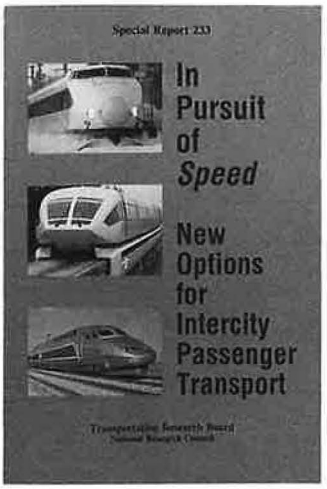
Putting a Price on *Speed*



TRB Publishes New Report

***Special Report 233—In Pursuit of Speed: New Options for Intercity Passenger Transport* is available from the Transportation Research Board, 2101 Constitution Avenue, N.W., Washington, D.C. 20418 ($22.00).**

High-Speed Trains Are Feasible, but Costly

Very high-speed trains capable of running up to 200 miles an hour are technologically feasible in the United States and might decrease airport and highway congestion, offering an alternative for intercity travel, according to a new report recently released by TRB.

Such speed has its price, however, and farebox revenues probably will not support a new high-speed ground transportation (HSGT) system in the United States in the near future, the study committee concluded. It added that public subsidies for HSGT might be justified because HSGT options could benefit passengers as well as those using other forms of transportation. If public subsidies are justified, the committee said, federal agencies could consider tapping national funds for airports, airways, and highways.

TRB *Special Report 233: In Pursuit of Speed* calls on the U.S. Department of Transportation and individual states to evaluate HSGT systems as a new mode of intercity travel.

Following is the opening statement of Lawrence Dahms, Executive Director of the Metropolitan Transportation Commission, Oakland, California, and Chairman of the TRB Committee for the Study of High-Speed Surface Transportation in the United States, at the news conference held to brief the news media on the release of the report.

"I am pleased to be here this morning to discuss our new report on high-speed surface transportation. It's appropriate that we meet in Washington—not only since this is the nation's capital, but because this city provides a good illustration of some of the issues our committee has been considering during the past year. Thousands of people travel every day between Washington and other cities along the Northeast Corridor. To visit Washington from New York City, for instance, travelers generally take one of the air shuttles, ride Amtrak, or drive along Route 95. All three modes of travel—air, rail, and highways—have their good and bad qualities. But with pressures on our transportation system growing all the time, some have suggested that we consider whether new technologies might be used to speed people between Washington, D.C., and New York at a reasonable price and without undue harm to the environment.

"At the request of the U.S. Department of Transportation, our committee has examined the feasibility of building new, high-speed ground transportation systems, not only in the Northeast Corridor but in other heavily traveled parts of the country as well; for instance, between Houston and Dallas, or between Los Angeles and the Bay area, where I live. Europe and Japan already have trains that travel much faster than anything available in the United States. Should we upgrade our existing rail systems to do the same? Should we build entirely new rail systems? Are trains that use magnetic levitation—maglev—a better choice? Or should we look to other options?

"There clearly is a need to consider new alternatives. Our transportation system is stressed, as all of us know from the traffic jams and airline delays we endure. These problems are getting worse, and expanding existing systems to meet the growing demand will not be easy. Building highways or new airport runways is expensive, and money is tight. Environmental concerns or community opposition are common. It also is getting harder to obtain new rights-of-way and to protect existing ones. Indeed, sometimes it seems that the only option is to do nothing and hope for the best. But such resignation is just a prescription for even more gridlock.

"So what should we do? Our committee briefly considered the merits of using tiltrotor aircraft—planes that take off and land like helicopters but fly like airplanes. We also examined a range of technologies known as intelligent vehicle-highway systems. Both options show potential and deserve closer study.

"We devoted most of our attention, however, to two options for high-speed ground transportation: very high-speed trains and maglev. We have good news and bad news to report. The good news is that high-speed trains similar to those in Japan and Europe are technologically feasible right now and might help to relieve airport and highway congestion along heavily traveled routes. Maglev also shows promise, although the technology needs further development. The bad news is that these systems are extremely costly and unlikely to attract enough ridership to pay for all of their costs without public subsidies.

"High-speed trains probably are more feasible than maglev vehicles for the near term. Maglev eventually could offer speeds of up to 300 miles per hour, but the technology is in a relatively early stage of development. More research is needed to assess the market potential and economic feasibility of systems operating at such speeds.

