# REPORT ON

# THE VALUE PRICING PILOT PROGRAM

# THROUGH MARCH 2004

U.S. Department of Transportation
Federal Highway Administration

## LIST OF ACRONYMS AND ABBREVIATIONS

BRT: Bus Rapid Transit
FAIR: Fast and Intertwined Regular (lanes or networks)
FHWA: Federal Highway Administration
FY: Fiscal Year
GPS: Global Positioning System
HGV: Heavy Goods Vehicle
HOV: High Occupancy Vehicle
HOT: High Occupancy/Toll
I-: Interstate (always followed by a number)
ITS: Intelligent Transportation System
ISTEA: Intermodal Surface Transportation Efficiency Act of 1991
PPP: Public-Private Partnerships
SOV: Single Occupancy Vehicle
SR: State Route (always followed by a number)
TEA-21: Transportation Equity Act for the 21st Century
VMT: Vehicle Miles Traveled

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## EXECUTIVE SUMMARY

Traffic congestion continues to be a serious problem facing drivers in many urban areas in the United States. To explore the potential of road pricing to mitigate congestion, the U.S. Congress established the Value Pricing Pilot Program in 1998. Much like the Congestion Pricing Pilot Program, this Federal grant program, authorized under the Transportation Equity Act for the 21st Century (TEA-21), provides states, local governments, or other public entities with 80 percent Federal matching funds to establish, maintain, and monitor pricing projects. While many of the projects are in early stages of development, several have already been implemented and have proven to be successful. The Value Pricing Pilot Program has provided some important lessons about pricing the use of highway infrastructure. Particularly with regard to projects involving tolling, the Value Pricing Pilot Program has demonstrated that:

- Pricing can be politically and publicly acceptable – so far, four priced lane projects and four variably priced toll facility projects are operating without any significant public or political controversy.
- Pricing keeps congestion from occurring on priced lanes, as demonstrated by the High-Occupancy Toll (HOT) lanes in the Houston, San Diego and Los Angeles metropolitan areas. It reduces congestion on toll facilities, as exhibited by shifts in traffic on variably priced toll facilities in New York, New Jersey and Florida.
- Pricing changes travel behavior, as shown by travel choices made by those motorists on toll facilities who choose to shift their time of travel to off-peak periods to take advantage of lower tolls (e.g., New York and Florida); and motorists who choose priced lanes (e.g., in Los Angeles, San Diego and Houston) to take advantage of faster and more reliable travel times.
- Pricing can improve utilization of existing highway capacity, as shown in San Diego, where traffic volumes have increased on the HOT lanes by as much as 140 percent (without loss of speed) to make use of spare capacity on these lanes. This project took traffic off the regular lanes and thereby reduced the congestion levels that they would have otherwise experienced.
- Pricing can provide funding for transportation improvements – new transit service was funded from toll revenues in San Diego, and the construction and operation of the new SR 91 Express Lanes in Orange County have been supported entirely from toll revenues.

The contribution of the pilot projects is that they provide valuable real world, on-the-ground evidence that has been very useful to U.S. transportation professionals in their efforts to convince the public about the potential impacts and benefits of pricing strategies. Elected officials have seen that some forms of pricing can indeed be acceptable to the public, and are more willing to explore this option. Several metropolitan areas in the U.S. have completed or have initiated efforts to assess the feasibility of regional pricing programs. HOT lane projects are being developed in a dozen States, and toll authorities in four States are exploring variable tolls to manage demand on their toll facilities.

Yet, issues remain with regard to political acceptance, equity, and public attitudes toward projects involving tolls. Technical issues have also stalled several projects, including high construction costs which limit self-financing capability, access to and egress from priced

lanes within freeways, and difficulties with regard to enforcement of toll exemption restrictions for high-occupancy vehicles (HOVs) on priced lanes.

The United States is not alone in focusing increased attention on value pricing. Singapore is the world leader in road pricing, having successfully used value pricing to maintain congestion-free conditions on the city's major streets since 1975, and on its freeways beginning in 1998. London implemented a major congestion charging scheme in its central area in 2003. Other countries in Europe and Asia have either implemented value pricing projects or are giving strong consideration to pricing as part of plans for the future of their transportation systems. A number of countries in Europe have implemented or are considering introducing distance-related charges for heavy goods vehicles. These charges can differentiate between vehicles with different axle weights according to the distance they travel, more successfully than a combination of fuel tax and annual taxes on ownership. Moreover, when associated with satellite tracking systems, the charges can vary between road types. Switzerland and Austria have already implemented such schemes, and implementation by Germany is scheduled for early 2005. The United Kingdom is planning implementation in 2006, with extension to automobiles in 2010.

Further efforts are needed for more comprehensive region wide applications of road pricing such as toll rings or toll zones on the scale of projects in Norway, Singapore and London. There are large technical as well as political risks involved in piloting such major path-breaking efforts. Transportation experts envision a long-term scenario involving radical changes in the current funding and institutional arrangements in highway transportation. Opportunities for value pricing projects would be enhanced as movements are made toward increased privatization of highway infrastructure. Value pricing could play an important role as part of a new financing mechanism for highways as existing funding sources become less effective with the advent of more fuel efficient vehicles and vehicles fuelled by alternative sources of energy.

In conclusion, value pricing holds the promise of reducing congestion, enhancing mobility and economic productivity, reducing environmental and energy costs, and providing a new source of investment capital for transportation infrastructure. Despite the promise and potential shown in early value pricing projects and the prevalence of value pricing in other sectors of the economy (e.g. peak hour electricity use charges and peak-season air fares and hotel rates), the concept of value pricing is not without controversy. It involves what for many people is an unfamiliar approach to dealing with congestion problems and a new way of charging for road use.

Through the Value Pricing Pilot Program, Congress has provided Federal assistance to States and localities to help realize the benefits of road pricing. Building on the success of this program, the Administration's SAFETEA legislation would mainstream the Value Pricing Pilot Program and extend to all States the demand management and financing benefits that flexible road pricing policies can deliver. While certain legislative proposals in the House seek not only to end the Value Pricing Pilot Program but also to limit pricing flexibility elsewhere among the States, the Administration remains dedicated to continuing and expanding the benefits of road pricing.

## I. BACKGROUND

### The Congestion Problem and Role of Value Pricing

Traffic congestion continues to be a serious problem facing drivers in many urban areas in the United States. Every year the problem is getting worse. A study by the Texas Transportation Institute at Texas A&M University assessed the growth of congestion on major road systems in 75 urban areas in the U.S. with a population of 100,000 or more. The study concluded that from 1982 to 2001 mobility did not improve in the areas surveyed, with the congested period getting longer and more traffic being subjected to congested conditions. The annual cost of traffic congestion, when aggregated across all drivers, amounts to billions of dollars in lost time and wasted fuel. In 2001, the cost of traffic congestion amounted to about $69.5 billion in the 75 urban areas included in the study. In the very large urban areas, the annual cost of congestion amounted $650 for each person on average. These cost estimates include only losses due to travel delay and wasted fuel, and ignore other economic costs that might be associated with inefficient pricing of road use, such as environmental costs and loss of economic productivity.

> "System efficiency remains the key concern for transportation officials and value pricing promises to improve efficiency….Available funding resources for transportation are not sufficient. Given the sobering picture of increased demand and increased social and economic costs to expansion, as well as decreased investment, it is necessary to change the course of thinking about transportation finance."
>
> **Doug MacDonald,** Secretary of Transportation for the State of Washington

Meanwhile, costs of highway expansion to mitigate congestion have also continued to rise. The Federal Highway Administration (FHWA) Office of Policy estimates average construction costs for adding a new freeway lane in an urban area at almost $10 million per lane mile, *excluding* costs for an excessive number of structures, major interchange modifications and engineering costs. This amounts to a cost of 30 cents per vehicle mile driven on the added lane during peak periods.

The funding for this added lane construction generally comes from the tax that drivers pay when buying gas for their vehicles. Nationwide, gas taxes average about 40 cents per gallon, including both federal and state taxes. Thus, at an average fuel efficiency of 20 miles per gallon, the gas tax generates on average only 2 cents per mile driven. The gap between costs of construction and gas tax revenues generated from highway use severely limit the financial capability of transportation agencies to address congestion through capacity expansion. Revenues from value-priced facilities can help reduce this gap.

FHWA's mission is: "Enhancing mobility through innovation, leadership and public service." To enhance mobility, one of three "vital few" goal areas for FHWA is congestion mitigation. Value pricing shows promise as a tool to mitigate congestion because it links the trip-making decision to the economic cost of making the trip, thereby encouraging more efficient travel patterns. Value pricing encourages some drivers to eliminate lower-valued trips or take them at different times, or to choose alternative routes or modes of transportation such as transit or carpooling. While localities have been cautious and slow in adopting this approach, their

interest has grown considerably over the years as the Value Pricing Pilot Program (the Program) has begun to mature.

## Types of Value Pricing Strategies

Value pricing encompasses a variety of strategies to manage congestion on highways and surface streets, including both tolling of highway facilities and other strategies not involving tolls. There are four broad types of pricing strategies that have been implemented or are under consideration in the U.S.:

- Newly-imposed tolls on existing toll-free facilities
- Tolls on lanes added to existing highways
- Variable tolls on existing or newly-built toll roads, bridges, and tunnels
- Pricing strategies that do not involve tolls, including usage-based vehicle charges and market pricing of employer provided parking spaces

> "Value pricing is the use of prices, charges and fees for traveling in order to produce needed revenue and simultaneously to influence travel behavior so that travelers make decisions that use highway and transit systems more efficiently and equitably."
>
> **Prof. Martin Wachs,** University of California at Berkeley

## The Multiple Benefits of Value Pricing

Value pricing contributes to congestion mitigation, mobility, economic productivity and environmental stewardship in several ways:

- ***Efficiency:*** Value pricing reduces congestion and the huge economic costs of congestion delays. By making more efficient use of existing highway capacity, value pricing delays or eliminates the need to expand capacity, saving public tax dollars.

- ***Mobility and Travel Choices:*** By keeping added lanes congestion-free, value pricing protects the public investment, ensures free-flow of transit vehicles and provides an option for premium *service* that a motorist can use when he or she needs to avoid delays in order to be on time for a business or social appointment. Revenues from value pricing can be used to enhance transportation alternatives in the corridor.

> "We need to rethink how we manage congestion. I can see myself paying a fee to use the lanes when late for committee meetings in St. Paul. On occasion I think I certainly would consider it."
>
> **Minnesota State Sen. Ann Rest**

- ***Economic Productivity:*** Value pricing can increase the reliability of travel time. As a result, firms can adjust their operations to increase efficiency and reduce costs, thereby contributing to economic productivity and international competitiveness. Toll revenue can accelerate the completion of projects that otherwise would have waited years to receive funding. Also, a replacement for the gas tax may be needed as alternative fuels become more pervasive. Value pricing will provide additional experience and familiarity with an alternative financing mechanism.

- ***Environment:*** Value pricing reduces air pollution and fuel consumption by improving traffic flow, reducing vehicle trips and encouraging shifts in travel mode from single-occupant vehicles to carpools, transit or other modes. It also reduces new highway travel that may be induced when highway travel time is reduced due to highway improvements, and supports smart growth by ensuring that highway users bear the additional costs they impose on others by choosing to drive during peak times.

## Legislative Action

To encourage the testing and evaluation of value pricing concepts, the U.S. Congress authorized the Value Pricing Pilot Program under Section 1216(a) of the Transportation Equity Act for the 21st Century (TEA-21) to support efforts by State and local governments or other public authorities to establish, monitor and evaluate value pricing projects, and to report on their effects. This program is a follow-on to the Congestion Pricing Pilot Program established by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The legislative language for the Pilot Program (as amended) is contained in the Attachment.

The TEA-21 program authorizes the FHWA to enter into cooperative agreements with up to 15 State or local governments or other public authorities to establish, maintain and monitor value pricing projects. A cooperative agreement may encompass one or more value pricing projects.

Notwithstanding Sections 129 and 301 of Title 23, United States Code, any value pricing project included under these local programs may involve the use of tolls on the Interstate Highway System. Section 1216(a)(6) specifically provides that a State may permit vehicles with fewer than two occupants to operate in high occupancy vehicle (HOV) lanes if the vehicles are part of a value pricing pilot program under this Section. This is an exception to the general provision contained in 23 U.S.C. 102, that no fewer than two occupants per vehicle be allowed on HOV lanes.

Potential financial effects of value pricing projects on low-income drivers are to be considered and, where such effects are expected to be significant, possible mitigation measures should be identified. The costs of such mitigation measures can be included as part of the value pricing project implementation cost.

The Secretary is to monitor the pilot projects for at least 10 years and report to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives every two years on the effects of the pilot projects. This is the third full Congressional report under TEA-21. The first covered the period through June 2000 and the second covered the period through June 2002. In addition, an interim TEA-21 Congressional report was submitted in January 2000, and four Congressional reports were submitted under ISTEA.

