MTI Report 05-01

# High-Speed Rail Projects in the United States: Identifying the Elements for Success

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# HIGH-SPEED RAIL PROJECTS IN THE UNITED STATES: IDENTIFYING THE ELEMENTS FOR SUCCESS

OCTOBER 2005

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a publication of the
Mineta Transportation Institute
College of Business
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San Jose, CA 95192-0219

Created by Congress in 1991

# Technical Report Documentation Page

| | | |
|---|---|---|
| 1. Report No.<br>FHWA/CA/OR-2005/06 | 2. Government Accession No. | 3. Recipient's Catalog No. |
| 4. Title and Subtitle<br>High-Speed Rail Projects in the United States:<br>Identifying the Elements for Success | | 5. Report Date<br>October 2005<br>6. Performing Organization Code |
| 7. Authors<br>Allison L. C. de Cerreño, PhD, Daniel M. Evans, Howard Permut | | 8. Performing Organization Report<br>MTI 05-01 |
| 9. Performing Organization Name and Address<br>Mineta Transportation Institute<br>College of Business<br>San José State University | | 10. Work Unit No.<br>11. Contract or Grant No.<br>65W136 |
| 12. Sponsoring Agency Name and Address<br>California Department of Transportation<br>Sacramento, CA 95819<br><br>U.S. Department of Transportation<br>Research and Special Programs Administration<br>400 7th Street, SW<br>Washington, DC 20590-0001 | | 13. Type of Report and Period Covered<br>Final Report<br>14. Sponsoring Agency Code |
| 15. Supplementary Notes | | |


16. Abstract

For almost half a century, high-speed ground transportation (HSGT) has held the promise of fast, convenient, and environmentally sound travel for distances between 40 and 600 miles. While a number of HSGT systems have been developed and deployed in Asia and Europe, none has come close to being implemented in the United States. Yet this is not for lack of trying. There have been several efforts around the country, most of which have failed, some of which are still in the early stages, and a few of which might come to pass.

The goal of this study was to identify lessons learned for successfully developing and implementing high-speed rail (HSR) in the United States. Through a broad literature review, interviews, and three specific case studies—Florida, California, and the Pacific Northwest—this study articulates those lessons and presents themes for future consideration.


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|---|---|---|---|
| 17. Key Words<br>High-speed trains; Rail transit; Rail transit facilities; Rail transportation; Rapid transit | 18. Distribution Statement<br>No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161 | | |
| 19. Security Classif. (of this report)<br>Unclassified | 20. Security Classif. (of this page)<br>Unclassified | 21. No. of Pages<br>106 | 22. Price<br>$15.00 |

Form DOT F 1700.7 (8-72)

Library of Congress Catalog Card Number: 2005924525

To order this publication, please contact the following:
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# ACKNOWLEDGMENTS

Many individuals contributed to the information provided in this report. Their candor and willingness to share information is greatly appreciated. In particular, Allison C. de Cerreño would like to thank the following people who contributed to the discussion of the Florida case study and provided general background for the project, which was invaluable for writing the introduction, synopsis, and concluding section as well as the Florida case: John Bennett, AECOM Consult; C. C. "Doc" Dockery, Member of the Florida High Speed Rail Authority Board; Heidi Eddins, Florida East Coast Railway; Nazih Haddad, Florida Department of Transportation; Al Harper, EWM Realtors; Ron Hartman, Yellow Transportation; Senator Ron Klein, Florida State Senate; Keith Lee Rupp, Florida Transportation Association; Adrian Share, HNTB Florida; Eugene Skoropowski, Capitol Corridor Joint Powers Authority, BART; and Bob Vander Clute, Association of American Railroads.

On the California and Pacific Northwest cases, Daniel Evans would also like to thank John Bennett, as well as Clem Bomar, Caltrans Rail Office, Sacramento; Rod Diridon, Mineta Transportation Institute; Bob Lingwood, Vancouver, B.C.; Mark Lynch, B.C. Ministry of Transportation; Mehdi Morshed, California High-Speed Rail Authority; Dick Nelson, Integrated Transportation Research; John Niles, Global Telematics; Ray Shay; Tom Till, Discovery Institute Cascadia Project; Paul Toliver, Computer Intelligence$^2$; Ken Uznanski, WSDOT Rail Office; and Warren Weber, Caltrans Rail Office, Sacramento.

Finally, all the authors would like to thank the Mineta Transportation Institute for its support of the study and the resulting report, as well as the following individuals: Research Director Trixie Johnson; Research and Publications Assistant Sonya Cardenas; and Webmaster Barney Murray. Editorial Associates Irene Rush, Catherine Frazier, and Beth Blevins provided detailed assistance in producing the final document.

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# EXECUTIVE SUMMARY

The goal of this study is to identify lessons learned for successfully developing and implementing high-speed rail (HSR) in the United States. Few broad statements can be made about high-speed ground transportation (HSGT) in the United States, but two points are clear:

1. With the exception of the Northeast Corridor, there has been relatively little forward movement if one looks at the number of years spent on many of these projects.
2. The federal government has played and continues to play a minimal role in HSGT, generally restricting its efforts to funding pilot studies and technological research.

Given the early stages of these projects, "success" cannot be based on implementation, but is defined in terms of whether a given HSR project is still actively pursuing development and/or funding.

This study proceeded in two phases. Phase 1 was a literature review following two parallel tracks: an assessment of federal and, where warranted, state legislation to determine what was intended in terms of objectives and criteria identified in the legislation; and a broader literature review that briefly assessed all HSR efforts in the United States since 1980 to determine their history and current status. The result was an interim report, written by Allison C. de Cerreño. Recommendations were made after Phase 1 to examine in more depth three case studies: California, Florida, and the Pacific Northwest. Phase 2 consisted of additional literature review and interviews with key individuals related to those three case studies. This final report includes the results of both Phase 1 and Phase 2.

Allison C. de Cerreño researched and wrote the Florida case study, along with the Executive Summary, the Introduction, the Synopsis of High-Speed Rail in the United States, and the concluding section of the report. Daniel Evans researched and wrote the two case studies on California and the Pacific Northwest. Howard Permut provided overall guidance on the structuring of the case studies and development of lessons learned, helped formulate the critical questions to address, and identified both the key players in the cases and the types of information that should be included.

## METHODOLOGY

The first step was to identify as many cases of HSGT efforts in the country since 1980 as possible. An extensive review revealed 19 cases. The cases offer a complex array of examples with differences in a number of areas, including, but not limited to, the type of HSGT being pursued; whether the project exists entirely in one state or spans several; the way funding is being sought, both in terms of partnerships and the actual funding mechanisms; whether the public is involved through voting and/or legislation; and the role of freight rail. In many cases, early feasibility studies and environmental impact studies have been or are being developed, but often on only a portion of a project, leading to a document trail that often has to be pieced together.

The 19 projects were differentiated according to the type of system proposed:

- Incremental high-speed rail, which generally uses existing technologies and rights-of-way, but makes improvements to allow for speeds up to 150 miles per hour (mph) (although in the United States, most projects aim for 110 mph) using either electrified or nonelectrified systems
- New high-speed rail, which requires new rights-of-way and imported technologies currently used in Asia or Europe, that typically would allow for speeds of just over 200 mph
- Magnetic levitation (Maglev) which, by doing away with steel-wheel-on-steel-rail, would allow speeds in excess of 300 mph

Because Maglev uses a completely different technology and different sources of federal funding, the lessons learned from those examples might not be helpful for other HSR efforts. Given the scope of and resources for this study, Maglev projects were excluded from the remainder of the study. The final fifteen projects—three new HSR and twelve incremental HSR—were briefly assessed in terms of their history and current status. California, Florida, and the Pacific Northwest were chosen for Phase 2.

## FINDINGS, LESSONS, AND THEMES FOR CONSIDERATION

Several specific findings and lessons were learned from each of the three case studies. The following broad themes for consideration were apparent.

## Leadership by the Federal Government

First and foremost is the need for leadership by the federal government, both in vision and funding—and both have been lacking for some time. Amtrak has attempted to fill this void to a degree but has been hampered by politics and funding issues.

Funding for both passenger rail and freight rail has long been neglected relative to other transportation modes. This is partly because of the common acceptance of the myth that railroads can pay for themselves, even when this is rarely the case. High-speed rail initiatives suffer from this same lack of willingness to provide public support. Florida, for example, is mired in debates over how its HSR project can be funded in the absence of public monies.

In terms of the type of vision that might be provided at the federal level, at the least, guidance and standards for successful models are needed. Without this, states will continue to fill the void with a multitude of models—constitutional amendments and legislation as in Florida and California, multistate compacts as in the Pacific Northwest, public-private partnerships—without a sense of what is most likely to succeed.

More important, there is an overarching need for a national network strategy for rail—one that combines passenger, freight, and high-speed rail—plus a vision for how rail connects to and interrelates with the other transportation modes around the country and how it all might be funded. Otherwise, the nation will continue to miss critical opportunities for key linkages and enhancing efficiency, not just for high-speed rail, but also for regular passenger rail and freight transport.

## Defining Cost

When cost-benefit analyses are developed for high-speed rail, the focus tends to be on the bottom line: how much money will be put in and how much will be generated. By looking at cost as bottom-line driven, we are unlikely to see high-speed rail implemented in the United States because of the large capital investment needed to build such systems. A broader tabulation that includes other costs borne by the transportation system and the public as a whole under the "no-build" or "modal alternative" options often yields different results.

Related to this is the need for clarity not only on the goals of the particular HSR project, but also on who is reaping the benefits. In Florida, the central concern has been who should

bear the risk for a project that is described as having a public benefit but looking for private dollars. The private sector would like to see the state bear more risk, while the state would like the private sector and the federal government to assume more risk. If there are public benefits to an HSR project, then arguing for only private funding makes no sense, and such projects are unlikely to succeed. If the public benefits are questionable, then private funding is a better choice.

## Institutionalized Support

The spark for building HSR often has begun with a particular person in a particular state. It was Governor Bob Graham in Florida who visited Japan and believed Florida should have a similar system. In California, several legislative leaders visited Europe and Japan and returned with the same sentiments. While the initial vision is important for beginning an effort, institutionalized support is critical to sustain the effort and successfully implement HSR. Without institutional buy-in for a project, as well as the authority and responsibility to identify, gather, and manage funding, and the responsibility for and capability of seeing a project through, many HSR projects fail as soon as the key supporter or visionary leaves. Indeed, this frustration led Florida voters to approve the constitutional amendment requiring the building of HSR. As Florida demonstrates, a constitutional amendment or legislative acts alone cannot replace the need for institutionalized support because the former still can be challenged by successive governments or other stakeholders.

In the Pacific Northwest—the one multistate case in the study—there is some institutional support in the state of Washington, but that is missing in Oregon and British Columbia, perhaps demonstrating the need for a federal leadership role to help bridge such gaps.

## Technologies and Approaches

Whether to develop a new HSR or an incremental HSR system depends greatly on what one hopes to accomplish and the context within which one is working. For example, if the goal is to increase the number of commuters using rail instead of automobile to minimize highway congestion, the key is to increase frequency and reliability of service, reduce travel times, and make the system more accessible. Such goals may be better met with an incremental approach that invests in station and equipment improvements, fixing curves and improving tracks, and enhancing signals, rather than new HSR. If the goal is to relieve air congestion between urban areas to free up space for more long-distance flights, a new HSR system linking key urban areas might be the better approach. However, such

discussions do not always occur; often the decision to pursue one approach or another is based more on political factors than on a clear assessment and explanation of what the specific goals are and how best to meet them.

## Opportunities

Opportunities for both incremental and new HSR exist in the United States and have for many years, particularly along those corridors federally designated as HSR corridors. A 1997 Federal Railroad Administration (FRA) study on HSGT concluded that HSGT could develop appreciable ridership. The key is to get at least one project fully implemented in a way that is clearly HSR (as opposed to those that are capable of high speeds but only run at such speeds for small distances). Once a project is in revenue service, many of the concerns expressed by critics, including ridership projections and whether HSR can work in a country where cars and air transport are dominant, can be addressed.

# INTRODUCTION

Since the 1960s, high-speed ground transportation (HSGT) has held the promise of fast, convenient, and environmentally sound travel for distances between 40 and 600 miles.[1] Japan was the first to deploy HSGT in 1964 when the *Shinkansen* bullet train began service between Tokyo and Osaka, with top speeds of 270 kilometers per hour (kph) (169 miles per hour [mph]). This was followed in 1982 by France's Train à Grande Vitesse (TGV), linking Paris and Lyon at speeds of 300 kph (188 mph), and later by Germany's Intercity Express (ICE) that also operates at speeds up to 300 kph (188 mph). South Korea recently began high-speed rail (HSR) service and Taiwan is expected to follow shortly, the former using French technology and the latter using Japanese bullet train technology.[2]

The U.S. experience with HSGT has differed greatly from that in Asia and Europe. Congress first authorized studies aimed at deploying HSGT with the High-Speed Ground Transportation Act of 1965, but to date there are only two examples of such systems in the United States—the Empire Corridor and Northeast Corridor—and whether these systems are truly high speed is debatable. Despite numerous efforts by states and the federal government, nearly all U.S. high-speed rail projects have failed to progress significantly, and none has come close to matching the performance levels of Asian and European systems.

Unlike its European and Asian counterparts, which made high-speed intercity rail a national priority once it became clear that railroads were either in or potentially headed for decline, the U.S. government has been reluctant to develop such projects. The only intercity rail effort moved forward by the federal government beyond pilot studies and technological research has been Amtrak. Ironically, the creation of Amtrak led to a stalemate regarding intercity passenger rail's relationship with other transportation modes and with government. Since its creation, Amtrak's relationship with other modes has been characterized by a division between passenger and freight rail and the isolation of the former from earmarked tax returns and cooperative planning and management.[3] Both of these issues also plague HSR efforts, along with other political and financial difficulties.

## PURPOSE OF THE STUDY AND SOME DEFINITIONS

The goal of this study is to identify lessons learned for successfully developing and implementing HSR in the United States. Phase 1 comprised a two-part literature review: an assessment of federal and, where warranted, state legislation to determine what was intended in terms of objectives and criteria identified in the legislation; and a broader

review that briefly assessed all HSR efforts in the United States since 1980 to determine their history and current status. Phase 2 comprised a deeper literature review and interviews to explore in more detail three case studies: California, Florida, and the Pacific Northwest. This report incorporates the findings from both phases of the study.

Given the early stages of these projects, this report defines success by whether a given HSR project is still actively pursuing development or funding. Comparisons are not made with European or Asian HSR models because most U.S. cases have different goals for speed, accessibility, and frequency. In some cases, HSR has been defined in terms of top speeds (for example, above 110 mph); in others, HSR definitions revolve around market penetration. Thus, each case is judged by how well the project has met its stated goals.

Since 1980, there have been 19 efforts to develop and deploy some form of high-speed ground transportation in the United States. These projects have taken different forms, both in terms of business models—which range from entirely public led and financed, to privately funded, to public-private partnership—and in the type of HSGT they have sought to employ:

- Incremental high-speed rail (Accelerail), which generally uses existing technologies and rights-of-way, but makes improvements to allow for speeds up to 150 mph (though in the United States, most projects aim for 110 mph) using electrified or nonelectrified systems.[4]
- New high-speed rail (HSR),[5] which requires new rights-of-way and imported technologies currently used in Asia or Europe that typically allow speeds greater than 200 mph.
- Magnetic levitation (Maglev), which, by doing away with steel-wheel-on-steel-rail, allows speeds greater than 300 mph.

Some of these projects have been formally designated by the U.S. Department of Transportation (DOT) as federal HSR corridors or identified under the Federal Railroad Administration's Maglev program. Such identification opens the door for federal funding that might not be available otherwise. Other projects have been pursued without federal designation, although several (as in Nevada) are hoping to achieve this status. Complicating the situation is the fact that in some cases, states or groups of states have been pursuing HSGT systems that include all or part of federally designated corridors, but expand upon them by adding additional linkages. Table 1 lists those projects identified, along with the

type of HSGT being pursued and their status relative to federal designation or identification.

While incremental and new HSR projects differ in several ways, both the basic technologies and the markets they would serve are similar. Maglev is fundamentally different than HSR: it uses a completely different technology; it offers competitive service at a broader set of distances (40 to 600 miles versus 100 to 500 miles); and its federal funding sources are different. Because of these differences and the scope of and resources for the current study, the remainder of this report discusses incremental and new HSR options, but not Maglev.

**Table 1 U.S. High-Speed Ground Transportation Projects as of May 2004**

| Project/Corridor | Federally Designated | Date of Initial Designation | HSGT Type Being Pursued |
|---|---|---|---|
| Atlanta–Chattanooga | No | -- | Maglev |
| Baltimore, MD–Washington, D.C. | Maglev Deployment Program | 1/18/01 | Maglev |
| California Corridor | Yes | 10/19/92 | New HSR |
| Chicago Hub Network<br>Midwest Regional Rail Initiative | Yes<br>No, but includes above | 10/15/92<br>-- | Incremental HSR |
| Empire Corridor | Yes | 10/10/98 | Incremental HSR |
| Florida Corridor | Yes | 10/16/92 | New HSR |
| Gulf Coast Corridor | Yes | 11/18/98 | Incremental HSR |
| Keystone Corridor | Yes | 10/10/98 | Incremental HSR |
| Nevada–Southern California | No | -- | Maglev |
| Northeast Corridor | No | -- | Incremental HSR |
| Northern New England Corridor | Yes | 10/11/00 | Incremental HSR |
| Ohio & Lake Erie Regional Rail Network | No, parts in Chicago Hub | -- | Incremental HSR |

**Table 1 U.S. High-Speed Ground Transportation Projects as of May 2004 (Continued)**

| Project/Corridor | Federally Designated | Date of Initial Designation | HSGT Type Being Pursued |
|---|---|---|---|
| Pacific Northwest Corridor | Yes | 10/20/92 | Incremental HSR |
| Pittsburgh | Maglev Deployment Program | 1/18/01 | Maglev |
| South Central Corridor | Yes | 10/11/00 | Incremental HSR |
| Southeast Corridor<br>Southeastern High-Speed Rail | Yes<br>No, but includes above | 10/20/92<br>-- | Incremental HSR |
| Texas Triangle | No, part in South Central Corridor | -- | New HSR |

## OUTLINE OF THE REPORT

The following section provides a synopsis of HSR efforts in the United States since the 1980s. It begins with a review and assessment of federal legislation and the goals for HSGT initially set forth by the U.S. DOT to provide the context within which to examine the various projects. A brief summary of each project in the past 20 to 25 years is provided to round out the three case studies.

High-Speed Rail Case Studies, on page 27, explores the California, Florida, and Pacific Northwest case studies in greater detail. The history of each case is discussed along with an assessment of why it has or has not progressed. The three cases offer an interesting mix: California is a new HSR project; Florida has two parallel plans, one new HSR and one incremental; the Pacific Northwest focuses on incremental HSR. California and Florida both focus on corridors within their states that could eventually be linked to corridors beyond their borders; the Pacific Northwest case involves more than one state, adding to some of the complexities. In terms of business models, California is relying on public funding for its project, Florida has experimented with several public-private partnership models, and the Pacific Northwest is partnering with Amtrak. The three cases offer some interesting counterpoints to each other and some broad lessons and themes for consideration.

The report concludes with a synthesis and comparison of the lessons provided by the case studies as well as information gleaned from other projects around the country.

# A SYNOPSIS OF HIGH-SPEED RAIL IN THE UNITED STATES

Section 1010 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) called for the selection and designation of five high-speed rail corridors around the United States. In October 1992, U.S. Secretary of Transportation Andrew Card, Jr., announced the designations of the following high-speed rail corridors: Midwest (renamed the Chicago Hub), Florida, California, Southeast, and the Pacific Northwest. Seven years later, Section 1103(c) of the Transportation Equity Act for the 21st Century (TEA-21) authorized six additional corridor designations, although to date only five additional designations have been made: Gulf Coast, Keystone, Empire State, South Central, and Northern New England.

## HISTORY AND STATUS OF U.S. HSR PROJECTS SINCE 1980

The case studies in the following section provide detailed information on California, Florida, and the Pacific Northwest, but it is instructive to briefly review the status of the other HSR projects in the United States. Together, they provide a sense of the difficulties involved with implementing HSR. The following pages provide brief descriptions and the status of each federally designated corridor as well as several corridors that are not federally designated. Where federally designated and not-federally designated systems overlap, they are discussed together if warranted.[6]

At different times, the U.S. DOT has defined HSGT both in terms of absolute speeds (anything over 90 mph) and in terms of markets and performance-based measurements, which look to total trip time savings and natural groupings of metropolitan areas.[7] In most discussions, however, it tends toward the speed-based definition. For most HSR efforts in the United States, the goal has *not* been to replicate European or Asian HSR systems but to improve on what already exists.

