Corridor. The Northeast Corridor connects with the NNEIRI Corridor in Boston and New Haven, but runs along the coast serving Boston, Providence, New Haven, New York City, and points further south. The Downeaster service runs five daily round-trips between Boston and Portland, Maine, with two trains extending north to Brunswick, Maine. The Adirondack Amtrak service operates between New York City, Albany, and Montreal.

Segments of the NNEIRI Corridor are owned by five different entities, including the Commonwealth of Massachusetts, CSX, New England Central Railroad, Canadian National Railroad, and Amtrak. The majority of any additional passenger services would operate over the tracks of existing freight railroads. Therefore, all passenger planning activities included consideration of providing track system capacity and related infrastructure needed to not only accommodate any additional passenger service, but also accommodate future expansion of rail freight operations.

NNEIRI CORRIDOR DEVELOPMENT

The purpose of the NNEIRI Study was to explore the feasibility, potential costs, and benefits of improving intercity rail transportation choices in New England. This included an assessment of and demand for more frequent and higher speed intercity rail service on both the Inland Route and the Boston-to-Montreal Route. The evaluation included a focus on how the rail system could be used to provide improved connections between the region's largest urban areas, such as Boston, New York and Montreal, and the regions smaller cities and rural areas.

The NNEIRI Study followed the FRA Passenger Rail Corridor Investment Plan process. This process consists of the preparation of a National Environmental Policy Act (NEPA) environmental review and development of a Service Development Plan (SDP). The NEPA review is the process during which the purpose and need of the postulated improvements are defined; and alternatives are analyzed and compared based on their environmental, socioeconomic, and transportation impacts. The SDP is a detailed plan that defines the service improvements, transportation network, operational and financial aspects for the passenger rail service alternative identified to be potentially implemented within the 20 year planning period that extends to 2035. This FRA Passenger Rail Corridor Investment Plan process would be the foundation for any future project development, including engineering design, financial planning, project environmental reviews, environmental permitting and construction.

To gather public and stakeholder input to assist in the development of service alternatives, the study effort included twelve outreach meetings throughout the two-year duration of the study. The meetings included public informational meetings, as well as meetings and conference calls with a group of designated stakeholders. The public informational meetings were held at locations in Vermont and Massachusetts. Public informational meetings focused on providing an

overview of the study and study findings and receiving input to the study. The stakeholder meetings were held in Springfield, and included discussions of technical study aspects and impacts to other passenger and freight operations. Stakeholders included rail owners and operators, FRA and state representatives, and local and regional planning representatives.

NNEIRI STUDY ANALYSIS, REPORTS & PLANS

A number of assessments, technical reports, environmental analyses, and plans were prepared as part of the NNEIRI Study. Collectively, these documents provide the basis for the development of the Preferred Alternative for service along NNEIRI Corridor. The major study elements are highlighted below.

At the onset of the study, an **Existing Conditions** analysis was conducted to assess current conditions, capacity, and characteristics of the infrastructure, stations, and communities along the NNEIRI Corridor. The Existing Conditions document also includes an analysis of anticipated 2035 corridor service levels and constraints, which was developed in part by reviewing existing documents and plans for infrastructure improvements related to the following completed, underway, or planned projects:

- The current New Haven-Hartford-Springfield Rail Project (CT Rail-Hartford Line)
- The current Springfield Union Station Project
- The recent passenger rail improvement projects on the Springfield to East Northfield, MA “Knowledge Corridor” line; and the New England Central Railroad line between Vernon, VT and the Vermont/Canada border
- The Boston South Station Expansion Project under study
- The proposed customs and immigration facility improvement project at Central Station in Montreal.

To provide a framework for the study, a **Purpose and Need** statement was developed that modeled the current and future travel demands, gaps in existing service to meet those modeled travel demands, and population characteristics that guided the modeled assumptions. The need for the NNEIRI Study stems from the recognition of benefits that could accrue to the region’s economy and livability from improved connections across and between the New England states.