## Federal Funding Under TEA-21

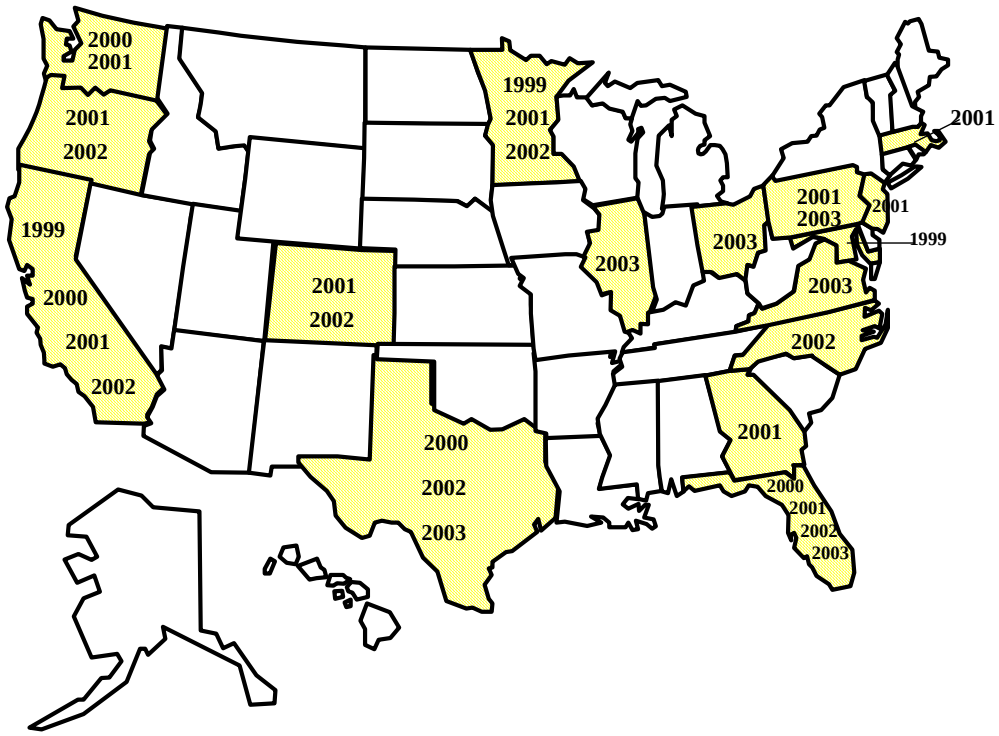
A maximum of $7 million was authorized for fiscal year (FY) 1999, and $11 million for each of FYs 2000 through 2003 to be made available to carry out the requirements of the Value Pricing Pilot Program. Additional authorizations for FY 2004 have been made available under extensions to TEA-21. The Federal matching share for local programs is 80 percent. Funds available for the Pilot Program can be used to support pre-project study activities and

to pay for implementation costs of value pricing projects. Activities eligible for reimbursement include costs of planning for, setting up, managing, operating, monitoring, evaluating and reporting on local value pricing pilot projects.

The Department of Transportation and Related Agencies Appropriations Act of 2002 rescinded $9.2 million of the authorizations for this program. Additionally in 2003, the Consolidated Appropriations Resolution rescinded $8.1 million of the authorizations. All funds made available to the Program after rescissions and obligation limitations have been allocated to projects, and the FHWA has entered into cooperative agreements with 15 States. This is the maximum number of public entities with whom FHWA is authorized to sign cooperative agreements under the Program. About $29 million have been obligated under the Program to support 36 projects in 15 states. This amount is in addition to about $30 million expended under the predecessor Congestion Pricing Pilot Program authorized in 1991 under ISTEA.

Table 1 lists projects funded under the Program by State, and shows the fiscal year in which Program funds were first provided. Two additional projects were funded using prior unspent ISTEA funds, and three others were incorporated into the program without specific funding. They are listed at the end of Table 1. The map below shows the States that have been funded and the Fiscal Year in which they were provided with funding.

States with Value Pricing Projects



## Table 1 Value Pricing Projects by State

| State | Fiscal Yr | Locality | Project |
|---|---|---|---|
| **California** | 1999 | Orange County | Peak pricing on the San Joaquin Hills Toll Road |
| | 1999 | Orange County | SR 91 evaluation |
| | 2000 | San Diego | Extension of I-15 HOT lanes |
| | 2000 | San Francisco | Car sharing |
| | 2000 | Santa Cruz | HOT lanes on median of Route 1 |
| | 2002 | Alameda County | FAIR lanes with dynamic ridesharing |
| **Colorado** | 2001 | Denver | HOT lane on C-470 |
| | 2002 | Denver | HOT lane on I-25 |
| **Florida** | 2000 | Lee County | Variable pricing of heavy vehicles |
| | 2000 | Lee County | Priced queue jumps |
| | 2000 | Miami-Dade Co. | Pricing options on Florida Turnpike |
| | 2001 | Ft. Myers Beach | Cordon pricing |
| | 2002 | Broward County | Variable tolls on the Sawgrass Expwy |
| | 2002 | Statewide | Sharing of technology on pricing |
| | 2003 | Miami-Dade Co. | HOT lanes on I-95 |
| **Georgia** | 2001 | Atlanta | Simulation of mileage-based insurance |
| **Illinois** | 2003 | Chicago | Variable tolls on Tollways |
| **Maryland** | 1999 | Statewide | Feasibility of value pricing |
| **Minnesota** | 1999 | Twin Cities | Regional study and outreach |
| | 2001 | Statewide | Variabilization of fixed auto costs |
| | 2002 | Statewide | Project development outreach/ I-394 HOT lane |
| **New Jersey** | 2001 | New York metro area | Variable tolls on river crossings |
| | 2001 | Statewide | Variable tolls on the N.J. Turnpike |
| | 2003 | New York metro area | Express bus/HOT lanes in the Lincoln Tunnel |
| **North Carolina** | 2002 | Raleigh/Piedmont | HOT lanes on I-40 |
| **Ohio** | 2003 | Statewide | Truck toll pricing on the Ohio Turnpike |
| **Oregon** | 2001 | Statewide | Mileage-based road user fees |
| | 2002 | Portland | HOT lanes on Hwy. 217 |
| **Pennsylvania** | 2001 | Philadelphia, Pittsburgh | Variable tolls on the Pennsylvania Turnpike |
| **Texas** | 2000 | Houston | HOT lanes on two radial corridors |
| | 2002 | Dallas/Ft. Worth | HOT lanes region-wide |
| | 2003 | San Antonio | HOT lanes+E77 on I-35 |
| **Virginia** | 2003 | Northern Virginia | HOT lanes regionwide |

| | | | |
|---|---|---|---|
| **Washington** | 2001 | Seattle | Parking cash-out and pricing |
| | 2001 | Seattle | Cash-out of cars |
| | 2002 | Seattle | GPS-based pricing |

**Additional Projects Not Using TEA-21 Value Pricing Pilot Program Funding**

| | | | |
|---|---|---|---|
| **California** | ISTEA | Alameda County | I-680 HOT lanes |
| | ISTEA | Alameda County | I-880 HOT lanes |
| **Texas** | No funds | Houston | Katy Freeway Managed Lanes Extension |
| | No funds | Dallas/Ft. Worth | HOT lanes on LBJ Freeway |
| **Washington** | No funds | Seattle metro area | HOT lanes regionwide |

Note: Acronyms are listed in the front of the report

## II. PILOT PROJECTS IN THE PROGRAM

### An Overview of Value Pricing Projects

There are four broad types of pricing strategies that have been implemented or are under consideration in the U.S.:

***A. Newly-imposed tolls on existing toll-free facilities*** (usually electronically-collected), including:

- Tolls for vehicles not meeting normal occupancy requirements for use of High Occupancy Vehicle (HOV) lanes;
- "Cordon tolls" around a designated area, and other forms of area pricing; and
- Tolls on one or more general purpose lanes of a multi-lane facility, with toll credits provided to users of adjacent lanes, a concept known as "FAIR" (Fast and Intertwined Regular) lanes.

***B. Tolls on lanes added to existing highways*** (usually electronically-collected), including:

- Tolls on newly-constructed general purpose lanes;
- Tolls on new HOV lanes for vehicles not meeting occupancy requirements; and
- Tolls on "Queue Bypass" lanes (also known as "Q-Jumps") that are added to arterial streets at intersections, or to freeway entrance ramps.

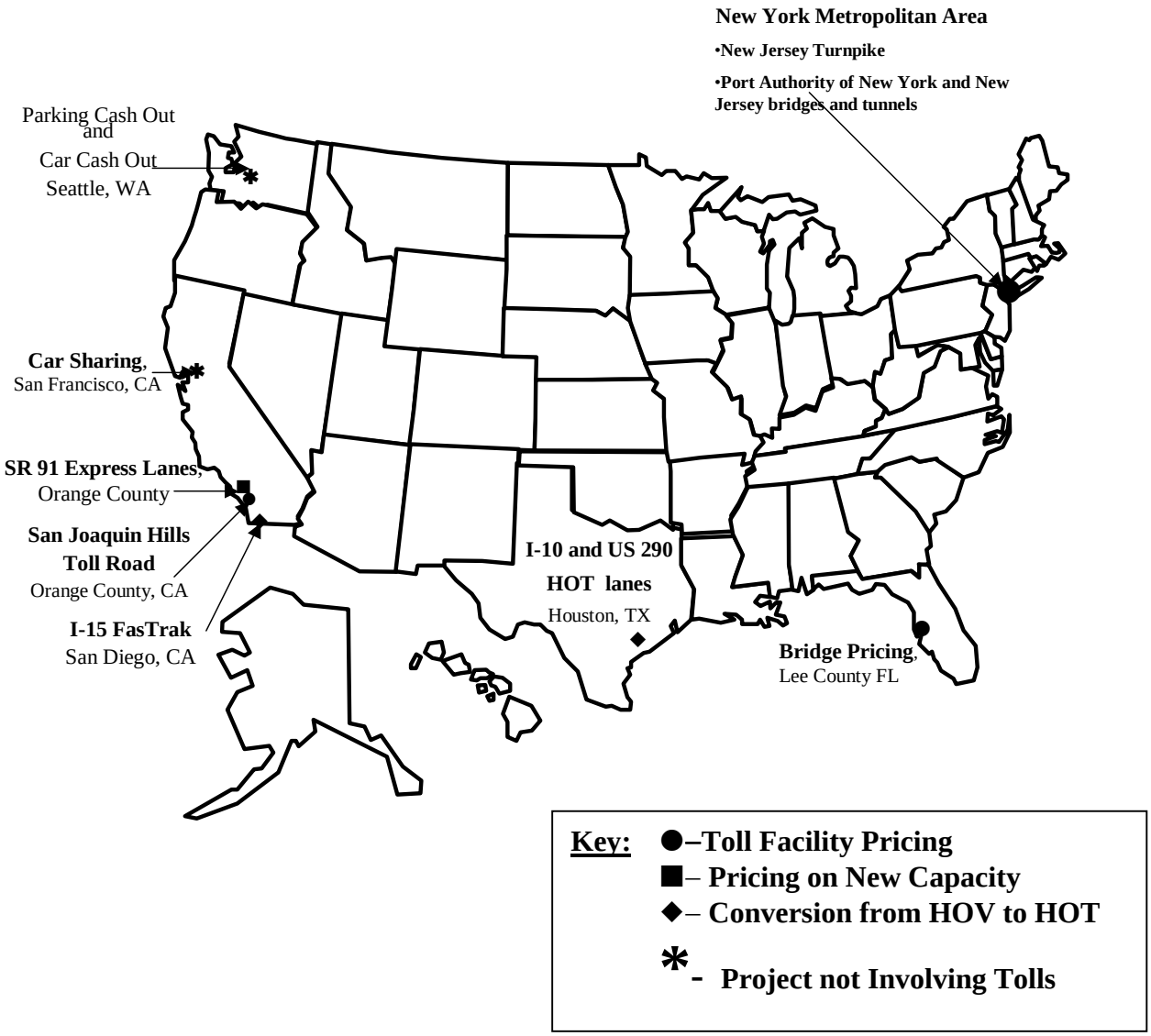
***C. Variable tolls on existing or newly-built toll roads, bridges, and tunnels***. The difference between this strategy and the preceding two strategies is that the first two strategies impose *new* (generally variable) tolls on existing *toll-free facilities*, while with this strategy, flat tolls on existing or new *toll facilities* are changed to variable tolls.

***D. Pricing strategies that do not involve tolls,*** including:

- Usage-based vehicle charges, including mileage-based charges for insurance, taxes, or leasing fees; and car sharing; and
- Market pricing of employer provided parking spaces (called "Cash-out" when accompanied by payments to former recipients of free parking)
- Payments to households to reduce their use of cars.

The map below shows the locations of the various types of projects that have been implemented in each of the above categories. They are listed in Table 2, and projects in the developmental phase are included in Table 3. In addition, the Value Pricing Pilot Program supports several region-wide studies within metropolitan areas attempting to identify candidates for implementation of pilot pricing projects.

## Implemented Value Pricing Projects



## Table 2. Value Pricing Projects by Type - Operational Projects

| State | Locality/ Year Implemented | Project |
|---|---|---|
| **A. Pricing on Existing Roads** | | |
| **California** | San Diego/<br>1996 (low tech)<br>1998 (electronic tolls) | HOT lanes on I-15: Toll varies dynamically from 50 cents to $4 depending on traffic demand. |
| **Texas** | Houston/ 1998 | HOT lanes on Katy Freeway (I-10): $2 toll charged to two-person carpools in the peak hour of the peak period; 3-person and larger carpools are free |
| **Texas** | Houston/ 2000 | HOT lanes on US 290: Toll policy same as for I-10, but applies only to morning peak period |
| **B. Pricing on New Lanes** | | |
| **California** | Orange County/ 1995 | Express Lanes on SR91: Toll varies from $1 to $5.50 depending on traffic demand |
| **C. Pricing on Toll Roads** | | |
| **California** | Orange County/ 2002 | Peak pricing on the San Joaquin Hills and Foothill Toll Roads: Toll surcharge ranging from 25 cents to $1.00 during peak period at three mainline toll plazas |
| **Florida** | Lee County/ 1998 | Variable pricing of two bridges: 50 percent toll discount (amounting to 25 cents) offered in shoulders of the peak periods |
| **New York** | New York metropolitan area/ 2001 | Variable tolls on interstate crossings: Off-peak tolls discounted by 20% relative to peak period tolls, i.e., $4 vs. $5 |
| **New Jersey** | Statewide/ 2000 | Variable tolls on New Jersey Turnpike: Peak period toll exceeds off-peak toll by 12.4%; for the entire 238 km (148 mile) length, off-peak toll is $4.85 vs. peak toll of $5.45 |
| **D. Pricing of Parking and Vehicle Use*** | | |
| **California** | San Francisco/ 2001 | Car sharing: Charges are $4 per hour (10 AM –10 PM) and $2 per hour (other times); plus 44 cents per mile |
| **Washington** | Seattle/ 2002 | Parking cash-out: Monthly average parking cost in downtown Seattle is about $175. This is the amount those cashing out might expect to get |
| **Washington** | Seattle /2000 | Cash out of cars: Weekly average cost for owning a car was estimated at $63.90. This is the amount those "cashing out" their cars might expect to save |

* Car sharing and parking cash out have also been implemented in other locations in the U.S. The projects shown are only those that have received federal Value Pricing Pilot Program funding.

