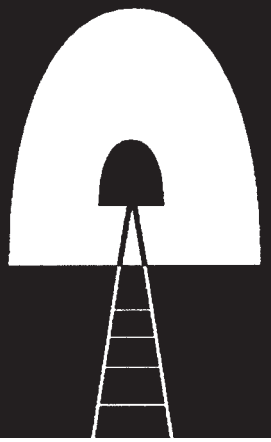
Intercity Rail Passenger Systems Update

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 news letter. Please keep your bookmark at www.trb.org/studies/publications/intercityrail.asp for upcoming editions.

The **Transportation Research Board** is a unit of the National Research Council, which serves as an independent advisor to the federal government on scientific and technical questions of national importance. The National Research Council, jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, brings the resources of the entire scientific and technical community to bear on national problems through its volunteer advisory committees.



CURRENT RESEARCH AND DEVELOPMENT IN INTERCITY RAIL PASSENGER SYSTEMS

NUMBER 12 SUMMER 2007

CONTENTS

TRB 87th Annual Meeting, January 13–17, 2008
Washington, D.C.
www.TRB.org/meeting/

The Transportation Research Board's Intercity Rail Passenger Systems Committee (AR010) 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 and new technology. Research will include demand analysis, financial considerations, economic effects (such as 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. Albert C. Witzig and Matthew J. Melzer, coeditors; Anthony D. Perl, Chair, TRB Committee on Intercity Rail Passenger Systems; Elaine King, TRB staff officer. Any findings and conclusions are those of the authors and not of TRB. Submit news items to Elaine King, Transportation Research Board, 500 Fifth Street, NW, Washington, DC 20001, telephone 202-334-3208, or email eking@nas.edu. **www.TRB.org**

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Also in This Issue

◆

Back to Page 1

CHAIRMAN'S LETTER

Dear Readers:

Welcome to the latest edition of the Transportation Research Board's *Intercity Rail Passenger Systems Update*. Some things have changed since our last edition appeared, but before mentioning these, let me highlight some items of interest.

Passenger rail developments in Europe, Asia, and the United States continue to demonstrate the mode's potential to deliver mobility that adds value to society. In his article, Aad Rühl identifies European passenger rail innovations that have occurred in the past year. Demonstrating that not all of the passenger train improvement news comes from overseas, Bill Bronte explains how California is strengthening its transportation system by finding the will and obtaining the funds to pursue improvements.

The know-how to plan, design, and execute a bright future for passenger rail in North America continues to be found among the members and friends of TRB's rail committees, and within the Intercity Rail Passenger Systems Committee, in particular. Dan Brand's overview of the nuances of applying a benefit–cost assessment to rail passenger investments exemplifies this analytical capacity. In order to help put knowledge into practice, I hope that you will spread the word, beginning with this newsletter, that TRB's rail committees provide valuable resources for those interested in improving North America's rail passenger system.

Since this committee's last newsletter, I have assumed the responsibilities that Jack Tone so ably held for six years. Jack now chairs our subcommittee on Intermodal Interfaces, succeeding George Haikalis, who has moved to chair the research subcommittee. Rit Aggarwala remains the chair of our socioeconomic and financial aspects subcommittee. We have completed a committee rotation, bringing in new members: Bill Bronte, John Cikota, Dharm Guruswamy, Ron Mauri, Joe Schweiterman, Eric Tyrer, Vukan Vuchic, Shirley Williams, and Frank Wilner. I welcome them all and thank outgoing members for their service during the past three years. I hope that recent veterans will add to our collective knowledge by staying active as friends of the committee. Special thanks are due to Nazih Haddad, the outgoing Vice-Chair, and to Allison de Cerreño, who, having served as Secretary during the past year, is succeeded by Eric Tyrer. Allison remains a member of the committee.

Eric has designed the committee's new website, at http://www.york.cuny.edu/ar010, which will contain articles not included in this newsletter. Articles that will be posted on the website include a comprehensive update of Midwest passenger rail developments by Randy Wade, an Amtrak update from Ross Capon, and a provocative analysis of the role of passenger trains in improving America's energy efficiency by Vukan Vuchic.

With this newsletter in the capable hands of coeditors Al Witzig and Matt Melzer, readers will continue to be informed of rail passenger developments in 2007. A second issue, with up-to-date news and essays will be published before TRB's annual meeting in January 2008.

Sincerely,
Anthony Perl
Chair

Also in This Issue

CALIFORNIA PREPARES TO IMPLEMENT TRANSPORTATION BOND PROGRAM

In January 2006, California Governor Arnold Schwarzenegger presented a Strategic Growth Plan that calls for $107 billion in investments during the next decade to strengthen California's transportation systems. The plan included a comprehensive investment package designed to decrease congestion, improve travel times, and increase safety, while accommodating future population growth and economic development.

