

12248



U.S. Department of Transportation

# Reducing Traffic Congestion

USING

MARKET

PRICES TO

ENHANCE

MOBILITY

THE HIGH COST OF IDLING



Report to Congress on  
the Progress and  
Accomplishments of the  
Congestion Pricing Pilot  
Program

**The Federal Highway Administration's Highway Revenue and Pricing Team wishes to thank the Pilot Program Project Partners for their contributions to this report.**

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# Reducing Traffic Congestion

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THE SECRETARY OF TRANSPORTATION

WASHINGTON, D.C. 20590

July 28, 1998

The Honorable Bud Shuster  
Chairman, Committee on Transportation  
and Infrastructure  
U.S. House of Representatives  
Washington, D.C. 20515

Dear Mr. Chairman:

I am pleased to present the Department of Transportation's 1997 biennial report on the Congestion Pricing Pilot Program, as required by Section 1012(b) of the Intermodal Surface Transportation Efficiency Act of 1991, P.L. 102-240. This report highlights significant progress that has been made in implementing pilot tests of congestion pricing and bringing congestion pricing to the attention of transportation planners and policy makers throughout the United States.

The Pilot Program now stands at a critical threshold, with interest in congestion pricing growing, both in the United States and abroad, and pilot tests beginning to illustrate the potential role that pricing can play in responding to urban congestion and air quality problems. Yet, it is at this point in the evolution of road pricing that Federal support is needed, both to continue the progress being made, and to ensure that the learning produced through a pilot program approach continues. For this reason, I am pleased to see such provisions in the reauthorization act.

We look forward to continuing our partnership with State and local governments, and others who have worked with us to explore the opportunities for using pricing to enhance the efficiency and mobility benefits of the surface transportation system. We believe that through this cooperative effort the most productive settings for congestion pricing can be identified.

A copy of this report has also been sent to the Chairman and Ranking Minority Member, Senate Committee on Environment and Public Works; and the Ranking Minority Member, House Committee on Transportation and Infrastructure.

Sincerely,

A handwritten signature in black ink, appearing to read "Rodney E. Slater".

Rodney E. Slater

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

July 28, 1998

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Chairman, Committee on Environment  
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United States Senate  
Washington, D.C. 20510

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# Executive Summary

In major United States metropolitan areas, traffic congestion is costing Americans billions of dollars every year in terms of lost time and productivity, air pollution, and wasted energy. States and localities are seeking innovative and effective approaches to reduce traffic congestion and improve air quality. Many in the U.S. and worldwide are implementing and evaluating the potential of congestion pricing. This strategy involves pricing roadways during peak-travel periods.

## Project Status

With the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, the Federal Highway Administration (FHWA) began an effort to test and evaluate the potential of congestion pricing. Funding was provided by Congress to support pilot tests and feasibility studies of road pricing by State and local governments and other public authorities. FHWA will continue this effort with the funds made available under the Transportation Equity Act for the 21st Century, passed by Congress on May 22, 1998. Some key highlights that have occurred to date follow:

- Three implementation projects are established in California, Texas, and Florida. An additional pricing project has been executed with private sector funding in California.
- Time savings via priced lanes is measurable and meaningful to the road users.
- More efficient use is being made of available lane capacity.
- Mobility improvements are being supported with project revenues.

- Projects are experiencing high levels of public acceptance.
- Feasibility studies of potential future pricing projects are being sponsored in California, Oregon, Colorado, Minnesota and New York. Much is being learned about successful planning, alternatives analysis, potential impacts, and public involvement strategies.
- Additional interest in congestion pricing has been expressed by localities in a number of other States, including formal proposals from Arizona and Virginia. Interest levels have grown significantly in the last 2 years.

## CONGESTION PRICING BENEFITS INCLUDE:

- Travel time savings
- Reduced frustration and delay
- Air quality and emissions benefits
- Increased travel choices
- More efficient modal choices
- Improved traffic conditions
- Revenue generation
- Greater personal mobility
- Productivity

## Lessons Learned

Over the course of 6 years, FHWA and its project partners have learned valuable lessons about the potential of congestion pricing as an approach to dealing with congestion problems, and about the process of implementing congestion pricing pilot projects. These lessons include:

- **Congestion pricing will reduce congestion.** Evidence from projects on State Route 91 (SR-91)

WHAT AMERICA IS SAYING:

*“...the Congestion Pricing Demonstration Program of the first Intermodal Surface Transportation Efficiency Act (ISTEA) has been effective and, in fact, crucial, in advancing the understanding and acceptance of various forms of transportation pricing as key strategies to ensure mobility and environmental quality in the next millennium.”*

Mark Pisano, Executive Officer, Southern California Association of Governments, letter to FHWA Administrator Kenneth Wykle, February 17, 1998.

*“Variable pricing is being implemented in Lee County to manage traffic congestion and air quality in the face of one of the highest growth rates in the country. The infrastructure currently in place is expected to be adequate until the year 2005 or so, but eventually the roadway infrastructure will have to be upgraded to accommodate the growth. Nontraditional, innovative strategies that make more efficient use of existing roadway facilities, such as variable pricing, need to be a part of the local, regional, state, and federal long-term transportation solution.”*

John E. Albion, Commissioner, Board of Lee County, FL, letter to FHWA, February 16, 1998.



*"I save about an hour each day – it's incredible. There's also the savings I wasn't counting on: gas, wear and tear on my car and wear and tear on me. With ExpressPass, what I've bought is peace of mind."*

Mr. Joaquin Hernandez, Jr., in *I-15 Express News*, Spring/Summer 1997.

*"In many ways, the 91 Express Lanes is a template for the future," says Stan Oftelie, Chief Executive Officer of the Orange County Transportation Authority. "It's success shows there are new ways to finance, design, build and operate highways. We're enthusiastic about exploring variations on this theme and continuing to tap the private sector's talents."*

California Private Transportation Company Annual Report, 1996.

*"The purpose of the pilot project is to find new ways to relieve congestion..., and allow commuters to regain a portion of control over the hours they spend in traffic,"*

Elliot Parks, Chairman of San Diego Association of Governments and Mayor of Del Mar, from *I-15 Express News*, Spring/Summer 1997.

in Orange County, and Interstate 15 (I-15) in San Diego, California, show that travelers are willing to pay for improved service (less congestion), and that changes in travel patterns resulting from road pricing will provide congestion relief.

- **Congestion pricing can be an important source of revenue.** For the SR-91 project, revenues are being used to pay off the costs of constructing and operating the new lanes. For the I-15 project in San Diego, revenues in excess of operating costs are being used to support express bus service in the corridor.



Traffic on the Katy Freeway in Houston

- **Congestion pricing can be a fair and equitable part of a user charge program.** The equity of congestion pricing has been examined in pricing projects that have been initiated under the

Congestion Pricing Pilot Program (Pilot Program), and studies that have been completed over the past several years, including studies sponsored by FHWA, the Minnesota Department of Transportation, and the Environmental Defense Fund. This research suggests that a carefully constructed congestion pricing initiative can be a fair and equitable part of a highway user charge program, particularly if the revenues from congestion pricing are used to enhance transportation service to those who are underserved by current transportation programs.

- **Congestion pricing can have positive environmental and energy conservation benefits.**

Congestion pricing will reduce peak-period travel, save time and smooth traffic flow. All of these effects are expected to result in positive environmental and energy benefits.

Simulations of areawide pricing policies indicate

that these benefits can be substantial. Estimates of the environmental effects of pilot projects will be derived from data on travel and traffic changes when such data become available, but the effects of small-scale pilot tests of congestion pricing can be expected to be more modest and localized.



## The Role of the Pilot Program

The Congestion Pricing Pilot Program has been instrumental in fostering interest in congestion pricing and development of pilot projects. The close working relationship that has been established between FHWA and its State and local project partners has resulted in three pilot tests of congestion pricing, and in active interest in road pricing strategies throughout the U.S. The Federal Transit Administration (FTA) supported pre-ISTEA efforts to consider congestion pricing and has continued to provide support to the Pilot Program and its partners. The role of the Pilot Program has been to assist State and local governments in evaluating alternative pricing strategies, designing pricing projects and related public involvement

programs, examining appropriate administrative and technological concepts, and developing comprehensive project monitoring and evaluation plans. FHWA has provided broad outreach and technology transfer services to its partners. A popular regional workshop series on congestion pricing has garnered increasingly high attendance and active participation by State and local governments in all parts of the country.

FHWA provides funding support as well as direct technical assistance to these activities. The Pilot Program has helped ensure that State and local governments will have the support needed to develop programs that will harness the power of the market to improve mobility and reduce the economic waste associated with congestion.

*“In a recent customer satisfaction survey conducted by Virginia Department of Transportation, Virginians cited congestion on highways as an area needing attention. Future research on the use of congestion pricing may prove to be an important tool for the Department in utilizing innovation and technology, enhancing economic opportunities, and structuring a transportation system which provides the highest standards of safety and quality.”*

James W. Atwell, Assistant Commissioner, Finance, Virginia Department of Transportation, letter to FHWA, February 9, 1998.



Speakers prepare for the October 1997 Pricing Workshop. From left to right: Bill Hayden, Arizona DOT, Debra Baskett, GO Boulder, John Berg, FHWA, Bridget Weighart, Portland Metro, Tom Higgins, K.T. Analytics, Will Ristau, New York State Thruway Authority, Photo by Keith Aden.





# The High Cost Of Idling

Traffic congestion is costing Americans billions of dollars every year in terms of lost time and productivity, air pollution, and wasted energy. These costs are measured in wasted minutes and extra gallons of fuel consumed, dirty air, added costs of business getting products to the market, or simply lost business opportunities. As indicated in the U.S. Department of Transportation's (DOT) "Condition and Performance: 1997 Status of the Nation's Surface Transportation System," highway congestion has stabilized at a high level in recent years, but overall congestion measured in density of use or hours of delay, continues to

increase, and is occurring in more and more locations.

As shown in the accompanying table, the costs of urban traffic delay are substantial, burdening individuals, families, businesses, and the nation. Congestion means lost time, hours spent stuck in traffic rather than being used in higher-valued activities. From the employer's standpoint, congestion takes its toll in lost worker productivity and higher production costs. The speed, reliability, and cost of urban, innercity, and international freight movements are increasingly affected by congestion.