Note: Acronyms are listed in the front of the report

## Table 3. Value Pricing Projects by Type - Projects Under Development

| State | Locality | Project |
|---|---|---|
| **A. Pricing on Existing Roads** | | |
| *A-1. Conversion of HOV Lanes to HOT Lanes* | | |
| **Colorado** | Denver | HOT lanes on I-25 |
| **Florida** | Miami-Dade County | HOT lanes on I-95 |
| **Minnesota** | Minneapolis-St. Paul | HOT lanes on I-394 |
| *A-2. Cordon Tolls* | | |
| **Florida** | Lee County | Cordon pricing in Ft. Myers Beach |
| *A-3. FAIR Lanes* | | |
| **California** | Alameda County | FAIR lanes on I-580/I-680 |
| **Georgia** | Atlanta | FAIR lanes simulation on GA 400 |
| **Oregon** | Portland | FAIR lanes on entrance ramps to Hwy. 217 |
| **Texas** | Houston | Managed Lanes on the Katy Freeway |
| **B. Pricing on New Lanes** | | |
| **California** | Alameda County | HOT lanes on I-680 |
| **California** | San Diego | Extension of I-15 HOT lanes |
| **Colorado** | Denver | HOT lanes on C-470 |
| **Florida** | Lee County | Priced queue jumps |
| **North Carolina** | Raleigh/Piedmont | HOT lanes on I-40 |
| **Oregon** | Portland | HOT lanes on Hwy. 217 |
| **Texas** | Dallas | Managed Lanes on LBJ Freeway |
| **Texas** | Houston | Managed Lanes on the Katy Freeway |
| **Texas** | San Antonio | HOT lanes on I-35 |
| **C. Pricing on Toll Roads** | | |
| **Florida** | Broward County | Variable tolls on the Sawgrass Expressway |
| **Florida** | Lee County | Variable pricing of heavy vehicles |
| **Florida** | Miami-Dade Co. | Pricing options on Florida Turnpike |
| **Illinois** | Chicago area | Variable tolls on Tollways |
| **Ohio** | Statewide | Truck toll pricing on Ohio Turnpike |
| **Pennsylvania** | Philadelphia | Variable tolls on Pennsylvania Turnpike |
| **D. Pricing of Parking and Vehicle Use** | | |
| **Georgia** | Atlanta | Mileage-based insurance |
| **Minnesota** | Statewide | Variabilization of fixed auto costs |
| **Oregon** | Statewide | Mileage-based road user fees |
| **Washington** | Seattle | GPS-based pricing |

Note: Acronyms are listed in the front of the report

**Pricing on Existing Toll-Free Facilities**

Three types of creative uses of this pricing strategy are being explored in the U.S.: Conversions of HOV lanes to HOT lanes; Cordon tolls; and FAIR lanes.

*Converting HOV Lanes to HOT Lanes*

"HOT" is the acronym for "High Occupancy/Toll". On HOT lanes, low-occupancy vehicles are charged a toll, while High-Occupancy Vehicles (HOVs) are allowed to use the lanes for free or at a discounted toll rate. HOT lanes create an additional category of eligibility for travelers wanting to use HOV lanes, since drivers can be eligible to use the facility either by meeting its minimum passenger requirement, or by choosing to pay a toll to gain access to the HOV lane.

There is increasing interest in HOT lanes in the U.S., due to their many potential advantages. HOT lanes can:

- Reduce congestion during the peak period by taking some traffic off the regular lanes;
- Offer drivers the option to bypass congestion when in a hurry, so that they can avoid delays when it is important to do so (for example if they have to catch a flight at the airport);
- Provide revenue to pay for congestion-reducing road improvement projects, expansion of roads, public transport improvements, or park-and-ride programs;
- Create financial incentives to make public transport and carpooling more attractive, while continuing to ensure congestion-free travel by these vehicles;
- Reduce air pollution resulting from cars idling in traffic jams by reducing congestion; and
- Reduce fuel consumption resulting from stop-and-go traffic.

> "We are out of money in our transportation trust funds throughout our region. There's no money to make the wholesale changes many would like to see. HOT lanes offer that opportunity."
>
> **Lon Anderson,** spokesman for the Mid-Atlantic American Automobile Association (*Washington Post*, Dec. 29, 2003)

These benefits are not exclusive to HOT lanes, since other forms of congestion pricing can also yield many of these same benefits. The difference between HOT lanes and other pricing systems, however, is that with HOT lanes drivers can choose between meeting the vehicle occupancy requirement or paying the toll in order to use the HOV lane. HOT lanes that have been converted from HOV lanes currently operate in San Diego and in Houston. Under the Program, conversion of existing HOV lanes to HOT lanes is being studied for implementation in Denver, Colorado on Interstate-25 (I-25)/US 36, and in the Twin Cities, Minnesota, on Interstate 394. In addition, the potential conversion of existing HOV lanes to HOT lanes is under study for I-95 in Miami-Dade County, Florida.

San Diego's Priced Express Lanes: San Diego's "FasTrak" pricing program was fully implemented in April 1998. Under this program, customers in single-occupant vehicles pay a toll each time they use the Interstate-15 (I-15) HOV lanes. The unique feature of

this project is that tolls vary dynamically with the level of congestion on the HOV lanes. Fees typically vary in 50-cent increments, but can increase or decrease as much as 75-cents and as often as every six minutes to help maintain free-flow traffic conditions on the HOV lanes. Fees are set to maintain free flow of traffic (i.e., level of service C), as required by state law. Motorists are informed of the toll rate changes through variable message signs located before the entrances to the Express Lanes, allowing the motorist to make a decision whether to enter the Express Lanes or remain on the main lanes at no charge. Under normal traffic conditions, the fees range from $0.50 to $4.00, but during very congested periods it can be raised as high as $8.00 per trip to restore free flow of traffic (i.e., level of service C). All toll transactions on I-15 are electronic. Overhead antennas read a transponder affixed to the inside of a vehicle's windshield and deduct the toll automatically from the driver's pre-paid account.

"There was a lot of resistance to the idea of letting people buy their way out of traffic."

**Jan Goldsmith,** former California State assemblyman and Mayor of Poway, who championed the I-15 HOT lanes project.

As of March 2003, there were 25,971 transponders issued, and average daily traffic on the Express Lanes peaked just above 23,000 total vehicles. This is a 150 percent increase from the 9,200 daily vehicles prior to the initiation of the program. On average, 77 percent of the daily traffic is from high occupancy vehicles (HOVs), and 23 percent is from FasTrak customers. Total revenue in 2004 is estimated at $2.2 million. Approximately one-half of these funds pay for the *Inland Breeze* Express Bus Service that operates in the I-15 corridor. The remaining FasTrak revenues pay for enforcement on the lanes by the California Highway Patrol; for maintenance of the electronic toll collection (ETC) system; and for operation of the Customer Service Center.

In 2001, the San Diego Association of Governments (SANDAG) conducted extensive outreach to measure public response to the value pricing concept. The surveys found that equity was not considered a major issue or obstacle to implementing pricing on the managed lanes. The majority of those interviewed in the phone survey (71 percent) felt that pricing the lanes was "fair" for travelers on the main lanes. Furthermore, 66 percent approve of the current configuration of the HOT lanes, and 71 percent believe that tolls are an effective way to manage demand. Both users and non-users of the HOT lanes strongly support the use of pricing. Support is high across all income groups, with 77 to 79 percent agreeing that solo-drivers should be allowed to use the "FasTrak" lanes for a fee.

**I-15 HOT Lanes, San Diego**

From September 2003 thru February 2004, the Express Lanes on I-15 were opened to HOV and FasTrak commuters on Saturdays and Sundays for the first time. The weekend operations pilot project was conducted to determine the most efficient configuration to operate the Express Lanes on weekends. The test showed nearly twice as many vehicles used the lanes in the northbound direction. During the northbound test, an average of 11,616 vehicles used the express lanes on Saturdays and 10,299 on Sundays, compared with an average of 5,954 vehicles on Saturdays and 4,697 on Sundays destined southbound. The most notable difference from weekday operations was the proportion of HOV to FasTrak users, with 95% having 2 or more persons. With limited FasTrak patronage, operating the facility as an HOV-only configuration on weekends rather than with a HOT lanes option may prove most effective. As of March 2004, the Express Lanes remain open following the Friday evening commute northbound the entire weekend until Monday morning when they reverse to southbound and resume the regular weekday schedule.

QuickRide Program in Houston, Texas: The "QuickRide" pricing program was initially implemented on an existing reversible HOV lane on Interstate-10 (I-10, also known as the Katy Freeway) in Houston in January 1998. A similar project was subsequently implemented on Houston's US 290 highway in November 2000. The HOV lanes are reversible and restricted to vehicles with three or more people during the core hours of the peak periods. The pricing program allows a limited number of two-person carpools to pay a toll to access the HOV lanes during these hours. Single-occupant vehicles are not allowed to use the HOV lanes. Participating two-person carpool vehicles pay a $2 per trip toll, while vehicles with higher occupancies continue to travel for free. As in San Diego, the QuickRide project is completely automated and no cash transactions are handled on the facility.

On the Katy Freeway, during the AM peak, average speed was 25 mph on the general-purpose lanes and 59 mph on the HOT lane. That difference represents an average travel time savings of 17.3 minutes on the HOT lane. During the PM peak, the average speeds are 27 mph on the general-purpose lanes and 58 mph in the HOT lane, representing an average 15-minute time savings on the HOT lane. On US 290, during the AM peak, average speeds were 29 mph on the on the general-purpose lanes and 58 mph on the HOT lane, representing an average time savings of 11 minutes on the HOT lane.

**Katy Freeway HOT Lanes, Houston, TX**

Results from surveys conducted on I-10 indicate that the primary users of QuickRide are persons who formerly traveled in single-occupant vehicles on the regular lanes. Bus transit was the previous mode used by only 5 percent of QuickRide participants. Currently, there are almost 2,200 registered users. A total of approximately 200 two-occupant vehicles elect to pay the $2 toll each day on both facilities. Toll revenues pay for all program operation costs. Total revenues generated by the program (from both I-10 and US 290) amounted to $417,734 between 1998 and 2003.

*Cordon Tolls*

Public opposition to tolling existing toll-free facilities has historically been strong. Given the broad acceptance of London's congestion charge, however, that may be starting to change. There is only one example of this being pursued in the U.S. The Town of Fort Myers Beach in Lee County, Florida, is an island community that experiences a heavy influx of visitors during the tourist seasons, thus aggravating the problem of traffic congestion. Due to the relatively small land area occupied by the Town and potential environmental costs, construction of new roads or widening of the existing ones would be difficult. The Town is studying the feasibility of introducing a new variable cordon toll at each of the two approaches to the Town.

> "Drivers are already paying a hidden tax in the form of fuel burned while in traffic, as well as time lost. Value pricing comes down to providing an alternative.…The fact is, the cost of doing nothing is prohibitive. It is important to find ways of getting more use out of existing capacity."
>
> **John Albion,** Lee County Commissioner

*FAIR Lanes*

"FAIR" lanes stands for "Fast and Intertwined Regular" lanes. This type of pricing seems likely to be more acceptable to the motoring public because it would provide drivers the option of paying to use faster lanes or being compensated for continuing to use unpriced lanes on the same facility. The system would involve separating multiple freeway lanes, typically using plastic pylons and striping, into two sections: "fast" lanes and "regular" lanes. The fast lanes would be electronically tolled express lanes, where tolls could change dynamically to manage demand. In the remaining unpriced lanes, drivers whose vehicles were equipped with transponders would be compensated with credits that would be based on the tolls in effect at the time they traveled, and would be established at a percentage of the toll rate.

Toll credits could be used as toll payments on days when drivers accumulating them chose to use the fast lanes, or as payment for transit fares, paratransit fees (vanpool membership fees, for example), or parking at commuter park-and-ride lots in the corridor. The credits would be funded from toll revenues generated by charges imposed for use of the fast lanes. Buses, paratransit vehicles and carpools could use the fast lanes without paying any toll.

