CURRENT RESEARCH AND DEVELOPMENT IN INTERCITY RAIL PASSENGER SYSTEMS

NUMBER 7 **JULY 2001**

Intercity Rail Passenger Systems Update

Intercity Rail Passenger Systems Update is now published exclusively on the Internet. The table of contents offers links directly to each article, or you can scroll down to read the entire newsletter. Please keep your bookmark at http://www4.TRB.org/trb/onlinepubs.nsf for upcoming editions.

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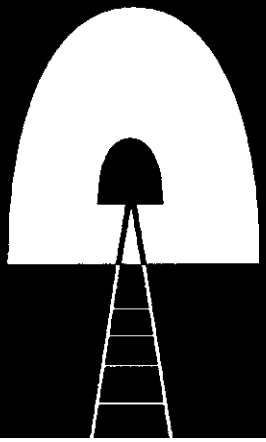

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The Transportation Research Board's Committee on Intercity Rail Passenger Systems (A1E13) is concerned with research that will lead to better planning and implementation of intercity rail passenger systems, with particular emphasis on the full range of high-speed systems, including new technology. Research will include demand analysis, financial considerations, economic effects (including consideration of user and social benefits), and public-private partnerships and should address impacts on other rail operations and the environment, coordination with other modes, rail–highway interfaces, corridor versus system concerns, technology assessment, and implementation strategies.

Intercity Rail Passenger Systems Update is published intermittently by the Transportation Research Board to disseminate information about current research and development in intercity rail passenger systems. Ronald C. Sheck, editor; John C. Tone, Chairman; and Nazih K. Haddad, Vice Chairman, TRB Committee on Intercity Rail Passenger Systems; Elaine King, TRB staff. Any findings and conclusions are those of the authors and not of TRB. Submit news items to *Intercity Rail Passenger Systems Update,* Transportation Research Board, 2101 Constitution Avenue, NW, Washington, DC 20418, telephone 202-334-3206, or e-mail eking@nas.edu.

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FROM THE EDITOR

Welcome to the second electronic newsletter of the Transportation Research Board's (TRB's) Committee on Intercity Rail Passenger Systems (A1E13). This newsletter is possible because committee members and friends provide materials that are incorporated by the editor. I would like to express my appreciation to the following committee members and friends who provided copy, comments, or information: Christine Anderson, Amy Elsbree, Ross Capon, Nazih Haddad, George Haikalis, Arrigo Mongini, Harriet Parcells, Matt Paul, Eugene Skoropowski, Michael Sullivan, Merrill Travis, Richard Tolmach, Jack Tone, and Warren Weber. Special thanks go to Elaine King, TRB, who provides organizational guidance. In 2001 we hope to publish two issues of the newsletter. To do that, your help is needed. Please contact me (e-mail transol1@home.com, telephone 206-632-3443, or fax 206-632-3444) if you are willing to contribute a research article or news item. The deadline for submission of materials for the December issue is **October 1, 2001.**

—Ron Sheck, Editor
President, Transit Solutions

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CHAIRMAN'S REPORT, SUMMER 2001

From the mile-high city of Denver, Colorado, I send greetings to all members and friends of TRB Committee A1E13. Business needs resulted in my June 2000 relocation, which has not proved to be a hardship assignment! Denver is truly a beautiful city, and the state is outstanding, particularly for those interested in railroad history.

Denver is off the beaten path as far as current intercity rail passenger systems and projects are concerned, but there is much interest in rail passenger services for the "Front Range" area—extending from Pueblo to Fort Collins—where 90 percent of the state's population is located. High-speed rail (HSR) is also under consideration between Denver's International Airport and downtown area. A state commission is exploring rail options for mountain resort area connections. Among options are a Swiss-type cog operation for the steep grades and a linear induction motor-driven train.

In 2000 and 2001 there have been both disappointments and encouraging events in intercity rail throughout the United States. The delays in the *Acela Express* service have been offset to some extent by the inauguration of all-electric service between Washington, D.C., and Boston shortly after the conclusion of the 2000 TRB Annual Meeting. The HSR Investment Act failed to pass in the 2000 session but appears currently to be moving forward again in the new Congress. If the act passes, the $12 billion in bonding authority for Amtrak and the state matching funds could have a tremendous impact on intercity rail passenger programs advancing throughout the United States.

This newsletter provides updates on projects and studies in progress around the country. From the start of work in Virginia on the Atlantic Coast HSR Corridor, to the Midwest Regional Rail Initiative, to the California and Cascade HSR Corridors, there is momentum building for intercity passenger rail. The Federal Railroad Administration (FRA) is well along on the Next Generation HSR Technology Program. Florida, after aborting the FOX Project, is moving forward with its Intercity Passenger Rail Service Vision Plan for incremental improvements of Amtrak services.

Thanks to the yeomanly efforts of Anthony Pearl, Rit Aggrawala, and Elaine King, the committee held a workshop in April in Washington to explore ways and means of financing expanded research in intercity rail passenger systems. Earlier in the year, there was a session during the 2001 TRB Annual Meeting where some excellent papers were presented with international flair. Committee Vice Chair Nazih Haddad presided over the session and organized and chaired a discussion titled "Financing for State-Supported Intercity Passenger Rail Service."

