

# Congestion Pricing Symposium

STEPHEN GODWIN

Amid concerns about growing traffic congestion and air pollution, the concept of charging highway users directly during rush hours—referred to as “congestion pricing”—has become a subject of considerable interest. (See the Point of View articles in the July–August 1993 issue of *TR News*.) Economists have long proposed congestion pricing but policy makers have shunned the idea. New developments, however, are causing policy makers to take a new look. Technological advances are making it possible to charge users electronically and inexpensively, without having to resort to toll booths. Opportunities to expand highway capacity in metropolitan areas are increasingly limited by environmental concerns and limited funds. Motorists are growing increasingly frustrated by traffic congestion.

Despite the renewed interest in congestion pricing, the most difficult questions still remain to be answered. Can the political barriers caused by concerns about public acceptance, equity, and the possible adverse effects on some commercial interests be overcome?

The Transportation Research Board (TRB) and the Commission on Behavioral and Social Sciences and Education (CBASSE) of the National Research Council (NRC) held a Congestion Pricing Symposium on June 23 and 24, 1993, in Washington, D.C., to address these and other questions. The Symposium was organized by the Committee for the Study on Congestion Pricing for Urban Transportation as part of an effort sponsored by the Federal Highway Administration (FHWA) and the Federal Transit Administration. Martin Wachs, Professor of Urban Planning at the University



of California Los Angeles is the chairman of this committee. A total of 17 papers were prepared for the two-day Symposium. A summary of the background, potential of pricing on behavior, major issues, and current proposals is provided in the following sections.

## Background

Congestion pricing has successfully reduced traffic into the central area of Singapore since 1975. José A. Gómez-Ibáñez, Professor of Public Policy at Harvard, reported that almost 20 years after drivers began to be charged to enter central Singapore, the amount of peak-period traffic

Above: Greig Harvey, Vice President, Deakin Harvey Skabarbonis, Inc., presents a paper at the TRB/CBASSE-sponsored Congestion Pricing Symposium.

Left: José Gómez-Ibáñez, Professor of Public Policy and Urban Planning, Harvard University, moderates the Symposium, which was held at the National Academy of Sciences.

entering the downtown area is still some 25 percent below what it was in 1974. A toll road outside Paris has successfully imposed a congestion pricing scheme to reduce peak congestion caused by weekend vacation travelers. Professor A. D. May, head of the Civil Engineering Department at the University of Leeds in England, noted that congestion pricing is being studied actively for London, Cambridge, and Edinburgh, Scotland. May also reported that advances in technology have made it possible to charge drivers electronically without invading individual privacy. Toll road authorities in the United States and around the world are adopting electronic toll collection at a rapid pace.

Given the projected increases in population and the lack of plans for adding extensive new highway capacity, traffic congestion, which is already perceived as unacceptable in many major metropolitan areas, could worsen. Kiran Bhatt, President of KT Analy-

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tics, noted that travel for the greater Washington, D.C., area is projected to increase by 52 percent by 2010, whereas highway capacity is projected to increase by only 14 percent. Stop-and-go traffic is projected to spread throughout the region. In his paper, Bhatt described how a future region-wide congestion pricing proposal might work in the greater Washington metropolitan area. A program that imposed average charges of 15 cents per mile (or roughly \$3 per day) could reduce peak-period vehicle miles traveled by 10 to 25 percent. Such a reduction in traffic would improve average round-trip travel times by 10 to 15 minutes. Annual revenues of more than \$1 billion would more than cover the cost of hardware, billing, and enforcement, which Bhatt estimated would total \$80 to \$160 million annually. Although such a proposal would reduce future congestion, Bhatt noted that legal impediments to automated enforcement and resistance from the general public are major barriers to implementation.