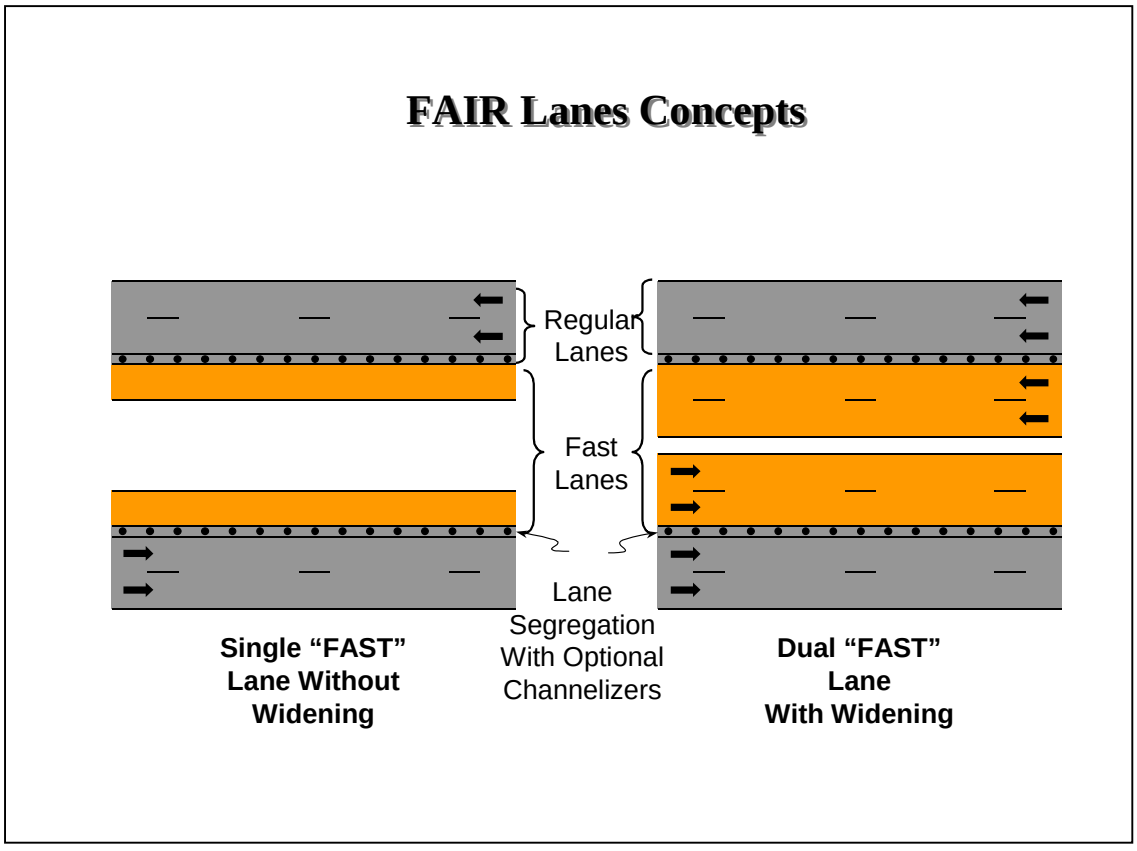
FAIR lanes have benefits similar to those identified above for HOT lanes. They increase freeway throughput and speed transit service, generate revenues to finance road and public transport improvements, and allow motorists to bypass congestion as they choose. However, in addition to these benefits, FAIR lanes make it easier to provide more than one express

lane, thereby allowing faster vehicles to overtake slower-moving vehicles. This prevents queuing of vehicles behind the slower vehicle, and prevents gaps from developing in front of the slower vehicle, which results in lower vehicle throughput.

Providing credits to the accounts of drivers using the regular lanes is intended to increase the public acceptability of taking an existing free lane from a facility for use as an express lane. Making more capacity available for paying motorists by transferring multiple lanes on the same facility from free to fast lane status might help to maintain tolls at affordable levels for those with lower ability to pay, thus allowing more motorists to make use of this premium service.

The strategy can be established on any existing congested freeway facility, preferably a facility with four or more lanes in each direction, or a facility with three lanes in each direction that is proposed to be widened. When adding new freeway lanes, an existing adjacent free lane could be combined with the added lane to create a wider fast section. On congested toll roads or bridges, higher tolls could be charged on fast lanes, while other motorists could be given toll discounts.

A feasibility study involving FAIR lanes is underway in Alameda County, California in the San Francisco Bay area. A FAIR lanes simulation study has also been proposed in Atlanta, Georgia. FAIR lanes are being studied at freeway entrance ramps on Highway 217 in Portland, Oregon and will be studied in connection with the proposed extension of HOT lanes on the Katy Freeway in Houston, Texas.



## Pricing on Lanes Added to Existing Toll-Free Highways

State and local budget cuts and unsuccessful attempts to fund transportation improvements through taxation have increased the interest of states in financing lane additions to existing highways using toll revenues. Newly-constructed express lanes with tolls have been implemented to date in only one location in California, but similar strategies are under development in many states. Tolls on added lanes could be allowed to vary by time-of-day and be collected without slowing highway speeds using electronic toll collection technology. Tolls could also be set "dynamically", i.e., they could be increased or decreased every few minutes in response to fluctuating demand so as to ensure that the lanes are fully utilized, yet remain uncongested.

There is only one operational pricing project involving addition of lanes, on the State Route 91 (SR 91) in Orange County, California. However, projects are under development in several locations. Pricing of new lanes is being studied for implementation on I-680 in Alameda County, California in the San Francisco Bay Area; on the I-15 expansion project in San Diego, California; on C-470 in Denver, Colorado; in Lee County, Florida on Queue-bypass lanes at two intersections; on I-40 in the Raleigh-Durham and Piedmont areas in North Carolina; on Highway 217 in Portland, Oregon; and on the Katy Freeway (I-10) in Houston, and the LBJ Freeway (I-635) in Dallas, Texas. In addition, a study in Sonoma County, California in the San Francisco Bay Area has recommended new HOT lanes on Highway 101, and a study has recently begun to plan for new HOT lanes on I-35 in San Antonio, Texas.

> "…It comes down to providing more options for commuters, and more solutions to combat the gridlock grind. Commuters of Houston will be the very first in Texas to experience tollways on an existing interstate. It will represent the best of both worlds — several free lanes for those who don't want to pay a toll, and tollways for those who want to bypass traffic."
>
> **Texas Gov. Rick Perry,** about pricing new lanes on the Katy Freeway.

**91 Express Lanes, Orange County, CA**

Express Lanes on State Route 91 in Orange County, California: The 91 Express Lanes in Orange County, California opened in December 1995 as a four-lane toll facility in the median of a 10-mile section of one of the most heavily congested highways in the U.S. The state-of-the-art facility is the first privately financed toll road in the U.S. in more than 50 years, the world's first fully-automated toll facility, and the first application of value pricing in the U.S. The toll lanes are separated from the general purpose lanes by a painted buffer and plastic channelizers.

91 Express Lanes customers pay tolls by having them electronically deducted from pre-paid accounts. All vehicles traveling on the Express Lanes must be equipped with a "FasTrak" transponder mounted on the inside of the windshield. Vehicles with three or more occupants are not charged except when traveling eastbound from 4pm to 6pm on weekdays, the peak period in the heavy traffic direction, and during that time they receive a 50 percent discount from the posted toll. This policy also applies to individuals on a motorcycle, zero-emission vehicles and vehicles with disabled person's license plates.

As of August 2003, tolls on the Express Lanes vary between $1 and $5.50. Tolls differ by direction, and are set by day of the week and time of the day to reflect the level of congestion delay in the adjacent free lanes that can be avoided by using the toll lane, and to maintain free-flowing traffic conditions on the toll lanes. Drivers can observe message signs before entering the 91 Express Lanes to obtain the current toll rate.

> "There's good data now that everyone values their time. You don't have to be wealthy to value your time. People use it when it's best for them."
>
> **Dan Beal,** spokesman for the Automobile Club of Southern California

There were over 151,000 transponders in circulation at the end of 2003. The facility served 10.5 million vehicles in 2003, yielding revenues of over $29 million. Toll revenues have been adequate to pay for construction and operating costs. In fact, in January 2003, the private company that had the franchise to build and operate the facility sold the franchise to the Orange County Transportation Authority (OCTA) for a profit. The Authority purchased the Express Lanes for $207.5 million and eliminated a non-compete clause, opening the doors to expansion of the freeway corridor. All surplus revenues generated on the 91 Express Lanes are dedicated to transportation improvements in the corridor. Short-term projects will direct $90 million to help relieve major freeway bottlenecks during the next five years, including adding auxiliary lanes and improving transit options for commuters. In February 2004, a new auxiliary lane opened on the westbound side of the Riverside Freeway / State Route 91 (SR-91) at the Orange/Riverside county line. Mid-term projects over the next decade include spending $260 million to add freeway lanes as well as create intermediate access to the Express Lanes.

Most commuters on SR 91 come from Riverside County, the county east of Orange County. Riverside County has launched $498 million in planned improvements for the SR 91 Freeway in Riverside County. It recently approved a plan to construct new lanes on SR 91. Both counties are funding a joint $3.3 million study of major long-term improvements, including a high speed rail line, elevated freeway lanes and an additional freeway. In November 2003, OCTA refinanced the taxable debt on the 91 Express Lanes. This action, refunding taxable bonds and issuing non-taxable bonds, is projected to save about $24 million over the life of

the debt. OCTA is the only single-asset toll road agency in the country to receive a single "A" bond rating.

SR 91 Express Lanes is not formally part of the Pilot Program, but FHWA joined with the State of California to fund an in-depth monitoring study of the project to generate information about traffic and travel behavior responses to variations in time-of-day toll levels, as well as on public acceptance of variable tolling. Analysts have noted that the SR 91 Express Lanes represent only 33 percent of the SR 91 freeway capacity (i.e., two out of six lanes in each direction), but are carrying 40 percent of the traffic in the busiest peak hours, at speeds of 65 mph versus 10 to 20 mph in the adjacent free lanes. As is well known among traffic engineers, congestion results in reduced throughput on the regular lanes, accounting for the higher relative throughput on the free flowing Express Lanes in peak hours.

**Pricing on Existing or Newly-Built Toll Facilities**

Facilities that are already tolled - but on which tolls do not vary by time of day or traffic conditions - can introduce variable rates in order to reduce traffic during peak times. Thus, existing tolls on congested facilities may be varied by day of the week or time of the day with the intention of encouraging some travelers to use the roadway during less congested periods, to shift to another mode of transport, or to change route. If congestion at peak times is reduced, the remaining peak period travelers will experience decreased delays. Ultimately, such shifts will result in less need for roadway expansion on the toll facilities. All of the projects in this category that have been implemented to date use electronic technology to vary tolls by time period, and to be eligible vehicles must be equipped with transponders.

Four projects have been implemented in four states in the U.S.: Florida, New York, New Jersey, and California, and are discussed below. In addition, several new projects are under consideration for implementation, including three in Florida (Florida Turnpike, Sawgrass Expressway, and pricing of heavy vehicles on bridges in Lee County) and one in Pennsylvania (Pennsylvania Turnpike). In addition, studies to implement variable tolls have begun for Chicago's Tollways; and discounted tolls for trucks are being studied on the Ohio Turnpike, to reduce truck traffic diversions to parallel free highways.

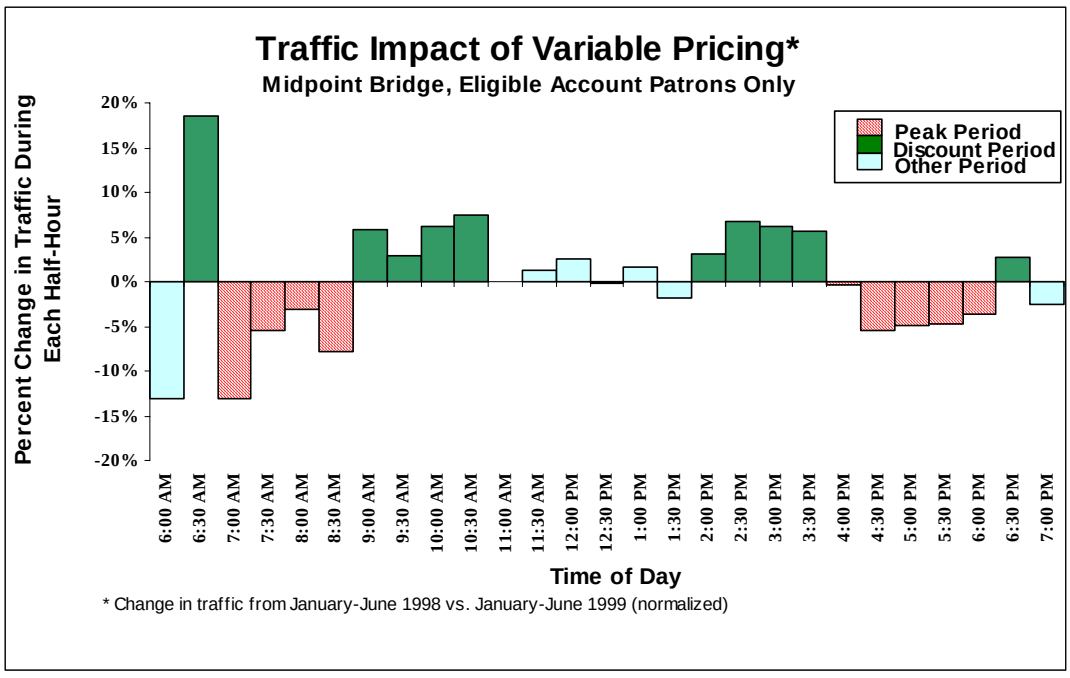
Bridge Pricing in Lee County, Florida: Variable pricing began August 3, 1998, on the Midpoint and Cape Coral toll bridges in Lee County, Florida. Bridge travelers were offered a 50 percent discount on their toll by traveling during specific discount periods if they paid their toll electronically. The discount periods are 6:30 to 7am, 9 to 11am, 2 to 4pm, and 6:30 to 7pm. This toll structure was developed to encourage drivers to leave the peak traffic periods and drive during off-peak/discount periods. User response to variable pricing and the resulting impacts on traffic were carefully monitored and evaluated.