You should all have received information on A1E13's mid-year meeting, which was held in Milwaukee in May 2001 in connection with the

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Annual Meeting of the High-Speed Ground Transportation Association. More details on the meeting will be included in the fall 2001 newsletter. And as a reminder, make plans now to attend TRB's 2002 Annual Meeting in Washington in January. Best regards to all!

—Jack Tone, Chairman
Committee on Intercity Rail Passenger Systems

INTERCITY PASSENGER RAIL: MILLENNIUM YEAR NEWS

The new millennium has begun on an optimistic note for rail passenger service. The following links highlight updates and changes from across North America and around the world.

EDITOR'S NOTE: This material has been compiled from a variety of sources, including several members of A1E13.

As this newsletter went to press, Amtrak announced its intent to restructure operations and to reduce management by 15 percent. Reductions in service and further reductions in the labor force are being considered to meet the Congressional deadline for breakeven operations by December 2002. More details to follow in the fall newsletter.

Amtrak Plans for Successful Future

Northeast Corridor Gears Up for Changes

New Cars, New Service Part of California's 20-Year Plan

Ridership Increases in Cascade Corridor

Midwest Orders New Train Sets

Florida To Link Metro Areas

Alaska Improves Service

Additional High-Speed Corridors Designated

Train Control Systems Advance

International Highlights

—Ron Sheck, Editor
President, Transit Solutions

Also in This Issue

ACELA EXPRESS, MOVING FORWARD: SECOND QUARTER PERFORMANCE RESULTS

America's first HSR service, *Acela Express*, continues to perform strongly. Revenue exceeded expectations by 4 percent, and more than 55,000 guests used the service between its launch in December 2000 and the end of the second quarter.

In April 2001 Amtrak increased its *Acela Express* service by offering two additional morning roundtrips and two additional afternoon roundtrips each weekday between New York and Boston. Also, new weekend service started.

Throughout the nation Amtrak's ridership and ticket revenue continued to increase during the first half of fiscal year 2001. Between October 1 and March 31 more than 11 million guests rode on Amtrak; ridership increased by 7 percent over the same period last year; and ticket revenue, $564.3 million, was up 12.2 percent.

The immense popularity of Amtrak's service in the West continued. Ridership grew by nearly 18 percent to more than 2 million guests, with ticket revenue increasing over 12 percent compared to the first half of fiscal year 2000. Leading this growth was the *Capitols* service connecting the San Francisco Bay Area with Sacramento and the Silicon Valley, which saw a record increase of 62 percent in ridership and 36 percent in ticket revenue over the previous year. Between October 1 and March 31, more than one-half million guests rode on the *Capitols*, generating nearly $5 million in ticket revenue.

The *Cascades* service in Oregon and Washington State enjoyed immense growth with increases of 14 percent in ridership and 15 percent in ticket revenue.

Among Amtrak's long-distance trains, the *Texas Eagle*, which travels between Chicago and Los Angeles through Dallas and San Antonio, continued its growth with an 18 percent increase in ridership and a 20 percent increase in ticket revenue, as compared to the first half of last fiscal year.

Trains serving the Northeast between Washington, D.C., and Boston also grew in ridership and revenue. For the first half of the fiscal year, ridership in the Northeast was up over 8 percent with revenue growing nearly 17 percent. Leading the way were the *Acela Express* and *Metroliner* service with increases of 10 percent in ridership and 19 percent in ticket revenue, and the *Northeast Direct* and *Acela Regional* service, which grew by 8 percent in ridership and 17.5 percent in ticket revenue.

—Amy Elsbree
Senior Director, Constituent Relations
Amtrak

Also in This Issue

EMPIRE CORRIDOR REACHES NEW MILESTONE

New York State's HSR program reached a new milestone with the successful testing of a rebuilt RTL-III Turboliner train set at 125 miles per hour (mph) in February 2001. In a partnership with Amtrak, New York State is rebuilding all seven 30-year-old Turboliners originally built by the Rohr Corporation, a southern California aerospace manufacturer.

The RTL-III is a gas turbine-powered motor train based on a successful French design that has seen widespread use in France and is currently still in operation in Egypt and Iran. The RTL-III consists of a combination power car and coach at each end and three intermediate coaches, one with a food service facility. Total empty weight is 308 tons and seating capacity is 264. Each power car contains a gas turbine engine rated at 1,600 horsepower (hp) connected to a hydraulic transmission. For operation into New York's Penn Station each power car is equipped with a 500-hp electric motor and third rail collector shoes. Both the turbine and the supplementary electric motor have been upgraded from the original Rohr design.

The test was conducted to satisfy FRA safety concerns about the wheel/rail forces that would occur when the cars travel around curves at high speeds. Test results showed that the RTL-III can be operated at 125 mph on curves with a 5.5-inch cant deficiency and not exceed limiting forces.

Completed nearly 30 years ago, New York State's initial HSR program focused on upgrading the 70-mile segment of track, now owned by CSX, between Poughkeepsie and Albany-Rensselaer for 110-mph operation. The state's long term goal has been to upgrade the entire New York City–Albany–Buffalo–Niagara Falls Empire Corridor to 125-mph standards and to operate a fleet of high-speed gas turbine-powered trains on this route. State DOT officials are conducting a study of advanced signal systems that could be used for the 300-mile route west of Schenectady, New York, where speed is limited currently to 79 mph.