## "IS AMERICA STUCK IN TRAFFIC?"

City	Annual hours lost/driver
San Bernardino-Riverside, CA	75
Washington, DC	71
San Francisco-Oakland, CA	65
Los Angeles, CA	63
Houston, TX	61
Seattle-Everett, WA	59
Detroit, MI	57
Atlanta, GA	56
Dallas, TX	55
Miami, FL	53
San Jose, CA	51

Data: 1994.  
Source: "Urban Roadway Congestion-1992 to 1994," Vol.1, Shrank and Lomax, Texas Transportation Institute, 1997.



Unless new approaches are taken to stemming the tide of congestion, many observers predict that the costs of congestion will continue to mount. In Washington, D.C., for example, a recent study done for the Greater Washington Board of Trade predicts that highway congestion will become

so bad over the next quarter-century that each household will suffer an additional 100 hours of traffic delay each year during the peak period. By 2020, according to the study, traffic jams will more than quadruple the cost of hauling goods in the region by truck.

**"The decreasing mobility on our highways affects our ability to conduct business, to move goods and people, to recruit a talented workforce, and to comply with strict air quality standards."**

Sunne Wright McPeak, President of Bay Area Council, a leading business group composed of 225 major employers in the San Francisco Bay Area, letter to U.S. DOT Secretary Peña, December 12, 1996.

**"Governments are running out of road space and money while traffic continues to increase, resulting in worsening jams.**

**If nothing is done, Americans will spend seven billion hours in traffic jams in 2005, more than quintuple the time wasted in 1985."**

"How to Make Traffic Jams a Thing of the Past," *Fortune*, March 31, 1997.

**"...traffic is reaching a critical threshold where it's unacceptable to more and more people. So we're looking for new strategies in communities all across America today."**

Michael Replogle, Environmental Defense Fund, FHWA, *Buying Time* video, 1998.



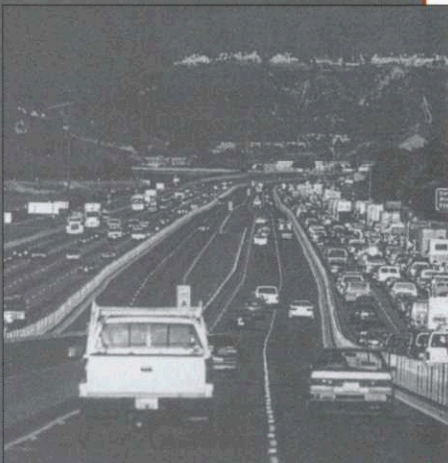
# What Can Be Done About It?

*“It’s about time. Time wasted while you’re sitting there, stuck in traffic. One minute, you’re crawling along at a snail’s pace. Now you’re stopped. You’re going to be late—again. Late for another business meeting. Late for supper.”*

Toronto Highway 407 Public Information Packet, 1997.

*“Like the phone customer who pays less for long-distance calls at night, or the golfer who pays less to play on weekdays than weekends, the motorist gets an incentive to use the facility when the infrastructure is less in demand.”*

Houston Chronicle, August 11, 1997.



Traffic on SR-91 in Orange County, California

A number of approaches to congestion relief have been tried in the past and new ones are emerging, including the use of intelligent transportation technologies. Yet, taken alone, each of these strategies has limitations which stem from the fact that travelers are not faced with the true cost of their decision to travel under congested conditions. Adding highway capacity has been a common response in the past, but capacity additions in today’s world are increasingly expensive and congestion is often back in short order. Also, in many cases capacity expansion is simply not possible, whether for economic or environmental reasons. Some world cities have opted for a regulatory approach—establishing no-drive days; creating rules for driving only on alternative days, depending on the license number; creating no-drive zones in central cities—allocating space on roads through regulation. Even major transit investments, to be effective in skimming excess travel demand from congested highways, require large ongoing fare subsidies to offset many existing inducements to drive alone travel.

## Time Has Value

Congestion pricing provides another approach to congestion relief. This approach relies on market forces and recognizes that trips have different values at different times and places and for different individuals. The market approach has long been used successfully in other sectors of the economy to allocate the use of scarce

capacity and is increasingly being considered as a way of responding to the problem of congestion on roads. Congestion pricing, also called value pricing or variable pricing, is a way of harnessing the power of the market to improve urban mobility and reduce the waste associated with congestion.

**Congestion Pricing (for roads):** applies tolls which vary according to the level of congestion. By charging higher tolls when congestion is heaviest and delay is at its worst, the use of limited road capacity is rationalized by encouraging some peak period users to shift to off-peak periods, to high-occupancy-vehicle (HOV) modes, including transit, to less congested routes, and/or to make more efficient trip decisions. **Congestion Pricing is also known as:** value pricing, variable pricing, peak-period pricing, market pricing, differential pricing, dynamic tolling and congestion relief tolling.

As a result of congestion, travelers incur a cost in travel time and also impose delays on other travelers. Congestion pricing incorporates both of these elements of trip cost into the traveler’s trip-making decision, encouraging travelers to eliminate some lower-valued trips or take them at a different time, or to choose alternative routes or modes of transportation, such as transit or carpooling.

The use of market pricing principles to charge for the use of roads may have the additional benefit of creating conditions that will allow more efficient transit pricing. With congestion pricing generating increased demand for transit services, transit operators would be better able to set prices to cover operating costs, reducing the need for public



support. Additional and more innovative transit and other HOV services could be provided and urban

mobility could be enhanced, without additional demand on state and local general tax revenues.

## CONGESTION PRICING IS IN COMMON USE THROUGHOUT THE ECONOMY

Consumers experience it everyday when they:

- pay higher rates for making phone calls during peak business hours rather than waiting for the lower evening or weekend rates;
- reduce the cost of using hot water by running the washing machine during off-peak hours in locations where time-of-day charges for electricity use are in effect;
- pay more to rent a hotel room during the peak season; and
- reduce the cost of attending a basketball game by sitting in the upper decks rather than at courtside.

In all of these cases, pricing is used to make better use of available capacity. Congestion pricing brings this concept to road transportation.

### Congestion Pricing Delivers Benefits

As this report will show, cities in the U.S. and around the world are launching new pricing initiatives as a way of responding to traffic congestion problems. Pricing is gaining favor because it both provides the means to improve traffic conditions, and raises revenues that can be used to supplement, or replace, traditional revenue sources. Pricing directly supports the U.S. DOT's strategic goals, by providing a means of improving the efficiency of the transportation system and promoting greater personal mobility.

Time savings due to reduced congestion and anticipated environmental benefits have been major attractions of recently opened congestion pricing projects in Orange County and San Diego, CA; Houston, TX; and a soon to be opened project in Lee County, FL. Other positive

impacts of these projects include:

- In Orange County, the revenue raised by congestion fees is being used to pay the cost of providing new capacity in one of the most congested highways in the U.S.
- In San Diego, project revenues support new transit service in the project corridor.
- A pricing project in Houston is providing improved service by making more efficient use of available highway capacity.
- In Lee County, pricing will provide incentives for travelers to shift travel out of peak congestion periods, thereby limiting the amount of capacity expansion needed to respond to rapid development in the area.

Other cities are looking at pricing options that fit their unique circumstances.

***“Whether applied by governments or by entrepreneurs, the logic is inescapable. Peak traffic pricing could serve as one of those terrific examples in which the invisible hand stirs up benefits for everyone—faster commutes, cleaner air, financial rewards for investors, and savings for taxpayers.”***

“How to Make Traffic Jams a Thing of The Past,” *Fortune*, March 31, 1997.

***“Congestion pricing has great promise: It could reduce congestion significantly while helping to meet air quality and energy conservation goals. Moreover, by relying on a market mechanism, it would accomplish these ends while providing net benefits to society.”***

Curbing Gridlock, National Research Council, Special Report 242, 1994.

***“We cannot build our way out of congestion.”***

Steve Clark, Citizen's Advisory Group for Portland, Oregon's Traffic Relief Options Study, newspaper publisher and former president of the Beaverton Area Chamber of Commerce, *The Oregonian*, September 25, 1997.





# Projects In Motion

A number of projects were launched under the auspices of ISTEA's Congestion Pricing Pilot Program, including three operating pilot projects, a comprehensive study of a private sector pricing project, and seven pricing feasibility studies. In

addition, in response to congestion pricing workshops held in various cities across the U.S., a number of State and local governments have expressed interest in using future pilot program assistance to develop pricing projects.

*"To me time is money, and I waste enough time just by sitting" in traffic, San Diego area driver Beatrice Henderson says. She cut her commute from her Poway, CA home to her La Jolla*

*workplace from 50 to 30 minutes by paying to drive in the car-pool lanes. "It's money well spent."*

*USA Today, March 3, 1997.*

## "PRICING ACTIVITIES"



## FHWA Projects Up and Running

### San Diego, California

In December 1996, a 13-km reversible HOV facility, allowing travel in one direction during the morning peak and travel in the opposite direction in the evening peak, opened to a limited number of paying solo drivers. Carpools of two or more passengers continue to travel for free on the I-15 facility. Traffic flow is

monitored to ensure that service on the HOV lanes is maintained at free-flow conditions. Starting in March 1998, charges varying with the level of congestion are being collected using vehicle transponders and overhead readers. A new express bus service has been introduced, supported with revenues generated by the pricing program. The principal goals of the pricing program are to increase HOV use and improve traffic flow in the corridor. A comprehensive monitoring and evaluation effort is



“On the very first day, we raised \$25,000, and there is a waiting list of 550 persons wanting to buy permits. We now have \$25,000 for I-15 transit improvements when previously we had \$0.” and “I am proud to have authored it and thank San Diego Association of Governments staff for their willingness to try something different. We need more of that attitude in government.”

Jan Goldsmith, California Assemblyman representing eastern San Diego County, editorial in San Diego Union Tribune, December 12, 1996.