"For now, high-speed trains using steel wheels on steel rails are more realistic. They could be pursued most easily—I say 'easily' only in relative terms—by upgrading existing rail systems. Realigning tracks, powering trains with gas turbines, or electrifying

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Study Recommendations

In summary, the committee urged DOT and states to consider a combination of HSGT and other technologies that show promise for safely improving intercity travel. The report includes seven specific recommendations:

- A new approach to transportation decision making. In the United States, transportation issues are addressed by institutions that focus on a single mode, such as air service, highways, or rail. There is no mechanism, however, for comparing and evaluating alternative transportation investments brought about by new technologies. The report calls on DOT and states to establish such mechanisms so that the entire range of alternatives can be evaluated to help solve transportation problems.
- Public subsidies. If public subsidies are justified, they could include contributions from national airport and airways and/or highway trust funds.
- Rights-of-way. DOT and state transportation departments should consider preserving and/or acquiring suitable rights-of-way.
- A broad range of options. In addition to new high-speed rail or maglev systems technology that increases speeds on existing rail lines must be considered.
- New standards. New safety and operational standards will be needed before HSGT systems can be installed. The committee urged DOT, through the Federal Railroad Administration, to re-evaluate, revise, and develop new standards for high-speed rail and maglev technologies.
- National clearinghouse. A central clearinghouse is needed for environmental permitting and other decision-making hurdles.
- Maglev vs. high-speed rail. Although maglev might offer speeds up to 300 miles per hour, more research is needed to determine the potential for lower cost systems and to assess the viability of this technology. Before proceeding to another stage of development in this area, the committee recommended a careful review of the potential market for maglev, as well as results of the National Maglev Initiative.

TOBIAS

Lawrence D. Dahms, Executive Director, Metropolitan Transportation Commission, Oakland, California, and Chairman, Committee for the Study of High-Speed Surface Transportation in the United States.

Bridge Design *continued from page 19*

binations of loads will occur at the same time. The statistically based derivation of these factors, however, is transparent to the designer using the specifications; what the designer sees are simple load factors, resistance factors, and load combination formulas that are used for the various design equations.

Status of Specifications

The second draft of the specifications and commentary was completed in May 1991 and widely circulated for review and evaluation. Fourteen states performed trial designs using the draft specifications, and the results were presented at a special AASHTO Bridge Subcommittee meeting held in St. Louis in mid-September.

The second draft received a positive reception during the St. Louis meeting. Many state bridge engineers noted that the new specifications looked different and took some getting used to. However, most of them said that once they became familiar with the new format, it was relatively easy to use for design and much more logically structured than the existing design specifications.

On the basis of the results of these trial designs, several minor problems were identified that will be corrected during the development of the final draft of the specifications. It is anticipated that the final draft will be completed and submitted in early April 1992 and that AASHTO will consider it for adoption in 1993.

To assist the states in converting to the new LRFD specifications, the Federal Highway Administration will develop a training course that should be available to the states shortly after the specifications are adopted by AASHTO.

Conclusion

The importance of NCHRP Project 12-33 and the new bridge design specifications is underscored by the national and international attention they have already received. Numerous presentations have been made at meetings and conferences in the United States and several other countries during the past three years. In March 1991 the 3rd TRB Bridge Engineering Conference featured a session on the new specifications, which was attended by 400 people. In addition, the project was highlighted as the cover story in the July 15, 1991, edition of the international weekly magazine *Engineering News-Record.*

When the specifications are eventually adopted by AASHTO, they will serve the bridge engineering profession into the next century with state-of-the-art design methods. The new specifications will be easier to keep technically up to date, and will have a commentary available to help bridge engineers interpret their provisions.

Will LRFD result in bridges built with thinner or lighter members? Not necessarily. Will bridges cost less to design or build? Not likely. Will it be more complicated to design with LRFD? No! The specifications will encourage bridge designers to use more accurate analysis methods and computer programs, but they will also allow the use of simple hand calculations.

What LRFD will do is result in the construction of bridges that exhibit a more uniform level of safety and that provide better long-term serviceability and maintainability. In addition, the new specifications will restore AASHTO to a leadership position in the international bridge engineering community.

For more information, contact Ian Friedland, Transportation Research Board, 2101 Constitution Ave., N.W., Washington, D.C. 20418.

Speed *continued from page 21*

rail lines could increase speeds substantially. So could the use of modern signaling systems and improved grade crossings. Special 'tilt' trains would enable trains to round curves faster without slinging passengers from side to side.

"The kinds of high-speed trains found in Europe or Japan are feasible in our country only in areas with the necessary rights-of-way. Trains are available that can operate safely at speeds of up to 200 miles per hour, and new ones are being developed to go even faster. A specially modified French train has achieved a maximum speed of 322 miles per hour.