Super Steel is remanufacturing the seven RTL-III train sets at its plant near Schenectady. Completion of all seven sets is expected by 2003.

Gas turbine propulsion is a promising option for incremental upgrading of lower density HSR corridors in the United States. The New York State program is the largest turbine-based HSR program currently underway in the United States. Train sets one and two are 50 percent funded by the FRA, and train sets three through seven will be funded 50 percent by Amtrak. For more information on this program, contact Mike Smith (telephone 518-457-3183 or e-mail MSMITH@gw.dot.state.ny.us).

—George Haikalis
President, Institute for Rational Urban Mobility, Inc.

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THE TRAIN TO MAINE

The citizens of Maine have been clear and unwavering in their desire to have intercity passenger rail service restored to Maine. Ten years ago, citizens gathered nearly 90,000 signatures to place a referendum on the ballot that would require Maine to begin intercity passenger rail service between Portland, Maine, and Boston, Massachusetts. State legislators heard the citizens and enacted legislation authorizing the funds to begin the rail service. Maine established the Northern New England Rail Authority to oversee the rail project, and the Authority selected Amtrak to provide and operate the trains. Various stumbling blocks have delayed start-up of the rail service. Issues raised by Guilford Rail Systems (GRS), owner of the track over which the rail service will operate for much of its route, have been particularly difficult. The planned inauguration of service on May 1, 2001, was recently postponed with no new start-up date projected. Maine citizens, led by the nonprofit group, Train Riders Northeast, continue to press for inauguration of the rail service as soon as possible.

The primary issue now is the speed at which the passenger trains will be allowed to operate. GRS asserts that speeds above 59 mph would not be safe with the 115-pound rail in place. Others, including FRA, believe the track could accommodate speeds of 79 mph. The speed issue is critical to the success of the rail service and to maximizing ridership. Under the terms of STB's ruling of October 22, 1999, the maximum speed at which the trains will be allowed to operate will be determined by a successful test of the stiffness of the rail. GRS asserts that unless the test is conducted on a daily basis, track conditions could be unsafe for operation at speeds above 59 mph. On March 12, citizens in Maine called on STB to resolve this issue expediently. On June 28, the STB reached the following decision (STB Finance Docket No. 33697):

> Track modulus testing on the Plaistow-Portland line through use of the Track Loading Vehicle [TLV] of the Transportation Technology Center, Inc., in the manner described by Amtrak, is a reasonable and practical method of testing the track to determine whether the level of rehabilitation described in our prior decision has been met. Testing should be conducted soon after rehabilitation of the line is completed. If the testing demonstrates that the track modulus requirements specified in our prior decision are met, then no further track modulus testing will be required, provided that the line is maintained to FRA Class 4 standards, the line is subject to routine FRA-mandated track safety inspections, and the line is periodically inspected by a track geometry car, as described by Amtrak.

TLV testing is scheduled to begin on September 24, 2001.

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Maine and the federal government are investing $47 million to upgrade the track, signals, and bridges on 78 miles of freight rail track in New Hampshire and Maine. Installation of continuous welded rail along the 78 miles is largely complete, as is replacement of turnout switches. All 23 public highway–railroad grade crossings have been improved. The Massachusetts Bay Transportation Authority (MBTA) owns track in Massachusetts over which the trains will operate and commuter rail service currently operates.

The Northern New England Rail Authority's plan is to begin service with four daily roundtrips between Portland and North Station in Boston. The trains will make the 114-mile trip in about 2.5 hours, assuming that Amtrak obtains the federal approval to operate up to 79 mph. The 59-mph limit would require a schedule that runs approximately 15–20 minutes longer.

—Harriet Parcells
Executive Director, American Passenger Rail Coalition

FLORIDA INITIATES 20-YEAR PLAN

For the past 18 months, Florida DOT and Amtrak jointly have been planning and developing intrastate intercity passenger rail service. In May 2000 Amtrak and Florida's DOT issued the Florida Intercity Passenger Rail Vision Plan. This plan presents a 20-year program of intercity passenger rail implementation, which would be accomplished through incremental improvements leading to four distinct phases of operation as follows:

• Phase 1 includes the restructuring of Amtrak's long distance service. All three daily Amtrak Silver Service trains in Jacksonville would be split, which would result in the operation of two roundtrip trains per day on Florida East Coast Railway Co. tracks from Jacksonville to West Palm Beach with the trains switching to the South Florida Rail Corridor to continue to Miami.

• Phase 2 includes the establishment of a state-supported, state-based intercity passenger rail system in the Miami-Orlando-Tampa corridor, utilizing the existing CSX rail line between Orlando, Tampa, and West Palm Beach and the state's South Florida Rail Corridor between West Palm Beach and Miami.

• Phases 3 and 4 address corridor service developments from approximately 2006 to 2020. Developments will include new service to southwest Florida, service between southwest and southeast Florida, additional service along the east coast of the state, and service between Jacksonville and the Panhandle.

Coast to Coast Rail Feasibility Study

Florida's DOT recently issued a preliminary report on the Coast to Coast Rail Feasibility Study. The study identified preliminary corridors for a new rail line connecting Port Canaveral to St. Petersburg, assessed possible technology options, estimated capital and operating costs, developed estimates of freight and ridership potential, and investigated financing options for the project.