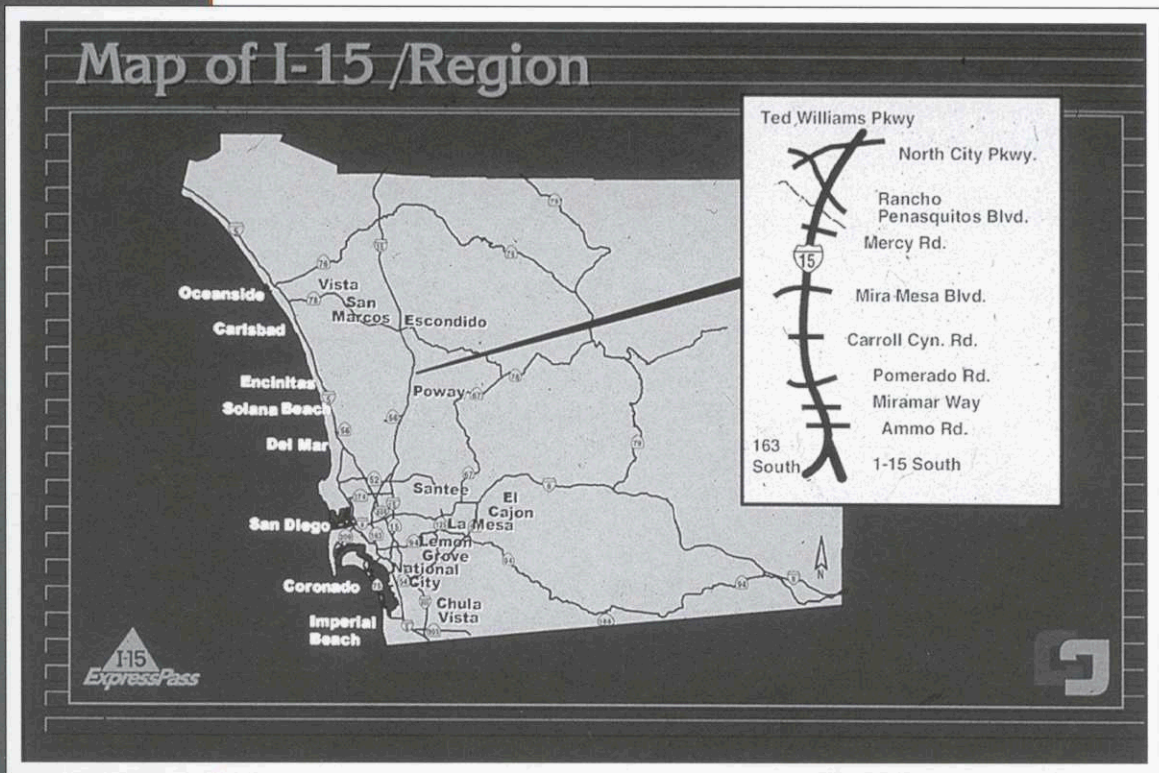
underway to assess the impacts on: traffic and speeds, modal usage, operational issues, costs, revenues, acceptance, and business activities. Funding for this project was provided by FHWA, FTA and the California Department of Transportation (CALTRANS).

Preliminary findings:

- High level HOV travel and speed

have been sustained.

- Solo drivers report travel time savings of 10-20 minutes.
- HOV use has increased by 20 percent.
- The number of illegal solo drivers in the HOV lanes has decreased by 85 percent.
- Public acceptance has been very high.



## “ON I-15, HOVS UP, VIOLATORS DOWN!”

Number of vehicles during a.m. and p.m. peak period on a typical weekday

	HOVs	Violators	Express Pass Users
Before Express Pass (Oct. 96)	7900	1400	0
After Express Pass (Oct. 97)	9300	200	1025

Source: San Diego Association of Governments



## Houston, Texas

In January 1998, a 21-km stretch of the I-10 Katy Freeway began allowing 2-person carpools to purchase entrance to the HOV-3 lanes for a fee of \$2 per trip during rush hours. The purpose is to get the best use of the HOV lane while relieving traffic congestion in the main lanes and encouraging HOV use. The single lane reversible facility uses fully automated windshield-mounted transponders.

## Anticipated impacts:

- More efficient use of available HOV lane capacity.
- Increased carpooling.
- Reduction in main lane congestion.

## Lee County, Florida

Beginning in Summer 1998, variable pricing will be used to improve efficiency and travel times on two bridges in Fort Myers, FL. Tolls will be

reduced during times surrounding the morning and evening rush hour peaks to shift traffic out of the peak.

Electronic toll collection facilities have been installed. A discounted toll will be offered only to those using a new electronic toll collection technology. Project activities are currently focused on gathering "before" data on travel patterns and on readying the public for the test of variable pricing.

*"Congestion pricing with its elegant theory of moving excess demand to periods of excess capacity, has the ability to be a powerful force in meeting and controlling future transportation demand in Lee County. Relatively small changes in demand have the ability to translate into large savings on construction of future capital projects."*

Phase I Report on the Midpoint Memorial, Cape Coral and Sanibel Bridges: A Congestion Pricing Program for Lee County, FL, Lee County DOT, August 28, 1996.

*"We hope this will be an additional way to improve mobility on the Katy Corridor."*

Lloyd Smith, conversation with FHWA, May 1, 1998.

TRYING TO  
FIGURE OUT A  
*faster*  
WAY TO WORK?  
REMEMBER,  
TWO HEADS ARE  
BETTER THAN ONE.

Now two people are all it takes to ride the Katy Freeway HOV lane.

**QUICK RIDE**

METRO's new QuickRide service lets you get to work on the double. That's right! Thanks to this special pilot program, now there are two ways to carpool on the Katy Freeway HOV lane during peak morning and evening rush hours. Use the lane as part of a 3+ carpool and ride for free. Or, for just \$2 each way, QuickRide lets you ride with just one other person. Use the inbound entrance between 6:45-8 a.m. Use the outbound entrance between 5-6 p.m. Hurry and act now! The QuickRide program will be limited to 300 vehicles at this time. So c'mon! Make your morning and evening drives twice as nice. Call METRO and start enjoying life in the fast lane. For more information, call METRO today at (713) 224-RIDE or 1-888-606-RIDE.

HOW HOUSTON GETS AROUND. **METRO**

Newspaper Ad for Katy Freeway Pricing Pilot

The one-year test will address marketing, enforcement, and evaluation issues. The transponder is compatible with those used on nearby toll facilities.

## Anticipated Impacts:

- Traffic shift from peak to off-peak.
- Reduction in peak period congestion and emissions.
- Postponement of future capacity expansion.



## A PRIVATE SECTOR CONGESTION PRICING PROGRAM

### SR-91 "Express Lanes" Orange County, California

Open since December 1995, the privately designed, constructed, financed, and operated SR-91 Express Lanes are the first variable priced and fully-automated highway facility in the U.S. Tolls range from \$0.60 to \$3.20 depending on the time of day and level of congestion. Vehicles carrying 3 or more persons receive a 50 percent

discount. Fares are automatically deducted from each customer's pre-paid account using electronic transponders mounted on the car windshield. Intelligent transportation system products facilitate smooth operations via careful monitoring of traffic conditions.

A monitoring and evaluation study funded by FHWA, FTA and Caltrans provided some highlights:

- Public response to the Express Lanes has been excellent. Almost 90,000 customers have SR-91 electronic on-board toll payment devices (transponders) and daily usage has steadily increased to 30,000 customer trips.
- Socio-economic profile of transponder users is similar to that of corridor users.
- Drivers on Express Lanes enjoy time savings of up to 20 minutes over main lanes.
- Carpooling of 3+ persons has increased.
- Level of service for HOV 3+ users has been sustained.
- Traffic is moving better on the mixed traffic lanes than it has since the early 1980s.
- Electronic toll collection is being administered and enforced effectively.
- Toll revenues are already exceeding operations and maintenance costs and the owners expect to fully cover bond obligations within a few years.
- The project is enjoying wide public support among all socio-economic groups.

*"Time is money! It's awesome... We have more time for family." Michael Ring of Corona, CA, a bedroom community on the east end of the SR91 tollway in Orange County, CA,"*

*Houston Chronicle, August 11, 1997.*



*'Getting set to go' - a user puts a transponder on the windshield.*

*"...Was it worth \$2.50 to avoid spending an extra hour or more in traffic? Absolutely! For three weeks now I've used the toll lanes. And every time I do, I come home feeling victorious — that's the only way I can describe it. Having driven that route for 10 years, I know what it's like to spend four hours of my day in bumper-to-bumper traffic. You come home tired, and drained; and you become accustomed to that. But not any more — not me, because I have FasTrak. I actually look forward to the drive home now because of the emotional rush it gives me for my \$2.50..."*

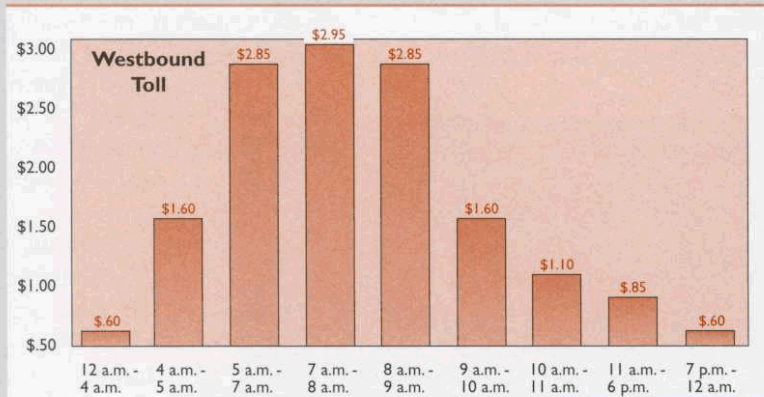
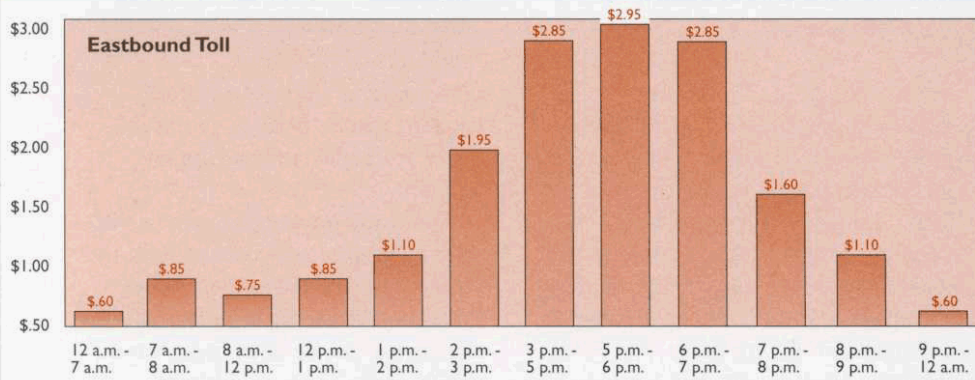
*Gregory Smith, of Riverside, CA in an editorial in The Press-Enterprise, February 7, 1996.*



*'Overhead gantries electronically record usage so there is no stopping at toll booths'*



## TOLL SCHEDULE FOR SR-91 (AS OF JANUARY 1998, WEDNESDAY TOLL RATES)



\* Several changes to the toll schedule went into effect on April 19, 1998, including a new highest toll of \$3.20. Tolls during holiday periods are now allowed to change from the published schedule.