The $107 billion figure includes $47 billion in current transportation funding, $40 billion in new funding, and $19.9 billion in general obligation bonds—passed by California's voters in November 2006.

Recognizing the role public transportation plays in developing a coordinated strategy to improve mobility in congested corridors, the plan includes $4 billion, or approximately 20 percent of the total general obligation bonds, for public transportation purposes. Of that amount, $400 million is allocated to the California Department of Transportation (Caltrans) for intercity passenger rail, including a minimum of $125 million for the acquisition of additional rolling stock. The remaining $3.6 billion will be distributed to California's transit agencies on a formula basis. Because several of these agencies include commuter rail operations that share corridors with intercity services, Caltrans will be working with those agencies to develop capital projects benefiting both services and leveraging the available dollars.

In addition, Caltrans also will be working with the state's two Class I railroads to leverage funds to improve rail infrastructure. Recognizing the impact of rail and roadway congestion in many of state's goods-movement corridors, the plan also included $2 billion for projects to improve capacity in heavily congested freight corridors. A large percentage of the projects, which require a minimum dollar-for-dollar match from nonstate sources, will be used on rail freight infrastructure—many in corridors shared with passenger rail operations.

Current timelines call for the Caltrans-proposed update of the five-year capital budget (revised to reflect the infusion of new bond funds), covering the period through 2010 to 2011 to be submitted to the California Transportation Commission in April for adoption in June 2007.

—Bill Bronte
Chief, Division of Rail
California Department of Transportation (Caltrans)
bill_bronte@dot.ca.gov

◆

Back to Page 1

Also in This Issue

◆

Back to Page 1

DIALOGUE ON ECONOMICS AND FUNDING: CONSIDERING ALL PUBLIC BENEFITS OF INTERCITY RAIL

When making any decision to continue or improve intercity rail service operation, all public benefits of publicly subsidized intercity rail service should be considered. These public benefits include

- All user and nonuser benefits of an improvement, and
- All corresponding losses if service is discontinued or degraded.

In the public sector, benefit-cost analysis (BCA) is widely used—it is federally mandated in many areas—to maximize economic efficiency or the total net benefits to the public from an investment. It is important to calculate all public benefits, not only commercial benefits, such as revenue from carrying riders and freight, from an operation or investment when justifying any public expenditure in transportation.

The absence of any quantitative estimates of public benefits as an input to publicly formulating federal and state policies for continuing to subsidize or possibly improve Amtrak's current operations is surprising. We know very well how to calculate such public benefits.

Individuals benefit from a transportation service or improvement when they derive more value from the service than the cost would suggest. These consumer surplus net benefits are the *user* benefits. In the case of an intercity rail service improvement, travelers who switch to the improved mode reduce the load on the other modes, reducing the congestion experienced by the remaining travelers on those modes. These congestion cost savings are the *nonuser* benefits—principally time and operating cost savings to remaining air and auto travelers.

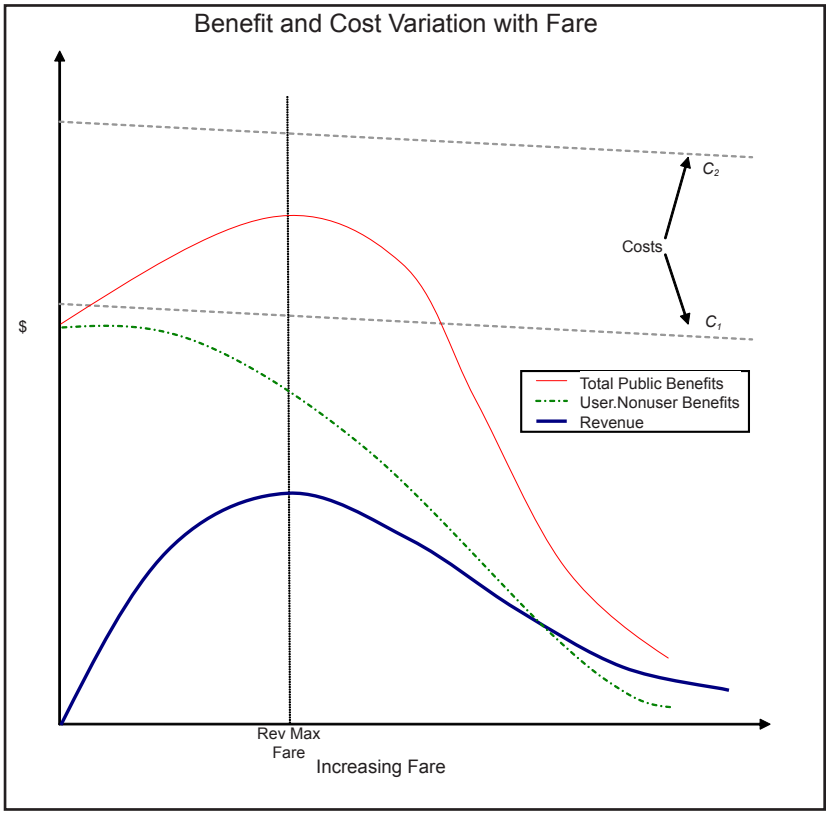
The reverse is also true. If Amtrak's Northeast Corridor (NEC) rail service, for example, were allowed to deteriorate or to cease operation, the losses in user and nonuser benefits would need to be considered in any public-sector BCA evaluating whether the financial cost savings from the disinvestment exceeds the loss in public benefits, including the loss in passenger revenue.