The report recommends that the state pursue implementation of the system in a phased approach starting with the Orlando to Tampa segment, use Interstate 4 and Beeline expressway alignments, and use a non-electric HSR technology capable of 125- to 150-mph operation. The total capital cost of this system is estimated at $1.2 billion with system revenues projected to cover 100 percent of operating and maintenance costs. The report was submitted to the governor and the Florida legislature for their review and further action.

Constitutional Amendment on High-Speed Rail

In November 2000 Florida voters approved a constitutional amendment that requires the governor and the legislature to begin construction on an HSR system in Florida by November 2003. In May 2001, the Florida legislature enacted the Florida HSR Authority Act—the act creates a nine-member authority that is responsible for conducting preliminary engineering and environmental assessments that would lead to the implementation of HSR in accordance with the constitutional amendment. To conduct the assessments, $4.5 million in state funds was appropriated in fiscal year 2001–2002. The nine-member authority is required to present a report of its findings and recommendations to the governor, speaker of the Florida House, and president of the Florida Senate by January 1, 2002.

—Nazih K. Haddad
Manager, Passenger Rail Development Office
Florida Department of Transportation

MIDWEST ROUNDUP

An agreement between Amtrak and the City of St. Louis should lead to a convenient, visible station. (A concourse will connect it to a reconfigured MetroLink station.) The $29-million St. Louis Gateway Transportation Center will be funded by the Federal Transit Administration, the Missouri DOT, the Bi-State Development Agency, the city, and Amtrak. Work on the new station should begin within a year.

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For Amtrak's April timetable, Alton–St. Louis running times were reduced as a result of completed track improvements, but savings were offset largely by allowances for major track work between Dwight and Springfield, including temporary rerouting of some Amtrak trains.

Amtrak and the Illinois, Michigan, and Wisconsin DOTs are cooperating on an order for 13 advanced train sets; the selection process was underway in May.

Progress continues on the ITCS on the Amtrak-owned portion of the Chicago-Detroit line, with regular 90-mph operation likely this summer. In April 2001 Amtrak initiated operations with speed enforcement by the ITCS. Speeds are limited to 79 mph for a 90-day period.

Work continues on the Illinois DOT PTC project, sponsored by NAJPTC, a partnership of FRA, Illinois DOT, and AAR. In June 2000, NAJPTC awarded a $34 million contract to Lockheed Martin Corporation for the development and deployment of a PTC system on a 120-mile segment of the UP-owned Chicago–St. Louis HSR corridor. The development of a cost effective PTC system is viewed as an essential milestone to achieving 110-mph passenger train speeds on freight railroad owned corridors. PTC is a communication-based signal technology designed to provide two safety critical functions: 1. enforce movement authority limits, speed limits, and track force work limits, and 2. advance activation of highway–rail crossing warning systems for trains operating at more than current timetable speed. A key objective of Illinois' DOT program is the development of a system that employs an open architecture and provides interoperability throughout the continental rail network.

In Wisconsin, public hearings on a state environmental assessment of the Milwaukee-Madison line were scheduled for late June. The state now owns the Milwaukee station and plans to develop it as a multimodal terminal including intercity and local buses. The state is investigating a Mitchell Field stop for Chicago-Milwaukee trains, or four more frequencies on the line, or both.

An Indiana passenger rail feasibility study proved inconclusive, and a tight budget led to dropping $10 million—included in the governor's original budget—for a more extensive study. However, an effort will be made to restore the funds during a summer legislative session. Hopes to separate passenger and freight across northeastern Indiana are threatened by lack of rail progress and by development of abandoned rights-of-way that the new route may require.

The Midwest Regional Rail Initiative is a program sponsored by nine states and Amtrak to develop an expanded and improved passenger rail system in the Midwest. The program envisions a system connecting major midwestern cities with Chicago as a hub. Trains will operate primarily on existing freight railroad owned corridors. Sponsoring states include Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin. The program will be aided greatly by the passage of

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bills HR3700 and S250, currently in Congress. Passage of the bills would provide $12 billion for passenger rail capital projects throughout the United States.

In January 2001 St. Louis–Kansas City became the newest federally designated HSR corridor; Cleveland-Cincinnati and Cleveland-Chicago were designated last fall. All are part of the "Chicago Hub" network. Support for passenger rail is growing in Ohio, partly in reaction to the dropping of plans to run Cleveland-Columbus trains during Interstate highway construction.

—Ross B. Capon
Executive Director, National Association of Railroad Passengers

—W. Robert Moore
Manager, Railroad Division-Midwest
Parsons Brinckerhoff Quade & Douglas, Inc.

DESPITE CHALLENGES, PACIFIC NORTHWEST CORRIDOR CONTINUES TO DEVELOP

Incremental development of the Pacific Northwest HSR Corridor continues despite funding challenges for Oregon and Washington. Track and signal construction is almost complete between Union Station in Portland, Oregon, and Vancouver, Washington. Burlington Northern & Santa Fe Railway (BNSF) signal crews are completing the enhanced train control system and will then move to the north end of Union Station where major changes will take place in the track layout and signal systems. The $6-million project will increase capacity for both passenger and freight trains and reduce the schedules of trains between Portland and Vancouver by 6 minutes. The installation of power switches at the station will eliminate train crews having to stop trains while they hand throw turnouts to get in and out of the station. One project being reviewed by UP engineering staff for track and signal improvements in Southeast Portland will increase train speeds from 20 mph to 55 mph, thereby removing approximately 8 minutes in running time between Portland and Salem. Construction will occur this summer.