*“A person headed to the shopping mall might wait until the road is cheaper, while a repairman headed to a job would gladly pay \$2.75 to get an extra 30 minutes of work. Everyone’s ride would be easier.”*

referring to the SR-91 project in *Houston Chronicle*, August 11, 1997.

### Laying the Groundwork – Pilot Program Feasibility Studies

All Pilot Program projects begin with a feasibility study to lay the necessary groundwork for possible future implementation. This phase includes careful evaluation of technical, administrative, and legal aspects of potential projects, formation of local steering committees and/or advisory groups to guide project development, and public participation in project planning and design. As the feasibility phase of the project proceeds,

projects become more specifically defined, and potential project benefits and implementation issues are brought more clearly into focus. Only those projects that have successfully completed the feasibility stage, and have been endorsed through the public participation process, are selected to proceed to the project implementation phase. The projects described below have completed the feasibility stage. Some of these projects are likely to move into implementation within the next year or two.



**“Unlike traditional tolls, fees would be based not only on the distance traveled, but the time of day. The highest fees would be charged during rush-hour periods when traffic is heaviest.”**

regarding SCAG pricing proposals in the *Desert Sun*, March 27, 1997.

**California Department of Transportation (Caltrans)/ Southern California Association of Governments (SCAG)**

A feasibility study is underway in the **Los Angeles metropolitan area**, where forecasts predict a 40 percent increase in population by the year 2020. Local officials and the community at large are searching for ways to meet the growing demand for travel while at the same time meeting ambitious air quality goals. The Pilot Program-funded study has examined several congestion pricing and emissions fee options. Several possible applications of pricing have

emission fee packages would produce significant reductions in congestion and emissions for the region and produce large economic productivity benefits.

- Pricing programs and collateral actions can be designed so as to produce benefits for all income groups.
- Regionwide pricing programs could generate large new revenues on the order of a few billion dollars per year, well in excess of project costs.
- Revenues can be used to enhance HOV mode services, mitigate possible hardships for low income travelers, or other worthy purposes.
- Pricing programs can be made

acceptable to the public if developed incrementally.

- Over 60 percent of 1700 survey respondents indicated support for tolled, express lanes similar to those on SR-91.
- The study recommended additional study of 5 potential locations for an express lane pricing pilot project.

In January 1998, the Task Force formed to guide the study decided to pursue congestion pricing implementation studies for State Highway 14 and State Route 57. The study's 75 member Task Force of elected officials, business

owners, air quality and transportation experts, and representatives from local community groups, agreed that a combination of congestion pricing on clogged freeways with an emissions-weighted “pollution fee” would provide optimal air quality and congestion-relief benefits. Local



Congestion on the I-405 in L.A.

been identified and plans are being made to subject these alternatives to corridor specific implementation analysis.

Study Findings:

- Regionwide congestion pricing and



officials intend to seek funding from a reauthorized Pilot Program for this study. SCAG's draft 1998 Regional Transportation Plan incorporates road pricing initiatives as one of the region's mobility and air quality strategies.

### **Caltrans / Metropolitan Transportation Commission (MTC)**

A pricing project being examined under FHWA's cooperative agreement with Caltrans and the MTC is the feasibility of adding priced express lanes in the median of a highly congested 32-km segment of U.S. 101 in Sonoma County north of the Marin County line up to Santa Rosa. The feasibility study, initiated in December 1996, is examining potential pricing structures, potential usage, impact on traffic in the corridor and estimated construction costs and revenues. The pricing structure examined in the study would provide an incentive for ridesharing, with high-occupancy vehicles being allowed to use the lanes without charge. The study has now entered into its second phase, focusing on gauging public acceptance of the pricing option.

#### Anticipated Impacts:

- Significant shift of drivers from existing mixed traffic lanes to the proposed priced lanes.
- Increase in carpooling.
- Reduction in congestion and improvement in corridor traffic flow.
- Pricing revenues sufficient to cover project costs.

Another Caltrans/MTC project served as the first feasibility study

funded by the Pilot Program. It was an investigation of the use of variable tolls on the San Francisco-Oakland Bay Bridge. A task force of State and local stakeholders was formed to guide the study, preliminary forecasting of the project's likely effects was conducted, and a series of focus groups and other public participation meetings were held to develop project implementation plans. In 1994, despite gaining significant local support for the variable toll proposal, the project had to be deferred due to concerns about possible public opposition.

#### Forecasted Impacts and Findings:

- Increase in HOV and transit use.
- Significant reduction in congestion and emissions.
- A 40 percent reduction in long waiting times at the toll plaza with a \$2.00 peak period surcharge for solo drivers.
- Significant new revenues that would fund major expansion in trans-bay rail and bus services.
- Only a small number of low income users would face a price increase. Potential adverse impacts on this group would have been mitigated via "lifeline rates," i.e. reduced rates for qualified low income users.
- Support from commuters, the public and the media.



Traffic stalls on the San Francisco-Oakland Bay Bridge

***"If demand-based pricing works in other sectors of the economy – such as in the telephone and travel industries – surely it's worth a try on our gridlocked highway system."***

Deborah Gordon of the Union of Concerned Scientists, [San Francisco Examiner](#), September 20, 1993.

***"...we believe pricing of travel based upon demand is a***

***'win-win' proposition to attack the seemingly intractable queue at the Bay Bridge Toll Plaza. For the region as a whole, it will help to***

***invigorate the economy and clean the environment. For transit riders and carpoolers it will provide better service."***

Steve Heminger, as vice president of transportation for the Bay Area Council, [Contra Costa Times](#), October 17, 1993.



**"I drive around too much, but I support any plan that will get people out of their cars. I've been here 18 years, and the traffic's gotten atrocious."**

Eric Simons of Boulder, *Sunday Camera*, June 29, 1997.

**"We were interested in looking at alternatives partly because we had been in gridlock over transportation funding since the late 1980s."**

State Senator Sandra Pappas, Minnesota State Legislature, at Chicago FHWA Pricing Workshop, May 17, 1996.



Adeel Lari, Director, Office of Alternative Transportation Financing, Minnesota DOT, answers questions at a Pricing Workshop, photo by Keith Aden.

### **Colorado DOT / GO Boulder**

The City of Boulder and Colorado DOT, with support from the FHWA Pilot Program, are exploring pricing options with the community through focus groups, surveys and a "Household Budget Exercise." In this last effort a more personal understanding of transportation expenses was developed by tracking a Boulder family through all of their weekly trips. Local officials have viewed pricing as one option for meeting an ambitious target of maintaining travel growth at 1994 levels. The area recently completed a concept plan for a 4-month pricing project to test the potential effects of variable pricing on automobile trips.

### **Minnesota DOT / Metropolitan Council**

Under the direction of the Minnesota State Legislature, the Minnesota DOT and The Twin Cities Metropolitan Council have been examining pricing alternatives as a way of responding to traffic growth in the Twin Cities metropolitan area. Extensive public

participation and in-depth analysis of political and institutional issues related to congestion pricing have characterized this study effort. After careful screening of pricing alternatives, two potential pricing demonstrations were selected for further analysis. However, both of these proposals have been deferred due to anticipated public opposition. Current efforts are being redirected toward additional public participation efforts to gain consensus on how to deal with emerging congestion problems and future roles for pricing.

#### **Study Findings:**

- Regional congestion pricing policies could greatly reduce peak period highway congestion.
- Such policies have the potential to reduce future need for highway capacity expansion as well as generate significant new revenue for the region.
- New revenue can replace some of the existing user taxes or can be used to enhance highway and transit capacity.
- The public is expected to accept congestion pricing as congestion worsens in the future and on new facilities.

### **New York DOT / New York State Thruway Authority (Thruway Authority)**

In 1995, Westchester and Rockland Counties requested the Thruway Authority to explore strategies to relieve traffic congestion on the Tappan Zee Bridge, which connects the two counties. During two hours of the morning peak-period commute, traffic on the bridge typically moves at speeds of less than 50-km per hour. The Thruway Authority, in cooperation with the NY DOT, applied for and received a grant under the Pilot Program to



explore the feasibility of implementing congestion pricing on the Tappan Zee Bridge. A Steering Committee composed of State and local agencies and jurisdictions is overseeing the study. To date, the project management team has conducted a series of focus group meetings with residents and bridge commuters and has conducted surveys of the Tappan Zee automobile commuters and truckers. Following completion of post-survey focus group meetings, results from these efforts will be incorporated into an assessment of congestion pricing's potential benefits and impacts. If congestion pricing proves to be a viable option for traffic congestion relief on the Tappan Zee Bridge, an implementation plan will be developed for further consideration.

### **Oregon DOT / Portland Metro**

Portland's pricing feasibility study is being overseen by a 13-member citizen advisory group of business and community leaders, as well as the chairman of the Oregon Transportation Commission and the Executive Director of Portland Metro. Outreach efforts have included focus groups, opinion research surveys, stakeholder interviews, workshops, open houses, news releases and postings on the Internet.

Nine potential peak-period pricing applications were selected for further analysis from an initial set of 40 possible alternatives. The impacts and implementation issues relating to these nine alternatives are being evaluated and first and second choice alternatives will be recommended to the Metro Council in 1998 as implementation candidates.

### **Study Findings Thus Far:**

- Congestion pricing policies would produce lasting reductions in congestion and emissions.
- Pricing policies can strongly support the region's long range land use and growth policies.
- Depending on scope and scale, pricing strategies would produce significant new revenues and support prudent highway capacity expansion or transit service enhancements.
- Pricing policies need to be tested incrementally to develop public support for comprehensive areawide applications in the future.

In 1997, in a separate show of support for a pilot project, the governor signed a bill proposed by State Senator Baker to amend existing Oregon State legislation to authorize implementation of toll roads in the Portland metropolitan region.



"Discussing Traffic Relief Options at an FHWA Workshop" are (from left to right): Carl Hosticka, Associate Vice President, University of Oregon, Henry Hewitt, Chair of the Oregon Transportation Commission, Steve Clark, Publisher and President of Community Newspapers and Ed Washington, Metro Councilor and Chair of the Transportation Committee at Portland Metro, photo by Keith Aden.