### Potential of Pricing on Behavior

Throughout the economy, consumers are accustomed to paying premium prices for goods that are in scarce supply. Hotel rooms at resorts, for example, cost a premium during the vacation season. Entrepreneurs, in theory, provide just enough capacity to make a profit. If they provide excess capacity, it would drive down prices and could lead to bankruptcy. If they provide too little capacity to satisfy peak demand, some other entrepreneur will expand capacity and share the profits. After a series of adjustments in supply and demand, economic theory predicts that the market will provide the goods that society demands in the most efficient way. David Gillen, a research economist at the Institute for Transportation Studies at the University of California, Berkeley, pointed out that consumers are accustomed to pricing as a way of rationing demand in the private marketplace and are increasingly accepting

it in situations analogous to road use. As examples, peak-period pricing has become common in long-distance telephone rates and small peak differentials are being charged by some transit operators.

Many opponents of congestion pricing argue that it would be unfair to charge commuters as a means of easing congestion because these drivers have no choice about driving to work. Even in the case of work trips, however, experience has shown that some workers can be flexible. Donald Shoup, Professor of Urban Planning at the University of California at Los Angeles, reported on his detailed case studies of changes in the cost of employer-provided parking. When employees are charged for parking, Shoup's studies show that, on average, the number of automobiles driven to work declined by 26 percent. The number of cars driven to work declined because some former solo drivers shifted to carpools or began taking transit.

Greig W. Harvey, Vice President of Deakin Harvey Skabardonis, Inc., summarized the reactions of travelers to past price increases on toll roads and bridges, fuel tax increases, transit fare increases, and increases in parking fees. Although most travelers' choices are unaffected by such price increases, a small but substantial fraction of travelers do change their behavior. Whenever highways are congested, a small reduction in traffic will have a substantially greater impact on traffic flow.

### Major Issues

Aside from the obvious problem of overcoming motorist resistance to being charged for something that is perceived as free, an often-cited political argument against congestion pricing is that it might hurt low-income commuters. Genevieve Giuliano, Professor of Urban Planning at the University of Southern California, pointed out that a previous study by Kenneth A. Small has shown that it is possible to compensate low-income groups: for example, by using the revenues earned

from congestion pricing to reduce regressive local sales, gasoline, and property taxes that support transportation. Giuliano pointed out in her paper, however, that some low- and moderate-income drivers could still be adversely affected, especially those with inflexible schedules or long commutes. Giuliano also presented data to show that working women have less flexible schedules than men even when they work in the same professional categories.

Low-income commuters, especially those who rely on bus transit, however, could gain from congestion pricing. John Kain, a Professor of Economics at Harvard, argued in his paper that by reducing highway congestion, bus services could be improved substantially. Such an outcome could increase ridership and transit revenues, and the shorter trip times would benefit the low- and moderate-income users of these systems.

The use of the revenues from congestion pricing is also a major issue. Giuliano cites estimates that peak period fees of 15 cents a mile applied on congested routes in the Los Angeles metropolitan area could generate as much as \$3 billion per year. Should these revenues be devoted exclusively to compensating disadvantaged groups? Should some be spent on expanding highways? Should some be spent improving alternative modes of transportation? These questions were debated extensively during the Symposium.

Environmental groups are attracted to congestion pricing as a way of containing the demand for automobile travel and reducing vehicular emissions. In his detailed modeling estimates of the effects of region-wide congestion pricing for the San Francisco Bay area, Greig Harvey estimated that an average charge of 10 cents per mile on all congested major routes in the Bay Area could reduce carbon dioxide emissions by 6.5 percent and oxides of nitrogen by 2.9 percent. Randall Guensler and Daniel Sperling, both with the Institute of Transportation Studies at the University of

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1993) to develop practical design specifications and supporting commentary for the determination of impact, drag, and hydrostatic forces on bridge piers and superstructures due to debris.

*For further information, contact Lloyd R. Crowther (telephone 202-334-3238).*

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## Aids for Car Side-Door Observation

After addressing the issues related to the one-person operation of multiple-unit rapid-transit trains, a National Cooperative Transit Research and Development Program study identified car side-door safety as an important issue associated with such operation. The study suggested that the vehicle operator can perform certain tasks more effectively with the aid of hardware or technology to observe

the car side doors at both curved and straight platforms.