Photo: Connecticut DOT

Amtrak 823, serving the Northeast Corridor, arrives at New Haven rail terminal.

Also in This Issue

Passenger revenue from a publicly subsidized operation can be counted as a benefit in a public-sector BCA along with the benefits from the service which users obtain over and above the fares they pay. Passenger revenues can increase from rail service improvements or from instituting revenue-maximizing fares. Strictly speaking, passenger revenue is a transfer to the service provider, which changes the operator's producer surplus. In the case of publicly subsidized Amtrak service in the NEC, revenue maximizing fares can reduce the subsidy cost to society. Whether this involves a tradeoff between more passenger revenue and less total public benefits, or a win-win result with more passenger revenue *and* more user and nonuser public benefits is illustrated in the following figure.



The figure shows, schematically, how revenues, other public benefits, and costs may vary with the fare charged for, say, Acela service in the NEC. The bottom curve, the inverted U-shaped curve, shows how farebox revenue varies with fare. That is, as fares increase from zero to their maximum revenue point, revenue is inelastic with respect to fare, meaning that as fare increases, revenue from the remaining riders increases faster than the loss in revenue from losing riders. After some point, indicated by the Rev Max fare, revenue falls off with further increases in fare.

User and nonuser benefits vary directly with ridership, so as fares are increased, ridership decreases, resulting in decreases in these nonrevenue public benefits. The top inverted U-shaped curve is simply the sum of the revenue and user–nonuser benefit curves; it represents the total public benefits for the publicly subsidized service.

Note that if fares are currently higher than their Rev Max level, lowering them to their Rev Max level can produce a win-win result with increased revenue *and* increased total public benefits. This means raising fares is not always the right answer for raising passenger revenue, or for maximizing the other public benefits that justify public subsidies for rail operations.

◆

Back to Page 1

Also in This Issue

We now arrive at the question: Do the total benefits for a particular service or service improvement justify a public subsidy? The downward sloping dashed lines represent two alternative possible costs for a particular passenger rail service improvement from, for example, publicly investing in high speed rail (HSR) service in the NEC. The curves, C_1 and C_2, are downward sloping since many components of total cost (rolling stock, for example), will be less as ridership decreases with higher fares. This is a subsidized service, since total costs exceed revenues at all demand levels. But the bottom line is whether at some fare (and service) level, the total public benefits exceed the total costs. The figure shows that if the cost of the improvement were C_1, then this is indeed the case, but not if the cost were C_2. In other words, if the cost of a particular rail service improvement is represented by C_1, the public investment is less than the total public benefits, and the result of this example BCA is that the public investment in the rail service improvement is justified.

In the example of HSR service in the NEC, the improvements could be expected to provide benefits to current and new, or diverted and induced, rail passengers; current intercity and urban highway travelers in the NEC; and airline passengers and airline operators at all major NEC airports. In addition, increased commercial benefits derive from being able to charge higher-revenue maximizing fares for faster, more competitive service. These public benefits are important in evaluating whether the public expenditures needed to restore the NEC to a "state of good repair" condition or better are worthy public investments. Conversely, abandoning all or part of current rail services in the NEC would result in substantial losses in public benefits. All these public benefits need to be considered in making any decision to continue or improve the operation of intercity rail service in the NEC and throughout the United States.