Washington DOT (WDOT) is developing two environmental impact statements (EISs) for key rail improvement projects. WDOT, the city of Vancouver, and BNSF are evaluating projects to alleviate freight and passenger rail conflicts through the 39th Street crossing in the Vancouver Rail Yard. In the Kelso-Kalama stretch, an EIS is being developed to evaluate impacts of adding a third rail line and additional siding and yard

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tracks. The purpose of the project would be to alleviate congestion delays—caused by freight operations at the four rail yards in the Kelso-Kalama area—which result in extensive congestion on the two existing BNSF main line tracks.

Passenger service in the corridor will soon be enhanced by the implementation of a real-time passenger information system, which incorporates a GPS signal generated from the American Public Safety Communications Officers' new APCO 25-radio transmission system in the corridor. Monitors have already been installed in Oregon stations and are expected to be fully operational later this year. Passengers will be provided with the exact time their train or thruway bus will arrive and depart from their station.

—Christine F. Andersen, P.E.
Deputy City Manager, Environmental Services
City of Boulder, Colorado

NEW PLAN TRACKS RAIL GROWTH IN CALIFORNIA

In March 2001 Amtrak issued the California Passenger Rail System 20-Year Improvement Plan in collaboration with Caltrans, local and regional entities supporting intercity rail passenger service in California, and key freight railroads. The plan identifies $10.1 billion in capital improvements for the statewide rail passenger network. For each rail corridor, the plan describes the 20-year vision in terms of service expansion, increased speeds up to 110 mph (and potentially up to 125 mph), trip time, operational reliability, capacity, and ridership. The plan lists improvements needed to achieve each corridor's goal and identifies funding required for infrastructure and rolling stock at the project and corridor level.

The governor's Traffic Congestion Relief Plan (TCRP), approved by the legislature and governor in July 2000, contributed $201.5 million in state funds to intercity rail projects, which will cost a total of $532 million. The state fund contributions will be matched by $330 million from Amtrak, federal, private, and local government funds to complete the proposed projects. By fall 2001 almost $80 million of the TCRP funds will be allocated for design and construction, with the balance to be allocated in fiscal year 2001–2002. At its March 2001 meeting, the California Transportation Commission approved Caltrans' application for $28 million to undertake the environmental work and engineering for the $167 million project—constructing run-through tracks at Los Angeles Union Station (LAUS). Amtrak and Metrolink trains will be able to operate through LAUS, rather than serve it as a stub-end terminal.

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The governor's 2001–2002 proposed budget includes $98 million to double and triple track portions of the *Pacific Surfliner*, San Joaquin, and Capitol routes to allow improved reliability and the operation of additional trains. On the Capitol corridor, the Yolo Causeway will be double tracked, eliminating the last remaining single-track segment between Sacramento and Oakland. A key segment of the San Joaquin route between Oakley and Pittsburg will also be double tracked. On the Orange County portion of the *Pacific Surfliner* route, state funds will allow triple-tracking of a portion of the heavily used Los Angeles–Fullerton segment, as well as double-tracking of existing single-track portions of the line in southern Orange County.

The 2001–2002 budget also includes $9.5 million for service expansions and additional frequencies, including a sixth roundtrip from Bakersfield to Sacramento on the San Joaquin route, where four Bakersfield-Oakland and one Sacramento-Oakland roundtrip currently operate. Introduction on the sixth San Joaquin train has been moved to early 2002 by environmental issues related to construction of track improvements essential to starting the service. On the Capital Corridor, the budget includes funding to add two roundtrips between Roseville-Sacramento-Oakland and San Jose. Separate legislation provided funding to start two additional Sacramento-Oakland daily roundtrips in April 2001 (rather than the October 2001 start of the 2001–2002 contract year), as well as to run two additional weekend roundtrip services between Oakland and San Jose. In May 2001 Amtrak added additional Friday, Saturday, and Sunday roundtrips between Los Angeles and San Diego.

Amtrak has provided $105 million for new *Surfliner* cars for the San Diego–Los Angeles–Santa Barbara–San Luis Obispo *Surfliner* route, supplemented by $17.5 million in state funds to purchase a total of 46 cars and 11 locomotives, providing the *Surfliner* route to be operated entirely with new bi-level equipment. Seven of the new train sets have been placed in revenue service; the last three will be delivered by the first quarter of 2002. Additional state funds will allow the purchase of 10 additional cars and six locomotives for use on the San Joaquin and Capitol Routes.

—Matt Paul
Chief, Planning and Policy, Division of Rail
California Department of Transportation

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CALIFORNIA'S CAPITAL CORRIDOR EXPANDS UNDER JOINT POWERS AUTHORITY

The Capitol Corridor (San Jose–Oakland-Sacramento-Auburn) experienced 45.2 percent ridership growth in the 12 months ending October 2000; during those 12 months 809,676 trips were generated. The 170-mile route is the third busiest in the nation. Ridership growth is taking place at an increasing rate as evidenced by monthly comparison between 1999 and 2000: July, increased by 40 percent; August, increased by 52 percent; September, increased by 75 percent; October, increased by 83 percent. This growth must be examined in the context of the goals, policies, and actions of the Capitol Corridor Joint Powers Authority (CCJPA), created in 1998 to operate the intrastate rail corridor in Northern California.