Door observation devices may be used along with other means intended to assist in the safe operation of the doors, such as interlocking of car side doors with train propulsion or the braking system (or both), sensitive door edges, warning chimes or announcements that doors are about to close, adequate platform lighting along the side of the train, and passenger-activated emergency stop devices on the cars and platforms. Several transit properties have experimented with mirrors and closed-circuit television.

Although these door observation devices appear to contribute to improved safety and lower train operating costs, their reliability, cost-effectiveness, and effect on passenger safety have not been fully evalu-

ated. Moreover, the devices are not trouble-free and their use must be assessed carefully for specific applications.

Telephonics Corporation has been awarded an 18-month, \$199,789 contract (NCHRP Project A-3, fiscal year 1992) to prepare guidelines for transit properties to use in determining the types of devices available to help rapid-transit train operators observe the side of the car to ensure safe door operation. The guidelines should cover typical rail-transit situations and identify the types of devices best suited for specific applications; it is not the intent of the research to rate or rank specific proprietary products.

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California at Davis, cautioned in their paper that it is very difficult to predict the air quality benefits of congestion pricing. The data used in air quality modeling of changes in traffic flow are subject to considerable uncertainty, and the effects on air quality will depend on local circumstances. Congestion pricing would improve air quality if it causes fewer trips, but if it only improves the flow of traffic, the effects are more difficult to predict. Guensler and Sperling conclude that emissions would decline if congestion pricing achieved a smoothing of traffic flow without allowing average speeds to increase over 40 mph and did not divert traffic to congested, untolled routes.

Other issues debated during the Symposium include the potential effects on commercial traffic, the appropriate institutions to manage a regional congestion pricing system, and the potential effects on metropolitan land uses.

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## Current Proposals

Although congestion pricing proposals are controversial and raise questions that have not yet been answered, proposals for

congestion pricing are moving forward. Gordon J. (Pete) Fielding, with the University of California at Irvine, reported on the congestion pricing plans of a private toll road in Southern California. On Route 91 between San Bernadino and Los Angeles, a private company has been granted the right to develop a toll road in the median of an existing, extremely congested freeway. Drivers of single-occupant vehicles will be able to use the toll road or the free road. The tolls will be set sufficiently high to ensure free-flowing traffic on the toll road, which high-occupancy vehicles can use free of charge.

Congestion pricing proposals are also moving forward because of the encouragement found in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). ISTEA allows FHWA to fund up to five pilot projects, with a maximum of \$25 million available in each of the fiscal years 1992 through 1997. After a first round of solicitations, the San Francisco Bay Area was invited to enter into negotiations with FHWA to become a funded project. Hank Dittmar, at that time the Manager of Legislation and Finance for the Metropolitan Transportation Commission, presented a paper

on the development and status of the Bay Area proposal to charge a peak-period premium for use of the Bay Bridge. John Duve, Transportation Demand Management Administrator for the San Diego Association of Governments (SANDAG), reported on the development and status of the SANDAG proposal for pricing sections of I-15 north of San Diego. FHWA is currently considering new and revised proposals for congestion pricing pilot projects.

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## Symposium Summary

In his remarks at the conclusion of the Symposium, Martin Wachs observed that congestion pricing will continue to be of great interest because few conceivable options can manage urban traffic congestion and meet air-quality goals. Efforts to suppress demand through regulation, he said, are not attractive to the public and may not even be very effective. Wachs noted that congestion pricing, if it moves forward, will occur as a variety of local experiments. He noted that local political and geographic contexts will determine the shape these experiments take, and urged fund-

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## Other Meetings

### Conference on Traffic and Transport Solutions

April 11–13, 1994

Amsterdam, The Netherlands

Sponsors RAI Amsterdam and *World Highways Magazine*

**Subjects** Practical urban solutions (advanced traffic management systems, public transportation, passenger safety, and the environment), high-speed solutions (facilities for intelligent vehicles, toll roads, sign posting, and road markings), and European solutions (integrated transportation solutions) for transport and traffic problems.

Contact H. Ypma, RAI Amsterdam, P.O. Box 77777, 1070 MS Amsterdam (telephone 31 0 20 549 12 12, fax 31 0 20 646 30 42).