As documented in the **Alternatives Analysis (AA) report**, 18 service options were initially developed to examine a range of potential improvements and services that could be implemented over the time period of the study timeline that extends to 2035. The preliminary options assessed variations of speed (up to 125 mph), equipment, service types including local versus express, and track engineering. Three build alternatives were advanced for further analysis of cost, ridership, infrastructure improvements, and environmental impacts. Each of the three alternatives considered variations in speed and frequency. Additionally, a No Build Alternative was defined to understand the impacts of providing no additional service and making no infrastructure improvements in comparison to the Build options. The AA resulted in a Preferred Alternative to advance for further evaluation. The Preferred Alternative included passenger rail services and

infrastructure investments on the Inland Route and Boston-to-Montreal Route that are described below.

Two **Service Development Plans (SDP)** were developed to identify approaches to implement the Preferred Alternative on the Inland Route and the Boston-to-Montreal Route. The SDPs provide the framework via a detailed plan to advance infrastructure investments and improvements needed to enhance service along the two routes. The two SDPs include the discussion of potential Investment Options for each respective route.

A NEPA **Environmental Analysis (EA)** was conducted for the Preferred Alternative to evaluate the environmental impacts of the full build (all Boston-to-Montreal Route and Inland Route services) compared to a No Build Alternative. This analysis was completed in accordance with the National Environmental Policy Act (NEPA) Tier 1 Service Level EA process. The analysis considered the potential major impacts to physical, biological, and human resources.

Other study documents refer to a Recommended Alternative for study process reasons. The term Preferred Alternative is used in this Study Summary to denote a "preference" for the identified rail alternatives of the NNEIRI Study should any service be considered for implementation in the future.

NNEIRI PREFERRED ALTERNATIVE

After examining regional needs and a range of potential options a Preferred Alternative (see Figure 2) was developed for additional passenger rail service that could provide the most cost-effective approach to meet the modeled passenger demand for rail travel along the NNEIRI Corridor through the 20-year planning period. The Preferred Alternative envisions new rail service to supplement and expand on existing rail service in the Corridor. Service details on frequency, travel times, station and infrastructure investments, anticipated ridership, and costs are provided below.

SERVICE & TRAVEL TIMES

Implementation of the Preferred Alternative would include three additional passenger services within the NNEIRI Corridor that are identified in Figure 2 below and are described below.