User surveys conducted in May 1999 indicated that over 71 percent of eligible motorists (i.e., those with vehicle transponders) shifted their time of travel at least once a week to obtain a toll discount amounting to just 25 cents. The surveys also indicated that 90 percent of bridge users are familiar with the program. However, eligible users only account for 27 percent of the traffic stream. Variable pricing toll discounts significantly impacted eligible traffic on the two bridges. The daily distribution of ineligible patron traffic indicated little change. For traffic eligible for variable pricing toll discounts, there were significant increases in traffic during discount periods and significant decreases in traffic during peak periods as shown in bar graphs below. Using these data and results obtained from the bridge user survey, it was estimated that over 300 drivers per day altered their trip time due to variable pricing.

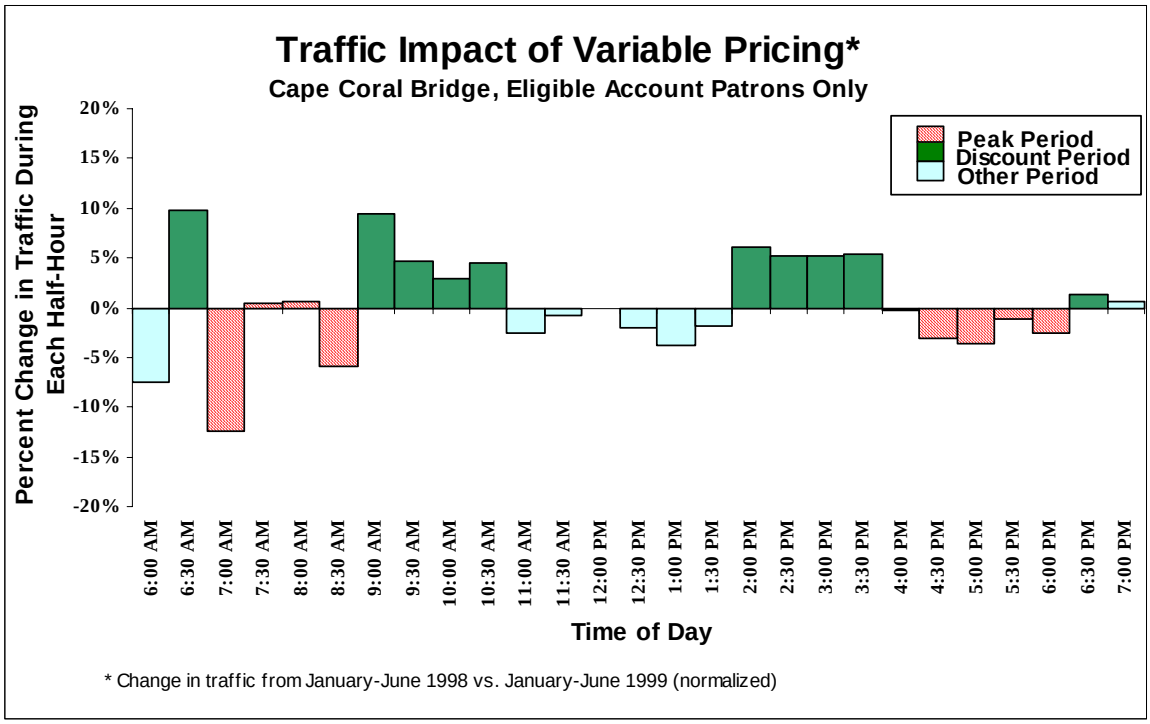
Studies have been ongoing to monitor the long-term effects of the Lee County variable pricing program. A more recent study presented at the Transportation Research Board annual meeting in January 2004 analyzes the long-term impacts of variable tolls on driver behavior on the Lee County Bridges. In analyzing the 30 minute discount period most affected by variable pricing, 6:30 to 7 a.m., it was found that the total number of vehicles receiving the variable pricing discount had increased from 201 vehicles in 1998 to 517 vehicles in 2002. However, the percentage change in traffic as compared to pre-variable pricing traffic patterns dropped from approximately 13 percent to approximately six percent in the 7 to 7:30 a.m. peak period segment that follows. Changes in traffic during other discount periods show similar results. The changes reflect the dramatic increase in the total number of drivers eligible for variable pricing during the same period. The results indicate that the impacts from variable pricing may decrease over time. However, it appears that over the four-year period of operation, a relatively small price differential of 25 cents is continuing to produce changes in driver behavior.

Lee County recently began offering toll discounts to 3+ axle vehicles; the results are not yet available.

**Traffic Impact of Variable Pricing on the Midpoint Bridge**



**Traffic Impact of Variable Pricing on the Cape Coral Bridge**




Variable Tolls on the Interstate Crossings in New York: The Port Authority of New York and New Jersey's (PANYNJ) Value Toll Pricing Program was introduced at the six tunnels and bridges that connect New Jersey with New York City in March 2001. Since that time, the program has generated incremental revenue to support an aggressive intermodal capital investment program, and has also produced traffic management benefits to address congestion. In addition to the six tunnels and bridges, the Port Authority operates two interstate bus terminals and the PATH rapid transit system between New York and New Jersey. An estimated 248 million vehicles traveled over the bridges and tunnels in 2003, with 58 million interstate bus passengers and nearly 48 million trips on PATH.

> "We urge our regional employers to encourage their workers to take advantage of the off-peak discounts and mass transit alternatives whenever possible. By removing some commuters from the peak period, we can work to improve traffic flow at all of the crossings."
>
> **Ernesto Butcher,** Chief Operating Officer, Port Authority of New York and New Jersey

The Port Authority's Value Pricing Toll Program represents one the more aggressive applications of value pricing on existing toll facilities in the U.S. Peak periods are weekdays 6-9am and 4-7pm, and Saturdays and Sundays 12 noon to 8pm. The value pricing approach is based on a high $6 round-trip cash toll rate, combined with varying E-ZPass electronic toll discounts depending upon the time of day. Passenger vehicles using E-ZPass enjoy a $2 off-peak discount and a $1 peak-period discount. A $1 carpool rate is available for passenger vehicles carrying 3 or more people. Trucks can take advantage of a $1 E-ZPass discount in the mid-day and evening hours and a $2.50 discount during weekday overnight hours from Midnight to 6am. The primary goal of the Port Authority's variable toll pricing program was to generate incremental revenue to support historically high levels of capital investment. A

number of underlying policy objectives were established as well, including: encouraging traffic shifts to off-peak periods; encouraging use of mass transit and higher vehicle occupancy; increasing the number E-ZPass electronic toll transactions; and creating commercial traffic management incentives. Key impacts of the value pricing toll program are highlighted below:

- A significant share of morning traffic has shifted to the 5-6am hour, before the peak rates go into effect. There was a 21 percent growth in vehicles traveling during the 5-6am period. This resulted in travel time savings and an earlier end to the morning peak by as much as 20 minutes at certain facilities.
- The sluggish New York City economy has dampened travel demand in 2003 in all time periods. As a consequence, there has been some shift back to the now less-congested peak hours by early hour off-peak motorists. This suggests that the $1.00 discount has had some meaningful and sustainable ability to shift travel demand, but the effectiveness of the discount to shift demand to off-peak hours is highly correlated to continued levels of peak-period congestion.
- Efforts to shift travel to later hours of the morning peak period (9- 10am) were not successful, mainly due to lack of flexibility in people's schedules.
- While similar results are evident during the weekday evenings, the effect is not as strong, suggesting somewhat less willingness to travel off-peak or less flexibility in evening schedules.
- There is little evidence that the off-peak discounts have been effective in influencing weekend travel patterns or overnight commercial movements.
- The weekday E-ZPass market share has continued to grow steadily since the value pricing toll program went into effect, rising by 7.4 percentage points for autos (68.0%) and 9.4 percentage points for trucks (66.6%) between 2001 and 2003. This is allowing a program of high-speed E-ZPass toll lanes to advance at the Port Authority's bridges.

Variable Tolls on the New Jersey Turnpike: The New Jersey Turnpike Authority operates a 148-mile facility with 28 interchanges. It is one of the most heavily traveled roadways in the country with average daily trips exceeding 500,000 vehicles. The Turnpike's variable pricing program began in the fall of 2000. The program provides for car tolls that are currently 12.4 percent higher during peak traffic hours (7-9am and 4:30-6:30pm, Monday through Friday) than during off-peak periods for users of the electronic toll collection system. When the value pricing program initially started, the price differential was 7.6 percent. Cash toll payers are required to pay the higher peak toll rate at all times of the day. The differential between peak and off-peak electronic tolls is scheduled to increase in a phased manner over several years.

Preliminary data collected in the year immediately following implementation suggest that value pricing is working to shift traffic out of the peak period. Most of the recent growth in traffic on the Turnpike has been in the off-peak hours, with total traffic up by around 7 percent, but morning peak traffic up by only 6 percent and afternoon peak traffic up by only 4 percent. The proportion of daily Turnpike traffic accounted for by the morning peak dropped from 14 percent to 13.8 percent, and the afternoon peak's share of traffic decreased from 14.7 percent to 14.3 percent. A more thorough evaluation is currently underway; results are not yet available.

Variable Tolls on the San Joaquin Hills and Foothill Toll Roads: The San Joaquin Hills Toll Road (State Route 73) in Orange County, California is 15 miles long and extends

from Interstate-5 (I-5) near San Juan Capistrano to Interstate-405 (I-405) in Newport Beach. It provides an alternative to heavily congested portions of I-5 and I-405, two North-South freeways in the southern portion of the Los Angeles metropolitan area. The toll road carries over 27 million vehicles annually on a six-lane facility, and is currently near capacity during peak periods. The Foothill-North Toll Road (State Route 241), also in Orange County, California is 12 miles long and extends from Oso Parkway in Rancho Santa Margarita to State Route 133 in Irvine.

A small peak-period premium of 50 cents (25 cents for those paying electronically) was implemented on the San Joaquin Hills Toll Road at the mainline toll plaza facility in February 2002. The premium was calibrated to reduce congestion and spread peak demand to shoulder and off-peak periods, while maintaining revenues at levels required to maintain the covenants on the Agency's revenue bonds. Evaluation results showed that there was a net reduction of 2.7 percent in mainline traffic along with a net increase of 5.8 percent in toll revenue due to the premium tolls.

In October 2003, a peak-period premium of $1.00 (50 cents for those paying electronically) was implemented on the San Joaquin Hills Toll Road at the Catalina View mainline toll plaza. This premium is in addition to the normal toll of $2.50. Traffic and revenue impacts were as follows:

**Table 5. Traffic and Revenue Impacts at Catalina View Mainline Plaza**

| Payment Type | Period | Toll Change | Traffic Impacts | Revenue Impacts |
|---|---|---|---|---|
| Cash | AM Peak | $0.50 | -8.8% | +6.5% |
| Cash | PM Peak | $0.50 | -11.0% | +5.2% |
| Electronic | AM Peak | $0.25 | +3.3% | +12.9% |
| Electronic | PM Peak | $0.25 | +1.4% | +11.2% |
| All | All | Varies | 0% | +2.0% |

A peak toll increase was implemented at the Tomato Springs toll plaza on the Foothill Toll Road (State Route 241). The increase was $0.25 for both electronic and cash payment. Data comparing 2002 to 2003 shows that there was a 2.3-percent increase in traffic and a 12.0-percent increase in revenue for those paying electronically. Cash-paying traffic decreased by 4.1 percent while revenue increased by 9.2 percent.

## Pricing Without the Use of Tolls

These strategies involve the pricing of vehicle use or parking. Three creative ways of pricing vehicle use are being explored in the U.S.: Pay-As-You-Drive Automotive Insurance; Mileage-Based Automotive Leasing and Vehicle Taxation; and Car Sharing. In addition, "cash out" strategies have been attempted. Cash out strategies involve paying car users some kind of compensation for not using their cars. The two options that have been considered to some extent are Parking Cash Out and Car Cash Out.

### *Pay-As-You-Drive (PAYD) Automotive Insurance*

By converting automotive insurance from a fixed to a per-mile cost, insurance companies may more accurately bill their customers based on crash risk and provide them a financial

incentive to drive less. This may in turn reduce accidents, public infrastructure costs, and congestion and environmental externalities. A study by the Economic Policy Institute estimates that conversion of automotive insurance costs to a pay-as-you-drive (PAYD) fee schedule could reduce accidents, congestion, and emissions from cars by 10 to 20 percent. A simulation study of this strategy is underway in Atlanta, Georgia.

*Mileage-Based Automotive Leasing and Vehicle Taxation*

About 80 percent of the costs of owning and operating a vehicle are fixed. Once a person has chosen to acquire a vehicle, the incremental costs of operating it are comparatively low. Converting some fixed vehicle costs to a PAYD fee schedule financially rewards consumers for reducing their driving and related congestion and vehicle emissions. Pilot simulation tests of various types of mileage-based pricing strategies are underway in the Twin Cities, Minnesota, the State of Oregon, and the Puget Sound (Seattle) region of Washington State.

Global Positioning System (GPS) Based Pricing is being tested in the Puget Sound Region of Washington State. In this pilot, meters will be placed in the vehicles of voluntary participants so that different charges can be imposed depending on the location and time of travel, which will be determined by an integrated GPS antenna/receiver.

Mileage-Based Road User Fees are being evaluated by Oregon DOT. A Road User Fee Task Force was formed to consider potential revenue sources to ultimately replace the fuel tax as the primary funding source for the state's highway system. The task force decided to go forward with a test of a vehicle miles traveled fee collected at the fuel pump, with data generated by either a simple GPS device or odometer sensor with automated vehicle identification technology.

**Oregon's House Bill 3946**

SECTION 1. The Legislative Assembly finds that:
(1) An efficient transportation system is critical for Oregon's economy and quality of life.
(2) The revenues currently available for highways and local roads are inadequate to preserve and maintain existing infrastructure and to provide funds for improvements that would reduce congestion and improve service.
(3) The gas tax will become a less effective mechanism for meeting Oregon's long-term revenue needs because:
(a) It will steadily generate less revenue as cars become more fuel-efficient and alternative sources of fuel are identified; and
(b) Bundling fees for roads and highways into the gas tax makes it difficult for users to understand the amount they are paying for roads and highways.