### Chicago Hub Network and the Midwest Regional Rail Initiative (2 projects/1 inclusive of the other)

In 1990, Illinois, Minnesota, and Wisconsin signed a Memorandum of Understanding (MOU) aimed at evaluating the potential for a high-speed rail corridor linking Chicago, Milwaukee, and Minneapolis-St. Paul. One year later, TMS/Benesch High-Speed Rail Consultants presented their report, *Tri-State High-Speed Rail Study: Chicago–Milwaukee–Twin Cities Corridor*, to the Departments of Transportation of the three states. The purpose of the

report was "to investigate the economic and financial potential for constructing and operating a high-speed rail system in one of two corridors…between Chicago and Minneapolis-St. Paul."[8] The corridors examined were a southern corridor linking Chicago, Milwaukee, and the Twin Cities via Madison, and a northern corridor linking the same cities via Green Bay. The study concluded that the southern corridor appeared "very promising in terms of ridership, revenues, financial, and economic benefits."[9] The report recommended using existing rights-of-way and targeting 125-mph service.

Formally designated a federal high-speed rail corridor on October 15, 1992, the Chicago Hub (formerly named the Midwest High-Speed Rail Corridor) initially included links between Chicago and Detroit, Chicago and St. Louis, and Chicago and Milwaukee. Additional linkages later were added, for a total of eight linkages covering 2,313 miles. The network is shown in Figure 1 and details are provided in Table 2.


**Figure 1 Chicago Hub Network**

**Table 2 Chicago Hub Links**

| City Linkages – Federally Designated | Distance (miles) | Goal (mph) | Date Designated |
|---|---|---|---|
| Chicago, IL – Detroit, MI | 279 | 110 | 10/15/92 |
| Chicago – St. Louis, MO | 282 | 110 | 10/15/92 |
| Chicago – Milwaukee, WI<br>– extension to Minneapolis-St. Paul, MN | 445 | 110 | 10/15/92<br>12/11/98 |
| Chicago – Indianapolis, IN – Cincinnati, OH | 319 | 110 | 1/28/99 |
| Chicago – Toledo, OH – Cleveland, OH | 341 | 110 | 10/11/00 |
| Cleveland – Columbus, OH – Cincinnati (3C) | 254 | 110 | 10/11/00 |
| Indianapolis – Louisville, KY | 111 | 79 | 10/11/00 |
| St. Louis – Kansas City, MO | 282 | 90 | 1/19/01 |

U.S. DOT, Federal Railroad Administration, "Chicago Hub Network," www.fra.dot.gov/Content3.asp?P=648 and "Corridor Chronology," www.fra.dot.gov/Content3.asp?P=1272 (accessed 18 February, 2004).

By 1994, Illinois planners had completed a study of 125-mph service for the Chicago–St. Louis spoke, and the second phase of a study focused on the Chicago–Milwaukee spoke recommended incremental nonelectric high-speed rail at 125 mph.[10]

In April 1997, Illinois entered into a cooperative agreement (DTFRDV-96-H-60006) with the U.S. DOT to perform a Tier I environmental impact study (EIS) of the Chicago–St. Louis spoke of the Chicago Hub Network. The total cost for the EIS was $4.469 million over seven years. FRA contributed $2.8 million ($2.5 million of which was provided in the first fiscal year of the study). This was matched with state funds totaling $1.66 million ($1.5 million from general revenues and the remainder from state planning funds, of which 80 percent is derived from the Federal Highway Administration.).[11] The final EIS, released in January 2003, proposed that HSR passenger service between Chicago and St. Louis be implemented with a maximum operating speed of 110 mph on the section south of Dwight and ongoing speeds of 79 mph north of Dwight. Three different alignments were identified for the north-of-Dwight portion of the line, but a formal recommendation was not made because of funding constraints.[12]

Work has begun along the Chicago–St. Louis spoke of the Hub Network. In 1999, Illinois voters approved $70 million for HSR infrastructure and grade-crossing improvements along the Chicago–St. Louis spoke.[13] Several improvements have been made to upgrade the tracks to allow for 110 mph speeds on the south of the Dwight–Springfield portion of the spoke. A Positive Train Control system[14] demonstration is underway along that same spoke. The FRA reports grants totaling $28 million to Illinois through fiscal year 2002 under FRA's Next Generation High-Speed Rail Program.[15]

Running parallel to the EIS efforts, nine Midwestern states (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin) joined to form the Midwest Regional Rail Initiative (MWRRI) in 1996. The goal was to develop an implementation plan for a more extensive HSR centered around the Chicago Hub. Totaling 3,000 miles, the MWRRI includes the federally designated corridors in the Chicago Hub Network, and adds additional passenger rail links at various speeds above and below 110 mph, as well as several feeder bus service links.

Working with Amtrak and the FRA, the MWRRI developed a report assessing the hub approach to the region. Their report, *Midwest Regional Rail System: A Transportation Network for the 21st Century*, issued in February 2000, concluded that completing the system envisioned would require a decade and approximately $4 billion in infrastructure upgrades and new equipment.[16] The proposed Midwest regional rail system includes the Chicago Hub Network as designated by the FRA, but expands upon it with a number of additional links. The following city links are not federally designated:

- Milwaukee, WI–Green Bay, WI
- Chicago, IL–Quincy, IL
- Chicago, IL–Iowa City, IA–Des Moines, IA–Omaha, NE
- Chicago, IL–Carbondale, MO
- Kalamazoo, MI–Grand Rapids, MI–Holland, MI
- Kalamazoo, MI–Lansing, MI–Port Huron, MI
- Detroit, MI–Pontiac, MI

In 1998, the Midwestern Legislative Conference formed a High-Speed Rail Task Force. Out of that task force, the Midwest Interstate Passenger Rail Commission (MIPRC) was formed

by a compact in 2000. The MIPRC works with the MWRRI, providing an advocacy arm for HSR in the region.

In 2002, Amtrak and the states of Illinois and Wisconsin began reviewing proposals for 110-mph tilting HSR trains. Lack of federal funding was cited as the reason for the delay in concluding procurement.[17] According to Amtrak, the state of Michigan, Amtrak, and the FRA have developed a state-of-the-art incremental train control system that permits passenger train operations on the existing rights-of-way at speeds up to 110 mph. The first phase of the system (up to 90 mph on 45 miles of track along the Chicago–Detroit spoke) was implemented in January 2002. Work began to extend the system an additional 20 miles and to seek approval for operations at speeds in excess of 90 mph.[18] Speeds have been increased to 110 mph on this section in southwest Michigan.[19]

With respect to the other spokes of the hub, Indiana has completed a series of high-speed rail public outreach meetings to define the state's interest and participation in the MWRRI. Indiana is working with Amtrak, the states of Illinois and Michigan, and freight railroads on the *South of the Lake Corridor Study* to identify the best way to route passenger trains through southern Chicago and northwest Indiana.[20] Minnesota is pursuing a $10 million capital budget request for preliminary engineering and environmental documentation for the Minnesota portion of the Chicago–Minneapolis–St. Paul Corridor.

With more than $10 million[21] from the states and the FRA invested in planning, the Chicago Hub Network provides a success story of an incremental HSR project—or series of projects, in this case—by this study's definition of success. Some work has occurred and the project is being actively pursued, both substantively and financially. Finding construction funding is a key obstacle, but the Chicago Hub Network gives a complex picture of federally designated and non-federally designated corridors. There also is a strong rail component, as the state of Illinois pursues its Chicago Regional Environmental and Transportation Efficiency Program (CREATE) in tandem with HSR efforts. Union Pacific, which owns several of the key lines, is willing to cooperate to implement HSR in the region.

### Empire Corridor

Designated in December 1998 as a federal HSR corridor, the Empire Corridor connects New York City with Albany and Buffalo, for a total of 439 miles running through New York State (Figure 2). New York State has run 110-mph passenger rail service on portions of the Albany–New York City stretch of the Empire Corridor route since the 1970s.[22] (The

improvements along the line that allowed higher speeds were largely financed through the 1974 Rail Bond Act.) Speeds along the rest of the corridor are limited to 90 mph at most, in part because of the shared right-of-way with the Metropolitan Transportation Authority south of Poughkeepsie and with CSX Corporation railroad for most of the corridor between Poughkeepsie and Buffalo.


**Figure 2 Empire Corridor, and Keystone, Northeast, and Northern New England Corridors**

In September 1998, an MOU was signed by the New York State DOT and Amtrak that committed the former to rebuilding several old Turboliners and the latter to track improvements that would allow speeds of up to 125 mph on the section between New York City and Schenectady. The estimated cost of the plan was $185 million, but travel times were expected to be reduced significantly throughout the corridor. In January 2004, Amtrak announced its intention to withdraw, citing delays and increased costs.[23] In the meantime, three Turboliners were delivered to Amtrak; two were placed in regular service until later in 2004, when they were taken out of service as a result of high fuel consumption and excessive costs.

One of the few corridors in the country where speeds of 110 mph are being achieved in places, the Empire Corridor is an interesting case and is considered by some to be a success story for incremental HSR. However, with the recent Amtrak announcement and the likelihood that the goal of 125 mph will not be reached soon, nor on a good portion of the corridor, it is unclear whether to consider this a success or failure.

## Gulf Coast Corridor

Formally designated as a federal HSR corridor in November 1998, with extensions approved in October 2000, the Gulf Coast Corridor (Figure 3) covers 1,022 miles and connects cities in Texas (Houston), Louisiana (New Orleans), Alabama (Mobile and Birmingham), Mississippi (Meridian), and Georgia (Atlanta).[24] The goal is to run HSR at speeds of 110 mph. Louisiana received a $1 million earmark in Fiscal Year 1999 and $1.85 million was provided under TEA-21 for elimination of at-grade crossings. The lead for planning the corridor is the Southern Rapid Rail Transportation Commission (SRRTC), which includes representatives from Louisiana, Mississippi, and Alabama.

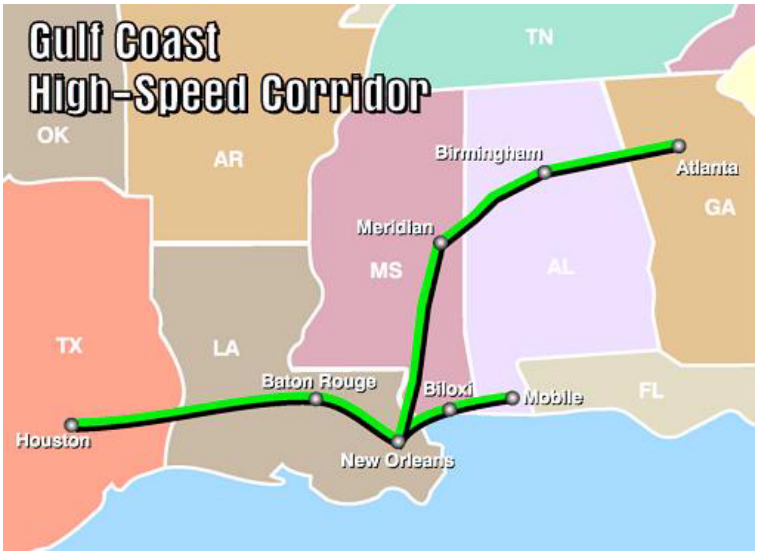


**Figure 3 Gulf Coast Corridor**

In September 2002, the SRRTC was awarded a cooperative agreement by the FRA for Phase I of the Deep South HSR Corridor Study. In Phase I, it will identify institutional issues, make service projections, gather information, and develop a rail operations plan. A specific strategy for implementation will form the basis for Phase II.

Because funding for the study was scheduled to last through September 2004, it is likely that the study is not yet completed. According to the FRA, there are physical constraints along the CSX lines between New Orleans and Mobile that might prevent HSR for much of this distance.

### Keystone Corridor

The Keystone Corridor was designated as a federal HSR corridor in December 1998 (see Figure 2). Now consisting of 349 miles, the initial designation linked Philadelphia and Harrisburg, with an extension to Pittsburgh approved by the U.S. DOT in 2000. Amtrak owns the roughly 100 miles of track between Philadelphia and Harrisburg where current efforts are focused.

In November 1999, Amtrak and the State of Pennsylvania entered into an MOU and announced a joint $140 million infrastructure and equipment upgrade program on the Philadelphia–Harrisburg segment of the line to reduce trip times to 90 minutes by 2004, enhance stations, and improve reliability.[25] In October 2003, Governor Rendell announced another $3 million for passenger rail service between Harrisburg and Philadelphia as part of a $125 million capital budget aimed at improving public transportation.[26] Work continues on the line, although more slowly than anticipated. Roughly $20 million has been expended, with an anticipated $30 million in total by the end of 2004.[27] Recent discussions with Amtrak have resulted in a verbal agreement that the remaining funding will be redeployed in light of a reassessment of needs on this segment of the corridor. However, the project is expected to continue, with a completion date of December 2006.

Another example of an incremental HSR project within one state, efforts continue on this line, although it appears to have some difficulties similar to the Empire Corridor in terms of Amtrak's role.

### Northeast Corridor

Although not formally designated as a federal corridor, the Northeast Corridor (see Figure 2) is one of the few U.S. success stories in HSR; however, its key successes in terms of speed came by the early 1970s and there has been little improvement since. As Perl notes, however, while HSR in the Northeast Corridor did not keep pace with the speed and reliability of European and Asian efforts, it did keep pace with respect to commercial performance by covering costs and generating an operating profit.[28]

In 1967, following the High-Speed Ground Transportation Act two years prior, the Office of HSGT at the U.S. DOT committed $6.7 million to support Pennsylvania Railroad's acquisition of new passenger cars that could attain speeds up to 160 mph.[29] The goal was to shorten the trip between New York City and Washington, D.C., to less than three hours.

What made the Northeast Corridor so marketable was a combination of economic and geographic circumstances. Because the Northeast Corridor lacked the space to add the highway and air capacity needed to match growing travel demands, it was a good candidate for enhancing existing infrastructure. The corridor had a well-developed and modern rail infrastructure when the decision was made, and Pennsylvania Railroad, which owned and operated the line between New York City and Washington, D.C., was willing to work with the government on the initiative.[30]

This was a true private-public enterprise: Private partners put approximately $860 million into the project, with only about $13 million from government sources. The key manufacturing companies—GE, Westinghouse, and the Budd Company—were all U.S. based. The partners had the Metroliner HSR system up and running within four years. However, because the long-term goal of upgrading the tracks to accommodate the higher speeds was not yet met, the trains could only run at speeds as high as 120 mph.

The partnership ended when Penn Central filed for bankruptcy in 1970, with other railroads following soon after. Amtrak took over operation of the Metroliner between New York City and Washington, D.C., between 1978 and 1999; FRA invested about $3.7 billion in rehabilitating and upgrading the corridor. In 1992, Amtrak initiated the Acela HSR program and has invested $1.8 billion to date in a system that could run at speeds of 150 mph. Work focused especially on the New York City–Boston segment of the corridor, rebuilding infrastructure and fully electrifying the line to Boston from New Haven, Connecticut.[31]

Revenue service of the Acela began in December 2000 and trains now operate between 110 and 150 mph on parts of the corridor. However, in more than 30 years, except for the introduction of the Acela, little has changed on the southern section of the corridor in terms of speed and number of trains making the trip on a daily basis, even as the airlines have modified their schedules to accommodate more passengers and more trips. This corridor is considered a success because the system has been operating at HSR speeds for several decades, although the ultimate goal has not yet been achieved on much of the line.

### Northern New England Corridor

One of the newest of the federally designated corridors, the Northern New England Corridor was formally designated in October 2000 (see Figure 2). Shaped like a lopsided V, the 489-mile corridor connects Boston with Portland and Auburn, Maine, on one side and

connects Boston with Montreal, Canada, on the other. Current speeds on the section from Boston to Portland (which began being serviced by Amtrak in December 2001) average only 59 mph. In January 2002, a meeting was held in Nashua, New Hampshire, to begin a Boston–Montreal high-speed rail feasibility study, jointly funded by the FRA and the Departments of Transportation of Massachusetts, Vermont, and New Hampshire. The study's first phase, which focuses on ridership forecasts, infrastructure, public participation, and institutional issues, was scheduled for completion in September 2002, but has not yet been released.

### Ohio and Lake Erie Regional Rail Network

In 1975, the Ohio Rail Transportation Authority (ORTA) was created and charged with creating a plan for an intrastate passenger rail system that could be brought to the voters for support, and with promoting a sound and efficient freight rail system. In 1979, ORTA recommended incremental HSR as the most viable option because it could be implemented at speeds up to 150 mph in a relatively short time. Within a few years, however, they had shifted to advocating a new HSR system, thinking that construction of such a system would also generate jobs in a state experiencing an economic downturn. In 1982, the ORTA proposal was defeated at the polls.

ORTA's responsibilities were shifted to the Ohio Department of Transportation's (ODOT) Rail Division in 1983, and an Ohio High-Speed Rail Authority was created in 1985 to assist in developing a statewide rail plan, including HSR. The latter was terminated in 1989. Five years later, the Ohio Rail Development Commission (ORDC) was established by the legislature as part of ODOT. Consistent with earlier Ohio policy on rail, the ORDC was charged with addressing all rail issues, including passenger and freight.

In 1997, the ORDC began another serious look at HSR. They actively pursued federal designation of the 3-Cs (Cleveland–Columbus–Cincinnati) Corridor as part of the Chicago Hub Network and actively participated in the Midwest Regional Rail System. The ORDC and ODOT also identified several other corridors for further investigation and continue to seek federal HSR designation.

In 2001, the ORDC requested funds from the state for a study of the Detroit–Pittsburgh section of what they are calling the Cleveland Hub (see Figure 4 from the Ohio Rail Development Commission Website, http://www.dot.state.oh.us/ohiorail/CleveHub%20Map.htm). ODOT and the Federal Highway Administration (FHWA) approved funding,

although at the time of this report it appears that study is not yet completed. ODOT has also been working on a study with the Michigan Department of Transportation (MDOT) on the Detroit–Toledo line.


**Figure 4 Ohio and Lake Erie Regional Rail: Cleveland Hub**

The remainder of the corridors remain unassessed with respect to their feasibility for HSR.[32] The following ORDC corridors are not federally designated:

- Toledo, OH–Detroit, MI
- Cleveland, OH–Pittsburgh, PA
- Cleveland, OH–Erie, NY–Buffalo, NY–Niagara Falls, NY–Toronto, Canada
- Toledo, OH–Columbus, OH
- Chicago, IL–Ft. Wayne, IN–Lima, OH–Columbus, OH
- Columbus, OH–Pittsburgh, PA

### South Central Corridor

The South Central Corridor was designated a federal corridor in October 2000. Shaped like a Y, it connects San Antonio, Texas, to Tulsa, Oklahoma, via Austin, Dallas/Fort Worth and Oklahoma City on one fork, and San Antonio to Little Rock, Arkansas, via Austin, Dallas/Fort Worth, and Texarkana on the other. The entire system covers 994 miles. Nothing appears to have moved forward in this corridor.

### Southeast Corridor and Southeastern High-Speed Rail (2 projects: 1 inclusive of the other)

Designated as a federal corridor in October 1992, the initial Southeast Corridor linked Washington, D.C., to Richmond, Virginia. In 1995, an extension was approved to Hampton Roads, Virginia, with additional extensions approved in December 1998 and October 2000 (Figure 5).


**Figure 5 Southeast Corridor**

The current corridor links Washington, D.C., with five states and the Gulf Coast Corridor in the following segments:

- Washington, D.C.–Richmond, VA
- Richmond, VA–Hampton Roads, VA
- Richmond, VA–Raleigh, NC–Greensboro, NC–Charlotte, NC
- Raleigh, NC–Columbia, SC–Savannah, GA–Jacksonville, FL
- Atlanta, GA–Macon, GA
- Charlotte, NC–Atlanta, GA

Southeastern High-Speed Rail includes the federally designated corridor, but extends the links to include the segment to Birmingham, Alabama, covered by the Gulf Coast federally designated corridor and an additional segment to Chattanooga and Nashville, Tennessee.[33]

A report issued in 1997 by the U.S. DOT identified the Southeast Corridor as the most economically viable of all the proposed HSR projects.[34] One year later, the Virginia Department of Rail and Public Transport, North Carolina's Department of Transportation, the FRA, and the FHWA signed an MOU to jointly develop environmental documentation related to implementing HSR on the portions of the corridor in Virginia and North Carolina. A Tier I EIS followed in 1999, focused on the Washington, D.C.–Charlotte segment of the corridor. The Tier I EIS was completed in 2002 and a Record of Decision on the proposed route was issued by the FRA and FHWA, allowing the Tier II EIS to begin. The proposed date of completion was 2004.