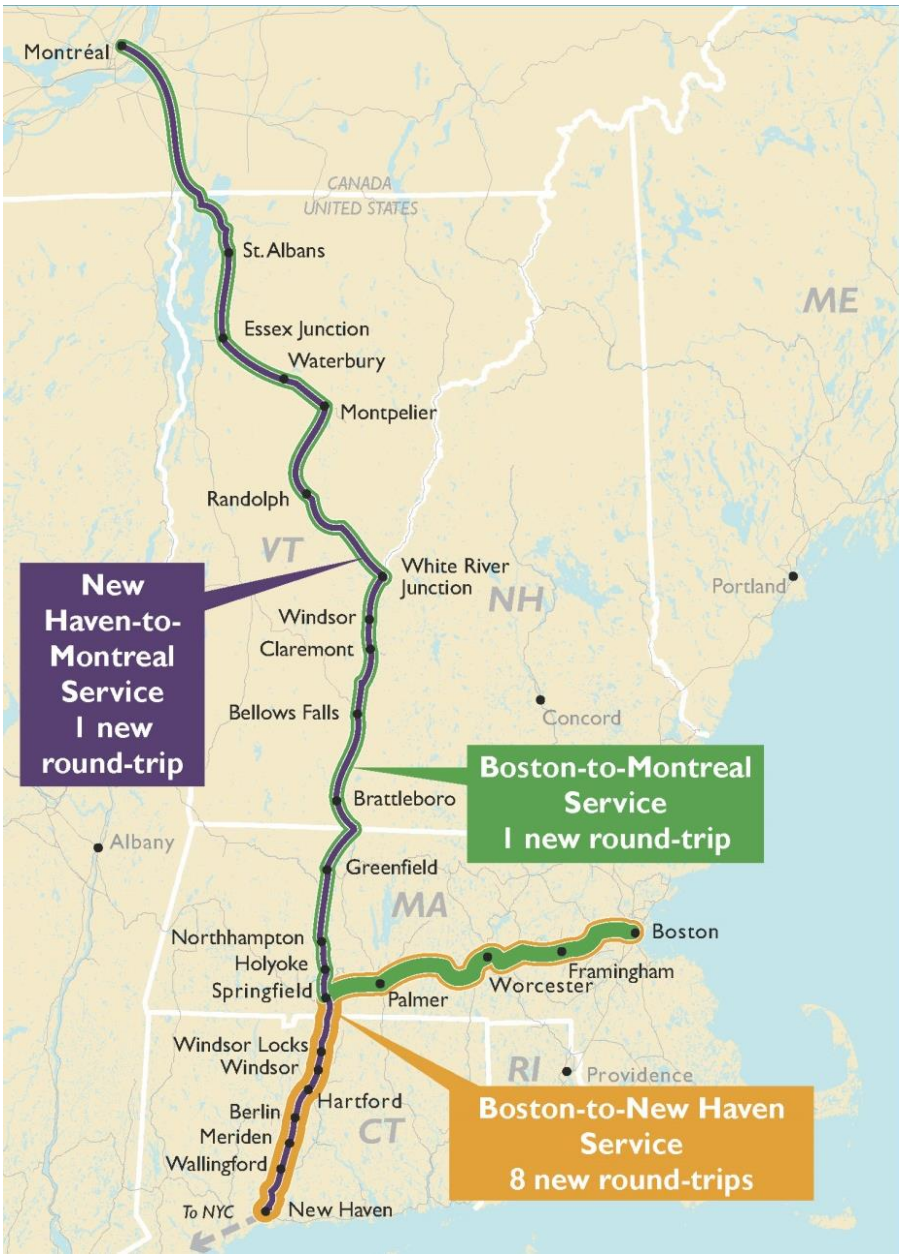


Figure 2. Preferred Alternative Service and Stations

- **New Haven-to-Montreal Service** – This service would run along the Boston-to-Montreal Route. It would provide one daily round-trip with stops at all existing stations between New Haven, Springfield, and Montreal with departures coordinated with Amtrak's Vermonter schedule. The one-way travel time would be 8 hours 40 minutes.
- **Boston-to-Montreal Service** – This service would also run along the Boston-to-Montreal Route. It would provide one daily round-trip with stops at all existing stations between Boston, Springfield, and Montreal. Train schedules would be coordinated with other intercity trains to provide adequate spacing and coordination of service. The one-way travel time would be 8 hours 10 minutes.
- **Boston-to-New Haven Service** – This service would provide eight daily departures with trains stopping at all existing stations along the Inland Route. Operating throughout the day, this 3 hour 40 minute-long one-way trip would provide both business and leisure travelers with convenient departure times.

STATIONS

- The three services would stop at a combined 28 stations along the two routes, including all existing stations in Massachusetts, Vermont, and Connecticut. One new station would be considered for construction in Palmer, Massachusetts. The new services would allow connections to other intercity rail services departing from Boston, Montreal, and New Haven.

INFRASTRUCTURE IMPROVEMENTS

The service as defined by the Preferred Alternative would require several infrastructure improvements along the corridor. The following improvements would be needed to ensure that passenger and freight trains can operate safely and on-time:

- Addition of a second platform to accommodate additional passengers at Union Station in Worcester;
- Restoration of a second track between Worcester and Springfield; and
- Extension of railroad sidings along several segments of the corridor in Vermont.

A number of corridor-wide improvements would also be required. Many at-grade rail crossings would need to be upgraded to increase the safety of roads crossing the railroad tracks. New trackage and turnouts would be added to ensure a reliable path for the service on the NNEIRI Corridor. Additionally, a full train control signal system would be added along the corridor to safely direct trains and increase efficiency. The signal improvements would not include additional positive train control (PTC) systems based on current criteria used to determine the requirements to installation of PTC systems. However, it should be noted that while the implementation of NNEIRI service alone would not trigger the installation of PTC systems for the various corridor segments, if other services were to be implemented in addition to NNEIRI service the cumulative result could require PTC systems.