***"I do believe we will see the day where we have pricing or incentives to manage our system better,"***

Henry Hewitt, chairman of the Oregon Transportation Commission, *The Oregonian*, October 8, 1997.

***"...the Oregon Transportation Initiative, in its report to The Governor, has endorsed market based policies as being the most cost effective way to manage transportation demand while enhancing mobility."***

Carl Hosticka, Chair, Traffic Relief Options Task Force, letter to FHWA Administrator Rodney Slater, January 22, 1997.



***“...congestion pricing would facilitate additional traffic capacity, generate new revenues for transportation improvements, encourage ridesharing, promote air quality and noise reduction, and reduce wear and tear on competing facilities.”***

James W. Atwell, Assistant Commissioner, Finance, Virginia DOT, letter to FHWA, February 9, 1998.

***“Our proposed initiative to implement high occupancy/toll lanes is viewed as a cost-effective solution to air quality and congestion problems.”***

Larry Bonine, Director, Arizona DOT, letter to FHWA, June 27, 1997.

***“To reduce the burden on taxpayers, Highway 407 was developed as a user-pay transportation route to bring relief by offering motorists a state-of-the-art, super-efficient alternative.”***

Toronto Highway 407 Public information Packet, 1997.

## **Emerging U.S. Interest in Pricing**

The success and public acceptance of the early congestion pricing projects in California, Texas, and Florida have generated considerable interest in pricing approaches in locations throughout the U.S. Each of the regional pricing workshops sponsored by FHWA has prompted lively discussion of how congestion pricing can mitigate local traffic problems. As a result, officials from a number of cities have expressed interest in future program participation.

Proposals for Pilot Program participation, and use of the Interstate tolling exemption this program provides have been received from the States of Arizona for the Phoenix area and Virginia for the Norfolk area. An expression of interest in program participation has also come from the Colorado DOT, with a potential Interstate pricing project in the Denver area.

Expressions of interest for Pilot Program participation have also been heard from the Caltrans/SCAG project, in the Los Angeles area and from transportation officials in Portland, Oregon, as a result of their pricing feasibility studies under the Pilot Program. Other future proposals for Pilot Program support could come from current project partners in Colorado, Minnesota, and New York. In addition, although no formal expressions of Pilot Program interest have been submitted, potential pricing

solutions to congestion problems are being discussed for other locations in California, Connecticut, Delaware, Florida, Illinois, Ohio, Pennsylvania, Texas, Washington State, and the Washington, D.C. area.



The Katy Freeway in Houston

## **International Interest in Pricing Solutions**

The United States is not alone in focusing increased attention on congestion pricing. A new toll road in Toronto, Canada, which is using sophisticated electronic tolling equipment to charge autos different peak and off-peak rates opened in the Fall of 1997. Toronto's Highway 407 varies tolls based on the time of day, vehicle class, and distance traveled. This variable pricing policy has kept cars moving freely at all times. First year revenues are anticipated to be \$70 million in Canadian dollars.

Over the past few years, French intercity toll roads have used variable toll schedules to spread peak-period traffic on congested portions of major intercity routes. In April, 1992, peak-period surcharges were introduced on Autoroute du Nord A1, which connects Paris with Lille. On Sunday



afternoons, peak prices were set 25 to 50 percent higher than base rates and off-peak rates were reduced by 25 to 50 percent. The variable tolls on Sunday afternoons reduced peak traffic by 14 percent and travel speeds were increased. The toll structure caused traffic to spread out over a much longer peak period and decreased congestion, despite overall growth in weekend traffic since 1992. Variable tolling has also been adopted on two other intercity tollways in France and has produced significant shifts from heavily congested to less congested routes.

Over the past 10 years, three Norwegian cities, Trondheim, Oslo and Bergen, have implemented cordon charges (i.e. fees charged at all entrance points to a particular area) to vehicles entering the city centers. Trondheim established a toll ring around the downtown area in 1991. Drivers electronically pay a per-trip fee to enter the city center between the hours of 6:00 a.m. and 5:00 p.m. The rates range from US \$ 0.62 to \$1.56. Rates are highest during the morning peak (6:00 a.m. to 10:00 a.m.). Revenues are 5 times the capital and operating expenses and are being used for financing road infrastructure, with some earmarking for public transit and pedestrian and bicycle facilities. Since the toll ring began operating, inbound traffic during the toll period has declined by 10 percent, while traffic during the non-toll period has increased by 9 percent. Weekday bus travel has increased by 7 percent.

In downtown Singapore, severe morning congestion was eliminated when peak pricing was introduced in 1975. In 1989 the peak surcharge was extended to the evening rush-hour, resulting in a sharp reduction in

afternoon traffic and a 20 percent increase in average travel speeds inside the restricted zone. In addition, air pollution has been significantly reduced, and business activities and rents in the downtown area have not suffered. Currently, charges equivalent to about U.S. \$1.50 per day are levied for peak-period entry into a restricted downtown priced zone covering about 2 square miles. Starting in the Spring of 1998, Singapore shifted from the city's manual Area License Scheme (ALS), to a fully automated electronic charging system.

Over the past few years, many cities overseas have embarked upon congestion pricing feasibility and implementation studies. Among these are: London and Cambridge in the U.K.; the Ranstad area of the Netherlands; Stockholm, Sweden; and Hong Kong. Congestion pricing policies are being investigated to address congestion, funding and air quality concerns.

***“Around the world there’s an upsurge of interest in toll roads. Motorists are frustrated by congestion on inadequate, overloaded roads. Tie-ups cause unproductive, irritating stop & go, wasted fuel, missed meetings, downtime from work, time lost from leisure, and unnecessary pollution and accidents. But there isn’t the tax revenue to build the needed improvements.”***

*Toll Roads Newsletter, August 1997.*



A Trondheim Toll Ring Entrance



## INTERNATIONAL CONGESTION PRICING INITIATIVES

“Tolling technology is advancing so fast that \$3 billion - worth of electronic charging systems have already been installed world-wide. From Bergen and Bilbao to Paris and New York, motorists are learning that road space does not come free.”



Traffic in Bangkok

“Living with The Car;” *The Economist*, December 6, 1997.

- 1975** Singapore institutes a peak-period charge for entry into a restricted downtown zone. These fees, together with improved public transport and by-pass roads, have helped to control central area traffic over a long period of time. In Spring 1998 full automation was completed.
- 1986** Bergen, Norway, institutes toll ring around city.
- 1990** Oslo, Norway, institutes toll ring, using Advanced Vehicle Identification (AVI), electronic toll tags allowing collection without stopping at toll plazas, as part of the toll collection system.
- 1991** Trondheim, Norway, uses AVI technology to charge motorists for passing through a toll ring into the city. The Oslo and Trondheim systems demonstrate that the technology is workable.
- 1992** Peak period pricing is introduced on “L’Autoroute du Nord” (A1) which connects Paris with the resort city of Lille.
- 1995** Stuttgart, Germany, implements the MobilPASS project, designed to determine how variable road pricing influences travel behavior. The demonstration shows that variable pricing would affect travel behavior.
- 1996** Seoul, South Korea, institutes congestion pricing in its Nam Sam Tunnels, one and three. Seven months later traffic volume was reduced by 14.4 percent, speeds increased by 64.8 percent, and carpooling, which is toll free, increased from 6.8 percent to 19.9 percent.
- 1997** In August, Hong Kong proceeds with a feasibility study to implement electronic road pricing. A pilot program is planned in 1998 as a first step to areawide congestion pricing. This phase follows extensive study in the 1980s.
- 1997** In October, Express Toll Route Highway 407 in Toronto opens with fully automated differential pricing for peak and off-peak periods.



# The Role of FHWA's Congestion Pricing Pilot Program

Section 1012(b) of the 1991 ISTEA established the Pilot Program to encourage testing and evaluation of congestion pricing in a variety of settings in U.S. cities. Up to 5 pilot projects were authorized, and up to 3 of the projects could involve tolling on Interstate highways. In addition, Federal funds could be used to support pre-project activities, such as public participation activities, planning, and project design.

In the six years since the pilot program was established, the United States has become a world leader in investigating the potential of this innovative approach to easing traffic congestion. Cities in all parts of the United States are showing interest in congestion pricing, and the experience now being gained through FHWA pilot projects, as well as a private sector congestion pricing project in Orange County, California, is providing valuable information to transportation leaders in the U.S. and around the world.

## A Partnership Approach to Program Implementation

Supported by a Federal Interagency Review Group composed of representatives from, several concerned offices in DOT, including offices in FHWA, FTA, the Office of the Secretary, and the Office of Intermodalism; the Environmental Protection Agency; and the Department of Energy, FHWA has solicited pricing project proposals, and has worked closely with State and local governments to develop these proposals into pilot tests of congestion pricing. One of the

strengths of the Program is the effectiveness of the close working relationship established between FHWA and its State and local partners, which has resulted in three active tests of congestion pricing, and in the active interest being shown in pricing strategies in cities throughout the U.S.

Over \$30 million in Pilot Program funds have supported pre-project feasibility studies in areas interested in exploring congestion pricing concepts, and defrayed the initial implementation costs of variable pricing projects. In addition, program funds have advanced interest and understanding of congestion pricing concepts through:

- Supportive studies.
- Technical assistance.
- Project monitoring and evaluation.
- National and international information exchange and synthesis.
- Information materials development.
- Workshops and outreach.

The role of the Pilot Program in these activities is to assist State and local governments in evaluating alternative pricing strategies, designing related

Speakers at a Pricing Workshop, from left to right: Dan Beal Automobile Club of Southern California, Lee Munnich, State and Local Policy Program, Univ. of Minnesota, and Norman Feder, Florida DOT, photo by Keith Aden.



*"This inter-agency and interregional communication and experience sharing has been invaluable."*

Judy Wright, Council member for the City of Claremont, CA, letter to FHWA Administrator Rodney Slater, January 7, 1997.

*"...the Congestion Pricing Demonstration Program of the first Intermodal Surface Transportation Efficiency Act (ISTEA) has been effective and, in fact, crucial, in advancing the understanding and acceptance of various forms of transportation pricing as key strategies to ensure mobility and environmental quality in the next millennium."*

Mark Pisano, Executive Officer, SCAG, letter to FHWA Administrator Kenneth Wykle, February 17, 1998.



public participation programs, and evaluating appropriate administrative, technological, and project design concepts. FHWA provides funding support as well as direct technical assistance to project partners.