### Texas Triangle

Linking the cities of Dallas and Houston, Dallas and San Antonio, and San Antonio and Houston, the Texas Triangle is not a federally designated corridor, although parts of it are included in the federally designated South Central Corridor. Efforts began in 1987 when the Texas Legislature directed the Texas Turnpike Authority to study the feasibility of HSR in the Texas Triangle. In 1989, a report was made to the legislature concluding that under certain assumptions, HSR would be feasible. In May 1989, the Texas High-Speed Rail Act created the 11-member Texas High-Speed Rail Authority (THSRA). It was charged with determining if HSR was in the public interest and, if so, awarding a franchise to develop and operate such a system. In 1990, requests for letters of intent and then a request for proposals were issued, with proposals received the following year from the Texas High-Speed Rail Joint Venture (later Texas FasTrac) and the Texas TGV Consortium. The latter was awarded the franchise to build, operate, and maintain an HSR system in the triangle.

Initially, the Texas TGV Consortium expected a more streamlined process with fewer constraints because there was to be no public funding for the project. It quickly became clear that there were major hurdles to overcome. In the franchise agreement, Texas TGV agreed to pay for THSRA's ongoing operating budget and to obtain $170 million in equity financing by the end of 1992. Because of new safety regulations under the FRA, a complete EIS would need to be prepared, including public hearings, all at Texas TGV's expense.[35]

The initial 1992 deadline was missed and extended for an additional year. The financing deadline was missed again in 1993, and by 1994 the contract had been terminated. Part of the difficulty in obtaining funding was directly related to Southwest Airlines' aggressive countercampaign, which launched several lawsuits during this period and allied with key

partners to block congressional funding in an effort to stop what they saw as a competitor for their customers.

Texas TGV's investors lost about $40 million by the end of the process.[36] More importantly, according to Perl, "The Texas TGV's failure was a delegitimizing event for the proponents of market-led rail passenger renewal."[37] The Texas Triangle is a clear example of a failure, as they are no longer actively pursuing funding or development.

# HIGH-SPEED RAIL CASE STUDIES

The following three case studies were selected for further review based on the potential for some demonstrable lessons learned or themes for consideration that would be relevant to other projects around the country. These three studies offer interesting counterpoints: California is pressing for a new HSR system; the Pacific Northwest case focuses on incremental HSR; and Florida has two plans—one for new HSR and one for an incremental system. In Florida and California, voters are heavily involved and, in some ways, leading HSR efforts, while the Pacific Northwest case is led primarily by state agencies. The Pacific Northwest demonstrates the difficulties of multistate efforts, while California and Florida are testaments to the fact that single-state efforts also often meet with difficulty. Finally, while California to a large degree and the Pacific Northwest to a smaller degree have a history of reliance on rail and public transit systems, Florida has for many years been focused on the automobile and highways, adding to the difficulty of implementing HSR.

## FLORIDA

Not clearly a success or a failure at this point, Florida's intercity passenger rail plan is an interesting case in dealing with high-speed rail. Florida's experience with HSR dates back more than 30 years, including several starts and stops and multiple plans and pieces of legislation. The current project plan focuses on building a new HSR system along a 92-mile stretch connecting Tampa and Orlando (Figure 6). A Draft Environmental Impact Statement (DEIS) has been completed as part of the Project Development and Environmental (PD&E) Process, preferred alignments have been identified, and the Florida High-Speed Rail Authority (FHSRA) has executed a contract with Fluor-Bombardier to provide professional services to complete the final EIS. A Record of Decision on the final EIS by the U.S. Federal Railroad Administration is pending,


**Figure 6 Florida Corridor**

All this activity is occurring against the backdrop of an intense and extremely divisive political debate within a state that is historically dependent on the automobile, with little commuter rail or transit, and an antitax culture. In 2000, a constitutional amendment, conceived and spearheaded by Florida citizens, was approved by voters, requiring the state to build a high-speed ground transportation system. Governor Jeb Bush (R, 1999–present), who curtailed an earlier HSR project when he took office, helped lead an effort to stop the current plans. Unable to get bills passed through the state House and Senate, he turned to the voters to gain enough signatures to place a measure on the November 2004 ballot to repeal the 2000 amendment. That amendment was repealed on November 2, 2004, with 63.7 percent of the vote in favor of repealing it.[38] Before the repeal of the amendment was definite, the Florida legislature cut all state funding for high-speed rail, citing the likelihood of veto by Bush.[39]

The public debate in Florida focuses on cost and marketability. Those opposed to building HSR in Florida argue that the costs are too high, the state is being asked to shoulder an undue burden, and contributing funds for HSR will reduce monies needed for other transportation programs, in particular, highway projects. Those pressing for HSR cite growing population pressures and transportation capacity needs that require an intermodal approach that links Florida's urban areas. They also argue that funds have been set aside for HSR within the Florida Department of Transportation, so an HSR project should not be a drain on other transportation programs, and that costs would be far outweighed by the economic benefits HSR would bring over the life of the project.

The Florida case also may provide lessons on other contextual issues. For example, while projected cost is an important rallying point for both sides of the debate, there are two more fundamental issues related to this that go beyond the immediate debate:

- the role of public investment in intercity passenger rail, and the unwillingness of government to subsidize this transportation mode as it does others
- defining cost as purely monetary costs rather than a broader definition that includes environmental costs, societal costs, energy costs, and so on.

Florida also provides insight about the effect of the type of project being pursued. The current debate relates to new HSR, but some people prefer an incremental solution, believing that would help prove HSR marketability without the financial risks of a new system. Why new HSR was chosen over an incremental approach and how that decision has affected the likelihood of a successful outcome is relevant for other projects. The role of the state legislature and the importance of the constitutional amendment also will be examined to see how they affected the likelihood of successfully implementing HSR in the state.

## A History of HSR in Florida

The history of HSR in Florida covers three decades of multiple starts and stops, numerous corridor studies and proposals, and millions of dollars in investments, yet still no HSR. In 1976, the Florida legislature mandated the *Florida Transit Corridor Study* to determine the feasibility of HSR between Daytona Beach and St. Petersburg. The study concluded that, if implemented in stages using existing highway corridors, HSR would be marketable in Florida. The study proposed using existing rail corridors and the possibility of locating HSR within limited access highway medians, an idea with which the Florida Department of Transportation (FDOT) agreed.[40]

Six years later, Governor Bob Graham (D, 1979–1987) visited Japan and traveled on the *Shinkansen*. He returned to Florida a strong supporter of HSR and authorized the creation of the Florida High-Speed Rail Committee (FHSRC) as a first step toward creating such a system in his state. In 1984, the committee released the *Florida Future Advanced Transportation Report*, which concluded that Florida's transportation infrastructure could not accommodate future growth and that an advanced HSR system was necessary to maintaining mobility in the state. The report recommended developing public-private partnerships and using existing publicly owned rights-of-way (ROWs). During that same year, Florida's legislature enacted the Florida High-Speed Rail Transportation Commission

Act, which created the seven-member Florida High-Speed Rail Commission (FHSRC) and authorized it to grant a franchise to build a privately funded and operated high-speed rail network serving Miami, Tampa, and Orlando.

In 1986, the HSR Commission released its own study by Barton Aschman Associates that recommended proceeding with a 356-mile HSR system connecting Miami, Orlando, and Tampa. Requests for proposals were issued; two were received in 1988, one from Florida TGV, Inc., and one from Florida High-Speed Rail Corporation. The former proposed using French TGV trains, which could run at speeds of 170 mph. The estimated cost of building the system was $2.2 billion, with ridership projections of 5.9 million annually.[41] The latter proposed using Swedish-built ABBX2000 trains with tilt technologies that could run at speeds of 150 mph. Estimated costs were $1.9 billion, with projected ridership at 3.7 million annually.[42] Both proposals assumed some public spending and/or real estate development rights, but when it was clear that there would be no support for public funding, Florida TGV, Inc., withdrew. Florida High-Speed Rail Corporation submitted a revised proposal in 1990 that proposed financing the project with a combination of tax increment financing, benefit districts, impact fees, and a new gas tax. One year later, Governor Lawton Chiles (D, 1991–1998) rejected the proposal, citing high costs.

Despite the lack of support in the governor's office, the legislature enacted a new High-Speed Rail Act in 1992, transferring the FHSRC's responsibilities to FDOT. FDOT also was charged with providing an updated rail system plan every other year that incorporated both passenger and freight components. That same year, on October 16, the Miami–Orlando–Tampa Corridor was federally designated as a high-speed rail corridor by the U.S. Department of Transportation, allowing the possibility of federal funds for studies.

During the next two years, more corridor studies were conducted by FDOT to evaluate the feasibility of a network of HSR corridors connecting major cities around the state. Based on the findings of these studies, FDOT announced its commitment to fund HSR, setting aside $70 million per year, plus a 4 percent inflation adjustment, for at least 30 years. The funds would service infrastructure bonds using a portion of Florida's gasoline tax that had been earmarked for nonhighway expenditures.[43] As Perl points out, "such a dowry, while small in relation to the level of government support routinely extended to air or road infrastructure, made Florida's planned high-speed rail development far more attractive to private industry than prospects in other states."[44] This was evidenced by the response to FDOT's 1995 request for proposals. Five proposals were submitted, offering a range of public-private options for the Miami–Tampa–Orlando corridor, including plans aimed at incremental

improvements, new high-speed rail using bullet trains, and two proposals for Maglev technologies. Cost estimates on the proposals ranged from a low of $740 million to a high of $20 billion.[45]

### *The Florida Overland eXpress Project*

After evaluating the proposals, FDOT selected the Florida Overland eXpress (FOX) Consortium, comprising Fluor Daniel Corporation, Odebrecht-Campanhia Brasileira de Projectos e Obras, Bombardier, GEC-Alsthom, Bear Stearns, Banque Nationale de Paris, and several consulting groups. FOX proposed to build and operate a new grade-separated, fully dedicated HSR serving the three cities at an estimated capital cost of $6.1 billion. The rationale for a new HSR system instead of an incremental approach stemmed from the goals laid out in the request for proposals (RFP) and the belief that if the critical goal were to move people from point A to point B quickly and efficiently, a dedicated ROW was necessary.[46] FOX officials felt strongly that sharing tracks through an incremental approach would never allow the speeds and frequency of service of a dedicated ROW.

Like the earlier proposal from Florida TGV, Inc., FOX planned to use French TGV technology for its rolling stock. Although other technologies were available, the selection of the TGV was aimed at minimizing risk, particularly in the eyes of the financial industry. Because HSR did not exist in the United States, it was (and still is) considered a high-risk venture; using a proven technology could at least mitigate risk on the technological side. In revenue service since 1981, the TGV had demonstrated the fastest trip times, the most reliability, and the best safety record of the potential technologies available.[47] (It should be noted that evolving FRA safety standards would have required changes to conventional TGV technology for high-speed operation in the United States.)

Envisioned as a private-public partnership, franchise and precertification agreements were executed in 1997, with the understanding that FDOT would provide $70 million per year (escalated at 4 percent per year) for 30 to 40 years. Using a portion of Florida's gasoline tax revenues, a percentage of which had been earmarked for nonhighway-related expenditures, these funds would be used to service infrastructure bonds. FOX would contribute $349 million in equity funds over the construction period to capitalize FOX.[48] Although a significant amount of money, the $349 million only accounted for 4 percent of the total projected costs, estimated at up to $9.3 billion total.[49] (Private investment was set at $349 million because of a state cap on the private equity share that demanded a high return of investment, making it less expensive to use public funds.[50]) The remainder of the costs

would be financed through debt financing and bonds, repaid by revenues and a portion of the annual state contributions, although $2 billion in federal loans through the Transportation Infrastructure Finance and Innovation Act (TIFIA) were also sought (Figure 7).[51]

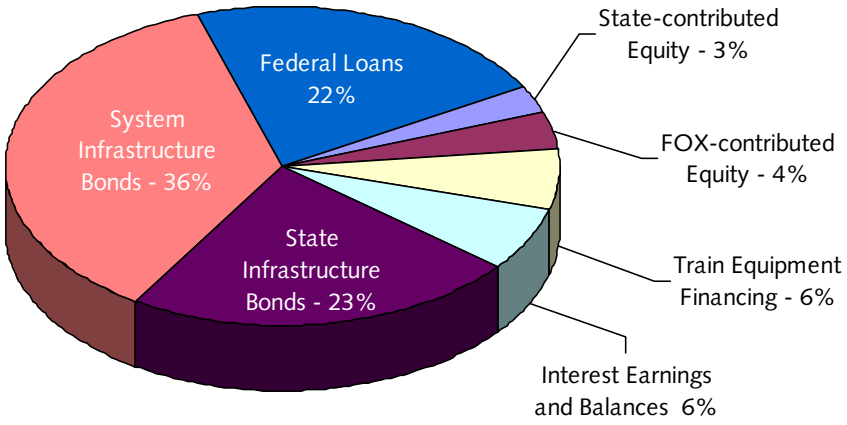


**Figure 7 Sources of Funding for the FOX Project**

This last point has been a continuous source of contention because it is not just unclear, but also unlikely, that federal support would be provided for HSR at the levels needed.

FDOT viewed the project as playing a key role in an integrated transportation system that would link various modes and meet the travel needs of tourists and residents, while being environmentally and fiscally responsible.[52] Studies undertaken by Tim Lynch at Florida State University's Center for Economic Forecasting and Analysis and by Steven Polzin at the University of South Florida's Center for Urban Transportation Research, provided a detailed description of the need for and projected impacts of the FOX HSR project.

Regarding the need for an HSR project, Lynch and Polzin noted that Florida's population grew by 91 percent between 1970 and 1990, and they projected an additional increase of 38 percent by 2010. Tourism was projected to increase by 82 percent during that same period. Increased numbers of residents and tourists was expected to create a tremendous increase in demand for highway capacity that would exceed the projected 18 percent increase in highway lane miles through 2010.[53] Thus, an alternate mode was necessary and Lynch and Polzin went so far as defining HSR as "one of several pivotal transportation investments needed...."[54]

Lynch and Polzin noted several benefits of HSR connecting Miami, Tampa, and Orlando:

- 1.4 million fewer auto trips by 2010
- 60,000 fewer airport flights by 2010
- $1.667 billion (1997 dollars) per year of increased economic activity during the four peak construction years
- 80 pounds fewer pollutants per person for any traveler who shifted mode to HSR by 2010
- Reduced energy consumption equivalent to 4.7 gallons of gasoline per person who shifted mode [55]

Bolstered by these findings and FDOT's support, FOX began its preliminary engineering and environmental work in 1998. Opponents quickly sprang up, questioning everything from costs and environmental issues to the use of imported technology. A grassroots campaign called Derail the Bullet Train actively campaigned against FOX, suggesting that the new HSR project would lead to "an ineffective use of public money." State Senator Ron Klein (D-District 30, Palm Beach), founder of Derail the Bullet Train, said that public transportation was and continues to be underdeveloped in Florida and, given the costs involved, he and many others would rather see such funds used toward regional forms of public transportation than intercity HSR.[56]

Others began poking holes in FOX's ridership projections and revenue estimates, often arguing that the United States was unlikely to follow European and Asian experiences with HSR. Although FOX's ridership study was said to have included "a more intense review and detailed ridership study than anywhere else in the world"[57] at that time, many were skeptical because there was no HSR in the United States. For example, FOX assumed that some airlines would agree to code-share agreements so travelers could easily transfer from planes flying into the cities onto HSR, as was done in Europe. However, an independent report in 1998 by Wilbur Smith Associates, commissioned by the Florida Transportation Commission, which oversees FDOT, concluded that the assumption was unverified in the United States. (The fact that U.S. airlines have not been quick to support HSR, and in several cases—most notably Texas—have openly opposed it, suggests that the assumption should be questioned.) FOX also assumed that some air passengers would choose HSR over air because of lower fares. However, the report stated that in many cases, air fares were already much lower than FOX projections. (In a letter from C.C. Dockery to Senator Toni Jenning, Dockery refutes these claims, demonstrating that the FOX fares were significantly

lower than the air fares at the time.[58]) It also was assumed that more than 50 percent of the riders would be automobile drivers who would shift mode, something that Wilbur Smith Associates again argued was unproven in the United States, and particularly in a state like Florida, which relies extensively on the automobile. Many people thought that FOX's ridership and revenue projections were too optimistic in an environment in which HSR was unproven.[59]

Shortly thereafter, U.S. House Budget Committee Chair John Kasich (R-Ohio) asked the U.S. General Accounting Office (GAO) to review FOX's proposal. The GAO's 1999 report noted that because it was in the early phases of development, the FOX project faced "several uncertainties regarding its cost, ridership, and schedule…. It will be at least 2 more years before sufficient information is available to comprehensively assess the project."[60] The GAO warned that investing in FOX could constrain other Transportation Infrastructure Finance and Innovation Act (TIFIA) allocations. The report stated that "the FOX project could require a substantial portion of TIFIA's total 5-year funding." It further noted that at least 31 projects nationwide would be eligible for TIFIA funds and that "limited TIFIA funds would be available for these projects if the Department decides to provide FOX with a $2 billion loan."[61]

The report had a strong chilling effect, especially among potential investors, and lent further credence to concerns over the ability to secure federal funding for the project. Upon taking office in January 1999, Governor Bush terminated funding (as Governor Chiles had eight years earlier), citing both environmental and financial concerns and the uncertainties identified in the GAO report. The funding that would have been used for HSR was redirected toward highway and aviation projects, dealing a devastating blow to HSR.

### *In the Wake of FOX's Demise: A Vision for Incremental HSR*

In May 2000, Amtrak and FDOT issued the joint *Florida Intercity Passenger Service Rail Vision Plan*. It took a different approach to HSR, focusing on incremental rather than new HSR, and posited a business model partnering the State of Florida and Amtrak. When asked about this shift, Nazih Haddad, Manager of Passenger Rail Development at FDOT, explained that with the failure of FOX, FDOT felt it needed to do something because an alternative to highways was still needed with demand for capacity continuing to increase. He noted that incremental HSR made sense because "the bottom line issues of frequency of service and travel time are more important than actual speed."[62]

An incremental approach to HSR in Florida has advocates. Al Harper, Chairman of EWM Realtors, believes that new HSR may be "too expensive for what Florida ought to do right now." The competitiveness of the first leg of the system (Tampa–Orlando) is questionable given that it is an 80-minute trip by car, and by rail it would be reduced only about 10 minutes.[63] He argues that an incremental approach could be put in place faster, at a lesser cost, and could help prove the marketability needed to expand the system further.[64]

Harper's thoughts are echoed by Bob Vander Clute, Senior Vice President of Safety and Operations at the Association of American Railroads. He notes that incremental HSR can begin with existing ROWs and structures, saving both cost and time so people need not wait many years to see progress—something quite important in a highly charged political environment. While incremental rail will never achieve the speeds of new HSR, much can still be done in terms of eliminating highway grade crossings, straightening curves, and deploying supplementary signalization systems so that faster times and increased frequency can be achieved and further built upon later.[65]

Citing the figures provided by Lynch and Polzin several years earlier, the Vision Plan noted that further highway and air expansion to meet projected travel demand would face major economic and environmental challenges. Although the FOX project was not implemented, the benefits of rail were recognized by FDOT. The Vision Plan connected major urban centers, tourist attractions, and intermodal transportation centers with the following objectives:

- Delivery of quality, corridor-focused rail service quickly, implementing initial service improvements by 2003
- Provision of continuous program improvement thereafter, including market development, service quality, and network expansion
- Implementation of the program cost effectively and affordably, while minimizing and managing financial, market, technological, and environmental risks
- Use of a wide range of partnerships to maximize customer and stakeholder support[66]

The Vision Plan identified two planning periods. The first would cover five years and include immediate actions that could "…initiate quality passenger rail service in high-demand travel markets quickly with minimal capital investment."[67] The second period would run 20 years, at the end of which Florida would have a well-integrated passenger rail system serving communities throughout the state.