Figure 3. Preferred Alternative Infrastructure Improvements

MODELED RIDERSHIP

Ridership for the full build of the Preferred Alternative was projected for 2035 horizon. A total of 875,000 passengers are expected to use intercity rail services on the NNEIRI Corridor in 2035, including 800,000 resulting from NNEIRI implementation and 75,000 on the existing Amtrak Vermonter and Lake Shore Limited services. Total ridership for each service is shown in Figure 4, and ridership between segments is shown in Table 1.



Figure 4. Preferred Alternative Service and Modeled Ridership

Table 1. Projected Annual Modeled Ridership between NNEIRI Corridor Segments

SEGMENTS	Montreal	Northern VT	Southern VT	Western MA	CT & NY
Northern VT	10,700				
Southern VT	39,200	14,500			
Western MA	34,400	15,000	10,000		
CT & NY	4,600	1,400	3,200	59,300	
Eastern MA	113,100	28,200	34,700	107,200	369,500

Note, this does not account for an additional 30,000 riders who would use the same corridor.

The largest cities in the region, due to high concentrations of employment, residents, and attractions would be the largest users of the NNEIRI Corridor services. As is the case with much of the rail ridership in the northeast, New York City would be the primary origin or destination for passengers on NNEIRI services, accounting for over 327,000 of the passengers on the NNEIRI Corridor.

The anticipated ridership compares favorably to annual ridership on other popular Amtrak services in New England and similar regions across the United States that includes the following services.

- Downeaster (Brunswick, Maine to Boston) - 560,000 riders/year
- Cascades Service (Eugene, Oregon to Vancouver, British Columbia) - 812,000 riders/year
- Empire Service (New York City to Niagara Falls, New York) - 1,081,000 riders/year

COSTS

The capital costs to implement the services of the Preferred Alternative, which includes the purchase of new train sets and infrastructure improvements, would be between $1.1and $1.2 billion and have been calculated in 2014 dollars. The estimated cost for new train equipment is $456 to $527 million. The estimated cost for track, signal, and station improvements along the entire NNEIRI Corridor is between $648 and $721 million. These costs are independent related projects that include the Montreal Station customs facility and the CT Rail-Hartford Line track improvements that are assumed to be in place prior to implementation of services considered within the NNEIRI Study.

All infrastructure capital costs associated with Inland Route services are located in Massachusetts, including full double track between Worcester and Springfield and capacity improvements to Worcester Union Station. The majority of infrastructure capital costs associated with Boston-to-Montreal Route are located in Vermont, with secondary projects also in

Massachusetts and New Hampshire, including passing sidings and track infrastructure upgrades Capital costs for any desired improvements in Quebec were not evaluated as part of the NNEIRI Study.

Investment options in the individual SDPs would provide the opportunity for incremental implementation of NNEIRI services. The allocation of costs for any capital improvements, operating and maintenance costs, or investment options costs would be determined based on an agreement between stakeholders in the NNEIRI region. The most significant negotiation relative allocation of costs by state would be associated with any Inland Route and Boston to Montreal route services as they would require shared use of the rail line between Boston and Springfield.

The anticipated annual cost to operate and maintain the three services is estimated to be $56 million. Over half of these costs, or $30 million, would be anticipated to be funded from fare revenue from passenger tickets. The remaining operating support would need to be provided by other sources.

Table 2. Estimated Costs, Revenue & Operating Support

Cost/Revenue	Inland Route	Boston-to-Montreal Route	NNEIRI Corridor
Capital Costs			
Infrastructure	$273-309 million	$415-458 million	$648-721 million
Equipment	$281-351 million	$176 million	$456-527 million
Total Costs	$554-660 million	$591-634 million	$1.1–1.2 billion
Annual Costs, Revenue & Required Operating Support			
Operating & Maintenance Costs	$33 million	$23 million	$56 million
Revenue	$18 million	$12 million	$30 million
Operating Support/Subsidy	$15 million	$11 million	$26 million

NOTE: The Inland Route includes Boston-to-New Haven Service. The Boston-to-Montreal Route includes Boston-to-Montreal Service and New Haven-to-Montreal Service. The NNEIRI Corridor includes all three services. The NNEIRI Corridor capital costs and O&M costs reflect cost savings from using the shared Boston to Springfield rail line segment that would occur with full implementation of all three services. Thus the costs for the NNEIRI Corridor infrastructure and operations are less than the sum of the individual Inland Route and Boston-to-Montreal Route estimates.