CCJPA is governed by a board of directors who represent eight counties and six transportation agencies. Although management responsibility rests with the Bay Area Rapid Transit district, Amtrak provides daily operations and train maintenance. UP dispatches trains, maintains track, and carries out capital improvements—except at stations, where local communities are responsible for improvements. Operating funds come from the State of California Department of Business, Transportation, and Housing. The California Transportation Commission provides capital funds, and local communities provide funds for stations. No federal funds are used.

CCJPA has developed a vision statement that sets parameters for operations of the Capitol Corridor. The parameters require Amtrak to

- Provide high-quality passenger rail and connecting bus service that is safe, fast, frequent, and reliable;
- Develop rail service into the preferred means of travel along the Northern California San Jose–Oakland–San Francisco-Sacramento-Auburn route;
- Deliver cost-effective expansion of superior rail service;
- Build constructive working partnerships with riders, local communities, Amtrak, UP, and the state of California; and
- Recognize and respect the interests of each of the partners.

Service quality and constructive partnerships are recognized as essential components in building a successful rail passenger operation in the Corridor. CCJPA increased service frequency in February 2000 by adding a roundtrip between Sacramento and San Jose, and a roundtrip between Sacramento and Oakland. This 17-percent service increase, using the existing four train sets of California cars, netted a 25-percent revenue increase. The revenue increase is lower than ridership growth because of increased use of discounted multiride tickets. Net train cost decreased from $.35 to $.18 per passenger mile. Increased service frequency and multiride

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ticket discounts are credited for much of the ridership growth. On-time performance, which has slipped from 90 percent to 80 percent in the 12-month period, and the use of attractive bi-level California cars, quality onboard food and beverage service, connecting bus services, and discounted tickets also contribute to the ridership growth. CCJPA has developed an agreement with some local transit agencies to provide free transit rides for Corridor rail passengers. Improved partnerships with stakeholders in the Corridor are viewed as essential to delivering the quality service that attracts riders. Although the stakeholders include Amtrak, state and local governments, and UP, CCJPA believes that much of the success of the Corridor is because of their approach with the operating railroad, which the authority sees as a valued customer. CCJPA makes investments to improve railroad capacity for freight and passenger services and recognizes that UP must make a profit from operation of passenger service. CCJPA expects UP to serve it well with on-time performance, track and signal maintenance, and travel time reductions. Growing intercity rail passenger service in the Corridor assumes a strong business partnership between the authority and UP. CCJPA will procure capital funding from available sources; make mutually beneficial investments in UP's physical plant; share the benefits of improved capacity, flexibility, and reliability with UP; and run more trains. These points are reinforced through a memorandum of understanding between the authority and UP.

Near term improvements implemented for the Capitol Corridor include additional services effective in April and May 2001. An additional set of California train cars was transferred from the Pacific Surfliner Corridor in April. The transfer will allow service expansions that include

- An additional two trains (which increases the total from seven to nine) between Sacramento-Oakland–San Francisco;
- An additional two trains (which increases the total from four to six) on weekends only between San Jose–Oakland–San Francisco, still more than four trains pending completion of track work by UP;
- Continued Sacramento-Auburn service; and
- Additional bus connections to meet new trains.

The authority has adopted a $407 million 10-year capital program that plans to accomplish the following goals for the Capitol Corridor:

- A new, jointly owned and operated state and Amtrak maintenance facility;
- Additional state-funded rolling stock;
- Track capacity and station improvements involving UP, the state, and local communities;
- Improved travel time and reliability from UP;

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• Increased service frequency with the objective of daily, hourly service from 6 a.m. to 10 p.m., traveling in both directions, in a cooperative CCJPA and UP effort; and

• Strengthened partnerships with riders, local transit, communities, Amtrak, UP, and state agencies.

EDITOR'S NOTE: This information was compiled from presentations made by Eugene K. Skoropowski, Managing Director, CCJPA, to Washington State DOT and the Washington Association of Railroad Passengers, December 2000.

—Ron Sheck
President, Transit Solutions

CAPITAL PLAN DEFINES AMTRAK'S TRANSPORTATION VISION

In February 2001 Amtrak released its updated strategic business plan, and with it, Amtrak's first ever long-term capital plan.

The plan was based on a long-term capital needs study performed during 2000 that examined all U.S. intercity passenger rail needs—corridor and long-distance services, fleet and infrastructure included. It was a first-of-its-kind analysis and concluded that with a modest investment of federal funds, the U.S. passenger rail system could fulfill its potential and provide the vital missing link in the nation's transportation system.

An annual federal investment in passenger rail—approximately $1.5 billion for the next 20 years—combined with leveraged state and private investments, will modernize the current rail system and advance HSR corridor development throughout the United States. In fact, nearly two-thirds of the investment would be for projects outside the Northeast Corridor.

