

1.0 Introduction and Background

■ 1.1 Purpose of the Study

In late 2000 the Boston to Montreal rail route was designated as one of the nation's three new High Speed Rail Corridors by the Federal Railroad Administration (FRA). The designation was in response to a joint application by the states of Vermont, New Hampshire, and Massachusetts.

Designation of High Speed Rail (HSR) corridors has been established by the U.S. Federal Railroad Administration to facilitate planning for alternative travel modes in specific corridors. In the application letter to FRA, the potential for use of HSR to reduce congestion on major highway and air corridors within the Boston to Montreal High Speed Route (BMHSR) was cited as a principal reason to evaluate the feasibility of HSR service. As with any long term transportation project, planning and implementation requires a comprehensive series of steps to first determine the feasibility of a proposed transportation alternative and then, if appropriate, progress to implementation of a project. The feasibility analysis used for this study generally follows the methodology utilized in the *FRA Report High Speed Ground Transportation for America, 1997* and in the publication *Railroad Corridor Transportation Plans, A Guidance Manual, 2002*.

The purpose of the Boston to Montreal High Speed Rail (BMHSR) Corridor Feasibility and Planning Study is to evaluate the Boston to Montreal High Speed Rail using appropriate methodologies to determine if a HSR service is feasible within the Boston to Montreal corridor.

■ 1.2 Study Overview

The Boston to Montreal High Speed Rail Feasibility and Planning Study (Study) is managed by the Vermont Agency of Transportation (VTrans) through a cooperative agreement with the FRA and directed in partnership with the New Hampshire Department of Transportation (NH DOT), and the Massachusetts Executive Office of Transportation and Construction (EOTC). A steering committee comprised of representatives of the three partner States, the Quebec Ministry of Transportation and the City of Montreal, has provided oversight, direction and primary product review for the Study.

To address all the criteria needed to fully evaluate the feasibility of the BMHSR, the Study has been divided into two phases. This report documents the findings of Phase I of the Study. The scope of Phase I is to provide information on three primary tasks:

- Identification of institutional and policy issues,
- Development of primary preliminary service ridership projections, and
- Inventory of basic corridor infrastructure elements.

Phase II will study the remaining elements of High Speed Rail evaluation criteria. The remaining major items to be studied in Phase II include:

- Detailed operational analysis and planning,
- Assessment of alignment, infrastructure, and environmental requirements,
- Determination of projected capital and operation costs and revenue, and
- Comparison of benefits and costs.

The BMHSR Study was divided into two phases to allow initial consideration of institutional and policy issues, potential ridership forecasts, and the identification of basic corridor infrastructure elements. The objective of this approach was to assess if sufficient ridership potential exists to warrant additional study of train operations, revenue, and costs required for a HSR service. In addition, the investigation of institutional and policy issues during Phase I was intended to document potential fatal flaws to implementing a BMHSR service. The findings of Phase I were, therefore, intended to be that either the BMHSR service was not feasible in the foreseeable future, or sufficient evidence was developed to support progression to Phase II of the Study.

Included in Phase I Study efforts was the development and implementation of a significant public awareness program. The purpose of this program was to make individuals and public and private organizations aware of the objectives of the Study and the potential issues associated with the HSR service, and to seek input that would aid in identifying benefits and impacts for the potential HSR service. Activities included establishing a Study website, holding public meetings at the beginning and end of the Phase I Study, and holding two focus group meetings with representation from specific public and private interests.

In addition, key stakeholders associated with the BMHSR corridor and the Study were encouraged to provide input and direction. Key stakeholders included railroad owners and operators, current bus operators within the corridor, local and regional planning organizations, environmental contacts, and representatives of US state, and federal agencies, as well as appropriate Quebec agencies. To facilitate the involvement of key stakeholders, a day-long partnering session was held at the beginning of the Study that promoted candid discussion of project goals, objectives, and issues. This early contact with groups directly involved with or potentially affected by the BMHSR service enabled the Study team to clearly focus on the key issues of the Study. Prior to completion of

Phase I, a second partnering session with the key stakeholders was held to inform them of the study findings, and to receive their input and comments.