ASSUMED PROJECTS

Over the past decade, substantial investments have been made on the NNEIRI Corridor and additional improvements are anticipated in the upcoming years. The following rail projects and

services are included in the analysis, which are assumed and necessary to be in place prior to implementation of any service identified in the NNEIRI Study.

- CT Rail Hartford Line - Commuter rail service will be provided between New Haven, Hartford, and Springfield. Service is anticipated to begin in December 2016/January 2017;
- Springfield Union Station Improvements - Construction is underway to improve the station building and platforms at Springfield Union Station;
- Knowledge Corridor - Amtrak Vermonter service was realigned along the Connecticut River Line between East Northfield, Massachusetts (near the Massachusetts-Vermont border) and Springfield, Massachusetts. The project infrastructure improvements was substantively completed in late 2015 and included service, track, and station improvements along this segment;
- Boston South Station Expansion - A planned expansion of Boston's South Station would accommodate additional track capacity, train storage space, and provide additional station platforms;
- Vermonter Extension to Montreal - Plans are in progress to extend the Amtrak Vermonter service to Montreal from St. Albans, Vermont;
- Montreal Central Station Customs and Immigration Facility - A new customs and immigration pre-clearance facility is planned for Montreal Central Station to facilitate faster travel between the United States and Canada; and

SUMMARY AND CONCLUSION

The result of the NNEIRI Study is a Preferred Alternative that defines the optimal configuration of rail services in the future, and the improvements that would appear to be promising for the 20-year planning horizon used in such planning studies.

The NNEIRI Study is an initial step in FRA's Passenger Rail Corridor Investment Plan process. The process is established to first identify what type of new services would be feasible, and if new services along the Corridor would provide sufficient public benefit to warrant further consideration.

The Preferred Alternative provides a program framework with which to evaluate potential future investments and investment strategies, possible incremental service improvements, and coordinated infrastructure needs and cumulative impacts of any increased rail service along the corridor. The outcome of the study is intended to provide a basis for a vision of what intercity rail service could be in the future along the corridor and define a comprehensive approach for the development of the service over the long-term.

As no current funding is designated or available for any of the services in the Preferred Alternative, it was deemed necessary to consider the implementation of service over time. Therefore, potential Investment Options within the respective Service Development Plans were developed to assess partial or incremental implementation of the Preferred Alternative. The various Investment Options were created to support the envisioned local and/or regional transportation needs within the 20-year planning horizon. These Investment Options provide a

framework to assess costs and benefits of approaches to incremental implementation which would have independent utility while advancing implementation of the Preferred Alternative.

Identification of the Preferred Alternative and Investment Options provides the basis for the next phases of planning. For implementation of any of the Investment Options outlined in the SDPs, project-specific work would be required to develop a more detailed infrastructure assessment. Additional project specific environmental impacts would need to be evaluated in accordance with the requirements of a project level (Tier 2) NEPA document.

Additionally, a financial plan would need to be developed for any project specific Investment Option that identifies sources of capital and ongoing operational funding support. As was done in this study, it is anticipated that any consideration of Investment Options would require collaboration with project partners to establish a management approach and appropriate governance, access, and operational agreements to ensure long-term success of any future service.

NEXT STEPS

The respective state agencies and departments should continue to evaluate public support relative to furtherance of the study's Preferred Alternative. The results of the study should also be included in any statewide passenger and freight rail planning efforts in order to prioritize the NNEIRI service improvements relative to other competing rail service needs. Additionally, if any elements of the NNEIRI study's Preferred Alternative should move forward, they would need to be evaluated as part of each state's capital investment planning and project selection processes in order to be scored and ranked relative to other capital rail projects.