### 2001: A Transportation Odyssey, International Cargo Handling Coordinating Association (ICHA) International Biennial Conference and Exhibition

June 13–16, 1994

Toronto, Canada

Sponsors ICHCA and Ports Canada

**Subjects** cover all transportation modes and include global economic realities, regulatory environments, air transport, survival of the shipping industry, the port of the future, intermodalism, freight technologies, and transportation marketing and logistics.

Contact ICHA, T. Prinsep, c/o Ports Canada, 99 Metcalf Street, Ottawa, Ontario, Canada (telephone 613-957-6788, fax 613-995-3501).

### 4th International Conference on COMPRAIL '94

September 7–9, 1994

Madrid, Spain

Sponsor Wessex Institute of Technology  
**Subjects** Computer-aided design, manufacture, and operations in railway and other transit systems: railway planning, management and information systems, design, manufacture and testing, train operations, signaling and train control, computer simulation of systems, financial planning using computers, traction and power supply, and role of computers in design and operation of maglev transportation and high-speed rail systems.

Contact Sue Owen, Conference Secretariat, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO4 2AA, United Kingdom (telephone 44 0 703 293223, fax 44 0 703 292853).

### 1994 TRB Committee Meetings

Many TRB committees will be convening at TRB's 73rd Annual Meeting at the Sheraton Washington, Omni Shoreham, and Washington Hilton hotels in Washington, D.C., January 9–13, 1994. See listings in the Annual Meeting program for further information.

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ing agencies and researchers to seize the opportunity to "learn from this variety of natural experiments." On a cautionary note, Wachs concluded that the growing interest in congestion pricing could be set back considerably by the failure of a poorly designed local project.

### Status Report on TRB/CBASSE Study

The Committee for the Study on Congestion Pricing for Urban Transportation will review and discuss the many issues raised during the Symposium. In its final report the committee will evaluate the prospects for congestion pricing and make recommendations on the potential role of congestion pricing as a tool of congestion management, guidelines for evaluation, and fruitful areas for further research. As the committee completes its report, the papers prepared for the Symposium (see box) will be revised by the authors. The committee report and revised papers are expected to be available in the early spring of 1994.

### Congestion Pricing Symposium: Commissioned Papers

Kiran Bhatt. *Congestion Pricing in the Washington Region.*

Elizabeth Deakin. *Effect on Urban Form.*

Hank Dittmar. *Institutional and Political Challenges of Implementing Congestion Pricing: A Case Study of the San Francisco Bay Area.*

John Duve. *A Case Study: How Congestion Pricing Came to be Proposed in the San Diego Region.*

Gordon J. Fielding. *Private Toll Roads: Acceptability of Congestion Pricing in Southern California.*

David Gillen. *Peak Pricing Strategies in Transportation, Utilities, Telecommunications: What Lessons Do they Offer for Roadway Pricing?*

Genevieve Giuliano. *Equity and Fairness Considerations of Congestion Pricing.*

Peter Gordon and Harry W. Richardson. *Trends in Congestion in Metropolitan Areas.*

Randall Guensler and Daniel Sperling. *Congestion Pricing and Motor Vehicle Emissions: An Initial Review.*

Greig Harvey. *Transportation Pricing and Travel Behavior.*

John Kain. *The Impacts of Congestion Pricing on Transit and Carpool Demand and Supply.*

A. D. May. *Potential of Next Generation Technology.*

Michael D. Meyer. *Alternative Methods for Measuring Congestion Levels.*

David Olson. *Administrative and Institutional Issues Confronting Urban Transportation Congestion Pricing Proposals.*

Michael Pietrzyk. *Electronic Toll Collection Systems.*

Donald C. Shoup. *Cashing Out Employer-Provided Parking: A Precedent for Congestion Pricing?*

Jeffrey Zupan. *The New York Region: First in Tolls, Last in Road Pricing?*

Drafts of the papers can be purchased from the TRB Publications Office at cost of \$5 each. Prepayment required. Contact Jennifer Boyd at 202-334-3213.