■ 1.3 Description & Definition of High Speed Rail

High Speed Rail is often described as a subset of the more general term, High Speed Ground Transportation (HSGT). HSGT has been documented most thoroughly in a Federal Railroad Administration (FRA) report, “High Speed Ground Transportation for America.”¹ According to the report, HSGT can be defined in terms of travel market and performance characteristics as:

“...a self-guided intercity passenger ground transportation – by steel-wheel railroad or magnetic levitation (Maglev) – that is time-competitive with air and/or auto for travel markets in the approximate range of 100 to 500 miles.”²

This is a market-based, not a speed based definition. However, to provide competitive travel times, high-speed trains must operate at maximum speeds that provide an average speed that corresponds to competitive travel times. When considering if a rail route could qualify for designation as a high-speed corridor, the Secretary of Transportation is required to consider whether railroad speeds of 90 miles per hour or more are occurring or can reasonably be expected to occur in the future. For the BMHSR it is anticipated that speeds within segments of the corridor in excess of 90 mph would be possible. This assumption was utilized in developing estimated trip times used to support development of the ridership forecasts projected in Chapter 3. The specific analysis of operations, including development of operating speed limits, will be included in Phase II of the Study.

Types of High Speed Rail Corridors

Most individuals, when asked how they would define HSR, would typically include the maximum speed of the train in the definition. Many people would respond that HSR means speeds in excess of 90, 150 or over 200 mph. Interestingly, each answer could be considered correct using the HSGT definition. For HSR to be competitive with air and auto travel in a specific transportation corridor, however, the maximum train speed can be significantly lower than the higher speeds normally associated with HSR corridors. To illustrate this point it is helpful to understand the types of systems in use or being considered for use today.

¹ U.S. Department of Transportation, September 1997.

² Ibid.

- **Accelerail** is the term coined by the U.S. Department of Transportation in its 1997 study of high-speed ground transportation, referenced above for the lower-speed end of the technology spectrum. Recently, **Incremental High-Speed Rail** has been utilized to describe this type of HSR service. Within the Incremental High-Speed Rail category is a range of both non-electrified and electrified systems capable of between 90 to 150 mph top speeds.



Typical Incremental High-Speed Rail type systems include tilt trains such as the X-2000 in Sweden, Talgo in Spain, Pendolino in Italy and Acela in the U.S. Northeast Corridor. Examples of non-tilt trains in this category are the Amtrak Turboliners, in service between New York City and Albany and the British InterCity 125 in the U.K.

- **New HSR** represents advanced steel-wheel-on-rail passenger systems generally on new, dedicated rights-of-way. Through a combination of electrification and other advanced components, expeditious alignments, and state-of-the-art rolling stock, New HSR can attain maximum practical operating speeds on the order of 200 mph. Prominent examples of New HSR include the French TGV, the Japanese Shinkansen, and the German Intercity Express.



- **Maglev** is an advanced transport technology in which magnetic forces lift, propel, and guide a vehicle over a specially designed guideway. Utilizing state-of-the-art electric power and control systems, this configuration eliminates the need for wheels and many other mechanical parts, thereby minimizing resistance and permitting excellent acceleration, with cruising speeds on the order of 300 mph or more. This high performance would enable Maglev to provide air-competitive trip times at longer trip distances than other HSR options. The first commercial application between Pudong Airport and Shanghai, China is scheduled to begin operations in 2003. Germany has a Maglev technology ready for commercial introduction (Transrapid) and Japan has a competing and technologically different system under test.



As the BMHSR corridor would require accommodation of both freight and passenger train operation, the service in the corridor would likely be an Incremental High-Speed Rail type of service.

■ 1.4 History of High Speed Ground Transportation in the U.S.

In the United States, interest in High Speed Ground Transportation has resulted in various federal and state government programs and policies since the 1960s. Federal support for High Speed Ground Transportation began with the passage in 1965 of the High Speed Ground Transportation Act. Originally authorized for \$90 million in federal funding, the act resulted in the development and demonstration of various HSGT technologies, most notably the 1969 introduction of self-propelled Metroliner cars and the Turbotrain in service along the Northeast Corridor between Washington, D.C. and New York City. Passage of the Rail Passenger Service Act in 1970 created Amtrak which thus became the operator of Metroliner service between Washington and New York City.

Beginning in the 1970's, federal efforts in support of HSGT also resulted in improved rail infrastructure between Washington and New York. Improvements included track reconstruction, new signal and control systems, elimination of many highway/railroad grade crossings and maintenance-of-equipment facilities, improvements to stations, and bridge replacement and repair.³

Government interest in the 1980's resulted in both federal studies of potential HSGT corridors, as well as the formation of several high speed rail entities in individual states. At the federal level, the Passenger Railroad Rebuilding Act of 1980 included funding authority for engineering and design studies, which resulted in Seven HSGT analyses in various corridors. Several states such as California, Florida, Texas, and Ohio formed authorities or agencies to investigate the feasibility of developing High Speed Rail networks between their major cities.