The Vision Plan chose the Miami–Tampa–Orlando Corridor as the best one in which to begin, noting that it was already served by an existing rail line, the distance between endpoint stations was between 75 and 300 miles (making rail competitive with air and automobile),[68] and it had the largest current and projected markets. Working within Amtrak's Network Growth Strategy, which had assessed the potential for connecting the national network to additional corridor service in partnership with states, the Vision Plan laid out its 20-year strategy, as shown in Table 3.

**Table 3 Florida DOT's Strategy for Incremental HSR**

| Phase — to Be Implemented by | Infrastructure and Service Modifications | Results |
|---|---|---|
| 1 —2002–2003 | Restructure long-distance passenger service along lines included in its Network Growth Strategy, mainly the Silver Star, Silver Meteor, and Silver Palm services.<br>Provide direct service between Jacksonville and Miami along Florida East Coast Railway (FEC).<br>Add more service between Tampa and Jacksonville and new service between Orlando and Tampa. | Increased service along sections of the route.<br>Reduced travel time between Miami and Jacksonville; no time saved on other routes.<br>Trains still limited to 79 mph. |
| 2 — 2005 | Introduce new intercity trains between Miami and Orlando, Tampa and Orlando, and Tampa and Miami along existing CSX ROWs.<br>Improvements to reduce bottlenecks and increase safety. | Increased service along sections of the route.<br>Trains still limited to 79 mph, but new rolling stock capable of 110 mph, with multiple amenities. |
| 3 — 2015 | New service between Orlando and Port Canaveral on a new line between Jacksonville and Orlando.<br>Increase service between Miami and Orlando along FEC.<br>Add stations. | Speeds increased to 110 mph in certain corridors. |

**Table 3 Florida DOT's Strategy for Incremental HSR (Continued)**

| Phase — to Be Implemented by | Infrastructure and Service Modifications | Results |
|---|---|---|
| 4 — 2020 | Construct a new line between Naples and Fort Lauderdale.<br>Add service between Jacksonville and Pensacola.<br>Connect Tampa to St. Petersburg. | Fully integrated system crossing the state. |

Florida Department of Transportation, *Florida Intercity Passenger Rail Service Vision Plan—Executive Summary* (1 May 2000).

Initial financing would be through joint investment by FDOT and Amtrak, with each sharing initial capital costs (estimated at $278 to $393 million) equally.[69] As shown in Table 4, the Vision Plan anticipates immediate benefits within the first five years (Phase 1 and Phase 2) in terms of frequency of service.

**Table 4 2000 and Proposed Year 2005 Intercity Rail Daily Round Trips**

| Markets | 2000 Amtrak Service | Proposed 2005 Service | | |
|---|---|---|---|---|
| | | Phase 1 | Phase 2 | Phase 3 |
| Tampa–Orlando | 0 | 2 | 6 | 8 |
| Miami–Orlando | 2 | 1 | 4 | 5 |
| Tampa–Miami | 1 | 1 | 1 | 2 |
| Jacksonville–Orlando | 2 | 3 | 0 | 3 |
| Jacksonville–Tampa | 1 | 3 | 0 | 3 |
| Jacksonville–Miami | 3 | 3 | 0 | 3 |

The Vision Plan remains in place and has some support, but many in Florida are skeptical of incremental HSR. Advocates of new HSR, like Eugene Skoropowski, Managing Director, Capitol Corridor Joint Powers Authority, BART, note that although passenger trains can be run along existing tracks, there is a basic incompatibility above 80 mph because of operations and safety issues. He also states that both new and incremental HSR can work, but what can be achieved with each of them is different.[70] (Interestingly, this theme is repeated on both sides of the debate.) C.C. Dockery is even more emphatic in his concerns that incremental HSR is not the right approach, arguing that it will never work if freight

rail controls the tracks because freight is in business to profit from freight, not to service tracks for passenger rail.[71] Others point out that although an incremental approach may be cheaper, it is still not cheap, and the issue of funding and public investment still need to be resolved. Finally, as Senator Klein points out, finding political support for incremental rail remains difficult because one still needs to make the case for a statewide benefit. With either this approach or with new HSR built in segments (for example, Tampa–Orlando first, then Miami, then other cities), many people do not see initial benefits where they live or work and wonder if they will see a benefit to their region, given the costs and time involved.[72]

### *Renewed Attempts to Implement New HSR—The Constitutional Amendment and the Fluor-Bombardier Project*

While FDOT was developing and releasing its Vision Plan, a parallel effort aimed at implementing new HSR was still underway, led in large part by Dockery, a Florida citizen who had been involved with HSR since the late 1970s. A firm believer in the need for new HSR in Florida and a board member of the FHSRA, Dockery initially had been involved with the issue as an observer as his friend and colleague, Governor Graham, pressed for it. Dockery then worked with the campaign of Governor Bob Martinez (R, 1987–1991) and was appointed by the latter to the Florida High-Speed Rail Commission, of which he eventually became chairman, until it was abolished by Governor Chiles. In 2000, the Florida legislature authorized another feasibility study, initially titled the *Coast-to-Coast Rail Feasibility Study* and later renamed the *Cross-State Rail Feasibility Study*, to be conducted by STV, Inc. At the same time, the legislature asked voters to decide on a constitutional amendment, drafted by Dockery, that directed the legislature to develop and operate a high-speed ground transportation system, with speeds above 120 mph and with construction beginning on or before November 1, 2003.

The amendment to the Constitution passed with 52.7 percent of the popular vote, although regional differences existed: On a county-by-county basis, 30 counties voted in favor and 37 against the amendment.[73] Article X, Section 19 stipulated that:

> To reduce traffic congestion and provide alternatives to the traveling public, it is hereby declared to be in the public interest that a high speed ground transportation system consisting of a monorail, fixed guideway or magnetic levitation system, capable of speeds in excess of 120 miles per hour, be developed and operated in the State of Florida to provide high speed ground

> transportation by innovative, efficient and effective technologies consisting of dedicated rails or guideways separated from motor vehicular traffic that will link the five largest urban areas of the State as determined by the Legislature and provide for access to existing air and ground transportation facilities and services. The Legislature, the Cabinet and the Governor are hereby directed to proceed with the development of such a system by the State and/or by a private entity pursuant to state approval and authorization, including the acquisition of right-of-way, the financing of design and construction of the system, and the operation of the system, as provided by specific appropriation and by law, with construction to begin on or before November 1, 2003.[74]

The legislature enacted the Florida High-Speed Rail Authority Act, creating the Florida High-Speed Rail Authority (FHSRA) in June 2001. Composed of a nine-member board, with three appointees each from the governor, the Senate, and the House, the FHSRA was charged with locating, planning, designing, financing, constructing, maintaining, owning, operating, administering, and managing HSR in the state. It was further authorized to "seek and obtain federal matching funds or any other funds to fulfill the requirements of this act either directly or through the Department of Transportation."[75] It appeared that progress was again being made.

That same month STV, Inc., submitted its final coast-to-coast report to FDOT, providing an assessment of route and technology alternatives, estimated costs, and ridership potentials for an HSR corridor linking St. Petersburg, Tampa, and Orlando. The report's final recommendation was to move ahead with what was considered the Minimum Operable Segment (MOS) required for a successful system startup, that is a nonelectrified high-speed technology operating at speeds of up to 150 mph, connecting Orlando and Tampa along the Interstate 4 alignment. The end points in each city would be Orlando International Airport and Tampa Union Station, with intermediate station stops at Disney World, the Orange County Convention Center, and Lakeland. STV recommended "no more planning studies," and the authors of the report strongly urged that "the State not engage in another planning study in order to create the perception of moving forward." In their words, "It is now time to begin the more refined engineering and environmental analyses that will move this project forward in the event that federal funding is secured for implementation."[76] The study also recommended that preliminary engineering and environmental work activities start and an investment-grade ridership study be developed. The FHSRA proceeded accordingly, initiating a Project, Development, and Environment (PD&E) Study in late 2001 for Phase 1, Part 1 of Florida's HSR system. (Phase 1, Part 2 would extend the line

from Tampa to St. Petersburg; Phase 2 would be the final extension between Orlando and Miami.)

The first report of the FHSRA to the governor was made in 2002. Later that year (on October 7), the FHSRA issued a request for proposals for the design, build, operation, maintenance, and finance (DBOM&F) of a high-speed ground transportation system for Phase 1, Part 1 of an HSR system from Tampa to Orlando.[77] Around that same time, the FHSRA also released several documents as part of the PD&E Study, including the *Florida High-Speed Rail: Screening Report*, prepared by Parsons PBS&J (October 2002) and the *Investment Grade Ridership Study,* prepared by AECOM Consulting and Wilbur Smith Associates (November 2002). The former documented the initial decision-making process used to determine which segments within the potential corridors between Orlando and Tampa would be moved forward for further analysis. It also reviewed the need, purpose, and markets for HSR in Florida, noting the following in particular:

- Tourist travel—studies consistently demonstrated that visitors to the Orlando area also visit either or both of the Gulf and Atlantic coastal areas.
- Commuters—previous reports documented a trend toward residents willing to travel 30 to 60 minutes to their jobs, a trend that was expected to continue.
- Businesses—six industrial clusters were identified (aviation and aerospace; information technology; medical technologies; microelectronics modeling; simulation and training; optics and photonics), all needing to bring employees to and from their places of business.
- Freight movement—the Interstate 4 corridor is a gateway to the Port of Tampa and provides connections to urban areas throughout the state; moving passenger rail off the same tracks used by freight would benefit both.[78]

The *Investment Grade Ridership Study* provided ridership and ticket revenue forecasts for two potential alignments. The report began with a description of base conditions and expected demographic trends that would warrant HSR. The study predicted that total corridor population would increase 33 percent between 2002 and 2025. The Orlando region, including Orange, Seminole, and Osceola Counties, was expected to increase by 46 percent during this same period; the Tampa Bay region, including Hillsborough, Pasco, and Pinellas Counties, by 23 percent; and Polk County by 38 percent.[79] Employment during that same 23-year period was expected to increase by 46 percent, and hotel rooms (a measure to estimate growth of visitor travel) was estimated to increase 83 percent, with the

highest increase in the Orlando region.[80] The tremendous growth potential was not limited to population and hotel rooms. Forecasts for air passengers at Orlando International Airport (OIA) showed steady growth through 2010, and estimates out another 15 years suggested a 93 percent increase, for a total of 52 million passengers per year by 2025.[81] When matched against the existing transportation system in Florida, it was clear that the tremendous projected growth in population, employment, and tourism would quickly outpace the system's highway and air capacity.

In August 2003, after two of the four proposals submitted were found to be preliminarily responsive to the 2002 Request for Proposals,[82] a Draft Environmental Impact Statement (DEIS) was issued for the Tampa-to-Orlando HSR, noting that "the purpose of the proposed project is to enhance passenger mobility between Tampa and Orlando" and that such mobility "is viewed as essential for the sustained economic growth of the region, as well as the quality of life of the region's residents and visitors."[83] It further argued that while current transportation demand between the two cities was primarily met through the highway system, that system "is already operating at or near capacity during an extended peak hour of each day, and although capacity improvements…are either currently underway or planned for the near future, they are considered interim, 'first phase' improvements."[84]

The DEIS considered several alternatives in meeting the forecasted demand via HSR:

- A no-build option that would provide no alternative travel mode to buses and automobiles
- Two technology alternatives
  - gas-turbine-powered, locomotive-hauled trains with passenger equipment similar to Amtrak's Northeast Corridor Acela (Fluor Bombardier)
  - an electric-powered, locomotive-hauled train similar to the French TGV (Global Rail Consortium)
- Four alignment alternatives (see Table 5)

**Table 5 Tampa-Orlando DEIS Alignment Choices**

| Alignment | Tampa | Tampa-Orlando | Orlando |
|---|---|---|---|
| A | I-275/I-4 | I-4 | Bee Line Expressway/Taft-Vineland Rd. |
| B | I-275/I-4 | I-4 | S.R. 536/Central Florida Greeneway |

**Table 5 Tampa-Orlando DEIS Alignment Choices (Continued)**

| Alignment | Tampa | Tampa-Orlando | Orlando |
|---|---|---|---|
| C | CSX Line/I-75 | I-4 | Bee Line Expressway/Taft-Vineland Rd. |
| D | CSX Line/I-75 | I-4 | S.R. 536/Central Florida Greeneway |

U.S. Department of Transportation, Federal Railroad Administration and FHSRA, "Draft Environmental Impact Statement: Florida High-Speed Rail–Tampa to Orlando" (August 2003), p. S-6.

At a minimum, the DEIS stipulated an HSR system that would operate 12 round trips daily, 7 days a week, from 6 A.M. to 8 P.M., at speeds of at least 120 mph. Each train would need to accommodate at least 250 passengers, with a travel time between Tampa and Orlando of 70 minutes. New tracks would be laid for the majority of the segment for any alignment. After taking into account the potential impacts and revenues for each of the technologies, running in each of the four possible alignments, the FHSRA named Fluor-Bombardier as the first-ranked proposer and selected the Greeneway as the preferred alignment in Orlando, noting that the environmental impacts for both Orlando alignments were similar but the Greeneway alignment offered a potential for higher ridership revenues, lower cost, and the least financial risk.[85] (In terms of the overall choices, Alignment B is the preferred alignment, but agreement is still needed from the Orlando-Orange County Expressway Authority.) The FHSRA executed a contract with Fluor-Bombardier to provide professional services in support of the completion of a Final EIS (FEIS), to be conducted at no cost to the FSHRA or the state.[86] Work on the FEIS began in January 2004. At the same time, the FHSRA began negotiations with Fluor-Bombardier regarding potential changes to the latter's proposal that would incorporate some of the attributes of the second-ranked proposal, in particular the addition of a second track to Disney World.[87]

### *The Fluor-Bombardier Proposal*

Like the earlier FOX proposal, the Fluor-Bombardier proposal is based on a public-private partnership that will provide a "privately developed and operated public facility that will be owned by the {FHSR} Authority."[88] Team members include Fluor Corporation; Bombardier, Inc.; Skanska-Granite-Lane, Joint Venture; Hubbard Construction Company; Martin K. Eby Construction Company, Inc.; Marta Track Constructors, Inc.; HDR Engineering, Inc; and Lehman Brothers. The base proposal, before the changes being negotiated, offered a single track, located in the median of Interstate 4 between Tampa and

the Osceola/Orange County border, with a double track in the Greeneway median from the border to the Orlando International Airport.

The financial plan places initial ridership revenue risk on the private sector and guarantees operations and maintenance costs for the first seven years of service. Figure 8 shows the proposed cash flow for the first full year of operation.[89] While the firm fixed price is $2.06 billion for construction, with the private sector responsible for any cost overruns, the FHSRA estimates a total cost of $2.38 billion once ROW, environmental mitigation, and other contingencies are factored in.[90] State contributions of $75 million annually would pay for infrastructure, and Fluor has proposed the use of Tax Credit Bonds to leverage annual state appropriations to finance the track and systems. Rolling stock would be financed using a combination of federal grants and tax-exempt bonds, again repaid from ridership revenues. Operations and maintenance would be financed by ridership revenues and backed by a $50 million credit from the Fluor team, although the contract may be reopened for negotiation after seven years if ridership projections are not met.

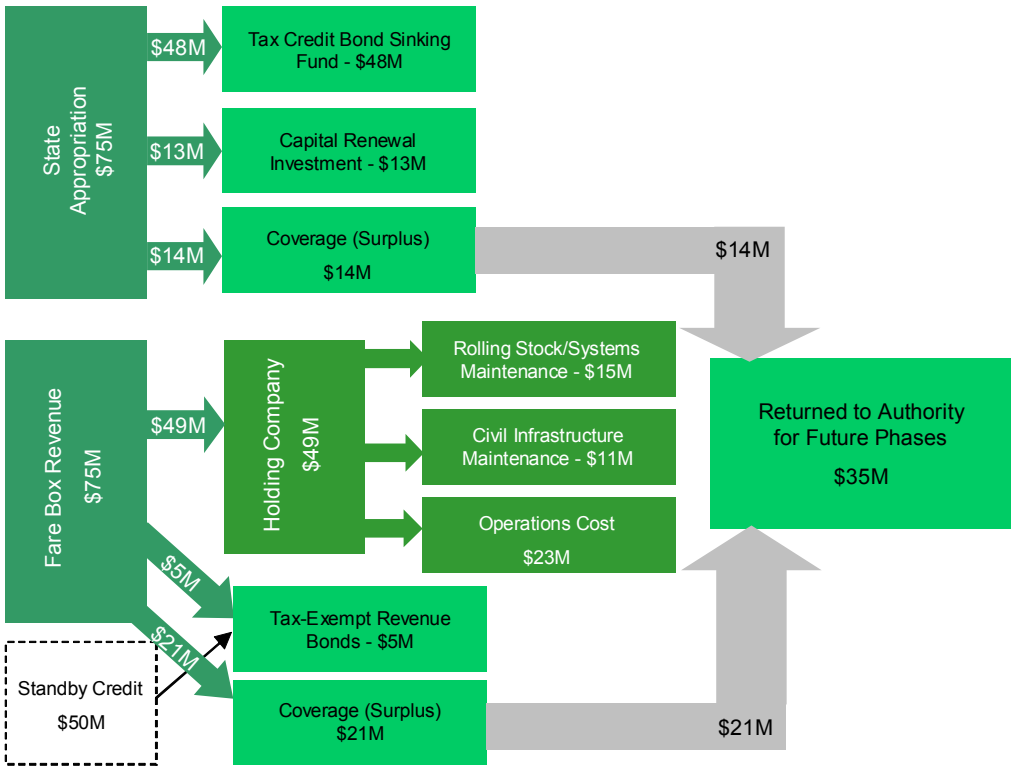


**Figure 8 Proposed Cash Flow in First Full Year of Operation**

*Current Status*

By the end of 2003, the Florida Legislature had authorized $14 million for the HSR project, but then Governor Bush vetoed $5 million of those funds and stated he would not support further new HSR efforts.[91] As mentioned earlier, he and the State CFO, Thomas Gallagher (who is also currently Chair of Derail the Bullet Train), actively engaged in the campaign to repeal the amendment in November 2004. By June 1, 2004, they had 54,774 signatures deemed valid, but for the repeal to appear on the November 2004 ballot, they needed 488,722 signatures.[92] On June 2, 2004, Dockery filed a "Complaint for Injunctive Relief and Petition for Writ of Mandamus," against Secretary of State Glenda Hood, demanding the invalidation of a number of the validated signatures, arguing that they were not obtained according to Florida State Law.[93] By November, however, enough signatures were declared valid that the repeal was placed on the ballot and was overwhelmingly supported in

the November 2004 general elections, with 63.7 percent voting for the repeal.[94] Nevertheless, as Dockery points out, this was not necessarily a vote to kill the concept of HSR in Florida, since prior legislation still exists and other avenues are still being followed.[95] According to Gary Brosch, Executive Director, Coast2Coast Rail Consortium and Chair of the National Center for Transit Research at the University of South Florida, the FHSRA met recently and decided to continue moving ahead with plans for HSR between Tampa and Orlando despite the repeal of the amendment.[96]

Prior to the repeal, the FHSRA had been negotiating with the Orlando Orange County Expressway Authority (OOCEA) and Walt Disney World in order to use the preferred (Greeneway) route.[97] In February 2004, the OOCEA agreed to begin an assessment of HSR using the ROW along the Greeneway if the FHSRA would pay for any costs incurred as a result of conducting the study. The OOCEA was clear that their agreement to assess the HSR option does not constitute their willingness to allow the use of their ROW nor will it necessarily result in a Memorandum of Agreement (MOA), which is needed for the Record of Decision to be issued by the Federal Railroad Administration.[98] In the most recent pronouncement by the FHSRA that they would continue to move ahead on HSR, the Authority also decided to change the preferred alignment from Greeneway to the Bee Line, which would serve Universal Studios.[99]

Fluor Bombardier continued to advance its plans, announcing that Virgin Group (Virgin Rail and Airlines) had agreed to join the team. Virgin Group, which has extensive experience with HSR operations in the United Kingdom, would operate and market HSR in Florida if the project is realized.[100] However, with the voter repeal of the HSR amendment in 2004, the situation has become more complex as the FHSRA has agreed to reconsider the proposal by Global Rail Consortium, initially ranked second behind Fluor Bombardier, because they are offering additional private sector investment.[101]

FDOT remains committed to its Vision Plan and intends to move ahead with Amtrak on Phase 1, the extension of Amtrak's national service. The state has committed $64 million to the project, and FDOT has begun negotiating with Florida East Coast Railway (FEC) over issues arising from use of FEC ROW. Negotiations were put on hold, in part because of the parallel effort aimed at new HSR and in part because of a change in the national legal and political climate when David Gunn assumed leadership of Amtrak. The focus of the national passenger rail system shifted from expansion to achieving a state-of-good-repair on lines owned by Amtrak. Furthermore, Amtrak was directed by the U.S. DOT to cease and desist on any expansion and planning for expansion as a condition of a $100 million

Railroad Rehabilitation and Infrastructure Funding (RRIF) loan to Amtrak in June 2002. This restriction, which was included in Amtrak's appropriations for FY2003 and FY2004, combined with the reluctance by the State of Florida to fund infrastructure improvements, has left the FEC initiative in limbo.[102] However, according to Haddad, there have been signals that this may soon be resolved so they can implement Phase 1 of the Vision Plan.[103]

## Assessment of the Case

For 30 years, the state of Florida has pursued HSR in one form or another. Each time progress is made, setbacks occur and the process begins again. The situation now appears to be more of a stalemate with three discernible positions: those advocating new HSR, those opposed to all HSR plans, and those who want an incremental approach. How to best end this stalemate, and whether the current Fluor Bombardier HSR project will be built, is unclear. However, Florida's experience offers some powerful lessons and themes for consideration for HSR elsewhere in the country.