*-72nd Legislative Assembly, 2001*

***Car Sharing***

This strategy involves automated hourly neighborhood car rentals that substitute for car ownership. By sharing a neighborhood car, individuals eliminate their fixed monthly car expenses such as car loan and insurance costs, and instead incur a variable car payment based on usage. This type of voluntary change in the manner of payment for automobile use is expected to result in users more clearly perceiving and recognizing auto ownership and operating costs incurred. This will result in an increase in the perceived costs of driving (without a real increase). In effect, this type of value pricing provides an incentive for auto

users to reduce vehicle miles in order to realize cost savings. At the same time, the locality benefits from a reduction in vehicle miles and congestion.

In the U.S., there are active and growing car sharing programs in Seattle, Boston, San Francisco, Portland (Oregon), Chicago, New York, and Washington, DC. The majority of these programs operate as private for-profit enterprises. The City of San Francisco funded a portion of start-up costs for a non-profit program in the San Francisco Bay Area. Using Value Pricing Pilot Program funds, an evaluation of the impacts of car sharing on driving and congestion has been completed in San Francisco.

After two years of operation of the San Francisco program, a third of those who signed up for the program (i.e., "members") have reduced their car ownership by at least one car, and two-thirds report that they have opted not to purchase another car because of their participation in the program. In a matched pair comparison with non-members, it has been estimated that members drove 6.46 miles less per day than non-members. While this program has also enabled some prior transit users to make new automobile trips, the overall net impact seems to have been to reduce vehicle miles of travel among the members. Further, the observed trend of reduction in auto ownership among members promises significant future reduction in vehicle miles.

***Parking Cash Out***

With Parking Cash Out, employers offer their employees the option of receiving an increase in taxable cash income in lieu of free or subsidized parking provided by the employer. Participation is completely voluntary, but those choosing to cash out subsidized parking now face an increase in parking prices and thus now have an incentive to reduce automobile travel.

Parking Cash Out works best in areas where transit is accessible or where employees are willing to carpool, telecommute, cycle or walk. Parking Cash Out has been implemented at several employment sites in the states of Washington, Minnesota, and California. Studies at seven employment sites in Minnesota have shown that, on average, Parking Cash Out in those sites resulted in an 11 percent reduction in solo driving. A similar study, conducted for eight employers in California concluded that solo driving to work on those eight sites fell by 17 percent, carpooling increased by 64 percent, transit ridership increased by 50 percent, walking and cycling increased by 33 percent, and commuter parking demand fell by 11 percent.

The Program has funded a Parking Cash Out demonstration project in downtown Seattle, Washington in order to identify the determinants of success. Preliminary results from this project show that about 10 percent of those offered a parking cash out option accepted cash in lieu of subsidized parking. This is expected to result in a reduction in vehicle trips and miles traveled by those participating.

***Car Cash Out***

Car cash-out involves paying households to use one less car for a certain period of time. The idea is to provide pricing incentives for households to consider alternative modes of transport such as transit, carpool, cycling, or walking. The overall objective of this voluntary pricing strategy is to reduce solo driver travel by encouraging shifts to high occupancy vehicle use.

Over the long run, such a pricing strategy is expected to reduce auto ownership levels among participants and produce further reductions in automobile travel over time.

A demonstration involving three studies was carried out in Seattle, Washington. Participating households were asked to use one less car and keep daily records of their trips and transport modes used. Households were paid a weekly stipend (equal to the average national cost of owning a second vehicle) during the time of the study to simulate the savings they would realize if they actually were to sell one of their cars. Daily records, odometer readings, and anecdotal evidence were analyzed to assess whether households made significant behavior changes such as carpooling, using public transport, cycling or walking.

Results indicate that participating households reduced solo driving by 27 percent during the periods they were required to refrain from using one car. Of the 86 participating households in the three demonstration phases, 14 (i.e., 16 percent) sold their cars after the study ended, seven (8 percent) pledged not to replace their cars after their vehicles were retired, and nine (10 percent) plan to sell their cars. Over time, these reductions in auto ownership are expected to produce significant reductions in automobile travel by participants.

**Regional Pricing Initiatives**

> "Our intention is to promote the value pricing concept from long-range planning policy into an operational environment as quickly as possible. To make this happen, we are currently evaluating the feasibility of value pricing within our region, and then assuming we receive positive feedback we plan to undertake a demonstration project to prove the concept. At the same time we encourage major investment studies to consider value pricing and are also identifying corridors for potential long-term implementation as part of the metropolitan transportation plan."
>
> **Wes Beckham,** Transportation Engineer at the North Central Texas Council of Governments in Dallas.

Several metropolitan areas in the U.S. have initiated efforts to assess the feasibility of regional pricing programs. Portland, OR completed a regional pricing study in 2000, which led to selection of HOT lanes on Highway 217 as its first pilot proposal. Phoenix, AZ completed a regional study of potential opportunities for HOT lanes in 2002. As shown in Table 4, studies and outreach efforts are underway under the Program in the State of Maryland (including Baltimore and the Washington, DC suburbs), in the Twin Cities of Minnesota, in Dallas, TX, in the Northern Virginia suburbs of Washington, DC, and in the Seattle metropolitan area.

**Table 4. Value Pricing Projects - Regionwide Initiatives**

| State | Locality | Project |
|---|---|---|
| **Florida** | Statewide | Sharing of technology on pricing |
| **Maryland** | Statewide | Feasibility of value pricing |
| **Minnesota** | Twin Cities | Regional study and outreach |
| **Texas** | Dallas/Ft. Worth | Region-wide value pricing study |
| **Virginia** | Northern Virginia | Regional HOT Lanes study |
| **Washington** | Seattle area | Regional HOT Lanes study |

Note: Acronyms are listed in the front of the report

## III. PROJECTS AROUND THE WORLD AND VISIONS FOR THE FUTURE

### Pricing Initiatives in Metropolitan Areas

The United States is not alone in focusing increased attention on value pricing. Singapore is the world leader in road pricing, having successfully used value pricing to maintain congestion-free conditions on the city's major streets since 1975, and on its freeways beginning in 1998. London implemented a major congestion charging scheme in its central area in 2003. Other metropolitan areas in Europe and Asia have either implemented value pricing projects or are giving strong consideration to pricing as part of plans for the future of their transportation systems. Brief descriptions of some of the leading pricing initiatives are presented below.

#### *Singapore*

In downtown Singapore, traffic congestion was eliminated when peak-period pricing was introduced during the morning rush hours 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 pricing zone. In the spring of 1998, the city shifted to a fully automated electronic charging system, demonstrating the technical feasibility of this approach. Variable electronic charges were also introduced on the expressway system, with charges set by time of day to ensure free flow of traffic.

#### *Norway*

Four Norwegian cities, Oslo, Bergen, Trondheim and Stravanger, have established cordon toll rings around their central business areas. Initially, the purpose of these toll rings was to raise revenue to finance improvements to the transportation system, but the use of peak/off-peak toll differentials has had the effect of moderating peak-period traffic congestion, and is increasingly being looked at as a traffic management tool.

#### *London, England*

> "The people who said it would never work were wrong."
>
> **Alistair Darling**, Secretary of State for Transport, U.K.

On February 17, 2003, London implemented an ambitious plan for using pricing to combat congestion in central London. The scheme involves a standard per-day charge for vehicles traveling within a zone bounded by an inner ring road. The charge is in effect from 7am to 6:30pm. The congestion charge, together with improvements in public transit financed with revenues from the charging system, led to a 15 percent reduction in traffic in central London, with no significant displacement to local roads outside the area. The majority of ex-car users have transferred to public transport. Journey times to or across the charging zone have reduced by 13 percent, and travel time reliability has improved by 30 percent. Excess waiting time on buses has fallen by around one-third.

Congestion charges only apply in central London. Motorists are charged £5 a day to drive within the central city zone between 7am and 6:30pm on Monday through Friday. Drivers using a vehicle in the central zone pay the charge, either in advance or on the day of travel. The registration numbers of these vehicles are entered into a database. Drivers are able to

pay on a daily, weekly, monthly, or annual basis by telephone, regular mail, Internet, or at retail outlets.

A network of fixed or mobile cameras observes the license plates of vehicles entering or moving within the central zone. There are no tollbooths, gantries or barriers. Drivers do not have to stop. The license plate numbers are matched against vehicle registration numbers of those who have paid the charge. A number of exemptions from the charging plan are allowed, including a 90 percent discount for residents.

***Rome, Italy***

A "Restricted Traffic Zone" or "Z.T.L." was implemented in central Rome in March 1989. Automatic systems were implemented to monitor and regulate traffic entering the zone in June 1999. Restrictions are enforced at entry points into the zone either through optical reading of license plates and matching them with a list of authorized vehicles, or through automatic reading of a smart card. On October 1, 2002, Rome initiated access control using a flat fee. Data on Rome's access-controlled roads show a 20-percent reduction in traffic flows and a six-percent increase in public transit usage. The access control system comprises 24 electronic gates that identify and apply the applicable tariff for vehicle entrance into the restricted area. Anticipated benefits to air quality have been offset by the increase in the number of scooters and motorbikes on the roads. These vehicles are allowed unrestricted access into the zone. Public opinion indicates a 75-percent approval rate. Retailers have a 52.5-percent approval rating.

***Seoul, South Korea***

In November 1996, transportation officials in Seoul converted the fixed tolls on Nam San Tunnel Nos. 1 and 3 to variable tolls. The tunnels serve as critical arteries to the downtown area. The effect of the peak/off-peak price differential was to significantly reduce traffic levels and increase average speeds in the tunnels. Carpools, buses, and taxis travel free of charge through the tunnels. Their volume more than doubled during the first year after the variable tolls were put into effect. Variable tolls on these tunnels remain a part of the city's efforts to deal with traffic congestion problems.

***France***

French transportation officials have been using peak/off-peak toll differentials to spread peak-period traffic on major intercity routes for a number of years. In 1992, weekend peak surcharges and off-peak toll discounts were established on a toll route between Paris and Lille in an attempt to ease congestion on a major route to the beaches. The result was a significant reduction in peak-period traffic and an increase in travel speeds. The toll structure has spread the peak over a much longer time period and reduced congestion despite growth in weekend traffic since the time the toll policy was adopted.

***European Commission's PRoGRESS Project***

As part of the European Commission's PRoGRESS project, eight cities across Europe -- Rome, Trondheim, Edinburgh, Copenhagen, Genoa, Gothenburg, Helsinki and Bristol --are taking part in a four-year effort to develop and implement road pricing concepts and technologies. Pricing concepts being tested include cordon-pricing systems, where vehicles

are charged per trip across a cordon line, such as a ring road around a central business district; zone systems where charges are levied based on trips across zonal boundaries within the cordoned area; time-based charging systems; and distance-based charging systems.

## National Pricing Initiatives

The European Commission policy on infrastructure charging is embodied in the 2001 White Paper *European Transport Policy for 2010: Time to Decide.* The policy is based on principles of "user pays" and "polluter pays." Implementation of the policy has been slow due to implementation barriers, including public acceptance. However, a number of countries in Europe have implemented or are considering introducing distance-related charges for heavy goods vehicles (HGVs). These charges can differentiate between vehicles with different axle weights according to the distance they travel. Differentiation is more successful than with existing systems that use a combination of fuel tax and annual taxes on ownership. Moreover, when associated with satellite tracking systems, the charges can vary between road types. Switzerland and Austria have already implemented such schemes, and implementation by Germany is scheduled for early 2005. The UK is planning implementation in 2006, with extension to automobiles in 2010.

The European Union has funded a research project called DESIRE – "Designs for Interurban Road pricing schemes in Europe". The aim of the DESIRE project is to assess, through the development of realistic case studies, the prospects for inter-urban road pricing in Europe. The research seeks to deliver a set of best designs for future interurban road pricing schemes for heavy vehicles and an in-depth analysis of the different aspects influencing the success of the implementation of these schemes.

### *Switzerland*

Operation of the Swiss LSVA (kilometer-based heavy vehicle charge) commenced at the beginning of 2001. Switzerland replaced its previous heavy vehicle fee, which was based on time duration of usage, with a kilometer-based charge (LSVA) with rates differentiated by the maximum permitted weight and the emission class of the vehicle. When the system is fully implemented, users of goods vehicles above 3.5 tonnes will be charged on all public roads in Switzerland. The system is based on an On Board Unit (OBU) in each vehicle that is connected to the vehicle's tachograph (an odometer-like device required on all heavy vehicles) and records the distance traveled on roads in Switzerland. Foreign vehicles entering Switzerland can also register manually into the system at a border station and are charged according to their amount of travel when leaving Swiss territory.

The rates to be paid per ton-kilometer depend on the emission class, and vary between 0.01 and 0.014 Euro per kilometer. At the time this pricing system was implemented, the general weight limit for goods vehicles was raised from 28 tons to 34 t  Preliminary results showed that the number of long vehicles (more than 12.5 m) had decreased by 2.5 percent on trunk roads and 4.2 percent on motorways, after having increased within the past four years by five to seven percent annually on trunk roads and eight percent annually on motorways. It is likely that these changes were caused predominantly by the higher weight limit, which reduces the number of vehicles required to carry a given amount of freight. Also, an incentive was provided to improve transport logistics, leading to a reduced number of empty vehicle trips. No significant diversion of freight from road to rail has been demonstrated.