In the 1990's, interest in HSGT included continued efforts by states such as California and New York to improve HSGT planning and implementation. By the end of the decade, 15 states had passed enabling legislation facilitating HSGT activities. Additionally, federal interest has included further investigation of Maglev technology and demonstration projects.

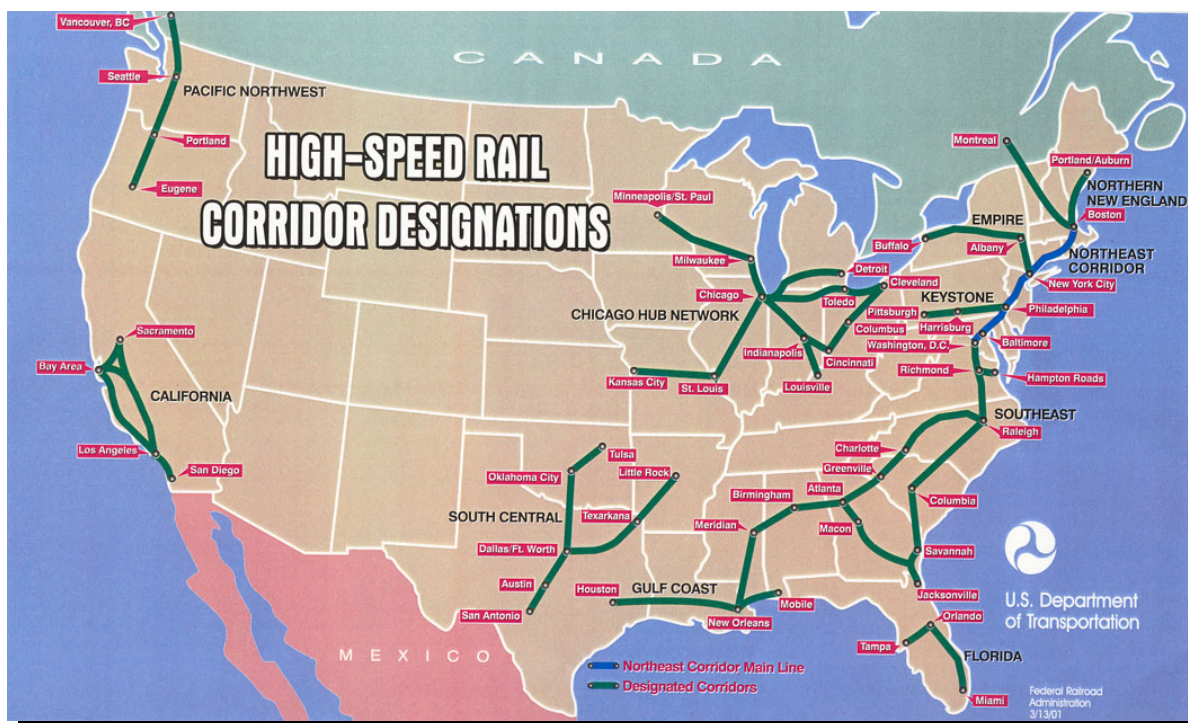
■ 1.5 Designated High Speed Rail Corridors

The FRA has designated high-speed corridors under section 1010 of the Intermodal Surface Transportation Act of 1991 (ISTEA) and Section 1103(c) of the Transportation Efficiency Act for the 21st Century of 1998 (TEA-21). The designation allows owners and operators of the corridors to receive specially targeted funding for highway-rail grade

³ U.S. Department of Transportation, September 1997. Reference Publication.

crossing safety improvements, and recognizes the corridor as a potential focus of HSR activity. The Boston to Montreal High Speed Rail (BMHSR) Corridor was designated by U.S. Transportation Secretary Rodney E. Slater on October 11, 2000 as a high speed rail corridor as part of the “Northern New England Corridor,” with a hub at Boston and two spokes: one to Montreal P.Q. Canada, via Concord, New Hampshire, and Montpelier, Vermont; and the other to Portland/Lewiston-Auburn, Maine. The BMHSR corridor is shown with other corridors in Figure 1.1.