### *Cost and Financing*

The issue of cost and financing in the Florida case has several dimensions. In the immediate debate over cost, the central concern is the business model and who should bear the risk for a project that is described as having a public benefit but looking for private dollars. The private sector wants the state to bear more of the risk; the state wants the private sector and the federal government to assume more risk.

Further complicating the question of who will pay is Florida's long-standing bias against taxes. Florida ranks 33rd among states in terms of per capita state and local tax burden and collects no income tax. The proportion of personal income spent on taxes in Florida is the sixth lowest in the country.[104] If HSR is to be built, public funds are needed, but how to raise such funds in an antitax environment, particularly when many people are skeptical of the public benefit, is a critical dilemma.

Another dimension of the cost and financing issue relates to how costs and benefits are measured. There is a tendency in the United States to look at financing HSR as bottom-line driven, identifying capital and operational costs on one side and revenues on the other. As long as this is the case, the United States is unlikely to see HSR in any form.[105] A broader view of costs and benefits—one that considers costs borne by the public as a result of

capacity increases in other forms of transport should a no-build option be taken—often results in a very different mixture of economic results.[106]

Finally, there is a fundamental issue related to the role of the federal government and what several people have deemed the myth that railroads can pay for themselves, even when this is rarely the case. The various proposals put forth in Florida have been expected to show how HSR can pay for itself, although there is no credible evidence that total self-sufficiency can be achieved. Such plans have been met with skepticism by those opposed to HSR, as well as by some who want to see HSR implemented in Florida but believe that public support is needed. All the proposals have included some federal monies in their cost estimates and projections; however, federal funding is unlikely to be available, given the historical reluctance to invest in rail. Federal reluctance to help subsidize rail, even as it aids air, highways, and other modes, trickles down to state and local governments. Thus, without more federal support for such projects, they are unlikely to succeed in the near future.

### *The Approach and the Need for Clear Goals Around Which a Consensus Can Be Built*

Another theme for consideration and potential lesson learned in Florida relates to the implementation approach being pursued, namely new HSR versus incremental HSR. In the United States, both new and incremental HSR projects have been presented. No new HSR systems have been implemented, but examples of incremental HSR exist (Northeast Corridor Acela and the Empire Corridor Turbotrain), and several others are underway (in the Pacific Northwest and the Chicago Hub). All the incremental HSR projects are, or are planned to be, supported by public funds.

The needs and goals identified determine the best approach for a particular area. In Florida, beyond the discussions of costs and time is an undercurrent of dissension over the exact need and goals for HSR. Advocates of new HSR speak of the need to eliminate or mitigate congestion, but opponents strongly believe that in a state with little passenger rail or transit, there are other ways to alleviate congestion that might be both more effective and less costly. As Heidi Eddins, Executive Vice President and General Counsel of FEC, notes, if the ultimate goal is to have an integrated and comprehensive transportation system for Florida, it "makes no sense to start at the end, and that is what {the new HSR project} is doing."[107] She argues that to relieve congestion and move people from cars to public transit, including rail and bus, the key is to offer more *commuter* options focused on reliability, frequency of service, and accessibility. The proposed new HSR system along a relatively short segment, with few stops, would not offer this.

Even among those who support new HSR in Florida, there is concern over the current choice of corridor. As Ron Hartman, Executive Vice President of Yellow Transportation, points out, the real time savings and revenue-generating possibilities are found on the longer trip to Miami, and "the Tampa–Orlando corridor, without the Miami link, is hard to justify."[108] Eugene Skoropowski notes that building new HSR between Tampa and Orlando is "like building a tree without the trunk. Will a train be nice in that corridor? Yes. Will it be able to demonstrate the real capacity of HSR? Not until it is expanded to include Miami."[109]

The current project, like those before it, appears to be caught in an impasse because it has been whittled down to a portion of the route that even some proponents find hard to support in the current political and economic climate. This relates to the ongoing debate over whom the current HSR will serve in Florida. Many believe that the key constituencies being served by the initial corridor are tourists and the related private sector industries, leading them back to the question of why public funds should be used. Private support among those who would most benefit by the Tampa–Orlando HSR is not as strong as one might imagine. During the earlier FOX project, Orlando International Airport was an active supporter of HSR (and continues to be) but many of the tourist attractions, notably Walt Disney World, were decidedly neutral in their reactions, waiting to see what alignments might be used. During the current discussions, Disney is more supportive of the project and negotiating with the FHSRA now that the alignment would include a stop at Disney World. However, Orlando Universal Studios was actively engaged in the Derail the Bullet Train efforts, contributing more than $220,000 to the campaign.[110]

### *The Political Arena*

In several other cases, most notably the Texas TGV experience, specific interest groups were much involved in preventing HSR plans from being implemented. In Florida, specific interest groups have also played a role at times. In the case of FOX, for example, environmental groups and land developers both voiced strong opposition to the Miami-Orlando routing, citing concerns over the Everglades (although in the latter case, this may have had to do more with the possibility of losing potential areas for development if the HSR line was put in place). The small airport authorities, which had been developing plans for expansion to serve as feeders to the larger airports, opposed HSR as a competitor. The role of the major airlines is more ambiguous. Furthermore, in the latest round of discussions regarding HSR, special interest groups do not seem to be playing as pivotal a role in the

overall discussions and debates as are key members of the legislature and executive branch, and the agencies and authorities involved.

The politics surrounding HSR in Florida are bipartisan, with opponents and proponents found on both sides of the political fence, and a somewhat disjointed process with multiple ideas being put forth and none being realized. Both Democratic and Republican governors, for example, have been critical to getting HSR projects underway and to stopping those projects under later administrations. Efforts to support the 2000 Constitutional amendment, as well as those aimed at repealing it, have been sponsored by both Republican and Democratic legislators.

Several individuals in key leadership positions have changed their stance on HSR, in particular Governor Bush and Thomas Gallagher. Before becoming Florida's CFO and current chair of the Derail the Bullet Train, Gallagher had voted to support HSR. Bush, while perhaps never a full advocate, was much less opposed to HSR before taking office, and some felt he was supportive of FOX. Why their stances shifted is unclear (their offices did not respond to requests for interviews); however, in the more recent discussions between FHSRA and Fluor Bombardier, Florida's bid for the 2012 Olympics may have played a role. Tampa was being supported as a potential site for the Olympics, but it would have needed the hotel capacity found in Orlando and quick and efficient transportation to get there. Thus, HSR found support in quarters it might not have otherwise. One cannot know for certain whether HSR would have been implemented if Tampa had been selected for the Olympics, but it offers a glimpse of the possibility that a key rallying point could have made a difference.

Individual personalities have played an important role, both positively and negatively, in shaping and modifying Florida's HSR experience for three decades. Governor Graham first launched Florida on its HSR path, with his unwavering belief that Florida needed a system similar to the Japanese *Shinkansen*. Many people were involved in the studies, proposals, and plans, but it was Governor Chiles who terminated them. Eight years later, Governor Bush was a critical stopping point for HSR, and some have wondered whether personality clashes with FOX leaders may have played a role here. Key personalities need not be in top leadership positions. C.C. Dockery has been involved in advocating HSR for several decades. He authored the recently repealed amendment and helped define the spirit in which it has been interpreted, that is, new HSR.

While the nuances are not all evident, it is apparent from the Florida case that, given the time to develop and implement HSR, *continuous* leadership and support is critical. More important, this leadership and support needs to be institutional in nature. Studies and plans often span several administrations, and Florida shows how easily efforts can be curtailed by a single person.

More important, but related, thus far the Constitutional amendment itself could not guarantee sufficient support to implement HSR. In a political climate heavily affected by personalities and lacking an institutional support structure with sufficient autonomy regarding funds, responsibility, and authority, the amendment has become one more item that is placed at the forefront of the debate by some and ignored by others. When asked what will happen now that the November 2004 elections are over and how best to overcome the HSR impasse, the answer often given is that proponents of HSR will probably have to wait until a more pro-HSR governor replaces Bush. At the least, everyone will need to wait until the legislature decides in 2005 whether to provide additional funding for plans in progress.

## CALIFORNIA

Despite several well-publicized problems, California is one of the few U.S. states that is promoting high-speed passenger rail and moving ahead to make it happen. Figure 9 shows a rough approximation of the proposed California Corridor.


**Figure 9 California Corridor**

California has three Amtrak corridors: the Los Angeles–San Diego Corridor, the Capital Corridor between Oakland and Sacramento, and the San Joaquin Service connecting Bakersfield, Stockton, Oakland, and Sacramento. Funding for each line is predominantly provided by the state, with federal and local governments, Amtrak, and the railroads making up most of the remainder.[111]

In terms of commuter rail, two major developments affect the development of incremental high-speed rail in California:

- Public agencies have assumed control from the railroads over some tracks.
- Successful commuter systems have resulted in a fundamental change in public attitudes about passenger rail.

In 2004, the Peninsula Corridor Joint Powers Board (Caltrain) inaugurated faster commuter trains called "Baby Bullets" that reduce the 1-hour-36-minute travel time from San Francisco to San Jose to less than 1 hour, comparing favorably with automobile travel. This is the only California commuter rail service that has emphasized high speed. The trains travel no faster than 79 mph, but the new grade separations, bypass tracks at stations, improved track throughout the system, and limited stops allow more efficient operation. Baby Bullets were supported by State Senator Jackie Speier, a Democrat from Hillsborough.

Her Peninsula constituents benefit from improved connections to San Francisco and San Jose. She obtained $127 million in traffic congestion relief funds from the state to build bypass track and to buy six new locomotives and seventeen cars. Other local and grant money went toward improvement in the line's signal system, track upgrades, and an overhaul of two stations.[112]

In terms of high-speed rail specifically, California has pursued two fronts:

- Incremental improvement of existing rail lines to provide faster, more frequent passenger rail service
- Advanced plans for a completely new rail system on dedicated, high-speed rails, to provide genuinely high-speed service competitive with air passenger service

The two fronts are largely separate, with little overlap in the organizational structure. Current incremental plans and projects do not depend on high-speed rail plans and projects. However, the history of intercity and commuter rail in California demonstrates support and some willingness to fund rail service as an alternative to the automobile. The support comes both from government agencies at state, regional, and local levels and from the public, as demonstrated by successful ballot measures to provide funding.

## The California High-Speed Rail Authority

The positive reaction of automobile-dependent Californians to two 1990 rail transit bond issues (Propositions 108 and 116) encouraged transportation thinkers and legislators to consider a more ambitious plan—to connect the San Francisco Bay Area with the Los Angeles area by a dedicated high-speed rail system. The distance is less than 500 miles, within the theoretical range where high-speed ground transportation could compete with air.

HSR innovators in the legislature included state senators Quentin Kopp, Jim Costa, Richard Katz, Jim Mills, and Rebecca Morgan; Bay Area political leaders included Rod Diridon, Chair of the Santa Clara County Board of Supervisors; Representative Lynn Schenk from San Diego was also involved. Given term limits and the passage of time, all have left office. Nongovernmental organizations included the Planning and Conservation League. Several private tours were organized for the legislators and local officials to visit and ride HSR lines in Japan (*Shinkansen*), Germany (InterCity Express–ICE), and France (*Train à*

*Grande Vitesse*–TGV). All three systems feature state-of-the-art electric trains on exclusive, dedicated rights-of-way, operating at speeds between 150 and 190 mph.

The first formal step was the legislature's move in 1994 to create the High-Speed Rail Commission, which was directed to conduct a feasibility study of HSR in California and report back to the legislature. The feasibility study was completed in 1996, and the commission reported that a high-speed rail system in California was feasible. As a result, the California legislature enacted Senate Bill 1420, effective September 24, 1996, as California Public Utilities Code Sections 185000, et seq. The leadership of Independent State Senator Quentin Kopp of San Francisco was essential. Governor Pete Wilson was unenthusiastic but deferred to Senator Kopp. The High-Speed Rail Commission eventually became an Authority, allowing substantial autonomy and power under California law.

The legislature required the California High-Speed Rail Authority (CHSRA) to prepare a business plan, which was completed in June 2000. As a result of legislative approval of the CHSRA Final Business Plan, the Authority mandate was extended. To date, the CHSRA has resisted attempts to bring it under the control of the California Department of Transportation (Caltrans), so it operates independently.

The CHSRA proposes to build a

> …high-speed train system for intercity travel in California between the major metropolitan centers of Sacramento and the San Francisco Bay Area in the north, through the Central Valley, to Los Angeles and San Diego in the south...projected to carry as many as 68 million passengers annually by the year 2020...speeds in excess of 200 miles per hour...on a fully grade-separated track, with state-of-the-art safety, signaling, and automated control systems.[113]

Electric propulsion is recommended.

The updated 2000 Business Plan estimated $25 billion. The first phase, the so-called Starter Line from Los Angeles to San Francisco, is planned to cost $14 to 15 billion. Additional lines later will extend to Sacramento from Los Angeles, to Sacramento from San Francisco, and from Los Angeles to San Diego.

The legislature authorized $20 million for a comprehensive environmental study. The CHSRA and the FRA completed the draft Environmental Impact Report/Environmental

Impact Statement (EIR/EIS) on January 20, 2004. Public hearings were held in Sacramento, Los Angeles, San Francisco, San Diego, San Jose, and Fresno. Comments from the public were published by CHSRA on October 7, 2004.[114]

A preliminary study conducted before 1999 by technical engineers had recommended against the Altamont Pass Corridor for operational reasons; therefore, the draft document did not fully analyze that corridor. Testimony received during the hearings suggested interest in the Altamont Corridor and the possibility of another corridor in the Pacheco Pass area. The Federal Railroad Administration (FRA) encouraged the CHSRA Board to conduct more detailed studies of the access between the Central Valley and the Bay Area. Assuming that additional funding is provided in the 2005-2006 state budget, the additional study should be complete for hearings, and the full document, now called a Program Level Environmental Clearance, could be certified by the CHSRA Board in the spring of 2006.

Among other issues, the EIR/EIS examines the No-Project Alternative: What happens if we do nothing? The number of passengers traveling intercity in California is forecasted to increase up to 63 percent over the next 20 years; the state's population is projected to increase by 31 percent by 2020.[115] New population estimates are forthcoming.

> The No-Project Alternative would result in an intercity transportation network that would not be as safe as, would have increased travel times, and would be significantly less reliable than existing conditions....would also exacerbate...energy use and dependence on petroleum...would result in environmental impacts...gridlock on the highways and airports.[116]

Another alternative is the Modal Alternative, that is, further expansion of highways and airports but no HSR. The Modal Alternative would produce greater environmental impact and would not be as safe or reliable as the high-speed alternative.[117] Any modal alternative would require the taking of far more land for highways and airports than any HSR alternative. In the original Business Plan, the CHSRA estimated that the complete HSR project would cost $37 billion. It would cost $82 billion to expand the highway network and the airports to accommodate as many passengers as HSR would carry.

The original schedule for certification had assumed placing bonds for the Starter Line on the state ballot in November 2004. Delay in certification became less significant when California's deepening fiscal crisis caused Governor Arnold Schwarzenegger and the legislature to place a $15 billion bailout bond on that ballot. Voters also had authorized

$4 billion in education bonds in March 2004, and the public willingness to support the HSR bonds might have been tested. With the consent of the CHSRA Board, the legislature and the governor agreed to delay the HSR bonds to what they presume will be a more favorable November 2006 ballot.

Some political forces wanted to delay the HSR bond vote until 2008. However, such a lengthy delay would invalidate the EIR/EIS already completed, and the expensive procedure would have to begin anew. The CHSRA stated that a delay to 2008 probably would kill the entire HSR idea. That the legislature followed this reasoning could indicate fundamental support among current California legislators for the project. There will undoubtedly be competing causes for voter support whatever year is chosen.

Federal action is uncertain. California expects about $18 billion in support from the TEA-21 renewal legislation, which at present is speculative. California Congressional members have stated that they would try to couple federal HSR funding with a designation as a "new industry," or perhaps as a "demonstration" project. The latter cannot be downgraded or ignored by the bureaucracy.

Construction was scheduled to begin in 2008-2009, but will have to await voter action in 2006. SYSTRA—a joint venture of Bechtel, Parsons-Brinckerhoff, and others—is waiting in the wings. There seems to be a genuine hope, based on an economic analysis prepared for the CHSRA, that the Starter Line will generate funds to build further lines.[118]

So far, organized opposition to California HSR has been light. Southwest Airlines, a vehement opponent of high-speed rail in Texas, has been quiet in California. The only major political opponent has been State Senator Tom McClintock, the unsuccessful Republican opponent to Governor Schwarzenegger in the 2003 recall and election. McClintock favors only highway projects.

Those who support HSR but want it to serve parochial interests create more serious difficulty. The Los Angeles County Metropolitan Transportation Authority (MTA), L.A. County Supervisor Mike Antonovich, L.A. City Councilman and mayoral candidate Antonio Villaraigosa, and other politicians want the HSR route to go far to the east via Palmdale and Tehachapi. This was the route of the Southern Pacific's San Joaquin Daylight, which took 4-1/2 long hours to travel from Los Angeles to Bakersfield. A recent public hearing in Los Angeles produced no enthusiastic supporters of high-speed rail; only public officials from Palmdale were present. Palmdale activists want a high-speed connection

between Los Angeles International Airport and the Palmdale Intercontinental Airport, which the Los Angeles Department of Airports wants to promote. High-speed rail to the Bay Area is not their focus.

The CHSRA prefers a direct route over the mountains from Los Angeles to Bakersfield. This is the highway route known as the Grapevine or the Ridge Route. Caltrans built I-5 over this difficult terrain because it is the most logical route. CHSRA believes likewise, since the purpose is to transport people rapidly between the Los Angeles Area and the Bay Area, not to service intermediate, out-of-the-way towns. So far there has been little opposition to the Grapevine route as a result of its planned tunnel crossing of the infamous San Andreas Fault. The EIR/EIS discusses this issue, but scientific study could be trumped by sensationalism if a major earthquake hits. Geologists and the authorities are aware of the Palmdale Bulge, a detectable rise in the earth, which signifies potential movement along the San Andreas Fault between Los Angeles and Bakersfield. CHSRA can point out that the 1989 Loma Prieta earthquake in the Bay Area destroyed highway structures, including part of the critical Bay Bridge, but did not harm any rail tunnels, such as BART's Trans-Bay tube.

Train Riders of California (TRAC), a small, nonprofit group, has voiced opposition to the proposed route linking the Bay Area over the coastal mountains to the San Joaquin Valley. While TRAC fundamentally supports incremental improvements to existing rail lines, it considers HSR to be a diversion of resources.[119] Several public agencies also are concerned about diversion of resources. The Southern California Regional Rail Authority (SCRRA) "...is concerned that...the [high-speed train] HST system will divert already limited state and federal funding from Metrolink projects. The HST system should not be funded in lieu of funding for expansion of the Metrolink system."[120] The Southern California Association of Governments (SCAG), which favors Maglev technology, states: "SCAG is concerned about the use of such existing local funds and state transportation revenue sources."[121] The MTA in Los Angeles, one of five SCRRA members, states: "The proposed project should not divert critical state and federal funding for MTA's surface transportation programs."[122] The San Joaquin Council of Governments in Stockton worried: "The cost of the HSR may delay other critically needed transportation improvements."[123] Political leadership will be necessary to overcome such interagency concerns.