"These systems are expensive. Estimates of building a system in the United States have ranged from about $10 million per mile to as high as $63 million per mile. This wide variation in estimates will shrink as we gain experience, but the cost will remain high. The most likely market is intercity trips in the range of approximately 150 to 500 miles, where high-speed ground transportation would compete principally with air travel for ridership. We find it very unlikely that farebox revenues could cover the capital and operating costs along likely U.S. routes. Several factors, such as the limited use of passenger rail and the popularity of automobile and air travel in the United States, suggest one needs to be cautious in extrapolating foreign experience with high-speed rail to the U.S. market.

"This, then, raises the basic question: Should the United States build the systems anyway? Well, that's a political as well as a technical question, and one not addressed directly by our committee. But we are urging everyone to be clear that construction costs probably cannot be amortized with revenues alone, and that operating costs will add to the bill. Subsidies will be needed. And, at least initially, the most likely source for subsidies will be other transportation funds, such as those for highways or air travel.

"As one who has been in the transportation business a long time, I know this suggestion will meet with resistance. But the only way rapid rail or maglev will happen is as part of a larger transportation system. Other modes may benefit, so perhaps they also should help pay the cost.

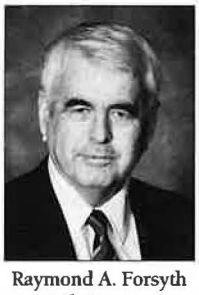
"There's a larger point that goes beyond which pots of money should be tapped, and it is that we need a new approach to making these kinds of transportation decisions in general. It's now very difficult—too difficult—to introduce any new transportation mode. Our institutional and financial arrangements for transportation are oriented toward existing modes. We need a

way to step back and view the larger picture. And we also must recognize that an important reason why high-speed rail has succeeded in Europe and Japan is the tradition in those areas of government support for rail passenger systems.

"Among our specific recommendations [see box on page 21] . . . [are those] for new standards and a clearinghouse on environmental permitting; especially note our call for additional research and development of maglev and other options. Our most important conclusion, however, is that although high-speed ground transportation could make travel easier for millions of Americans, it will not come cheaply. Such systems would attract riders from other transport modes but are unlikely to gain enough passengers to cover the full costs. Subsidies will be necessary, and we'll need changes in our institutional systems for transportation. The country should travel in this new direction with its eyes open, but the time has come to start thinking seriously about making the journey."

Correction

Photographs of the chairmen of Design and Construction of Transportation Facilities (Group 2) were inadvertently omitted from the 1991 TRB Annual Report. We apologize for this omission.



Raymond A. Forsyth
Chairman
Group 2 Council
(through
January 31, 1991)

Charles T. Edson
Chairman
Group 2 Council
(from
February 1, 1991)

PROFILES

Fell *continued from page 24*

session at the TRB Annual Meeting on Effectiveness of Recent Impaired Driver Programs, sponsored by the Committee on Alcohol, Other Drugs, and Transportation.

Fell received a B.S. in industrial engineering and an M.S. in human factors engineering from the State University of New York at Buffalo. He has been active in the Association for the Advancement of Automotive Medicine (AAAM), serving as a member of the Board of Directors for several years, treasurer for two years, and president from 1987 to 1988. He is also a member of the Human Factors Society and the National Safety Council's Traffic Records Committee. In 1989 he was elected a member of the American Public Health Association. He also serves on the Editorial Board for the *Journal of Safety Research*.

The recipient of awards for the best scientific paper from AAAM in 1979 and 1983, Fell also received the AAAM Service Award in 1985. He was U.S. representative for an Organisation for Economic Cooperation and Development project on Young Driver Accidents in 1973. He has also received many outstanding performance awards from NHTSA.

McLaughlin *continued from page 25*

Angeles County were able to establish paratransit systems for the elderly and disabled, along with activity center circulators, park-ride lots, user-side subsidy programs, and transit centers. The program served as a precursor to UMTA's Public-Private Transportation Network.

Another program, for which LACTC and McLaughlin received the 1989 UMTA Administrator's Award, established the first large-scale demonstration program of competitive contracting of fixed-route transit. In 1977 McLaughlin also received national recognition for her authorship of the first energy contingency plan by a major fixed-route operator. The plan was used as a model by UMTA and the American Public Transit Association.

McLaughlin's current activities include planning and environmental clearance for an Advanced Aerial Technology alternative for the median of the Ventura freeway in the San Fernando Valley. She is involved in a project to seek private-sector bids on a high-speed rail connector between Los Angeles International Airport and Palmdale Regional Airport and an east-west rail connector in the San Fernando Valley. She is also working on the design of new San Fernando commuter rail stations to serve as suburban community links for employment services and housing.

A graduate of Purdue University with a bachelor's degree in community development, McLaughlin received a master's degree in planning from the University of Southern California. She is the author of many papers and has served as speaker, panel moderator, and panelist in her areas of interest.