Figure 1.1 – FRA High Speed Rail Corridor Designations

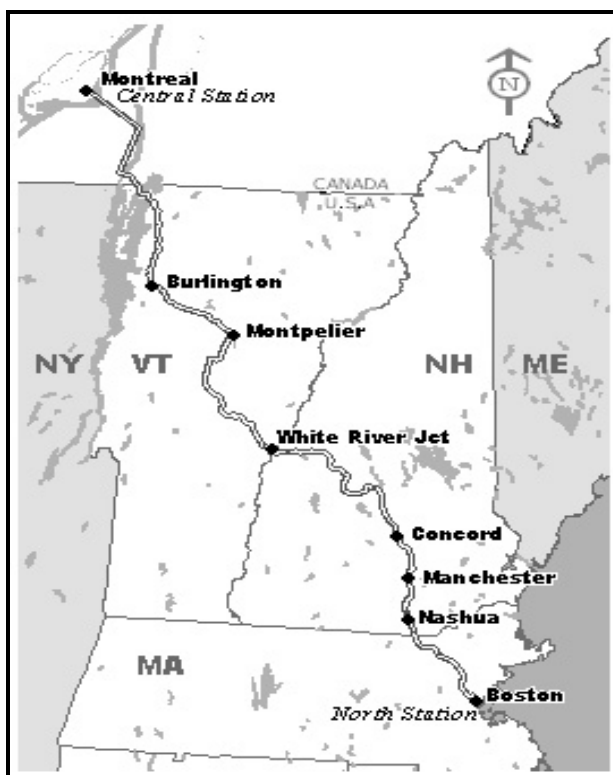


1.6 History of the Boston to Montreal Corridor

The Boston to Montreal railroad corridor dates back to the mid-nineteenth century. The combined facilities of the Canadian National, Central Vermont, and Boston & Maine systems were utilized to provide “through” passenger services between Boston and Montreal, whereby passengers could travel without having to change trains at connecting points. As early as 1852, Boston-Montreal passenger services were advertised using the combined systems. Two daily trains, named the “Ambassador” and the “New Englander,” continued to operate over this route until the early 1960’s. Comparable Boston-Montreal service was also provided by a Boston & Maine – Canadian Pacific joint operation via Wells River, Vermont.

The connection from Montreal to the US border at East Alburg, VT was provided via Canadian National railroad subsidiary, the Canada Atlantic Railroad. Beginning in the 1840s, the Central Vermont Railway developed an extensive network of rail lines, notably throughout Vermont and southeastern Canada. In 1899, as a consequence of bankruptcy, the Central Vermont railway became a subsidiary of the Canadian National Railroad. In Vermont, the BMHSR route utilizes the tracks of the New England Central Railroad from East Alburg to St. Albans through Essex Junction and Montpelier Junction and to White River Junction. The New England Central is the recent successor to the Central Vermont Railway. In 1994 the Canadian National placed the Central Vermont railway up for sale. A short-line railroad holding company, RailTex, purchased the Central Vermont Railway and continued operations as the New England Central Railroad. RailTex was, in turn, purchased by a holding company named Rail America. The New England Central Railroad continues to operate as a key freight route, with traffic composed primarily of paper, lumber, grain, cement, and LP gas, much of which crosses the international border.

Figure 1.2 - BMHSR Corridor Map



From White River Junction into New Hampshire and Massachusetts, BMHSR follows the former Boston & Maine's New Hampshire Main Line. The portion of the route between Boston's North Station and Lowell has its origins in the Boston & Lowell Railroad founded in 1835. From Lowell, through Nashua and Concord to White River Junction, the route traces its origins to the predecessors of the Boston & Maine Railroad's New Hampshire Main Line. Railroad operations on the rail line between Lowell and Nashua

began in 1838, and by 1848 a second main-line track was added along its entire length to Manchester. Operations were extended to the Vermont/New Hampshire border at White River Junction in 1847.

Passenger service on the 70-mile segment between White River Junction and Concord was discontinued in 1965. Freight service continued to be operated over this segment until 1982. Guilford Rail System (GRS) obtained permission to abandon approximately 60 miles of this segment between West Lebanon and Boscawen in 1992. When it sold the line to the state of New Hampshire in 1995, GRS retained ownership of the track and began removing it in 1996. In 1999, GRS sold the remaining 2.5-mile section between White River Junction and West Lebanon to the state of New Hampshire. In May of 2000 the Claremont Concord Railroad (CCRR) entered into an agreement to operate this section for a period of ten years. The CCRR has begun using the Westboro Yard and anticipates shipping aggregate materials on the line.