Environmentalists and the California Department of Parks and Recreation oppose the proposed route through the Henry Coe State Park and the Orestimba Wilderness east of Gilroy, and do not like the alternate proposal through neighboring Pacheco Pass.[124] The CHRSA maintains that environmentally friendly construction can be done through the

Pacheco Pass, where a four-lane highway already exists, or even through Henry Coe State Park under Mt. Hamilton. Either of those routes is necessary in order to route the HSR from San Francisco through San Jose, over (or under) the hills, into the San Joaquin Valley. Some environmentalists prefer a route over the Altamont Pass, but this route is to the north of San Jose, which then would be served by a secondary line instead of the HSR main line. San Jose is the third-largest city in California, the tenth-largest in the nation, and the center of Silicon Valley, an important producer of economic activity and jobs. In making the original choice of the Pacheco Pass option, the CHSRA determined that a more direct line to San Jose saves time and has higher potential to attract passengers. "The CHSRA and the Bay Area Metropolitan Transportation Commission recommended dropping the Altamont Pass alternative route in 1999, and reaffirmed that decision in 2003."[125] The Altamont Pass alternative also would require a new bridge across the lower San Francisco Bay, in the middle of a marine sanctuary, guaranteeing intervention from environmental interests. The continuing environmental work is focusing more analysis on the Altamont Pass alternative and another more southerly option.

It appears that most political forces support HSR in principle. Legislative leaders such as state senators Burton and Murray are active supporters, although under California's strict term limits, Burton left office in 2004. The Senate Transportation Committee has taken leadership for HSR. The press has been favorable, although not passionate. The Sierra Club had been a supporter, until some members became embroiled in the debate over Altamont Pass versus Pacheco Pass.[126]

The Business Plan estimated that "nearly two-thirds of Californians already endorse building a high-speed system and would be willing to pay for its construction." That may be, although this estimate is a result of a poll which asked simply if the respondent approved or disapproved. The estimate might be different if HSR were to be ranked with other projects such as public school construction, medical care for seniors, tax reduction, and police and fire protection.

CHSRA Executive Director Mehdi Morshed is optimistic about the chances of success. He believes that there is political momentum and that California voters will respond to the innovative, high-tech nature of the project. The voters will find it on the 2006 ballot, unless the legislature ultimately moves it to the 2008 ballot.

### Observations

A few preliminary observations may be drawn from the California experience:

- Leadership is critical. There was leadership in the California Legislature at several stages in rail development, including the successful 1990 bond issues and in the moves to create the CHSRA. It remains to be seen whether strong pro-HSR leadership will be in place in 2006 when the HSR bonds will be on the ballot. HSR success at that point might depend on the strong support of Governor Schwarzenegger and on his impact on voters at the time. As with any California election, the ability of supporters to raise the funding for a strong statewide campaign will be a factor.
- Seeing is believing. When politicians or other leaders visit and ride existing HSR systems (*Shinkansen*, ICE, TGV), they return enthusiastic. Major political leaders in California have made such visits, but not at state expense. The same might be true of the traveling public. The international nature of many California businesses means that many voters have been exposed to existing HSR, presumably with favorable results.
- The incremental approach *may* lead to success in implementing new HSR if both are pursued concurrently. California has had several successes in incremental rail projects, persuading at least a portion of the public that rail is a good alternative to the auto culture. More likely, political leadership is a far more important factor.
- Timing is important. The 1990 California bond issues were voted on in an upbeat economy. The HSR bonds have been delayed until the economy is more robust, which legislators believe will improve chances for approval.
- While successive campaigns have played a role in educating Californians about the respective costs and benefits of various transportation modes, most citizens are unprepared to assess the value of a project as major as the California Corridor. This lack of understanding is not unique to California, which suggests that a federal role in public education about all modes and their costs and benefits would be beneficial.

It is uncertain to what extent a federal political role in California may be appropriate. Undoubtedly a federal voice would be appropriate commensurate with federal money.

## PACIFIC NORTHWEST

When Amtrak assumed passenger rail services from the railroads in May 1971, it continued limited passenger service—one train—on the Burlington Northern Railway (BN, formerly

Great Northern Railway) track between Portland, Oregon, and Seattle, Washington. One additional Amtrak train per day, the Coast Starlight between Seattle and Los Angeles, ran on the BN between Seattle and Portland, and on the Southern Pacific between Portland and Eugene, Oregon. There was no rail service between Seattle and Vancouver, B.C., after 1981.

People in the Pacific Northwest often pride themselves on environmental sensitivity and look for ways to reduce reliance on the environmentally unfriendly automobile. This has led to attacks on the automobile culture in the public at large and required a change of philosophy about railroads. Railroads have remained private companies with a negative image because of the nineteenth-century robber barons.[127] Public reluctance to use public funds to support railroads lingers. In the 1980s, however, sentiment began to grow in Washington State to develop the obsolete rail passenger service into a modern, high-speed, high-intensity rail corridor. (Unless otherwise noted, in this section "Washington" refers to the State of Washington.) The Washington Legislature began funding improvements to railroad stations, apparently a first step toward the treatment of a rail passenger system as a state concern, not simply an obligation of Amtrak and the private railroad companies.

Similar efforts were underway in Oregon. Oregon experimented with state-supported, Amtrak-run Willamette Valley passenger trains between Portland and Eugene in 1980 and 1981. The Willamette Valley is the heart of Oregon, and there are important population centers between Portland and Eugene in this 124-mile minicorridor.[128] However, the state withdrew funding and the trains were discontinued, officially because of lack of funds.[129] In fact, ridership had been poor because of poor schedule adherence and substandard track conditions on the Southern Pacific line. It was easier and faster to drive. The Oregon Legislature established a State Rail Rehabilitation Fund in 1985, but never appropriated money for it.

### The Era of Federally Mandated Studies

In 1991 Congress passed ISTEA, which, among other things, required the U.S. DOT to identify potential major high-speed transportation corridors. In 1992, the U.S. DOT identified the Pacific Northwest Rail Corridor (PNWRC) as one of five potential high-speed corridors. This designated corridor extends from Washington State south to Eugene, Oregon, and north to Vancouver, B.C. The PNWRC extends a total of 466 miles: 134 miles in Oregon, 297 miles in Washington, and 35 miles in British Columbia (Figure 10). It appears that political pressure from Washington was significant in this Congressional action, particularly from Washington Congressman Al Swift. Designation as a corridor

means the possibility of matching federal grants for construction and operation through the FRA. It also requires the states in the corridor to complete studies and plans to develop the corridor at federal expense.


**Figure 10 Pacific Northwest Corridor**

*Washington*

Washington efforts preceded ISTEA. In the late 1980s, the legislature requested the Washington State Department of Transportation (WSDOT) to conduct a "High-Speed Ground Transportation Study." Upon enactment of ISTEA, the Washington State Legislature took the next formal step with a directive to WSDOT to develop a "comprehensive assessment of the feasibility of developing a high-speed ground transportation system *in the State of Washington*"[130] (emphasis added). WSDOT responded in October 1992 with a *High-Speed Ground Transportation Study*, which confirmed the feasibility of high-speed rail in Washington. Based on that study, the Washington legislature in April 1993 directed WSDOT to develop "high-quality intercity passenger rail service...through *incremental* upgrading of the existing service"[131] (emphasis added). WSDOT had used the term "high-speed"; the Washington legislature did not. The legislature specifically wanted to build a "rail culture" to "make rail a competitive and viable alternative to automobile and commuter air travel."[132] Washington defines "high speed" as "up to 125 mph on sections of the corridor," after 20 years of development.[133] After 20 years, WSDOT plans for the trains to make the 466-mile trip between Vancouver, B.C., and Eugene, Oregon, in 7 hours, 12 minutes. Seattle to Portland, 186 miles, should take 2-1/2 hours instead of the current

3 hours, 25 minutes.[134] WSDOT estimated that the PNWRC upgrades from Seattle to Portland will cost $2.7 million per mile, compared with $6.5 million per mile *per lane* for a freeway in the corridor area.[135]

In 1998, the Washington Legislature and Governor Gary Locke created a Blue Ribbon Commission on Transportation to assess and oversee the entire Washington transportation system. The commission also assumed responsibility to plan for financial resources to fund the state's portion of the 20-year transportation plan.

WSDOT published the *Amtrak Plan for Washington State* in April 2000. WSDOT always assumes a cooperative working relationship with the railroad (by that time Burlington Northern Santa Fe—BNSF). There do not appear to be any WSDOT suggestions to purchase railroad company rights-of-way, as public Authorities did in the Los Angeles area and on the San Francisco Peninsula.

### *Oregon*

Inspired by the study incentives contained in ISTEA, Oregon prepared its first comprehensive assessment, the *Oregon Rail Passenger Policy and Plan*, in 1992, followed by the *Oregon Rail Freight Plan* in 1994. Oregon DOT published the *Pacific Northwest Rail Corridor, Oregon Segment* in April 2000, which is supposed to coordinate PNWRC efforts with Washington's efforts. Oregon DOT followed up on November 8, 2001, with the *2001 Oregon Rail Plan* (*2001 ORP*), which followed the policies set in the 1992 Rail Passenger Policy.[136] The *2001 ORP* is an element of the Oregon Transportation Plan. Once again, the incentive for the plan was federal: "The Oregon Rail Plan is prepared to fulfill numerous federal and state planning requirements....The Plan also fulfills the Transportation Equity Act for the 21st Century (TEA-21) requirement that state transportation planning consider, among other issues...options available to people...of the transportation system."[137]

The practical goals of these plans are modest. Oregon originally proposed a $31 million capital program to improve the track, particularly the Portland-to-Eugene segment that Union Pacific (UP) had taken over from Southern Pacific. UP agreed to participate in funding track and signal system improvements.[138]

Unlike Washington, Oregon's plans do *not* specify high-speed. Oregon DOT would be happy if two or three additional trains could traverse the 124 miles from Portland to Eugene in 2 hours, 15 minutes, an improvement of only 20 minutes over current scheduled

performance. In a brief three paragraphs, the *2001 ORP* dismisses high-speed rail; that is, train speeds in excess of 150 mph.[139] Oregon is pursuing an incremental approach, as "an effective plan...that can be implemented in the next six years." Oregon calculates that real high-speed rail would cost 12 to 15 times as much as the incremental plan, but would only attract five times as many riders. This thinking reflects highway planner logic, as if the comparisons were between two different highway alternatives. The three-paragraph dismissal of high-speed rail in *2001 ORP* makes no effort to place any value on the consequences that might result if significantly more riders choose to use rail instead of the highway. Oregon does not compare the cost of rail per mile with the cost of a highway per mile, as WSDOT does.[140]

It is telling that Oregon DOT also refers to the I-5 corridor, an expression highway planners would use, not rail planners.[141] Even if Oregon chose an incremental high-speed alternative, it would only allow passenger trains to operate at 110 to 125 mph.[142]

### *British Columbia*

During this period, there was limited parallel interest in British Columbia. British Columbia contributed minimal cooperative funding for *Options* in 1995 and for the December 1997 *Pacific Northwest Rail Corridor Operating Plan*, but nothing further. There is no Canadian legislation comparable to ISTEA or TEA-21, no rail "corridor" designation from Ottawa, no mandated studies. The province of British Columbia did not prepare extensive studies comparable to those prepared in Washington and Oregon, and there are no plans there to improve the 35 miles of the PNWRC within British Columbia. The impetus to extend the PNWRC to Vancouver comes from the U.S. side, federal and state.

## The Incremental Approach

The Washington legislature specified an incremental approach to what was loosely termed high-speed rail. Many reasons were given for an incremental approach instead of a new, dedicated high-speed rail system:

- Better chance to obtain funding over a period of years. Washington has adopted a 20-year plan, with financing to be obtained in phases as construction occurs. Funding would be less probable for a new, and more expensive, dedicated high-speed rail project.
- Logical progression. Using existing rail routes reduces environmental impact problems; no "greenfield" project can escape massive environmental and NIMBY challenges. This

reason also presumes that freight railroads will welcome high-speed corridor development because improved rights-of-way imply more efficient freight movements.

- Market demand-driven development. Further construction phases will depend on the level of success or failure of service improvements already made. The public can see various phases of improvement as improvements are made.
- Rail culture development. This is a corollary to the previous item. As service improves and more people use the system, the population will become more favorably inclined toward rail systems, will use rail more and rely on automobiles less, and will support rail funding measures.
- Freight improvement. As rail infrastructure becomes more developed and sophisticated, freight will move more efficiently, providing a major impetus to the economy. Freight rail rationalization plans are afoot in Washington, comparable to the recently completed Alameda Corridor project in the Los Angeles area.[143]
- Less costly. The incremental approach may only attract 50 percent as many riders as a new, dedicated high-speed rail system, but the cost of incremental rail is only about 12 percent as much as a new, dedicated, "greenfield" high-speed rail system.[144]

The population of the Pacific Northwest is smaller than that of California; therefore, the area is less able to justify an expensive, new, dedicated high-speed rail system.[145]

## What Has Happened

### *Talgos*

Probably the most important development was the WSDOT decision to experiment with Talgo technology. This Spanish technology features a pendular process that allows rail cars to tilt on curves. Tilting makes the ride on curved track more comfortable to passengers and allows faster operation on curves. Talgo trains also are lightweight, have a low center of gravity, and are articulated, all for a smoother ride on curved track. The trains are largely manufactured by the Talgo company in Spain, with some final assembly performed in Washington to comply with local-manufacture requirements. The locomotives are adapted General Motors F59s, manufactured in Canada. Talgos have been used successfully in Europe for many years.[146] Washington leased two Spanish Talgo trains in 1995 for use on the PNWRC, and Amtrak operated them under the marketing name "Cascades." Oregon began to support the service in 1995 and paid Amtrak to extend one Cascade per day from

Portland to Eugene. Washington paid to extend one Cascade per day to Vancouver, B.C. Introduction of the Talgos reduced the operating time from Seattle to Portland by 30 minutes, largely due to higher speed capability on curves.

WSDOT initiated the experiment with Talgo technology in 1993, *before* WSDOT published the various studies in response to ISTEA.[147] The trains were popular with passengers, so Washington returned the leased Talgos and bought two new, customized Talgo trainsets. Amtrak also bought two such trainsets. Talgo built a fifth trainset on spec and leased it to Oregon in 1999. The trains are modern and comfortable, and Talgo technology allows faster speeds on curved BNSF track along Puget Sound. Seattle-to-Portland ridership in 1993 was 94,000 per year; it grew to 590,000 per year by 2003.[148] The increase of ridership on the PNWRC is largely due to the popular introduction of the Talgos, which have been described as follows:

> ...based on growth trends, this service is the most successful passenger operation in North America in the past decade....Credit for the political commitment, say passenger advocates, mostly goes to Washington state, which significantly supported the service with cash, guidance, and staff....Amtrak has put its best into the effort, it's widely agreed, as has track owner Burlington Northern Santa Fe, which has operated the *Cascades* service as if it were its own.[149]

Talgos are European design and have some minor discrepancies with FRA train regulations. The FRA waived the discrepancies but limited operation to a maximum of 79 mph. At present, this limitation is not important; PNWRC track conditions will not support speeds in excess of 79 mph. BNSF engineers, worried about increased rail wear on curves, studied the issue and determined that the Talgos did not materially increase wear on rails. The Talgos are lightweight, have a low center of gravity, and have tracking wheels, factors that save wear and tear on track.

The Talgo company decided to sell the Talgo trainset leased to Oregon. WSDOT bought that fifth trainset in 2003. According to the *2001 ORP*, Oregon intended to buy new trainsets, but could not or simply did not find the money to buy one Talgo to support existing Cascade service in Oregon.[150] Oregon continued to support Cascade service with the WSDOT and Amtrak Talgos.

### *Washington*

Efforts by WSDOT, the Blue Ribbon Commission, and nongovernment supporters such as the Discovery Institute Cascadia Project led to Referendum 51, an effort in 2002 to persuade Washington voters to approve a 9-cent-per-gallon gas tax to fund various transportation projects in Washington. Several other tax increases were designated for PNWRC improvements. Voters in Seattle favored Referendum 51, but it failed 37 percent to 63 percent statewide.[151]

Why did Referendum 51 fail? A few quotes from the *Cascadia Report* are illustrative:

- "Voters are not heeding the advice of business, labor and media leaders...and are distrustful of government and anyone affiliated with it." (p. 22)
- "Political power is spread so thinly here that nobody can effectively assert leadership." (p. 5)
- "...intergovernmental and special interest infighting...." (p. 30)
- "...the picture is one of electoral negativism, disappointing performance in the biggest program that *was* adopted by the voters (Sound Transit) and almost every imaginable variant of factional disagreement" (p. 1)
- "...usual fault lines of King County/City of Seattle/suburban cities...." (p 31)

Voters outside Seattle were insufficiently sympathetic to traffic congestion in Seattle. There has long been resentment by the more rural, conservative population east of the Cascade Mountains against the Seattle area; many of these people perceived Referendum 51 as another money grab by Seattle. Seattle itself has suffered through a period of tumult (World Trade Organization riots in 1999, loss of the Boeing Headquarters to Chicago, the telecom bust) which has challenged the political leadership. It is possible that Referendum 51 was too complicated and that the political leadership did a poor job explaining how a 9-cent-per-gallon gas tax would be spent. "The Legislature and the Governor...punted to the voters on the investment package."[152] The Washington Legislature did not need voter approval to impose a 9-cent tax, but submitted the issue to the voters anyway.

There also may have been a desire to maintain the status quo. Business, labor, and media leaders could assert that the Seattle area economy desperately needed transportation infrastructure improvements, but perhaps many voters preferred to do nothing. Economic growth might attract more Californians to the Northwest, might cause environmental

damage, and so on. Voters with such an orientation did not share the perception that a more sophisticated economy was needed. The failure also calls into question one rationale for incremental approaches—that it should be easier to obtain funding in incremental steps.

WSDOT had been truncated before Referendum 51. Citizens Initiative 695 in 1999 reduced Washington vehicle registration fees, and the fallout caused a 40 percent budget cut at the WSDOT Rail Office. As a result, the most important state agency supporting HSR was weakened at the time of the Referendum 51 debate.

The failure of Referendum 51 fundamentally set back plans for high-speed rail improvement in Washington and, therefore, in the PNWRC. The Washington political psyche has not recovered, and the PNWRC has not proceeded as planned.

Subsequently, the Washington legislature pursued a more modest Nickel Plan, a 5-cent gas tax for transportation projects throughout Washington. About 79 percent of Referendum 51 projects were planned for the Seattle area. The Nickel Plan contained $165 million for passenger rail improvements, but nothing specifically for high-speed rail. The Nickel Plan was approved by the Washington legislature and enacted in May 2003. A popular referendum vote was not needed; no new taxing authority was created.

Washington claims to have invested $400 million in PNWRC projects so far, much of it for Cascades operational subsidies.[153] In 1996, voters in the three counties of the Seattle-Tacoma area (King, Snohomish, and Pierce) approved creation of Sound Transit. The purpose was to create and operate Sounder commuter rail service from Seattle north to Everett and south to Tacoma. Sounder commuter service has begun, with limited service and over budget. Sound Transit has invested almost $1 billion, some of which was used to double-track the main line and for signaling.[154] Washington pays 50 percent of district costs. Rail improvements on BNSF track for Sounder trains will benefit the Cascades. For now, the Cascades are still limited to 79 mph.

In 2000, WSDOT proposed several specific projects to be done in the initial five-year phase for about $1.9 billion.[155] To date, none have been built. Five projects have been targeted by WSDOT:

- *Vancouver, Washington, rail yard bypass*. There is a major bottleneck where BNSF freight trains from the north and south meet and cross UP freight trains from the east and south and try to cross an old rail bridge across the Columbia River. The bridge is a swing bridge that must be closed for river traffic. A two-track bypass would substantially

speed up the Cascades and improve freight movement through Vancouver, Washington.[156] An environmental impact statement is complete, and WSDOT is now finishing the engineering work. $55 million in state funds may be available for construction in 2007-2009.