A series of regional workshops on congestion pricing and the Pilot Program has stimulated interest in many parts of the country. To date, workshops have been held in Claremont, California; Philadelphia, Pennsylvania;

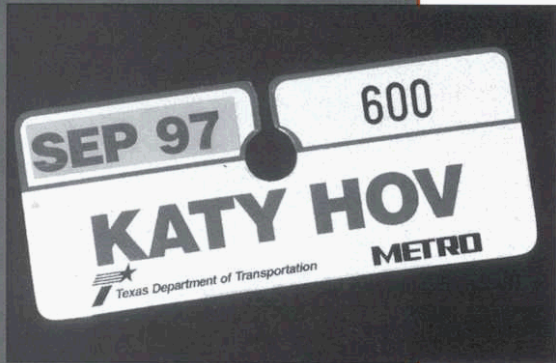
Chicago, Illinois; Houston, Texas; Tampa, Florida; and Portland, Oregon. The workshops, sponsored jointly by the State and Local Policy Program at the University of Minnesota, have introduced the concept of congestion pricing to local audiences, featured

presentations by representatives of active pricing projects from across the country, and examined potential pricing applications in the local context. Initially designed for a target audience of 75-80 people, the workshops have been expanded in response to the high level of interest in congestion pricing, with participation levels rising to well over 125 people per workshop. The most recent workshop, in Portland, Oregon, was attended by over 150 people.

The Pilot Program also has developed and widely distributed a variety of materials relating to planning, design, implementation, monitoring and evaluation of congestion pricing concepts and projects. Some key program outreach materials are summarized in the box below.

## SELECTED OUTREACH MATERIALS DEVELOPED UNDER THE PILOT PROGRAM

- **Congestion Pricing Notes**, a periodic newsletter on national and international developments.
- **Congestion Pricing Guidelines**, a planning, project development and implementation resource document for those interested in exploring potential congestion pricing applications.
- **Overview and Status Report**, a periodic update on the current status of the Pilot Program and associated projects.
- **Summaries of Regional Workshops and FHWA Symposium Summaries.**
- **Jointly sponsored National Academy of Sciences study, resulting in publication of *Curbing Gridlock*, Volumes I & II.**
- **Reports to Congress.**
- **Congestion Pricing Homepage and ListServe**, the world's leading internet site for dissemination of news on congestion pricing, and the only on-line forum for discussion of issues related to congestion pricing. Address: <http://www.hhh.umn.edu/Centers/SLP/Conpric/conpric.htm>
- **"Buying Time: A New Strategy for Traffic Congestion Relief,"** 14-minute video explaining congestion pricing, jointly sponsored with Minnesota DOT and the State and Local Policy Program at the University of Minnesota.



A Katy Freeway hangtag.

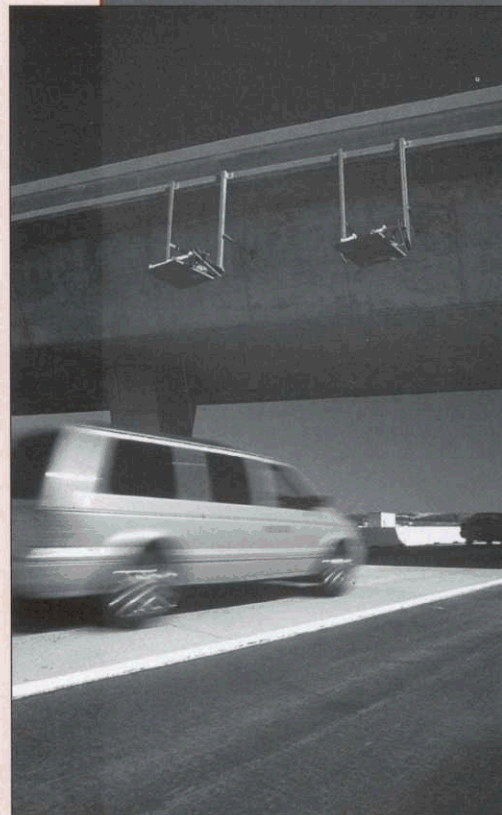


An I-15 Transponder.



## THE PRICING PROGRAM TIMELINE

- 1991 December 18 — U.S. Congress authorizes Pilot Program in Section 1012(b) of the 1991 ISTEA.
- 1991 FHWA sponsors a July Seminar on the Application of Pricing Principles to Congestion Management, 75 attendees.
- 1992 FHWA sponsors a June Symposium on Congestion Pricing, 2 1/2 days, 160 attendees.
- 1993 National Research Council (NRC) jointly with FHWA and FTA sponsors an International Symposium on Congestion Pricing.
- 1993 FHWA awards first ISTEA Pilot Program grant to San Francisco Bay Area's MTC.
- 1994 NRC publishes *Curbing Gridlock*, with support from the Pilot Program.
- 1994 Congestion pricing feasibility studies begin in Minneapolis-St. Paul, MN and Los Angeles, CA.
- 1995 Feasibility studies begin in Boulder, CO and Portland, OR.
- 1995 Maine turnpike is site of a summertime off-peak pricing experiment to encourage tourists to travel during less congested weekend periods.
- 1995 In July, the first FHWA regional pricing workshop is held in Claremont, CA.
- 1995 90 persons attend October pricing workshop in Philadelphia, PA.
- 1995 December 27 marks opening of the country's first variable-priced, automated express lanes on SR-91 in Orange County, CA, and evaluation research is sponsored by FHWA.
- 1996 Feasibility studies begin in Sonoma County, CA. and for the Tappan Zee Bridge in NY.
- 1996 In May, 104 persons attend pricing workshop in Chicago, IL.
- 1996 140 attend November pricing workshop in Houston, TX.
- 1996 In December, the Pilot Program's first implementation project opens on I-15 in San Diego, CA.
- 1997 In April a regional pricing workshop is held in Tampa, FL.
- 1997 In October, over 150 persons attend regional pricing workshop in Portland, OR.
- 1998 January marks opening of pricing project on the I-10, Katy Freeway in Houston, TX.
- 1998 Starting in March, San Diego I-15 project implements fully electronic dynamic pricing varying with the level of congestion.
- 1998 Starting in the Summer, motorists are offered a 50 percent discount on tolls during the off-peak period on two Lee County, FL bridges to shift travel out of the peak-period.



Passing under the overhead readers.







# Lessons Learned

The authorizing legislation for the Pilot Program under ISTEA called for reports on the potential effects of congestion pricing and an assessment of the feasibility of implementing congestion pricing in a variety of urban settings. Over the course of 6 years, FHWA and its project partners have learned valuable lessons about the potential of congestion pricing, and about the process of implementing congestion pricing pilot projects. FHWA's 1995 report to Congress on the Pilot Program stated that the program was on the threshold of significant advances in the application of variable pricing concepts in several areas throughout the United States. Today, that statement has become a reality, as new and exciting tests of congestion pricing are underway in California and Texas, and the State of Florida is

getting set to launch its test of variable bridge pricing. Other areas in the U.S. are likely to see pricing projects moving into the implementation phase in the near future. Although the U.S. experience with road pricing is in its infancy, important lessons are beginning to emerge.

These lessons are summarized below as lessons on the effects of congestion pricing, and lessons related to examining the feasibility of congestion pricing.

Kim Kawada, Senior Regional Planner, San Diego Association of Governments, discussing the I-15 project at a Pricing Workshop, photo by Keith Aden.



## Lessons on the Effects of Congestion Pricing

### **Congestion Pricing Will Reduce Congestion**

Evidence from operating projects on SR-91 in Orange County, CA and I-15 in San Diego, as well as preliminary estimates from Pilot Program feasibility studies, show that travelers are willing to pay for less congestion, and that changes in travel patterns resulting from road pricing will provide congestion relief. Other findings include:

- Users of SR-91 variable toll lanes are reporting time savings of up to 20 minutes for a 10 mile trip.
- Traffic conditions on SR-91's non-tolled lanes are reported to be the

least congested they've been since the 1980's.

- On the I-15 toll lanes in San Diego, travelers are reporting time savings of 10-20 minutes for a trip of 8.5 miles.
- The number of HOV 3+ travelers has gone up both on SR-91 and I-15.
- New transit service funded from project revenues in the I-15 corridor, is supporting congestion relief initiatives and contributing to enhanced mobility.
- Congestion pricing projects have produced dramatic and lasting

*"If it makes so much sense, why don't we have it already? First of all, until recently, congestion pricing would have required millions of tollbooths, which, besides*

*costing a lot of money to build and operate, would cause far worse delays. With new technology, however, road authorities can now hand out credit-card-size transponders that, when mounted on dashboards, pay tolls to overhead computers while cars speed along. Such*

*hardware is already being used successfully from California freeways to the bridges and tunnels of New York City."*

*"How to Make Traffic Jams a Thing of The Past," Fortune, March 31, 1997.*



*“In many ways , the 91 Express Lanes is a template for the future,” says Stan Oftelie, Chief Executive Officer of the Orange County Transportation Authority. “It’s success shows there are new ways to finance, design, build and operate highways. We’re enthusiastic about exploring variations on this theme and continuing to tap the private sector’s talents.”*

*California Private Transportation Company Annual Report, 1996.*

#### What Can Congestion Pricing Do?

- It does reduce congestion.
- It can be an important source of revenue.
- It can be a fair and equitable part of a user charge program.
- It is expected to have positive environmental and energy benefits.

reduction in congestion in Toronto, France and Singapore; and projects in Canada and Norway are also showing that travelers are sensitive to pricing, and that resulting changes in travel patterns, combined with appropriate uses of project revenues, can provide lasting congestion relief.

- Project feasibility studies in Los Angeles, Minneapolis, the San Francisco Bay Area, Portland, Oregon, and Boulder, Colorado estimate that congestion pricing will encourage some peak period solo drivers to shift to alternative times, modes, routes or destinations. Even relatively modest shifts would

produce a large reduction in congestion and a significant increase in average speeds. For instance, it has been estimated that pricing on all freeways in the greater Los Angeles area during peak travel periods would increase peak period speeds from about 35 mph to 45 mph, resulting in annual time savings of over 120 million hours.