### *Austria*

Beginning in 2004, Austria began operating an electronic toll-collection system on its freeways and expressways. This system will allow payment of tolls based on the distance travelled without obstructing traffic flow. All vehicles above a permissible gross weight of 3.5 tons, i.e., mainly commercial vehicles are required to pay the toll. The rates are differentiated into three classes according to the number of axles. Vehicles with 2 axles pay 0.13 Euro per kilometer, vehicles with 3 axles pay 0.18 Euro, and vehicles with 4 or more axles pay 0.27 Euro.

Almost 2,000 kilometers of the existing road network are covered by the new microwave based toll-collection system that replaced the prior time-based road user fee. The revenues expected from the first year of operation are 600 million Euros, which will be exclusively used to maintain and develop the tolled network.

### *Germany*

On behalf of the German Ministry for Transport, a high-level Commission studied possibilities for future financing of the transportation infrastructure. The Commission recommended changing to a new system based on more financing from user charges. The Commission calculated that allocating to heavy goods vehicles (HGV) an average user charge of 0.15 Euro per kilometer would provide sufficient revenue to finance the costs of freeways. The German government has decided to introduce the new charge for heavy goods vehicles based on the kilometers driven on freeways. This charge will replace the existing time based user fee called "Euro-Vignette." The toll rates will be differentiated by the number of axles and the emission class of the vehicle for all trucks above 12 tons permissible weight. All freight vehicles with a permissible gross weight of 12 or more tons will be charged electronically using GPS. Net toll revenues will go toward transportation infrastructure. Calculation of the tolls will be based on distance traveled, number of axles, and the vehicle's emissions class.

### *Netherlands*

In June 2001, the Dutch Parliament gave conditional approval to a plan by the Ministry of Transport, Public Works and Water Management to implement variable road pricing in the Netherlands. The plan would be based upon the "Mobimiles Concept" that will allow for in-car or in-truck collection of data about distance driven, the location of the vehicle, and the time of day. These would then be used to calculate differentiated tariffs. The Mobimiles system would incorporate a number of value-added services, such as traffic warnings, alternative route suggestions, or electronic parking fee payment. Work on this system has been discontinued after a change in policy at the national level.

## **Long-Term Proposals in the U.S.**

In March 2001, a forum sponsored by the Federal Highway Administration and the Eno Transportation Foundation looked at future possibilities for pricing, political and institutional barriers to pricing, and policies to overcome existing barriers. Transportation experts in attendance envisioned a long-term scenario involving radical changes in the current funding and institutional arrangements in highway transportation. Participants felt that opportunities for pricing projects would be enhanced as movements are made toward increased

privatization of highway infrastructure. They also felt that pricing could play an important role as part of a new financing mechanism for highways as existing revenue sources, which are mostly based on fuel taxes, become less effective with the advent of vehicles fueled by alternative sources of energy.

The Reason Foundation has made proposals for a system of long distance, inter-city toll truck lanes that would be added to existing interstate highways. The truckways would be separated from regular traffic by continuous concrete barriers. The truck lanes would have their own entrance and exit ramps to avoid mixing heavy truck traffic with car traffic in the regular lanes. Proposals have also been made by the Reason Foundation to convert and expand existing stretches of HOV lanes into seamless networks of HOT lanes in major metropolitan areas. The networks would integrate high quality Bus Rapid Transit (BRT) service on the free-flowing lanes. Additionally, a recent research paper presented at the 2004 Annual Meeting of the Transportation Research Board proposes a system that seeks to eliminate *all* existing congestion on freeway networks in metropolitan areas, through a flexible, integrated approach comprised of three key features:

(1) Conversion of the existing freeway network *during peak periods only* into a premium-service free-flowing freeway network that provides new fast, frequent and inexpensive bus service; free premium service for carpools; and premium service for single-occupant vehicles paying a charge which varies to manage demand and keep the freeway congestion-free;
(2) An intertwined network of improved free arterial routes, including management and operations improvements; and
(3) Credits or refunds of peak charges for low-income commuters to address equity impacts and reduce the incentive for them to divert to an alternative free route.

A recent cooperative study sponsored by 15 States and FHWA has presented a new approach for charging vehicles that travel on public roadways. Key to the new approach is a simple on-board computer that stores a record of actual road use charges. Periodically, this record is uploaded and transmitted to a data processing center called the collection center. The center bills the vehicle owner and reimburses the states, counties, and cities operating the roads on which the vehicle has traveled. The on-board system is simple, secure, and capable of protecting the user's privacy. Importantly, the on-board system enables a variety of user charge conventions. In its simplest form, this approach can be used to assess a vehicle-miles-traveled (VMT) user charge. With a VMT user charge, the computer would calculate road mileage actually traversed. It then applies appropriate user charge rates to the mileage traveled within each jurisdiction.

# IV LESSONS LEARNED FROM THE PILOT PROGRAM

## Overview

Table 6 summarizes key information about the types of value pricing projects implemented in the U.S. during the past decade. Particularly with regard to operational projects involving tolling, the Value Pricing Pilot Program has demonstrated that:

- Pricing can be politically and publicly acceptable – so far, four priced lane projects and four variably priced toll facility projects are operating without any significant public or political controversy.
- Pricing keeps congestion from occurring on priced lanes, as demonstrated by the High-Occupancy Toll (HOT) lanes in the Houston, San Diego and Los Angeles metropolitan areas. It reduces congestion on toll facilities, as exhibited by shifts in traffic on variably priced toll facilities in New York, New Jersey and Florida.
- Pricing changes travel behavior, as shown by travel choices made by those motorists on toll facilities who choose to shift their time of travel to off-peak periods to take advantage of lower tolls (e.g., New York and Florida); and motorists who choose priced lanes (e.g., in Los Angeles, San Diego and Houston) to take advantage of faster and more reliable travel times.
- Pricing can improve utilization of existing highway capacity, as shown in San Diego, where traffic volumes have increased on the HOT lanes by as much as 140 percent (without loss of speed) to make use of spare capacity on these lanes. This project took traffic off the regular lanes and thereby reduced the congestion levels that they would have otherwise experienced.
- Pricing can provide funding for transportation improvements – new transit service was funded from toll revenues in San Diego, and the construction and operation of the new SR 91 Express Lanes in Orange County has been supported entirely from toll revenues.

While many of these impacts are what theory has predicted for decades, the contribution of the pilot projects is that they provide valuable real world, on-the-ground evidence that has been very useful to U.S. transportation professionals in their efforts to convince elected officials and the public about the potential impacts and benefits of pricing strategies. Elected officials have seen that some forms of pricing can indeed be acceptable to the public, and are more willing to explore this option. Several metropolitan areas in the U.S. have completed or have initiated efforts to assess the feasibility of regional pricing programs. HOT lane projects are being developed in a dozen States, and toll authorities in four States are exploring variable tolls to manage demand on their toll facilities.

Yet, issues remain with regard to public attitudes toward projects involving tolls; equity concerns; and political acceptance. Technical issues have also stalled several projects, including high construction costs that limit self-financing capability; access to and egress from priced lanes within freeways; and difficulties with regard to enforcement of toll exemption restrictions for high-occupancy vehicles (HOVs) on priced lanes. Private sector involvement in investment and operation of priced lanes has also encountered problems.

**Table 6. Comparison of Key Aspects of Operational Pricing Strategies**

| | Projects Involving Tolls | | Projects Not Involving Tolls | |
|---|---|---|---|---|
| | **Priced lanes on otherwise free facilities, including conversions of HOV lanes and new priced lanes** | **Variable tolls on toll facilities** | **Mileage-based user charges for insurance, taxes and leasing fees and car sharing** | **Parking pricing with cash-out of existing free parking** |
| **How does it reduce congestion?** | Keeps traffic free flowing on the priced lanes, maintains high vehicle throughput, accommodates some traffic previously using regular lanes | Shifts peak period travelers to other modes, routes and times | Reduces use of driving for all trips, both peak and off-peak | Induces solo-drivers to shift to other modes for their work trips |
| **What economic incentive is offered to change travel behavior?** | Prices change in the priced lanes to influence traveler choice and keep demand within pre-determined limits | Off-peak toll discounts, or higher peak tolls | Travelers save money by reducing driving | Cash or transit fare subsidies are offered in lieu of free parking |
| **What are the key observed travel impacts?** | In the peak hour, Express Lanes on SR 91 carry twice as many vehicles as the regular lanes, and speed is 3 to 4 times higher. | 4% to 7% reduction in peak period traffic observed in New York; 71% of participants shifted time of travel to get discount at least once a week in Florida | San Francisco, California's car sharing members drove 6.46 miles less per day than non-members | Average reduction in solo-driving of 11% observed at work sites in Minnesota*, and 17% at work sites in California* |

*The Value Pricing Pilot Program did not fund these projects

## Effects on Freeway Efficiency

Experience with the variably tolled Express Lanes on SR 91 in Orange County, CA has clearly demonstrated the ability of pricing to maximize freeway efficiency. The Lanes became operational in December 1995. Initially, due to the addition of four lanes in the median, there was little congestion on the regular lanes, since total capacity had increased by 50%, i.e. two lanes were added per direction to the existing four lanes per direction. However, by 1997, congestion had increased on the free lanes as demand increased due to development growth in Riverside County, from which most commuters on SR 91 come. As congestion increased, vehicle throughput decreased on the free lanes, consistent with freeway traffic flow theory.

In 2004, speeds are 60 to 65 mph on the Express Lanes while congestion on the free lanes reduced average peak hour speeds to no more than 15 to 20 mph. Moreover, the share of

vehicles carried in the peak hour of the peak day on the Express Lanes has increased to 49%. The peak hour occurs on Friday afternoon (5-6pm) in the eastbound direction. This means that the two express lanes each carry almost 25% of the vehicles. This also means that the remaining four free lanes are carrying 51% of the vehicles, or slightly more than 12.5% of the vehicles per lane. The Express Lanes are thus carrying almost twice as many vehicles per lane than are the free lanes. This demonstrates clearly the benefits of pricing on freeway lanes. Pricing allows twice as many vehicles to be served on a lane in the peak hour than the same lane without pricing. Also, it does so at three to four times the speed on the unpriced lane. Table 7 provides recent 2004 data on traffic carried on the Express Lanes and the regular lanes.

**Table 7. Traffic in the Peak Hours on SR 91 Eastbound on Friday Afternoon in 2004**

| | 9-Jan | 15-Jan | 29-Jan | 19-Feb | 4-Mar | 11-Mar | 25-Mar | Average | Share | Per lane |
|---|---|---|---|---|---|---|---|---|---|---|
| General Purpose Lanes | | | | | | | | | | |
| 4 - 5 pm | 3527 | 3578 | 3295 | 4218 | 3624 | 4163 | 3881 | 3755 | 54% | 939 |
| 5 - 6 pm | 3066 | 3098 | 2992 | 3823 | 3199 | 3633 | 3682 | 3356 | 51% | 839 |
| Express Lanes | | | | | | | | | | |
| 4 - 5 pm | 3192 | 3129 | 3242 | 3149 | 3257 | 3182 | 3342 | 3213 | 46% | 1607 |
| 5 - 6 pm | 3068 | 3200 | 3246 | 3110 | 3288 | 3184 | 3416 | 3216 | 49% | 1608 |
| Total | | | | | | | | | | |
| 4 - 5 pm | 6719 | 6707 | 6537 | 7367 | 6881 | 7345 | 7223 | 6968 | | |
| 5 - 6 pm | 6134 | 6298 | 6238 | 6933 | 6487 | 6817 | 7098 | 6572 | | |

## Public Attitudes

Despite several early successes, value pricing involving tolls still encounters public opposition. However, an 800-person telephone survey of I-15 users in San Diego in the Summer/Fall of 2001 found that support for value pricing is deep among the people who have the most extensive experience with value priced HOT lanes. This suggests that operational pilot projects can have a significant influence on public attitudes. Some of the findings from the survey are summarized below:

- *Overall Support*. Ninety-two percent of citizens think it is a good idea to have a time saving option on I-15.
- *Support Across All Income Groups*. While equity concerns have repeatedly been raised in areas with no experience with value pricing, in San Diego nearly 80% of the lowest income users of I-15 agree with the statement: "People who drive alone should be able to use the I-15 Express Lanes for a fee." Also, there was no significant difference of responses to this question when analyzed by ethnicity.
- *Regular Lane User Support*. Almost two-thirds of users who do *not* use the HOT lanes also support the HOT lane program.

- *Congestion Reduction*. Seventy-three percent of non-HOT lane users agree that the HOT lanes reduce congestion. Extending Express Lanes was the top choice for reducing congestion.
- *Support for Expansion*. Eighty-nine percent of users support extending the Express Lanes.

Both HOT lane and non-HOT lane users of I-15 felt that the most effective way to reduce existing and future congestion on I-15 was to add priced lanes. This option was even preferred over adding regular lanes, by a wide margin (37% for priced lanes vs. 26% for regular lanes). It appears that a large share of the public in San Diego have grown to understand the value of priced lanes, and that simply providing new general purpose lanes, without fees or other restrictions, will not help much in relieving congestion due to continuing increases in traffic.

## Equity Concerns and Political Acceptance

One of the most important political challenges to overcome has typically been the concern over equity. While surveys conducted on priced lanes in San Diego and Orange County have found that motorists from all income groups do use the priced lanes, those with higher incomes *do* use the Express lanes more often. Use increases with income, according to data collected on SR 91 in 1996 and 1999. In 1999, 45 percent of the highest-income quintile of users of SR 91 reported *frequent* use of the Express Lanes as a solo-driver paying the fee, vs. only 18 percent of users in the lowest-income quintile.

**Projects Stalled by Political Issues**

- Initial proposal on I-394 HOT lanes in Minnesota
- Regional priced network by United Infrastructure in Puget Sound, WA
- Bay Bridge peak period premium tolls in San Francisco, CA
- HOT lanes on Route 101 in Sonoma County, CA

What was learned from successfully implemented pilot projects, is that there are two key strategies that need to be employed to get public and political acceptance: (1) conducting an effective public information campaign early in the process; and (2) implementing an integrated package that addresses concerns of various user and income groups. These two strategies have been employed in many of the successful value pricing projects in the U.S., and in the recent successful London congestion-charging scheme.