Amtrak's vision for the nation's passenger rail system is of a set of high-speed corridor services linking major metropolitan areas that are tied together by a national network of long-distance trains. In the high-speed corridors, trip times would be reduced to give travelers a viable choice between air, rail, and highway. In the Pacific Northwest the Seattle-Portland trip would be cut from 3.5 hours to 2.5 hours. In the Midwest the Chicago–St. Louis trip would be cut from almost 6 hours to just under 4 hours. In the Southeast Charlotte to Atlanta would be cut from almost 6 hours to just 3.5 hours. In the Northeast, the Washington–New York journey would be just over 2 hours. Most importantly, these rail services would allow convenient access to airports, transit, rental cars, and highways to make transfers between modes seamless.

Also in This Issue

Amtrak's development of the long-term capital needs assessment for passenger rail and corresponding vision for what passenger rail can achieve for America was an essential first step in the process of reinvesting in our nation's passenger rail system. The federal government must provide the stable, long-term source of capital funds sufficient to realize the vision. To see Amtrak's complete strategic business plan and long-term capital plan, log onto www.amtrak.com.

—Amy Elsbree
Senior Director, Constituent Relations
Amtrak

FEDERAL RAILROAD ADMINISTRATION PROJECTS: WHAT'S NEXT?

Mobility between major urban areas is vital to American society, but highways and airport facilities on critical intercity corridors around the nation are suffering unacceptable congestion as travel demand grows. Construction of new limited access highways can cost $40 million per lane mile, and airport expansion is often not feasible because of surrounding development.

High-speed ground transportation systems such as those which have been built in Europe and Japan provide superb service quality, but implementation of such systems in the United States has been prevented by high costs and the difficulties associated with acquiring new right of way. FRA's Next Generation High-Speed Rail (NGHSR) program seeks to demonstrate that the public will welcome incrementally upgraded HSR passenger service that has air or road competitive door-to-door trip times between major city pairs and reliable, high-quality, cost-effective service.

Further technology development and demonstration is needed to provide cost-effective, high-quality service in applications in the United States. FRA has identified the following four program areas where development and demonstration activities have a high potential return on investment when upgrade programs are implemented:

- **Advanced Train Control** systems particularly suited to maximizing the capacity of railroads to carry a mix of high-speed passenger, commuter, and freight trains with minimal risk of collision and implemented at considerably lower cost than conventional methods of upgrading railroad signal and control systems to support high-speed operations.
- **Non-Electric Locomotives** to achieve the speed and acceleration capability of electric trains without the expensive infrastructure of railroad electrification.

• **Grade Crossing Hazard Mitigation**, including barrier systems and innovative warning devices and methods that provide nearly the same security as grade separations but at much lower cost.

• **Enhanced Track and Structures** to cost effectively increase route capacity or improve performance of the infrastructure on existing corridors, or both, to be sufficiently robust to permit shared heavy freight and high-speed passenger use with satisfactory ride quality.

Following are major projects currently under way:

Advanced Train Control

Incremental Train Control System

ITCS taps the existing signal system for status information; radios to train; uses the onboard computer to combine status, automatic location, and database information to inform engineers of safe operating limits; and stops unsafe train operation. The system is in revenue service on the Amtrak-owned line in Michigan. Installation is complete on the 80-mile demonstration territory, and 44 miles are in service; cutover testing is under way on the remainder. Safety verification is under way. Accomplishing revenue service speeds of 90 mph is targeted for 2001; full safety verification and validation, permitting speeds up to 110 mph, is targeted for 2002. NGHSR funding totaling $14.08 million has been awarded through fiscal year 2000; $3 million is appropriated for fiscal year 2001; $3 million is requested to enhance system capabilities and to move the system toward interoperability in fiscal year 2002. Michigan DOT, Amtrak, and Harmon Industries have contributed over $16 million in cost sharing.

North American Joint Positive Train Control Program

NAJPTC's project, jointly funded by AAR**,** Illinois DOT, and FRA, is installing a system to support revenue-service high-speed operations. The system will also demonstrate flexible-block operation using movement authority commands radioed to each train on a 123-mile track segment of UP's Chicago–St. Louis Corridor and establish industry-wide standards for control system interoperability. A joint program office at TTCi manages the overall effort. A team led by Arinc serves as system engineer. A $34 million system design and integration contract was awarded to a team led by Lockheed Martin in June 2000 to design and install the demonstration system in Illinois. The target is to have the system installed and fully safety validated, so that Illinois and Amtrak can begin revenue high-speed passenger service in January 2003. FRA has funded $18.75 million through fiscal year 2000; $7 million is appropriated for fiscal year 2001, and $7 million is requested for fiscal year 2002. Illinois DOT has committed $12 million in cost sharing for the project. AAR committed $20 million to be funded by its member railroads over a 4-year period that began in 1998.

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Total project cost over 4 years is estimated at $60 million. Parallel with the baseline effort, the signal system on the demonstration territory will be upgraded to a modern microprocessor and digital-radio-based signal system.

Nonelectric Locomotives

FRA-Bombardier Advanced Turbine Locomotive

Construction of a 5,000-hp, 150-mph turbine-electric locomotive was completed in November 2000, and it is undergoing high-speed qualification testing at TTCi in Pueblo. In May 2000 the locomotive reached 156 mph—well within the train and occupant safety criteria established by FRA. Demonstrations on high-speed corridors will follow the Pueblo tests. FRA awarded a cooperative agreement to Bombardier, Inc., in fiscal year 1998 to produce and demonstrate the locomotive, initially at 125 mph and ultimately at 150 mph. Total cost of designing and constructing the locomotive is $26 million, and has been funded equally by Bombardier and FRA through fiscal year 2000. Three million in federal funds are available in fiscal year 2001 to conduct service demonstrations and coordinate with the Advanced Locomotive Propulsion System (ALPS) project (described below) on demonstration trains; $3 million is requested in fiscal year 2002.