- *Kelso to Martin's Bluff 3rd main line.* An environmental impact statement should be ready in late 2005, with construction scheduled to begin in 2009. The legislature may provide 20 percent of construction funds if the federal government and the railroads pay the balance. The project will allow through trains, including the Amtrak service, to avoid local freight traffic associated with the Kalama and Longview ports.
- *Point Defiance bypass*. All trains follow the circuitous shoreline and single-track tunnels around the Tacoma Narrows. A 9-mile build-out of neglected track through Tacoma would shorten and straighten the route. This new alignment would be for passenger trains only; freight trains would continue to use the current BNSF route.[157] Cascades would save about 11 minutes. An environmental impact study is scheduled for 2005; if funded, construction would not start until 2009. Reasons for such a lengthy schedule are not given, but are probably related to funding. The legislature may pay 20 percent of construction costs over 10 years if the federal government and the railroads pay the balance.
- *Centralia Siding extension.*
- *Bellingham Siding extension*.

WSDOT has spent $23 million for track improvements and sidings north of Seattle. One siding at Blaine, just south of the Canadian border, is called Swift Siding in honor of Rep. Al Swift, who helped begin the impetus towards HSR. Additional projects, for the most part double-tracking, are planned by Sound Transit (which is independent of WSDOT) and BNSF. Once all these improvements in rail infrastructure are in place, WSDOT expects 13 to 14 daily round trips of 2.5 hours each way between Seattle and Portland. Ridership is projected to reach 2.2 million passengers per year.[158] Passenger service cannot increase until these bottlenecks are removed. However, the only relevant construction activity south of Seattle appears to be two rail crossovers under construction in the Tacoma area, which will allow one additional Cascades round trip between Seattle and Portland by July 2005.

Current plans are reflected in the 2004 Regional Transportation Improvement District proposal to spend $12.8 billion. There is nothing in that plan for the PNWRC.[159]

### *Oregon*

Ridership is up on the Portland-to-Eugene segment of the PNWRC. There were 24,000 passenger trips in 1993, 100,000 in 2000, and the trend continues.[160] The reason is the popularity of the Cascade Talgos, not any major track or signal work in Oregon. Oregon DOT has spent $4.5 million for rail projects, but that money went for short-line purchase and for studies.[161] Oregon DOT also claims to have spent $127 million in federal funds for track rehabilitation, but most of that money went to the short lines. It is unclear if, and how, the $31 million in the original plans for passenger train improvements was allocated or spent. Oregon states that it would cost $80 million to make track and signal improvements on the Oregon portion of the PNWRC.[162] That money has not been allocated, and the current Oregon Transportation Plan update includes nothing for long-distance rail or for the PNWRC.[163]

Oregon has spent a great deal of money to improve rail transportation in Portland, largely with the construction of Metropolitan Area Express (MAX). MAX, a light-rail system inaugurated in 1986, centered on a downtown Portland pedestrian transit mall. Three MAX lines, including one to the airport, now carry 80,000 passengers daily. The Yellow Line opened May 2004, ahead of schedule and $25 million under budget.[164] MAX has no direct impact on high-speed rail, but it substantially increases the market for public transportation, which could feed into the PNWRC at Portland. Unlike commuter rail in California, the success of the MAX system has not translated into more general support for rail passenger service, perhaps because the remainder of the state has not benefited from commuter or intercity rail success.

### *British Columbia*

There is no HSR activity in British Columbia. B.C.'s past contribution is limited to $30,000 for the PNWRC plans. Only one daily Cascade reaches Vancouver, B.C., at Washington's expense. A second Cascade runs to Bellingham, Washington, about 20 miles from the B.C. border. An official in the B.C. Ministry of Transportation stated on the phone that the B.C. legislature has prepared a five-year review of transportation in the province, but that plan does not mention high-speed rail nor the PNWRC. He stated that there is no public interest, there is a reluctance to spend public funds on privately owned railroads, and the people are highway conscious. A few years ago the province did offer to invest $20 million (Canadian) in rail infrastructure, but the railroads refused. He did not say what

the conditions for the funding would have been on the railroads. At any rate, any PNWRC project in B.C. is "dead as a doornail."[165]

Perhaps the reason could be a Canadian preference for a Canadian focus, not on the PNWRC. (The Pacific Northwest is a U.S., not a Canadian, designation.) Another reason could be that Oregon, even Washington, prepared studies and plans based on federal U.S. directives found within ISTEA and TEA-21.[166] Perhaps the incentive was found in money available from federal sources for studies, regardless of whether U.S. federal money would become available for a high-speed rail system. The Dominion of Canada provided no such study and plan incentive for British Columbia, which had no desire to commit any provincial money.

Only 35 miles of PNWRC track is in British Columbia. The BNSF track crosses a bog, parallels a popular beach at White Rock, and feeds into a congested, 100-year-old Fraser River bridge at New Westminster. Traffic on the federally owned bridge is controlled by the Canadian National Railway, not the BNSF. It would cost $1 billion (Canadian) to build a new bridge. The B.C. Ministry of Transportation considers an upgrade of this route to be too expensive, although there are reports that Transport Canada, a Canadian federal agency, is studying Fraser River transportation issues.

Considering that the Winter Olympics will be held in Vancouver in 2010, the lack of interest in improving rail transportation in British Columbia is surprising. Where will the people come from, and how will they travel? Will visitors pour through the congested road crossing at Blaine, Washington? The Pacific Northwest is a major potential market for Olympic visitors, and a rail connection would seem to have considerable potential for success. Seattle and Portland are closer to Vancouver, B.C., than any major Canadian city is. The previously quoted representative of the B.C. Ministry of Transportation stated on the phone that there are no plans or intentions to improve the 35 miles of BNSF track in B.C. in preparation for the Olympics.

PNWRC is the only designated active corridor that extends outside the United States and outside the reach of ISTEA and TEA-21. There is no evidence of any U.S. diplomatic effort to promote the PNWRC with Canadian officials. Washington State appears to be the only official U.S. proponent of the Corridor. The results are instructive. Federal legislation induced states to prepare major studies and plans at federal expense. Washington studies were backed by genuine rail interest in the state government and by certain private agencies, but were not backed by a sufficient groundswell of enthusiasm by the Washington

public. Oregon studies are equally complete but reflect little genuine Oregon DOT enthusiasm for rail improvement; Oregon studies tend to contain a greater critical mass of statements that have no associated actions. British Columbia had no financial incentive to prepare studies and plans, prepared no such plans, and has performed no track or signal improvement for the Cascades.

## Observations

A few preliminary observations may be drawn from the PNWRC experience:

- As in the Florida and California cases, ***leadership is essential***. Although there is leadership for HSR in Washington State agencies and private organizations, the lack of strong pro-HSR political leadership in the state has arrested development of the PNWRC. Political indecision in Washington also means that less motivated partners—Oregon and British Columbia—will not contribute their share to the partnership.
- At least some of the incentive for various HSR plans and studies was found in the monies for plans and studies in federal legislation. It is questionable if Oregon would have produced several of the studies it did without ISTEA and TEA-21 funds. British Columbia had no such funding available and produced nothing. Did the availability of funding lead to unwanted studies, or did this exercise in taking advantage of federal money stimulate a state to increase the priority for HSR? The Oregon example is questionable at best.
- As in California and Florida, seeing is believing. Whenever politicians or other leaders visit and ride existing HSR systems, they return enthusiastic. Although a few political leaders in Washington State had visited HSR systems, those legislators had become relatively inactive by the time of the critical battle over Referendum 51. This further reinforces that dependence on elected officials, or perhaps any individual, to lead the effort will not provide the continuity that a project like HSR requires. Institutions that can continue regardless of who is in office or in a leadership role are probably a necessity.
- The incremental approach does not guarantee HSR success. Washington State proved success with the popular Talgos, but that was not sufficient to persuade voters of Referendum 51.
- Timing is crucial. Washington's Referendum 51 was not voted on in an upbeat economy; the political psyche in Washington State has been poor since the World Trade Organization riots in 1999. Perhaps leadership could have delayed the vote for a sunnier day.

- What should the federal role be, other than financing? Limiting the federal role to funding studies has not resulted in notable success in this corridor. What other federal actions or support might have made a difference here, or would federal action be construed as meddling? Probably not, if substantial federal construction funds are available.

Diplomatic efforts would have been appropriate to coordinate U.S. and Canadian efforts to promote and develop the PNWRC; that is not a role that a state government can perform. There is no evidence of any such efforts. A U.S. federal political or diplomatic role with Canada will be important if the PNWRC is to provide transportation to Vancouver, B.C., for the 2010 Winter Olympics. The state of Washington and the province of British Columbia cannot do it alone.

# KEY FINDINGS, LESSONS, AND THEMES FOR CONSIDERATION

At the end of each case study in the previous section, observations and assessments related to the specific cases being examined were provided. In addition, some overall findings stand out and bear mentioning, as they are likely to be relevant for other HSR efforts in the United States.

## LEADERSHIP BY THE FEDERAL GOVERNMENT

First and foremost is the need for stronger leadership at the level of the federal government, in both vision and funding. With respect to the latter, rail (both passenger and freight rail) has long been neglected relative to other transportation modes, as the myth that railroads can pay for themselves is perpetuated.[167] Between 1978 and 1999, federal transportation expenditures on rail totaled $18.3 billion (in constant 2002 dollars), roughly 3.6 percent of all transportation expenditures. This compares with $251.5 billion (49.9 percent) for highways; $58.3 billion (11.6 percent) for transit; $114.0 billion (22.6 percent) for air; and $58.0 billion (11.5 percent) for water transport.[168] While all other modes experienced annual growth in expenditures of between 7.3 and 10 percent, rail actually experienced a decline during this period of 1.9 percent annually.[169] According to Tim Lynch of Florida State University, this underinvestment in rail has resulted in the "serious erosion of potential ridership and high-end commodities shipments and resulting losses in user revenues and tax sources to support the mode."[170]

High-speed rail initiatives suffer from lack of public support as well. Florida, for example, is mired in debates over how the project can be paid for without any public funds. Even when minimal amounts of public funding are available, responses do occur. In the Pacific Northwest, for example, it appears that the only reason any studies moved forward is because the federal government made public monies available. However, providing funds for studies alone is not enough; funding for implementation is also needed.

There is an overarching need for a national network strategy for rail at the federal level. As John Bennett, vice president of AECOM Consult, points out, it was leadership at the federal level that helped build the Interstate Highway System; a similar vision is needed for both passenger and freight rail in the United States as well as a vision for how rail connects to and interrelates with all the other modes around the nation.[171] Otherwise, the United States will

continue to miss critical opportunities to make key linkages and enhance efficiency, not just for high-speed rail, but for regular passenger rail and for freight transport as well.[172]

Such a strategy must include several facets, including, but not limited to, the following:

- Incorporating passenger (including Amtrak), freight, and high-speed rail in the United States with a vision of how they are all related
- Envisioning how rail connects to and interrelates with all the other modes around the nation (and in cases like the Pacific Northwest, with other nations), particularly given trends to multimodal solutions
- Developing a funding program—tax-based, user-fee-based, or by some other method
- Providing guidance and standards for successful models. Without this last feature, states will continue to fill the void as they are currently doing, with a multitude of models ranging from constitutional amendments and legislation, to multistate compacts, to public-private partnerships, without a sense of what is most likely to succeed.

## DEFINING COST

When cost-benefit analyses are developed for high-speed rail, the focus tends to be on the bottom line—how much money will be put in and how much will be generated. As long as one looks at cost as bottom-line driven, we are unlikely to see high-speed rail in the United States, given the capital investment needed to build such systems. Different results are often obtained when there is a broader tabulation, such as that being developed in California, that includes other costs of the transportation system (for example, additional cost of highway maintenance and repair) as well as the public as a whole (for example, increased levels of pollution as highway use increases) under the no-build option.[173]

Related to this is the need to be clear on not just the goals of the particular HSR project, but also on who is really reaping the benefits. If there are truly public benefits, then arguing for only private funding makes no sense and such projects are unlikely to succeed. If the public benefits are questionable, then private funding is a better choice.

## INSTITUTIONALIZED SUPPORT

In many cases, the spark for building HSR has begun with a particular person in a particular state. It was Governor Bob Graham in Florida who visited Japan and believed Florida

should have a similar system. California had similar experiences, with leaders who traveled abroad and returned to the United States with the goal of building an HSR system similar to those in Europe and Asia. While the initial vision is important for beginning an effort, institutionalized support and organizational capability are critical for sustaining the effort and successfully implementing HSR. Without institutional buy-in for a project as well as the authority and capability to identify, gather, and manage funding, and the responsibility for seeing a project through, many HSR projects fail as soon as the key supporter or visionary leaves (as in Florida) or as economic downturns take place (as in California and the Pacific Northwest). Equally important, as is seen in Florida and to some degree California, constitutional amendments or legislative acts alone cannot replace the need for institutionalized support because the former can be challenged by successive governments or other stakeholders. Amtrak might be able to play an effective role here, providing some of the organizational capacity needed, but an integrated vision is needed first.

## TECHNOLOGIES AND APPROACHES

Whether to develop a new HSR or an incremental HSR system depends greatly on what one hopes to accomplish and the context within which one is working. If the goal is to increase the numbers of commuters using rail instead of automobiles to minimize highway congestion, the key is to increase frequency and reliability of service, reduce travel times, and make the system more accessible. Such goals may be better met with an incremental approach that invests in station and equipment improvements, fixing curves and improving tracks, and enhancing signals, rather than new HSR. Alternatively, if one is trying to relieve air congestion between urban areas to free up space for more long-distance flights, a new HSR system linking key urban areas might be the better approach. Such discussions do not always occur; often the decision to pursue one approach versus another is based more on political factors than on a clear assessment and explanation of what the specific goals are and how best to meet them. Without such discussions, as all three cases demonstrate, whether incremental or new HSR is being pursued, plans may not progress.

## OPPORTUNITIES

Opportunities for both incremental and new HSR exist in the United States and have for many years, particularly along those corridors federally designated as HSR corridors. Indeed, a 1997 FRA study on HSGT concluded that HSGT could develop appreciable ridership.[174] The key will be getting at least one project fully implemented in a way that is

clearly HSR (as opposed to those that run at high speeds only for small distances rather than at sustained high speeds). Once a project is in revenue service, many of the concerns expressed by critics, including ridership projections and whether HSR can work in a country where cars and air transport are dominant, can be addressed by example.

# ENDNOTES

1. For high-speed rail, the distance is generally cited as 100-500 miles; for Maglev it is generally assumed to be 40-600 miles.
2. James Brooke, "Bullet Train Remakes Map of South Korea," *The New York Times* (April 2, 2004): W1+.
3. Anthony Perl, *New Departures: Rethinking Rail Passenger Policy in the Twenty-First Century* (Lexington: The University Press of Kentucky, 2002), p. 78.
4. What constitutes high-speed rail in this first category (incremental HSR) is of some debate. While some experts point to speeds of at least 125 mph, the U.S. Department of Transportation considers 90 mph to be the low end of high-speed rail. Others identify high-speed rail based on trip times and market penetration rather than on top speed alone. Because most U.S. projects do not approach 125 mph, this study uses 90 mph as the standard.
5. HSR is sometimes written as "high speed rail" rather than "high-speed rail." In this report, the phrase will be used with the hyphen unless the hyphen was not used in a quotation or as part of a document title or organization name.
6. Unless otherwise noted, all corridor maps and pictures are from the specific corridor descriptions on the FRA Website, http://www.fra.dot.gov/us/content/203.
7. See the FRA Website as well as U.S. DOT, FRA, *High-Speed Ground Transportation for America*, p. 2-1.
8. TMS/Benesch High-Speed Rail Consultants, "Tri-State High-Speed Rail Study: Chicago–Milwaukee–Twin Cities Corridor," prepared for Illinois, Minnesota, and Wisconsin Departments of Transportation (May 1991), pp. 1–3, http://ntl.bts.gov/data/819.pdf (accessed February 20, 2004).
9. Ibid., p. vi.
10. Midwestern Office of The Council of State Governments, *Firstline Midwest* 4, 2 (March 1997): 2.
11. Merrill Travis, Consultant for the City of Chicago Department of Transportation, personal communication, March 2, 2004.
12. U.S. DOT, FHWA and FRA, and the Illinois Department of Transportation, *Final Environmental Impact Statement: Chicago–St. Louis High-Speed Rail Project* (January 2003), http://www.dot.state.il.us/hsrail/pdf (accessed February 17, 2004).

13. Amtrak, "Amtrak's Vision for America's High-Speed Rail Program" (Spring 2002), http://www.amtrak.com/about/government-hsr-index.html (accessed February 18, 2004).
14. Positive Train Control systems are command, control, communications, and information ($C^3I$) systems that control train movement. They aim at improving railroad safety by reducing accidents.
15. http://www.fra.dot.gov/Content3.asp?P=648 (accessed February 18, 2004).
16. Transportation Economics & Management Systems, Inc., "Midwest Regional Rail System: A Transportation Network for the 21st Century–Executive Report," prepared for the Departments of Transportation of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, and Wisconsin, the Nebraska Department of Roads, the Ohio Rail Development Commission, and Amtrak (February 2000).
17. Amtrak, http://www.amtrak.com/about/government-hsr-index.html (accessed February 18, 2004).
18. Ibid.
19. Richard Hazlett, Chicago of Transportation, pers. comm., March 2, 2004.
20. Amtrak, http://www.amtrak.com/about/government-hsr-index.html (accessed February 18, 2004).
21. "High-Speed Passenger Corridors," *Trains* 64, 6 (June 2004): 58-59.
22. http://www.fra.dot.gov/Content3.asp?P=653, (accessed February 18, 2004), and Stephen Slavick, Acting Director Freight & Economic Development, NY State Department of Transportation, pers. comm., March 2, 2004.
23. "Amtrak leaving New York Deal," *Destination: Freedom Newsletter* (January 5, 2004), on line, accessed January 5, 2004, http://www.nationalcorridors.org/df/df01052004.shtml.
24. This last segment, from Birmingham to Atlanta, links the Gulf Coast Corridor with the Southeast Corridor.
25. Amtrak, http://www.amtrak.com/about/government-hsr-index.html and Amtrak, "Atlantic Coast High-Speed Rail Corridor," http://www.amtrak.com/press/HSR-atlanticcoast.html. Also see CONEG Policy Research, Inc., "Intercity Passenger Rail," *Getting There from Here* 1 (March 2001), http://www.coneg.org/reports/gt/go01-03.htm. The figure cited in the latter two is $140 million; on the more general Amtrak page, it is cited at $150 million. All on-line documents here accessed February 18, 2004.

26. Pennsylvania Department of Transportation, "Governor Rendell Announces $125 Million for Public Transportation Improvements," October 10, 2003, http://www.dot.state.pa.us/internet/secinet.nsf (accessed February 18, 2004).
27. Joseph Daversa, Director, Bureau of Public Transportation, Pennsylvania DOT, pers. comm., March 3, 2004.
28. Perl, *New Departures*, p. 140.
29. Ibid, p. 141.
30. Ibid.
31. Amtrak, "Atlantic Coast High-Speed Rail Corridor," and "Amtrak's Vision for America's High-Speed Rail Program, http://www.amtrak.com/about/government-hsr-index.html (accessed February 18, 2004).
32. Ohio Rail Development Commission, "Ohio & Lake Erie Regional Rail Cleveland Hub Study," http://www.dot.state.oh.us/ohiorail/passenger_rail.htm (accessed February 17, 2004).
33. The Southeast High-Speed Rail Corridor Website only shows the corridor to Chattanooga, but Tennessee DOT describes the corridor through to Nashville. See Larry Bivins, "State Says High-Speed Rail to Atlanta is the Ticket for Savings," *Gannett News Service* (December 23, 2003), Lexis Nexis Academic, (accessed January 22, 2004).
34. Southeast High-Speed Rail Corridor, www.sehsr.org/projdesc.html (accessed January 11, 2004).
35. Perl, *New Departures*, p. 164.
36. Ibid., p. 170.
37. Ibid.
38. See Florida Department of State, Division of Elections, http://enight.dos.state.fl.us (accessed November 5, 2004).
39. Jason Garcia and John Kennedy, "Lawmakers Trim Money for Bullet Train from Budget," *Orlando Sentinel* (April 20, 2004).
40. PBS&J, *Corridor Screening Report: Florida High-Speed Rail–Tampa to Orlando* (October 2002), p. 1-1, http://www.floridahighspeedrail.org/uploaddocuments/p25/Screening%20Report%20Sec%201.pdf (accessed March 29, 2004).
41. Florida Bullet Train, http://floridabullettrain.com (accessed March 29, 2004).
42. Ibid.