From Concord, south to the Massachusetts-New Hampshire border the rail line remains in ownership by GRS. The railroad line has served both passenger and freight services throughout its history. Passenger service north of Lowell to Concord was discontinued in 1967; and by then one of the two main-line railroad tracks had already been removed between Concord and North Chelmsford. In Massachusetts, the Massachusetts Bay Transportation Authority (MBTA) owns the railroad right-of-way from the New Hampshire state line to North Station. The MBTA operates commuter rail service along the corridor from the Gallagher Transportation Terminal in Lowell to North Station in Boston. This service includes stops at eight stations: Lowell, North Billerica, Wilmington, Anderson Regional Transportation Center, Mishawum, Winchester Center, Wedgemere, and West Medford. The NHDOT is planning a Nashua to Lowell Commuter Rail Extension project which includes the replacement of the removed second track, and a rail bed and signal system upgrade to both tracks to provide commuter rail service with a maximum operating speed of 59 mph. The distance between the proposed station location near the Everett Turnpike Exit 1 in Nashua and the Lowell station is 10.5 miles. Service is proposed to begin in 2005.

On September 29, 1972, Amtrak inaugurated operation of a New York – Montreal passenger train named “The Montrealer” over the tracks of the then Central Vermont Railway. The service was suspended during 1987-1989 to permit repairs to deteriorated sections of track. Service resumed in 1989 until Amtrak budget cuts forced its suspension on April 1, 1995. The next day, the currently operated and state of Vermont-subsidized “Vermont” commenced operations from New York through Springfield and Palmer, MA, then traveling up the eastern side of Vermont to White River Junction. The “Vermont” then continues on the BMHSR route to a terminus at St. Albans. Passengers traveling further north into Quebec, Canada continue to be provided with bus connections.

■ 1.7 Public Involvement and Outreach

The project team sought to inform and involve the public in the BMHSR Study on several levels. News of the Study was broadcast on television and radio, an interactive website was established and many stories ran in newspapers in Massachusetts, New Hampshire, Vermont, and Canada. The public had an opportunity to learn more about the Study and share their views through a series of public meetings. More intensive dialogue and discussion were possible through focus groups and a partnering workshop with key stakeholders.

This approach disseminated information to a wide audience in the three participating states, while targeting groups and individuals with an interest in rail for more focused discussion. This resulted in a high level of awareness of the project among stakeholders and the media. Many people followed the progress of the Study by checking the BMHSR Corridor website. As a result, as Phase I drew to a close, the Study team fielded many inquiries from the press and public anxious to know what was learned in the Study.

Public Informational Meetings

At the outset of the project, a series of public meetings was held to both announce the beginning of the Study and to give the public an opportunity to share their views and ask questions about what the Study would entail. Meetings were held during February 2002 in Lowell, Massachusetts, Concord, New Hampshire, and Montpelier, Vermont. Attendance ranged from 30-60 participants per meeting. People who attended the public forums were largely interested in rail as an alternative mode of transportation or as a stimulus to tourism and economic development.

Discussion at the public meetings was lively and people were encouraged to ask questions and make comments during the meetings. Some common themes emerged:

- There was general overall support for the development of the BMHSR corridor.
- Feasibility should be defined to consider economic and social impacts to the region from high speed rail, not just the number of tickets that can be sold.
- Connectivity to other transportation services is important, including regional airports, bus and other rail services.
- Minimizing delays at customs on the US/Canadian border should be a priority.
- Flexibility was desired to serve many needs. Ideas to meet potential needs included equipping trains to store bicycles and skis, providing rail service between intermediate cities without making the complete Boston to Montreal run.
- Understanding the positive and negative impacts on freight service in the corridor.

A second round of public meetings was held at the conclusion of Phase I in November 2002 in Lowell, Concord, Montpelier, and Montreal. Attendance at these meetings ranged from 30 to 70 people. Each meeting began with a formal presentation, followed by a question and answer session. People attending the public meetings had similar questions and comments including:

- Can a high speed rail service be implemented in a phased approach, installing one segment at a time?
- How many station stops will there be?
- Who would operate the service?
- Will the service share the line with freight?
- How many trains a day will there be?
- Will it help tourism, the major industry of New England? Will enhanced freight infrastructure attract businesses?
- When looking at subsidies for high speed rail, the government should apply the same subsidy for all modes of transportation – airline, automobile, etc.
- High speed rail ridership should not be viewed as the only benefit of this system, additional system benefits should be considered.