While these early tests of congestion pricing provide evidence that road users do respond to changes in the price of using roads, and that these changes can result in significant benefits in terms of reduced congestion, it is too early in the evolution of congestion pricing to make definitive statements about the exact relationship between price and travel behavior. However, estimates presented in *Curbing Gridlock*, the landmark National Research Council study of congestion pricing in 1994, indicate that congestion fees in the range of \$0.10 to \$0.15 per mile on heavily congested highways would reduce peak-period travel on the priced facilities by 10 to 15 percent, and that even this relatively modest shift in travel choices would result in significant reductions in overall congestion.

#### ***Congestion Pricing Can Be an Important Source of Revenue***

Although mobility enhancement is the primary reason that congestion pricing might be considered, the fact that this approach to congestion relief also generates revenues has also received considerable attention. Congestion pricing revenues might be used to supplement, or even replace, existing sources of transportation revenue, and these revenues can make an important contribution to mobility enhancement. Certainly, the more comprehensive the pricing application, the greater the project’s revenue



Traffic on I-15 in San Diego



potential, but even the lane pricing projects implemented to date have shown significant revenue benefits. Findings thus far include:

- The SR-91 project provided greatly needed new road capacity, with the first year's toll revenues fully covering facility operating costs and a part of the amortized capital costs. The company's expectations are that the full facility annual costs (operating and capital) will be covered in a few years.
- For the I-15 project in San Diego, revenues in excess of operating costs are being used to support express bus service in the corridor.
- Revenues on the I-10 project in Houston will defray project operating costs, as the toll strategy provides for improved service on the tolled and untolled lanes.

Studies completed in the 1990's also indicate that congestion pricing can be an important source of transportation revenue. Although these study estimates are necessarily rough, they do give an indication of a significant revenue potential from congestion pricing. Research shows:

- An estimate presented by Professor Kenneth Small of the University of California at Irvine at a DOT conference in 1992 shows that a net revenue collection (after deducting collection costs) of nearly \$3 billion annually could be realized from applying congestion fees on all congested freeways and arterials in the 5-county Los Angeles region (i.e. peak-period congestion fees averaging 15 cents per mile).

- Estimates prepared for the MTC in the San Francisco Bay Area as part of their Pilot Program feasibility study indicate that raising the peak-period toll on the San Francisco-Oakland Bay Bridge from \$1 to \$3 in the westbound direction during peak traffic periods would yield revenues in the range of \$22 million annually.



The Inland Breeze bus, provided by revenues from the I-15 Express Lanes

### **Congestion Pricing Can Be a Fair and Equitable Part of a User Charge Program**

Discussions of equity, and the meaning of equity in the context of transportation, will likely be heard for as long as there are transportation programs, and, certainly, when a new concept like congestion pricing is being introduced, equity will be a major consideration. FHWA has ensured that equity concerns have been incorporated into all the pricing projects undertaken under the auspices of the Pilot Program, and will continue to do so in the reauthorized program. Equity considerations

*"If people wish to use the carpool lane as a single driver, the revenues from their usage will go toward more buses in that part of the city — more bus routes to further away places than they have now — and that*

*will be a help to those of us who live there."*

Barbara Warden, Deputy Mayor, San Diego, CA, FHWA [Buying Time](#) video, 1998.



**“Road pricing requires careful scrutiny, but it merits vigorous support when it is structured to provide fair rebates and transit improvements that can enhance access, equity and dignity.”**

Charles Komanoff, Komanoff Energy Associates, in Surface Transportation Policy Project *Progress*, November, 1996.

**“Pricing is part of reversing the whole set of subsidies for sprawl and driving and instead sending policy signals that support comprehensive efforts to revitalize communities and provide people better access....we need to involve affected communities in defining the problems, collecting the needed data and coming up with the answers.”**

Hank Dittmar, Executive Director, Surface Transportation Policy Project, *Progress*, November, 1996.

have been made a part of each of the pre-project study efforts, and a number of separate studies on the equity of congestion pricing have been sponsored.

- When the proposal to institute peak-period tolls on the San Francisco-Oakland Bay Bridge was presented to the public, the concept of “lifeline rates,” or reduced rates for qualified low-income users, was incorporated into the proposed rate structure. This proposal, as well as the proposal to enhance transit service to underserved areas, did much to gain local public and press support for the project.
- Equity was also an early concern on the SR-91 express lanes, because of the possible perception that “only the rich” would use the lanes. Experience to date indicates that this is not the case. Surveys show that the users of the facility reflect a similar income spectrum as users who travel on the non-tolled lanes. Even though some may perceive toll lanes to be inequitable, low income users value their time too. As one user of the express lanes put it, “anyone who calls these lanes ‘Lexus Lanes’ isn’t a single, working mother who gets charged \$5 for every 5 minutes she is late picking her child up from daycare!”

One clear conclusion from the research that has been done on this issue over the past 6 years, is that the equity of congestion pricing needs to be viewed within the context of the overall transportation financing system, where, in the absence of congestion fees, the costs of providing peak-period highway service are borne by all highway users, not just those who travel during congested periods, or on congested routes. Studies of the equity of congestion pricing that have been completed over the past several years, including

studies sponsored by FHWA, the Minnesota DOT, and the Environmental Defense Fund, suggest that a carefully constructed congestion pricing initiative can be a fair and equitable part of a highway user charge program, particularly if the revenues from congestion pricing are used to enhance transportation service to those who are underserved by current transportation programs.

### **Congestion Pricing Can Have Positive Environmental and Energy Conservation Benefits**

Congestion pricing will reduce peak-period travel, save time and smooth traffic flow. All of these would reduce emissions and fuel consumption. It is too early to tell about the environmental and energy benefits from the recent pricing projects, since estimating environmental benefits will be derived from travel and traffic changes observed when such data become available. However, some estimates have been generated based on traffic and travel impact forecasts made by Pilot Program feasibility studies, as well as other simulation analyses. These estimates indicated that reductions from congestion pricing can be much larger and longer lasting than those of other travel demand management strategies:

- A peak-period congestion price of \$0.10/mile on major routes in the San Francisco Bay Area is estimated to reduce trips by 2.2 percent, precursors to ozone by 3 to 5 percent, carbon monoxide by 6.5 percent, and fuel consumption by 6.5 percent.
- A peak-period price of \$0.15/mi on all congested facilities in the Los Angeles Area would reduce trips by 4 percent, precursors to ozone by 8 percent, and carbon monoxide and fuel use by 9 percent.



- Greenhouse gas emissions could be expected to decrease in proportion to reductions in travel.

While the air quality and energy conservation benefits of small-scale congestion pricing projects such as pricing on a single facility, would have modest impacts on an overall regional scale, such projects still could have pronounced health benefits by reducing localized concentrations of carbon monoxide.

### Findings on Examining the Feasibility of and Implementation of Congestion Pricing

FHWA and its Pilot Program partners have identified important lessons about the process of examining the feasibility of congestion pricing and successfully implementing pilot tests in specific settings. Many of these lessons were discussed in great detail at the Pilot Program's Project

Partners Retreat held in Portland, Oregon in October, 1997. These are summarized below.

#### Steps to Successful Project Implementation:

1. Define the problem.
2. Take the time to include all interests.
3. Consider a full range of alternatives.
4. Make impact estimation a part of the process.
5. Introduce congestion pricing as part of a package.
6. Focus on customer relations.

of delay, air quality problems, accidents, lost productivity and other problems citizens and decision makers perceive. Proposals must show how market-based solutions are expected to improve the situation. Congestion pricing can also be

viewed as an alternative way of raising transportation revenues, but the advantages of pricing solutions over other ways of raising revenues need to be shown.

**Take the time to include all interests** - Congestion pricing is a significant departure from existing road provision practices, and it may have far reaching impacts and require realignment of existing institutional relationships. Several different public and private agencies are likely to have a stake in the outcome of a pricing proposal. Local businesses, commuters, low-income groups and environmental interests may all have



Involving law enforcement early on is important for a successful implementation project.

different perspectives on the potential outcomes of pricing solutions. Considering all of these interests in the process of project development takes time and patience, but will make for a much more successful outcome.

**Consider a full range of alternatives** - Pricing should be viewed in the context of a range of strategies for addressing congestion, and alternative applications of pricing should be considered. The initial applications of congestion pricing in

**“Congestion pricing has great promise: it could reduce congestion significantly while helping to meet air quality and energy conservation goals. Moreover, by relying on a market mechanism, it would accomplish these ends while providing net benefits to society.”**

*Curbing Gridlock, Vol. I, Special Report 242, National Research Council, 1994.*



**“You’ve got to go to your neighborhoods. You’ve got to go to your stakeholders. You’ve got to go to the people that are the decision makers, and you have to give them the tools and you have to let them make the decisions so that they have ownership in what has happened. And when you do that, you have successful projects.”**

Oregon State Senator Kenneth Baker, FHWA Buying Time video, 1998

the U.S. include pricing of new capacity (SR-91 in Orange County, CA), pricing of excess capacity on HOV lanes (San Diego and Houston), and use of off-peak toll discounts to shift traffic out of the peak period (Lee County, FL). Allowing single occupant vehicles to purchase access to HOV lanes (this situation is often referred to as HOT lanes, for High Occupancy Toll lanes) has been of interest in several locations because it is a way of introducing pricing while leaving open the option of traveling on unpriced lanes. Additionally, peak-period congestion surcharges combined with off-peak discounts were considered for the San Francisco-Oakland Bay Bridge. Areawide pricing approaches, including cordon pricing as is used in Trondheim, Norway; time-of-day

pricing on existing toll roads, such as has been used in France, or on tunnels as is used in South Korea; differential parking charges; congestion fees combined with emissions charges as has been considered in Los Angeles — as well as other approaches might all be under consideration. Finally, a pilot project should be viewed as one step in introducing variable pricing concepts in a region. An initial limited pricing approach might later be expanded into more comprehensive pricing.

**Make impact estimation a part of the process** - Estimation of the potential impacts of pricing approaches is both difficult and essential. The difficulty stems from the lack of experience with road

## A TOTAL SOLUTION FOR A MORE PLEASANT CITY

For Trondheim there is a long-term plan of action where the objective is to create a city with improved flow of traffic, better environment and happier citizens. Over a 15 year period the intention is to spend about NOK 2 billion on

roadbuilding, bus lanes, lanes for pedestrians and bicycling, and various environmental measures.

These are financial efforts of great dimensions - funded by toll charges (60%) and government grants (40%). The Toll Ring is not popular, making car driving in Trondheim even more expensive. But there is no other possibility: Road conditions and environmental conditions must be improved, and we must act quickly.