43. Perl, *New Departures*, p. 171.
44. Ibid.
45. Perl, *New Departures*, p. 171.
46. Eugene Skoropowski, Managing Director, Capital Corridor Joint Powers Authority, BART, pers. comm., April 30, 2004.
47. The TGV had been in revenue service since 1981 and had been involved in derailments in which the trains performed as expected, with no injuries resulting. Eugene Skoropowski, pers. comm., April 30, 2004.
48. Florida Bullet Train, http://floridabullettrain.com (accessed March 29, 2004). Also see Perl, *New Departures*, p. 172.
49. Perl, *New Departures*, pp. 172-173.
50. Eugene Skoropowski, pers. comm., April 30, 2004.
51. U.S. General Accounting Office, *Surface Infrastructure: High-Speed Rail Projects in the United States*, Report to the Chairman, Committee on the Budget, House of Representatives (January 1999), GAO/RCED-99-44, p. 7.
52. Florida Overland Express, "High-Speed Rail Alternative," http://www.cefa.fsu.edu/FOX.html (accessed March 29, 2004).
53. Center for Economic Forecasting and Analysis at Florida State University and Center for Urban Transportation Research at University of Southern Florida, *An Analysis of the Impacts of Florida High-Speed Rail—Executive Summary*, prepared for the Florida Department of Transportation and Florida Overland eXpress (June 1997), p. 2, http://www.cefa.fsu.edu/pdf/execsum.pdf (accessed April 12, 2004). Note that the Executive Summary was developed from two separate reports: *An Analysis of the Economic Impacts of Florida High-Speed Rail* and *Travel Time, Safety, Energy and Air Quality Impacts of Florida High-Speed Rail*.
54. Ibid., p. 4.
55. Center for Economic Forecasting and Analysis and Center for Urban Transportation Research, *An Analysis of the Impacts of Florida High-Speed Rail*, p. 3.
56. State Senator Ron Klein (D-District 20, Palm Beach), pers. comm., May 4, 2004.
57. Attributed to Fitch Ratings by Eugene Skoropowski, pers. comm., April 30, 2004.
58. Letter dated July 1, 1997, from C.C. Dockery, Dockery Management Corp., to Senator Toni Jenning, President of the Senate.
59. U.S. GAO, *Surface Infrastructure*, p. 14.

60. Ibid., p. 5.
61. Ibid., pp. 22-23.
62. Nazih Haddad, Manager, Passenger Rail Development, Florida DOT, pers. comm., April 13, 2004.
63. These times do not take into account peak-hour traffic congestion, accidents, or closures, which often make this trip much longer by car than one might expect.
64. Al Harper, Chairman, EWM Realtors, pers. comm., April 8, 2004.
65. Bob Vander Clute, Senior Vice President of Safety & Operations, Association of American Railroads, pers. comm., April 20, 2004.
66. Florida Department of Transportation (FDOT), *Florida Intercity Passenger Rail Service Vision Plan – Executive Summary* (May 1, 2000), p. 2, http://www.dot.state.fl.us/rail/Publications/IntercityVisionPlan/intercitypassengerrainservicexecutivesummary.pdf (accessed April 15, 2004).
67. Ibid., p. 8.
68. Note that the shorter leg of the trip, between Tampa and Orlando, is about 80 miles, less than the 100 to 500 miles usually deemed competitive with air and automobile.
69. FDOT, *Florida Intercity Passenger Rail Service Vision Plan*, p. 16.
70. Eugene Skoropowski, pers. comm., April 30, 2004.
71. C.C. Dockery, Member, Florida High-Speed Rail Authority Board, pers. comm., April 15, 2004.
72. State Senator Ron Klein, pers. comm., May 4, 2004.
73. Kelly Layman, "High-Speed Rail: All Are Not Aboard!" *Point of View* (January 2, 2002): 10.
74. "Amendment to the Florida Constitution, Article X, Section 19, High-Speed Ground Transportation System," http://www.floridabullettrain.com/content/amend.htm (accessed March 9, 2004). Also see Joe Follick, "Bids Show High-Speed Rail Could Cost up to $2.7 billion," *Tampa Tribune* (February 11, 2003): 1, Lexis-Nexis Academic, (accessed January 22, 2004).
75. "Florida High-Speed Rail Authority Act," Section 341.822 (4), http://www.floridabullettrain.com/content/statutes.htm (accessed March 9, 2004).
76. STV Inc., *Cross-State Rail Feasibility Study—Executive Summary* (2001), p. ES-29.

77. See Florida High-Speed Rail Authority, *2004 Report to the Governor and Legislature* (January 2004), p. 2, http://www.floridahighspeedrail.org/servlet/com.hntb.flhighspeedrail.web.DocumentManagement?option=3&subheaderid=1 (accessed March 29, 2004).
78. Parsons PBS&J, *Corridor Screening Report: Florida High-Speed Rail–Tampa to Orlando* (October 2002).
79. AECOM Consulting and Wilbur Smith Associates, *Investment Grade Ridership Study: Summary Report*, Prepared for the Florida High-Speed Rail Authority (November 20, 2002), p. 3.
80. AECOM Consulting and Wilbur Smith Associates, *Investment Grade Ridership Study*, p. 3.
81. Ibid., p. 5.
82. The four were submitted by ET3.com, Inc.; Fluor-Bombardier; Georgia Monorail Consortium; and Global Rail Consortium, LLC.
83. U.S. DOT, Federal Railroad Administration (FRA) and FHSRA, *Draft Environmental Impact Statement: Florida High-Speed Rail–Tampa to Orlando* (August 2003), p. S-2.
84. FRA and FHSRA, *Draft Environmental Impact Statement: Florida High-Speed Rail– Tampa to Orlando* (August 2003).
85. FHSRA *2004 Report to the Governor and Legislature* (January 2004), p. 3.
86. Ibid., p. 2, and FHSRA, "Agency Action Ranking Proposals for DBOM&F Contract for Tampa to Orlando Segment of Florida High-Speed Rail Project," FHRSA Docket No. 03-03 (November 4, 2003).
87. The FHSRA preferred many features of the second-ranked proposal by Global Rail Consortium, but chose Fluor-Bombardier because of its management structure, experience, and financial guarantees. Adrian Share, Senior Vice President of HNTB, Director of Florida Operations, and Program Director of HSR, pers. comm., April 30, 2004.
88. Fluor Bombardier "Executive Summary," http://www.bombardier.com/fluor/summary.html (accessed March 9, 2004).
89. Ibid., p. 10.
90. FHSRA, *2004 Report to the Governor and Legislature*, p. 9.
91. Ibid., p. 15.

92. Florida Department of State, Division of Elections, "Repeal of High-Speed Rail Amendment," http://election.dos.state.fl.us/initiatives/initdetail.asp?account=34876&seqnum=2 (accessed May 6, 2004).
93. "Complaint for Injunctive Relief and Petition for Writ of Mandamus," filed in the Circuit Court of the Second Judicial Circuit in and for Leon County, Florida, Case No. 04-CA1293.
94. There is still a great deal of debate occurring around this repeal. Many HSR advocates noted that the language of the repeal was confusing, and that many who thought they were voting for the amendment actually voted for its repeal. Discussions also continue about the Florida election results because exit polls showed markedly different results than the final counts. See "Florida Fast Trains Hang in the Balance," *Destination: Freedom Newsletter* 5, 42 (November 1, 2004), http://www.nationalcorridors.org/df/df11012004.shtml (accessed November 3, 2004). Also, C.C. Dockery, pers. comm., November 22, 2004.
95. C.C. Dockery, pers. comm., November 22, 2004.
96. Gary L. Brosch, Chair, National Center for Transit Research, University of South Florida, and Executive Director, Coast2Coast Rail Consortium, pers. comm., December 13, 2004.
97. The OOCEA operates 79 miles of limited-access highways and provides automated toll collection services. Its leadership consists of five members, three of whom are appointed by the governor.
98. FHSRA, Board Meeting–Meeting Minutes, March 1, 2004, www.floridahighspeedrail.org (accessed April 29, 2004).
99. Gary Brosch, pers. comm., December 13, 2004.
100. C.C. Dockery, pers. comm., June 7, 2004.
101. Gary Brosch, pers. comm., December 13, 2004.
102. John Bennett, Vice President, AECOM Consult, pers. comm., April 9, 2004.
103. Nazih Haddad, pers. comm., April 13, 2004.
104. U.S. Department of Commerce and Florida TaxWatch (December 2001), pp. 8-9.
105. Bob Vander Clute, pers. comm., April 20, 2004.
106. Eugene Skoropowski, pers. comm., April 30, 2004.
107. Heidi Eddins, Executive Vice President and General Counsel of Florida East Coast Railway, pers. comm., May 12, 2004.

108. Ron Hartman, Vice President, Yellow Transportation, pers. comm., March 29, 2004.
109. Eugene Skoropowski, pers. comm., April 30, 2004.
110. Florida Department of State Division of Elections, "Campaign Contributions: Derail the Bullet Train (DEBT) (PAC)," http://election.dos.state.fl.us/cgi-bin/TreFin.exe (accessed April 15, 2004).
111. California Department of Transportation, "California Intercity Rail Capital Program," March 2004.
112. "Express Train Set to Leave Traffic Behind," Los Angeles Times, June 7, 2004.
113. California High-Speed Train Program EIR/EIS, Summary, p. S-1.
114. California High-Speed Rail Authority, "Comments Received on the Draft Program EIR/EIS," October 7, 2004.
115. California High-Speed Train Program EIR/EIS, Summary, pp. S-2–S-3.
116. Ibid., p. S-6.
117. Ibid., p. S-7.
118. In the Business Plan, op. cit. supra, the consultants estimate $300 million per year in "excess revenues." The CHSRA believes the excess will be closer to $1 billion.
119. "HSR Hijacked for Sprawl," *California Rail News* (April–May 2004).
120. SCRRA Comments on the Draft Program EIR/EIS, August 27, 2004, p. 4.
121. SCAG Comments on the Draft EIR/EIS, August 31, 2004, p. 3. Note that some agencies use the term "HST" (high-speed train) instead of HSR (high-speed rail).
122. Comments on the Draft Program EIR/EIS, August 27, 2004.
123. Letter to CHSRA, August 25, 2004.
124. Comments on Draft Program EIR/EIS, California Department of Parks and Recreation, August 19, 2004. The Park Service opposes an HSR tunnel under the entire area as well as any encroachment on Taylor Yard, which until recently was the Southern Pacific Railroad's rail yard near downtown Los Angeles.
125. Rod Diridon, "Main Rail Line Must Stop in San Jose," *San Jose Mercury News* (May 24, 2004).
126. "Smart Choices, Less Traffic," Sierra Club brochure, Solution #3, 2002.
127. The Washington State Constitution prohibits the lending of public credit to private interests. This provision dates back to the robber-baron days of the railroads. Cascadia Report, op. cit. infra, p. 25.

128. The Willamette Valley once supported three passenger rail routes: The Southern Pacific main line, the "Red Electric" from Portland to Albany, and the "Oregon Electric" from Portland to Eugene.
129. 2001 Oregon Rail Plan, Oregon DOT, p. 92.
130. Substituted House Bill 1452, 1991.
131. Revised Code of Washington Chapter 47.79.
132. Amtrak *Cascades* Plan for Washington State, April 2000.
133. Morrison Knudsen, et al., for WSDOT, "Options for Passenger Rail in the Pacific Northwest Rail Corridor," 1995, Executive Summary, p. *x.* Hereinafter "Options." http://www.wsdot.wa.gov/rail/plans/library/roptions.cfm.
134. Bruce Agnew and Bruce Chapman, "How Do We Get There from Here?" Discovery Institute Cascadia Project, January 2003, p. 61. (Hereinafter: "Cascadia Report.")
135. Ibid, p. viii.
136. Oregon DOT, 2001 Oregon Rail Plan (2001 ORP), p. ES-1.
137. Ibid, p. ES-1.
138. 2001 ORP, op. cit. supra, p. 86.
139. Ibid, p. 109, chapter entitled "Prospects for High-Speed Rail in Oregon."
140. "Options," op cit supra, p. viii.
141. HDR, *I-5 Rail Capacity Study* (February 2003). See also 2001 ORP, op. cit. supra, p. ES-2.
142. 110 mph is about the speed German ICE trains can operate on nondedicated track, where slower trains also operate. The same ICE trains operate at 180 mph on dedicated high-speed track.
143. Evans, "Analysis of Policy Issues Relating to Public Investment in Private Freight Infrastructure," Mineta Transportation Institute (1999), p. 27.
144. "Options", op. cit. supra, p. vi.
145. 6–7 million people live within 20 miles of rail in the PNWRC, "Options," op. cit. supra, p. iii.
146. The author has experienced a Deutsche Bahn German Talgo on hilly, curvy track NE of Nuremberg. The Talgo trains could travel the approximately 80 miles about 25 minutes faster than conventional trains.

147. Tilt suspension technology is recommended in "Options," Executive Summary, p. *x,* but Talgo is not named specifically.

148. "Cascades quietly passes its 10th anniversary," *Trains* 1 (July 2004): 18.

149. Ibid, p. 18.

150. 2001 ORP, op. cit. supra, p. 86.

151. State Sen. Jim Horn, presentation to the Pacific Northwest Economic Region Summit, July 2003.

152. Cascadia Report, op. cit. supra, p. 6.

153. Telephone interview with Cascadia Project staff member at the Discovery Institute, Seattle, July 27, 2004.

154. "Cascadia Report," op. cit. supra, pp. 11, 61.

155. "Cascades Plan," op. cit. supra, pp. 6-8.

156. Do not confuse Vancouver, Washington, which is across the Columbia River from Portland, Oregon, with Vancouver, B.C.

157. "Options," op. cit. supra, pp. *x, xiii, xv.*

158. "Cascades Plan," op. cit. supra, p. 3.

159. *Seattle Times* (April 30, 2004).

160. 2001 ORP, op. cit. supra, p. ES-2.

161. Ibid., p. 80.

162. Press release by Governor Kitzhaber of Oregon, October 25, 2001.

163. Oregon DOT Update, May 5, 2004.

164. *Trains* (July 1, 2004): 27.

165. Telephone interview with B.C. Ministry of Transportation official, May 14, 2004.

166. "Options," op. cit. supra, states that significant "bypass" or "alternative alignment" work will be necessary in B.C., pp. *x, xiii.* "Options" was prepared "under the guidance" of the PNWRC Technical Oversight Committee, which included two representatives of the B.C. Ministry of Environment and Investment.

167. European and Asian rail systems often are pointed to as self-sustaining models. However, Bob Vander Clute, Senior Vice President of Safety and Operations, Association of American Railroads, notes that these systems tabulate their accounts differently. For example, the United Kingdom has a purchase agreement; in France, subsidies appear in the revenue lines; and Japan uses a holistic approach that includes

both the monies saved by not having to build new highways and deal with pollution and the monies gained from economic development related to rail investments. Thus, a better understanding of the various accounting systems is needed before drawing such comparisons. Bob Vander Clute, pers. comm., April 20, 2004.

168. Tim Lynch, *Florida High-Speed Ground Transportation Economic Benefit and Cost Impact Restudy & Public Transportation Financing and Subsidies by Mode in the United States,* Florida State University (August 2002), http://www.floridabullettrain.com/content/economics.pdf, p. 31 (accesed April 12, 2004).
169. Ibid.
170. Ibid., p. 33.
171. John Bennett, Vice President, AECOM Consult, pers. comm., April 9, 2004.
172. For an excellent discussion of the dangers of not investing in freight rail, see American Association of State Highway and Transportation Officials, *Transportation—Invest in America: Freight-Rail Bottom Line Report* (Washington, D.C.: AASHTO, 2003).
173. Bob Vander Clute, pers. comm., April 20, 2004; and Eugene Skoropowski, Managing Director, Capitol Corridor Joint Powers Authority, BART, pers. comm., April 30, 2004.
174. U.S. DOT, FRA, *High-Speed Ground Transportation for America* (Washington, D.C.: FRA, 1997), p. 9-1.

# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| BART | Bay Area Rapid Transit |
| BN | Burlington Northern |
| BNSF | Burlington Northern Santa Fe |
| Caltrain | Peninsula Corridor Joint Powers Board |
| Caltrans | California Department of Transportation |
| CHSRA | California High-Speed Rail Authority |
| CREATE | Chicago Regional Environmental and Transportation Efficiency Project |
| DBOM&F | design, build, operate, maintain, and finance |
| DEIS | Draft Environmental Impact Statement |
| DOT | Department of Transportation |
| EIR/EIS | Environmental Impact Report/Environmental Impact Statement |
| EIS | Environmental Impact Statement |
| FDOT | Florida Department of Transportation |
| FEC | Florida East Coast Railway |
| FEIS | Final Environmental Impact Study |
| FHSRA | Florida High-Speed Rail Authority |
| FHSRC | Florida High-Speed Rail Committee<br>Florida High-Speed Rail Commission |
| FHWA | Federal Highway Administration |
| FOX | Florida Overland eXpress |
| FRA | Federal Railroad Administration |
| GAO | General Accounting Office |
| HSGT | high-speed ground transportation |
| HSR | high-speed rail |

| | |
|---|---|
| HST | high-speed train |
| ICE | Intercity Express |
| ISTEA | Intermodal Surface Transportation Efficiency Act of 1991 |
| KPH | kilometers per hour |
| Maglev | Magnetic Levitation |
| MAX | Metropolitan Area eXpress |
| MDOT | Michigan Department of Transportation |
| MIPRC | Midwest Interstate Passenger Rail Commission |
| MOA | Memorandum of Agreement |
| MOS | minimum operable segment |
| MOU | Memorandum of Understanding |
| MPH | miles per hour |
| MTA | Metropolitan Transportation Authority (Los Angeles County) |
| MWRRI | Midwest Regional Rail Initiative |
| NACTO | National Association of City Transportation Officials |
| NIMBY | Not in My Back Yard |
| ODOT | Ohio Department of Transportation |
| OIA | Orlando International Airport |
| OOCEA | Orlando Orange County Expressway Authority |
| ORDC | Ohio Rail Development Commission |
| ORP | Oregon Rail Plan |
| ORTA | Ohio Rail Transportation Authority |
| PD&E | Project Development and Environmental (process/study), State of Florida |
| PNWRC | Pacific Northwest Rail Corridor |
| ROW | right-of-way |
| RRIF | Railroad Rehabilitation and Infrastructure Funding |
| SCAG | Southern California Association of Governments |

| | |
|---|---|
| SCRRA | Southern California Regional Rail Authority |
| SRRTC | Southern Rapid Rail Transportation Commission |
| TEA-21 | Transportation Equity Act for the 21st Century |
| TGV | *Train à Grande Vitesse* |
| THSRA | Texas High-Speed Rail Authority |
| TIFIA | Transportation Infrastructure Finance and Innovation Act |
| TRAC | Train Riders of California |
| TRB | Transportation Research Board |
| UP | Union Pacific |
| U.S. DOT | U.S. Department of Transportation |
| WSDOT | Washington State Department of Transportation |

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## HOWARD PERMUT

Howard Permut is New York Metropolitan Transportation Authority's Metro North Vice President of Planning and Development. His areas of expertise include strategic planning, operations and service planning, capital planning and programming, marketing, long-range planning studies, organizational development, project management, and interagency negotiations. Previously, he worked at the Northeastern Illinois Regional Transportation Authority during its formative years, and at the Chicago Transit Authority.

Permut is currently a Visiting Practitioner at New York University's Robert F. Wagner School of Public Service. He has performed consulting services for a number of major transit agencies in London, Santo Domingo, Philadelphia, San Francisco, and Los Angeles. He has served on various TCRP Research and APTA panels, and has lectured at New York University, City University of New York, and Northwestern University.

# PEER REVIEW

San Jose State University, of the California State University system, and the MTI Board of Trustees have agreed upon a peer view process to ensure that the results presented are based upon a professionally acceptable research protocol.

Research projects begin with the approval of a scope of work by the sponsoring entities, with in-process reviews by the MTI Research Director and the project sponsor. Periodic progress reports are provided to the MTI Research Director and the Research Associates Policy Oversight Committee (RAPOC). Review of the draft research product is conducted by the Research Committee of the Board of Trustees and may include invited critiques from other professionals in the subject field. The review is based on the professional propriety of the research methodology.

Funded by
U.S. Department of
Transportation and
California Department
of Transportation