Partnering Workshops

To build good communication and understanding of the HSR Study, two partnering meetings were held. Key stakeholders such as railroad and bus company operators, regional planning agencies, transit agencies, representative of rails to trails programs, the Federal Railroad Administration and state Department of Transportation officials from the partnering states were invited.

The initial meeting was held in January 2002, with 30 participants. The group identified objectives, agency/stakeholder responsibilities, issues and impacts of a high speed rail corridor. Through a brainstorming process, three topics were selected for further discussion in break out groups. They were:

- What are the impacts?
- What are the critical success factors for BMHSR?
- What are the issues for protecting/enhancing existing investment in transportation infrastructure?

Partnering workshop stakeholders, realizing the potential importance of the project to regional mobility committed to working together to study the corridor by signing an

agreement. It said that the partners agree “to the principles of honesty, trust, professionalism and open communication.” In addition, the partners committed themselves to the following principles:

- Full cooperation and communication with key stakeholders and local communities,
- A proactive approach,
- Thorough identification of potential positive and negative project impacts.

A second partnering workshop was held in November 2002 in Concord, New Hampshire near the conclusion of Phase I to share the findings of the Study. Discussion centered on the details of the report, especially the ridership model. The group recommended the Study more thoroughly examine economic and environmental benefits of a high speed rail service and develop more information on who might use segments of the service rather than looking solely at the feasibility of the whole route.

Focus Groups

In May 2002, focus groups were held in Nashua, New Hampshire and South Burlington, Vermont. While each meeting provided an opportunity to inform participants about the BMHSR Study, the primary purpose was to listen to the views of participants. Unlike the partnering workshop, whose participants were heavily involved in the transportation business within the BMHSR corridor, many of the people who attended the focus groups were involved in the tourism industry or interested in economic development issues and opportunities. Discussion in these groups centered on consumer amenities, such as good food, comfortable seating and bathrooms, storage capacity for bicycles, skis and travel gear, as well as the need for convenient stops, schedules and connectivity to other transportation facilities. Concerns were also raised about whether adequate funding would be provided for BMHSR.

Project Website

To reach a wide audience and provide a vehicle for the public to keep abreast of the Study’s activities, a website, www.bostonmontrealhsr.org, was developed at the beginning of the Study in January 2002. The website communicated the vision of the project and provided an effective means of communicating with and soliciting feedback from the public. The site provided a source of study documents, information on high speed rail systems developed internationally, as well as news on other HSR corridors in the United States. Minutes of the focus groups and public meetings, accompanied by photos, were also posted on the website.

The website was designed for two-way communication. The public could write messages, register for e-mail updates on project status, or receive notification of upcoming meetings, as well as ask questions about the project. All questions were responded to by the project team.

The first month the website was available it received approximately 2,000 visits. This level of website activity has been consistently maintained throughout the course of the Study. People who attended the public informational meetings praised the website for both its graphic presentation of information and its content.

Media Interest in Study

The BMHSR Study generated significant media attention. It has been reported on in the *Boston Globe*, *Boston Herald*, *Lowell Sun* (Lowell, Massachusetts), *Manchester Union Leader* (Manchester, New Hampshire) *The Telegraph* (Nashua, New Hampshire), *Foster's Daily Democrat* (Dover, New Hampshire), *Times Argus* (Rutland, Vermont), the *Andover Beacon* (Andover, New Hampshire) and *La Presse and Le Devoir* (Montreal, Quebec). Some of the stories were featured in prime locations, including popular transportation columns or the newspaper's front page. The New Hampshire public meeting in Concord was telecast on the evening news and was recorded by New Hampshire Public Radio. The Vermont public meeting received news coverage by two television stations, including one based in Plattsburg, New York. Interviews with Vermont Public Radio and distribution of stories by the Associated Press to local newspapers spread news of the BMHSR Study throughout northern New England.

Future Public Involvement

Subsequent study of the BMHSR corridor can build on a solid base of public awareness and involvement established in Phase I. An extensive database of transportation organizations and officials, regional planners, rail advocates, economic development and tourism agencies as well as interested members of the public has been developed. Additionally, media resources and contact people in Massachusetts, New Hampshire, Vermont, and Quebec have been identified, which will enable efficient and extensive distribution of information on high speed rail in the future.