—Daniel Brand
Vice President
CRA International
DBrand@crai.com

◆

Back to Page 1

Also in This Issue

◆

Back to Page 1

RAIL NEWS FROM EUROPE

High-Speed Network

Important developments are taking place within the European high-speed rail network this year. As a result of the new annual timetable introduced on December 10, 2006, the German high-speed rail network was extended to include a new 300-km/h line between Nuremberg and Ingolstadt. Intercity-Express (ICE) trains will operate between Nuremberg and Munich on this route at half-hour intervals. Hourly trains will operate between Berlin and Cologne.

Photo: Deutsche Bahn

Construction under way on an Intercity-Express line between Nuremberg and Ingolstadt, Germany.

In France, the first stage of the LGV Est Européen (Ligne à Grande Vitesse or high-speed line, east) opened on June 10, 2007, and provides 320-km/h trains to destinations in eastern France, with continuing service to Luxemburg, as well as to Frankfurt and Stuttgart, Germany. In winter 2008, service will be added to Munich, Germany, and Basel and Zürich, Switzerland.

The Paris, Brussels, Cologne, Amsterdam, and London (PBKAL) network in Northwest Europe was completed on June 10, 2007, and underground platforms at Antwerpen Centraal are servicing both the traditional line and the new high-speed line to the Netherlands.

The final stage of the high-speed line to London St. Pancras will open on November 14, 2007—exactly 13 years after the introduction of Eurostar services. The Waterloo International terminal will no longer be used. St. Pancras, a Victorian building constructed as a terminal for the Midland main line to Derby and Sheffield, neighbors Kings Cross, from which trains to York, Newcastle, and Edinburgh depart, and is one bus stop from Euston, terminal for the Manchester, Liverpool, Glasgow, and North Wales line. This location will simplify journeys between continental Europe and destinations north of London, though less than originally envisioned, with direct Eurostar service to destinations north of London. The shorter Eurostar sets running north of London will be used regularly, under lease to the Société Nationale des Chemins de fer Français (SNCF) for service between Paris and the north of France.

After December 9, 2007, with the introduction of the 2008 timetable, a short section of high-speed line between Liège and Aachen will open, as the last stage of several projects

Also in This Issue

on the route between Brussels and Cologne. Services on the high-speed line between Brussels and Amsterdam also will start up. However, since the signaling system needed for high-speed running is not expected to be completed, services will be provided provisionally by rerouting the hourly Benelux trains at 160 km/h over the new line; Thalys HSTs will continue to use the traditional line. In Spain, the Cordoba–Malaga high-speed line is scheduled to open in 2007.

Regional Trains on High-Speed Lines

Although designed primarily for long-distance service, high-speed lines are also used for regional service as demand and capacity allow. This will apply to some of the new line openings.

In Belgium and Germany, and for the first few years in the Netherlands, normal locomotive-hauled trains have operated at speeds not higher than 200 km/h. South of London and in the Netherlands, special high-speed stock will begin operating within a few years. Trains on order for South England will be provided by Japanese builders, and these trains will be the first Japanese-built, high-speed trains used in Europe.

Playing Meccano with High-Speed Trains

Many readers will remember, as children, playing with boxes of metal strips that could be put together, taken apart, and then used to form a new structure. This is what the French national railway company SNCF is doing with its fleet of high-speed trains in Opération Meccano.

For economic and environmental reasons, SNCF wants to expand its fleet of high-speed trains by commissioning only double-decked trains (TGV Duplex). However, expected ridership on the LGV Est does not yet justify the use of these high-capacity vehicles. For this reason, older stock is being reshuffled.

A total of 52 TGV Réseau sets, built from 1992 to 1994 will be reconditioned and used on the new line. Because trains to Germany and Switzerland need to operate on 15 kV, 16.7 Hz, which is not possible for the Réseau motor cars, 19 sets will receive new, tricurrent power cars. The 38 power cars freed up will be combined with new rakes of double-deck coaches to form 19 TGV Réseau Duplex sets that will be allocated to the Southeast network. Three of them can operate on 1500 and 3000 V dc and 25 kV, 50 Hz. Because there are only 49 bicurrent Réseau sets, they could, theoretically, operate to Belgium or Italy.

—Aad Rühl
Amsterdam, Netherlands
aad.ruhl@laposte.net

NEWSLETTER COMMENTS

We look forward to your feedback on the format and the content of this publication. Comments on this newsletter, and most especially, continued contributions by committee members, friends of the committee, and others can be sent to the editors:

• Albert C. Witzig, DMJM Harris, Inc.
303 E. Wacker Drive, Suite 600, Chicago, IL 60601, albert.witzig@dmjmharris.com

• Matthew Melzer, National Association of Railroad Passengers, 900 2nd St., NE, Suite 308, Washington, DC 20002-3557, mjmelzer@gmail.com

◆

Back to Page 1