Advanced Locomotive Propulsion System Project

The ALPS project is producing a very high power generator to be direct-driven from a turbine engine and will use a carbon fiber composite flywheel energy storage "battery" to substantially increase the acceleration of the turbine-powered locomotive. The ALPS team consists of University of Texas Center for Electromechanics, Honeywell (formerly AlliedSignal), AAR, and Argonne National Laboratory. As of May 2001 the turbine-driven 3-megawatt generator has begun spin testing, and the full-scale energy storage flywheel is being assembled and will begin testing shortly. The generator will be mated to a Honeywell turbine and mounted on a skid for installation in the FRA-Bombardier demonstration locomotive. The energy storage flywheel will be mounted in an auxiliary carbody for subsequent testing with the locomotive. Federal funds in the amount of $13.8 million have been provided through fiscal year 2000; $3.8 million is appropriated for fiscal year 2001, and $3.8 million is requested in fiscal year 2002, with $7.2 million in matching funds by the project team.

RTL Turboliner Enhancements

With New York State DOT (NYSDOT), reliability and maintainability demonstrations of enhanced turbine-powered train sets were conducted to assure that promise of new technologies can be delivered in practice. Under NGHSR, one train set was upgraded with higher horsepower to a Turbo-

liner RTL-2 configuration and has operated successfully in revenue service since 1997. To achieve further improved acceleration in an RTL-3 configuration, FRA awarded $12.5 million through fiscal year 1998, equally matched by NYSDOT. SuperSteel Schenectady received the upgrade contract in fiscal year 1997. Under separate funding, NYSDOT and Amtrak have now committed to upgrade all existing seven RTL train sets to the RTL-3 configuration, successfully completing the NGHSR demonstration phase and moving to implementation under separate funding. The upgrade of the first RTL-3 is complete and testing has begun.

GRADE CROSSING HAZARD MITIGATION

Michigan ITCS Demonstration

Michigan ITCS demonstration (described above under advanced train control) includes the upgrade of 57 public grade crossings to provide constant warning time and improvement or elimination of 21 private grade crossings. A system linking crossings to locomotives via the PTC system is in daily revenue service operation as of April 2001.

North Carolina's "Sealed Corridor"

North Carolina's sealed corridor surveyed all grade crossings on the Greensboro to Charlotte developing high-speed corridor and is applying appropriate cost-effective techniques to mitigate or eliminate risk at each crossing. Federal funds totaling $10.73 million from the NGHSR and TEA-21 Section 1103 Grade Crossing programs have been provided through fiscal year 2000; $700,000 is appropriated for fiscal year 2001, and $700,000 is requested for fiscal year 2002. The effectiveness of alternative crossing warning methods has been documented and installation of the selected methods has begun. The methodology will be documented and made available for use on other corridors. As requested by Congress, FRA and North Carolina DOT are finalizing a report that summarizes the effectiveness of measures taken in the form of lives saved. Preliminary results show that five lives have been saved thus far, and accident reduction is sustainable over time, so many additional lives will be saved in the future.

Dragnet Barrier Systems

Operation and evaluation of three Dragnet systems, which could physically stop intruding vehicles, began early in 1999 on the Chicago–St. Louis corridor in Illinois. The state concluded that the barrier systems were too maintenance-intensive to continue in operation, and the systems will be removed.

Other Concepts

Other innovative concepts are being sought for integrated demonstration and assessment for efficacy on revenue corridors through the National Academy of Sciences' Innovations Deserving Exploratory Analysis Program and through broad agency announcements. The fiscal year 2000 NGHSR broad agency announcement was issued in the *Commerce Business Daily* in June 2000.

ENHANCED TRACK AND STRUCTURES

Infrastructure Upgrade on the Pacific Northwest Corridor

A cooperative agreement for $5.2 million was awarded in fiscal year 1997 to the state of Oregon for track, grade crossing, and structures improvements to the developing high-speed corridor between Eugene, Oregon; Portland, Oregon; and Vancouver, Washington. These improvements are complete.

Subgrade Mitigation Techniques

A contract for more than $400,000 was awarded in fiscal year 1997 to Foster-Miller, Inc., to demonstrate advanced techniques to resolve long-standing subgrade problems, which degrade ride quality and threaten the operational safety of high-speed track and which cause excessive maintenance requirements and expense. An innovative mitigation technique employing grout injection was applied to a test zone on MBTA near Boston in early 2000; results to date show a marked reduction in track settlement and in maintenance required.

Increase Operating Speeds While Improving Ride Quality Over Bridges

A contract for $360,000 was awarded to the University of Delaware to develop techniques to improve ride quality and increase permissible operating speeds over bridges. These low-cost techniques have been successfully demonstrated on the Northeast Corridor and the Norfolk Southern and are now being employed by Amtrak.

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ADDITIONAL RAIL LINKS

TRB 81st Annual Meeting, January 13–17, 2002 Washington, D.C.
http://www4.TRB.org/trb/annual.nsf

TRB Calendar
http://www4.TRB.org/trb/calendar.nsf

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