The Trondheim solution is an outline of a plan which will be adjusted gradually. Planning takes place in 4 year-periods - and the revenue determines how much can be achieved. More than NOK 250 million was spent in advance on the most preceding measures (such as the Ringroad, and the Kroppan bridge).

Trondheim chose the Q-FREE system because of its low costs of administration and technical installations. Having to pay a toll is annoying. But we want you to know that the money is dedicated for its purpose: Traffic Development and Environmental Measures which really carry weight.

Dedicated lane for pedestrians and bicycling at Lerkendal, with a pedestrian stairway in the tower of the "town gate". Financed through toll ring funds.

Marvin Wiseth  
Mayor of Trondheim

Advertisement from Norway Tollring, highlighting the alternatives.



pricing, and the limitations of existing impact forecasting tools. Yet, despite these difficulties, projects must do the best job they can in predicting the consequences of pricing proposals. This has been done well by several of FHWA's project partners, with models being used to rank, screen, and refine the alternatives being considered. The expectation is that these techniques will be improved over the next few years. FHWA will continue to support these developments, because it is through improved analysis of pricing and non-pricing policies that better transportation policy decisions can be made.

**Introduce congestion pricing as part of a package** - Alternative travel mode enhancements (e.g. transit, carpooling, etc.) or alternative work hour programs may be packaged with a time-of-day road pricing strategy. Uses of pricing revenues to improve mobility options, or otherwise meet local transportation goals and objectives, may be an important attraction of pricing programs. Technologies such as automatic vehicle identification, electronic toll collection, video

enforcement, can all be part of a package that will make pricing approaches both feasible and attractive. One role of the Pilot Program has been to provide up-front financing that will make these alternatives available at the time the pricing program is introduced.

**Focus on customer relations** - Support for public outreach and education activities by the project partners has been a critical component of the Pilot Program's role in promoting tests of congestion pricing. From the very beginning, FHWA has emphasized the importance of public participation, education, and media relations, as a continuing part of the process of project development. Focus groups, public opinion surveys, media campaigns, even a "Citizen's Jury," have all been used in communicating project information to the public. Support to these activities has been provided by FHWA's various publications on congestion pricing and its regional workshop series.

A happy I-15 Express Lanes user









# Conclusions and a Look To The Future

## Interest in Congestion Pricing Remains High

State and local governments are showing continued interest in harnessing the power of the market to deal with congestion and related air quality problems. Congestion pricing has come to be viewed as an innovative way of coping with recurring congestion problems and as an effective complement to existing transportation improvement programs. As a result of this interest:

- Three pilot tests of congestion pricing concepts are underway in California, Texas, and Florida. Each project is providing improved transportation service by responding to congestion problems in a way best-suited to local conditions, and each is providing the Pilot Program with valuable information about the role that pricing can play in meeting State and local transportation needs.
- A fourth congestion pricing project, on SR-91 in Orange County, CA, is providing much-needed express service in the corridor, while the monitoring and evaluation study being supported with Pilot Program funds is gathering important information about the impact of pricing in this corridor.
- Feasibility studies investigating the potential of using congestion pricing techniques to improve mobility are underway in Minneapolis-St. Paul, MN; Los Angeles, San Francisco and Sonoma County, CA; Portland, OR; Boulder, CO, and Westchester County, NY.

- New areas not now included under the Pilot Program are expressing interest in congestion pricing, and could become the next candidates for Federal support and partnership, including new locations in Arizona, California, Colorado, Florida, Maine, New York, Texas, Virginia, and Washington.
- While the United States has become a world leader in advancing interest in pricing, other countries have also made great strides. Projects incorporating variable road pricing have been successfully introduced in Canada, France, Korea, Norway, and Singapore. England, the Netherlands, Hong Kong, and Japan are also considering implementation of congestion pricing projects.

## The Federal Government Should Continue to Play a Supportive Role

Launching congestion pricing projects requires careful planning, coalition building, public education and participation, and sufficient time for the development of well-designed and locally acceptable project plans. The Federal Congestion Pricing Pilot Program provides the framework needed to bring together often diverse State and local interests to help move these projects from the conceptual to the operational stage. Indeed, the support by the Federal government makes it easier for State and local leaders to introduce these relatively new approaches for dealing with congestion.

The Federal government also plays a valuable supporting role by facilitating

*“...regions such as ours will continue to require Federal support for incremental steps, demonstration and pilot projects, public information and education, theoretical and technical research and planning activities. Further, we need the policy continuity implied in reauthorization of ISTEA with a pricing program at an equal or enhanced level of intensity, to provide our local elected leaders with sufficient political security to lead us forward with key pricing-related components of the plan.”*

Mark Pisano, Executive Officer, Southern California Association of Governments, letter to FHWA Administrator Kenneth Wykle, February 17, 1998.

*“In lieu of adding capacity to the metro area’s highway system, traffic demand pricing strategies must be fully explored.”*

James Denn, Commissioner, Minnesota DOT, in a news release on September 4, 1997.



***“The purpose of the pilot project is to find new ways to relieve congestion..., and allow commuters to regain a portion of control over the hours they spend in traffic,”***

Elliot Parks, Chairman of San Diego Association of Governments and Mayor of Del Mar, from I-15 Express News, Fall 1996.

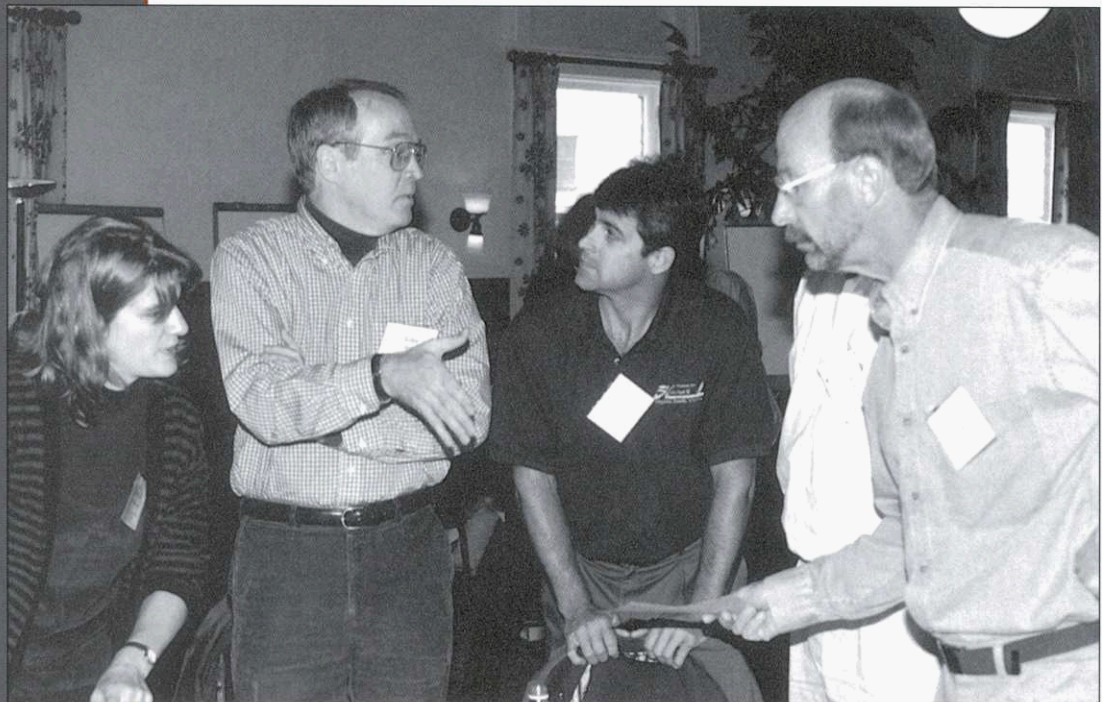
information exchange and sharing of experience among the various project partners, and providing direct technical assistance on the many aspects of project design, implementation and evaluation. Finally, the Federal program plays an important role in promoting comprehensive monitoring and evaluation of pilot projects, and by developing periodic recapitulations of national and international project experience.

The National Research Council (NRC), in its 1994 study of urban transportation pricing, concluded that congestion pricing proposals are likely to take several years to develop, and would require strong Federal support in the early stages. The report recommended that Federal support for State and local congestion pricing programs be extended when ISTEA is reauthorized. This NRC recommendation is supported by the

experience of the ISTEA Pilot Program and the urgings of current and potential partners in State and local pricing initiatives.

### **Program Reauthorization – The Value Pricing Pilot Program**

Under landmark legislation, the Transportation Equity Act for the 21st Century, the Pilot Program is continued under a new name, the Value Pricing Pilot Program. The Congressional support embodied in this historic legislation reflects the national interest in supporting State and local efforts to explore the potential of pricing solutions to urban congestion and air quality problems. The new name symbolizes the value that is placed on reducing congestion and improving the economic efficiency of the transportation system. The new program provides a cumulative total of \$51 million for



Project partners discuss the federal role in congestion pricing. Shown from left to right are: Mariia Zimmerman, Federal Transit Administration, John Berg, Federal Highway Administration, John Krause, Virginia DOT, and Carl Ohrn, Twin Cities Metropolitan Council.



fiscal year 1998 through 2003 to support up to 15 new State or local value pricing programs.

As exceptions to general Title 23 provisions, any local value pricing program established under this program may involve the use of tolls on the Interstate system, and a State may permit vehicles with fewer than 2 occupants to operate high occupancy vehicle lanes if such vehicles are operating as a part of a value pricing program. Provisions of the new legislation provide for consideration of potential financial effects on low-income drivers, and where appropriate, program funds can be used to support mitigation measures to correct potential adverse financial

effects on low-income drivers. The Federal matching share is set at 80 percent, and revenues generated by value pricing projects can be used for any Title 23 purpose, including impact mitigation.

Value pricing holds the promise of reducing congestion, enhancing mobility, improving quality of the natural environment by reducing highway-related pollution, and increasing the economic efficiency of highway transportation. Congress has provided the mechanism for achieving these important national goals by reauthorizing federal assistance to State and local efforts for incorporating pricing approaches into their congestion mitigation efforts.

***“In 20 years’ time, when paying for road space will be regarded as the norm, people will look back and wonder why they were ever prepared to put up with the pollution, noise and paralysis of today’s cities.”***

*“Living with the Car,” [The Economist](#), December 6, 1997.*