"Planners must take stock of changes in demographics and attitudes that can provide opportunities for implementation of value pricing as part of a solution to congestion."

**Carol Flynn**, former Minnesota State Senator and Chair of the Minnesota Value Pricing Advisory Task Force

If a proposed value pricing project is to be publicly acceptable, its benefits must be clearly identified to motorists. Motorists may benefit either directly in the form of reduced travel delay and enhanced travel options, or indirectly through appropriate use of toll revenues. To help address equity, pricing may need to be combined with some form of direct benefits to those who pay tolls or those who give up the right to use facilities that were formerly provided without charge. These can take a number of forms, including highway improvement or expansion,

construction of new highways, provision of alternative modes of transport such as transit, or investment in other areas within the transport sector such as safety and environment. Other revenue allocations may include some kind of explicit compensation to low-income groups, such as toll credits similar to credits provided to low income public utility customers, tax credits to low-income commuters for tolls paid by them on value priced lanes, or toll credits provided to those who choose not to use value priced lanes, such as in the FAIR lanes concept.

## Technical Issues

Technical issues have also stalled several projects, including high construction costs which limit self-financing capability, access to and egress from priced lanes within freeways, and difficulties with regard to enforcement of toll exemption restrictions for high-occupancy vehicles (HOVs) on priced lanes.

*Cost and Financial Feasibility*

The operational HOT lane projects in the Program were relatively inexpensive to implement. The HOT lanes in San Diego and Houston did not involve new construction, since existing lanes were used. The SR 91 Express Lanes were constructed on existing right-of-way in the median of the facility. New rights-of-way did not need to be acquired. Also, construction of the lanes did not involve major modifications of existing freeway interchanges. There are no intermediate access points and only a single entry and exit is provided in each direction. Consequently, cost of construction per lane mile averaged only about $3 million, vs. nationwide average costs of almost $10 million per lane mile for high-cost urban freeway construction.

**Projects Stalled by Technical Issues**

- Route 1 in Santa Cruz, CA
- I-880 in Alameda County, CA
- SR 91 extension in Riverside County, CA
- SR 57 public-private proposal, Orange County, CA

On the other hand, revenues from operational HOT lanes vary significantly from one project to another. The Houston QuickRide projects, with only about 2,200 toll account holders, have an average of about 200 toll-paying vehicles per day. The rest are HOVs and buses. Toll-paying vehicles generate less than $100,000 annually, sufficient to cover only costs for operation of program. San Diego's HOT lanes carry over 5,000 toll-paying vehicles daily. The rest, approximately 17,000 vehicles, are buses and HOVs with two or more occupants. Tolls generate about $2.2 million annually, providing funding for on-going operation of the program and the operating subsidy for peak- and reverse-commute express bus service in the corridor. Finally, Orange County's SR 91 Express Lanes carry an average of about 30,000 toll-paying vehicles daily. Toll exemptions or discount tolls are provided only to HOVs with three or more occupants, zero emission vehicles and vehicles used by the disabled. Tolls generate almost $30 million annually, sufficient to provide funds not only for operation of the Express Lanes, but also to pay debt service charges on bonds amounting to approximately $130 million. The bonds were used by the Orange County Transportation Authority (OCTA) to finance the purchase of the franchise from the private company that constructed and operated the project through 2002.

Unlike SR 91, however, the two new HOT lane projects that broke ground in 2003 (i.e., extensions of the I-15 HOT lanes and Katy Freeway HOT lanes) will not be self-financing. The expansion and extension of the HOT lanes on I-15 in San Diego is projected to yield between $7 and $9 million in annual toll revenues at full build-out. This amount would be sufficient to pay for operations of the value pricing element, toll enforcement, and subsidy of an enhanced bus rapid transit (BRT) system that will operate in the corridor. Toll revenues from the existing I-15 Express Lanes will fund a portion of the design and installation costs of an upgraded and expanded electronic toll collection and monitoring system for the 20-mile Managed Lanes. This cost is less than two percent of the total project costs of $750 million. The Katy Freeway expansion project in Houston will include four HOT lanes and several new free lanes. Total costs, including costs for construction, right-of-way, engineering and project management will exceed $2.0 billion. However, the Harris County Toll Road Authority, the agency designated to operate the HOT lanes, expects that bonds backed by toll revenues will finance only $250 million of these costs.

*Traffic Operations*

Access to and egress from HOT lanes are proving to be major issues with regard to implementation of HOT lanes on urban freeways. Unlike the SR 91 and I-15 HOT lanes, which have a single point of entry and a single point of exit, other HOT lane projects being developed require multiple entry and exit points. This poses problems. Weaving through several lanes of traffic to use slip ramp entrances may pose safety problems, and may exacerbate congestion on the regular lanes. On the other hand, if direct connector flyover ramps are provided to allow direct entry and exit without having to weave through the regular lanes, construction costs rise precipitously, affecting financial feasibility of the HOT lanes.

Conversion of existing HOV lanes to HOT lanes might appear to be more financially feasible, since construction costs for new lanes are avoided. However, experience with projects under development suggests that the I-15, US 290 and Katy Freeway HOT lane projects cannot be easily replicated. Unlike these HOT lanes, few existing HOV lanes are barrier-separated. In many cases, no barriers or even buffers exist between regular lanes and HOV lanes, and use of plastic pylons to separate HOT traffic from regular lanes (as on SR 91) is not favored in regions of the country where snow removal must be undertaken.

*Enforcement*

Enforcing proper use of HOV and HOT lanes is generally more complicated than policing traditional toll facilities. Most HOV lanes do not have tollgates or electronic tolling. They rely on visual inspection (including camera monitoring) to count occupants – an approach that may require vigorous application to be effective. HOT lanes pose an additional challenge, in that vehicles not meeting occupancy requirements may still use the lanes if they pay a toll. This makes visual inspection insufficient, as both valid users and violators could be traveling on the lanes at the same occupancy levels. Relatively complex combinations of visual and electronic methods are thus needed to address enforcement in such situations. One approach to simplify priced lane enforcement is to charge all vehicles using the lane, as the State of Maryland has recently proposed. HOV vehicle occupants would still receive an effective discount, as the standard toll would be spread over multiple occupants of a single vehicle.

## V. SPREADING THE WORD

The Federal Highway Administration, working with its State and local partners, has carried out an active program of public outreach in support of the Value Pricing Pilot Program. The outreach program focuses on acquainting the public and transportation professionals with value pricing concepts and the possible role they might play in addressing local transportation problems. The program is designed to promote open discussions and citizen participation in the development of potential pricing projects. It also supports FHWA's project partners by providing opportunities for information exchange about issues related to project development. This section briefly summarizes some of the tools that have been used. The map below shows the location of five regional workshops, four project partners forums, and four issue forums co-sponsored by FHWA across the country.

**Regional Workshops –** Through a series of regional workshops on value pricing, the Pilot Program has stimulated interest in many parts of the country. Workshops have introduced the concept of value pricing to local audiences, featured presentations by representatives of active projects and examined potential pricing applications in the local context.

**Project Partners' Forums** – Another key element of FHWA's value pricing public outreach program is its Project Partners' Forum series. The Forum series brings together current and prospective partners in the value pricing program to discuss key technical and political issues associated with project implementation. Experts on various aspects of developing and implementing pricing projects are featured to stimulate forum discussions, and partners are given the opportunity to exchange ideas with their peers.

**Issues Forums –** The issues forums were designed to explore with stakeholders the longer-term potential for value pricing to address congestion problems. In 2001, two forums on value pricing issues were co-sponsored with the Eno Transportation Foundation. The first forum brought together national experts to consider the role of pricing in the nation's future transportation system. The second Eno forum discussed the potential of the innovative concept of FAIR lanes in addressing transportation problems, with a focus on the New York region.

In January 2002, fifteen members of the transportation community experienced in both freight movement and value pricing met to discuss the possibility of applying value pricing to freight transportation to maximize the efficiency of the flow of goods.

In November 2003, the Federal Highway Administration, the Organization for Economic Cooperation and Development (OECD), the Transportation Research Board (TRB), and the Florida Department of Transportation collaborated in sponsoring an international symposium to set the stage for consideration of wider implementation of innovative pricing strategies to meet congestion relief, emission reduction, and fiscal objectives. The symposium assembled key pricing experts from across the U.S. and overseas and provided a unique opportunity to synthesize the lessons learned about pricing policies throughout the world, including case studies from the United States, Europe, and Asia. An international group of participants discussed the rationale and motivations for implementing pricing; factors affecting the political and public acceptance of pricing strategies; the use of pricing revenues; and project outcomes. Drawing on papers, presentations, and symposium discussions, the TRB Steering

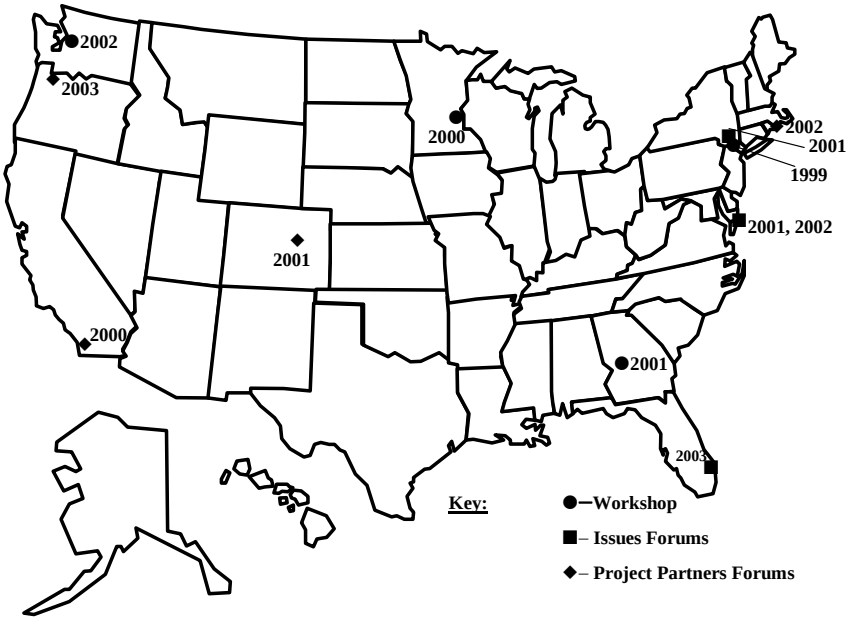
committee evaluated the current state of practice, assessed future directions and opportunities, and identified research and information needs.

**Other Outreach Resources** - In addition to the value pricing forums and workshops, FHWA carries out a number of other activities designed to promote program interest and provide information about value pricing and ongoing projects.

- ✓ FHWA supports program participants and those considering program participation by providing *advice and technical assistance*.
- ✓ FHWA manages a *national website* on value pricing at FHWA's Highway Community Exchange (http://knowledge.fhwa.dot.gov/cops/hcx.nsf/home). The website provides a center for the exchange of information about value pricing projects. The Hubert H. Humphrey Institute of the University of Minnesota, one of the project partners, also manages a web-based *List serve* on value pricing, a forum for on-line discussions of value pricing and related issues.
- ✓ *Federal Register Notices* announcing solicitations for program participation are published.
- ✓ A *brochure*, "Value Pricing Pilot Program: Notice of Grant Opportunities," describing value pricing and the Pilot Program, is disseminated.
- ✓ *Value Pricing Notes*, a newsletter on value pricing, is published.
- ✓ FHWA contributes *papers and articles* to professional journals and newsletters and makes presentations at professional conferences.
- ✓ FHWA works with the Transportation Research Board to include *sessions and workshops on pricing* in its Annual and Mid-year meetings.

In addition, Pilot Program participants are conducting numerous outreach activities including focus groups, media campaigns and neighborhood forums in project locations.

Value Pricing Outreach



## VI. CONCLUSIONS

Value pricing projects in the U.S. are breaking new ground and providing important lessons for those interested in exploring the use of market-based approaches in responding to traffic congestion problems. Observations from projects implemented to date reveal that travelers are willing to pay for improvements in transportation service and that pricing can lead to more efficient use of existing highway facilities. People respond to price signals when making transportation decisions, just as they do in other aspects of their economic lives, and those responses can serve as important guides for transportation planners and policy makers.

The FHWA and its State and local project partners have now had many positive experiences with the Value Pricing Pilot Program and its predecessor, the Congestion Pricing Pilot Program. Major successes are:

- Priced express lanes on State Route 91 (SR 91) in Orange County, California,
- Dynamic pricing on San Diego's I-15 priced express lanes,
- Priced express lanes on I-10 and US 290 in Houston,
- Variable tolls on bridges in Lee County, Florida,
- Variable tolls in New York and New Jersey on several major toll facilities, including the River crossings into New York City and the New Jersey Turnpike
- Peak-period premium tolls on the San Joaquin Hills Toll Road in Orange County, CA

The first three projects listed above are commonly referred to as HOT lanes. Some transportation experts expect HOT lanes to be part of the future freeway networks in all metropolitan areas.

Much has been learned about the promise and potential of value pricing over the last several years, yet much more remains to be learned. Many aspects and types of pricing remain untested in the United States:

- New tolls on one or two lanes while providing toll credits to motorists using the remaining "regular" lanes, a concept known as "Fast and Intertwined Regular" or FAIR lanes;
- New peak period tolls on all lanes of an existing toll-free facility, implemented in conjunction with new transportation alternatives, facility expansion or toll rebates for local residents;
- Mileage based insurance;
- Priced Q-Jumps at congested locations on the highway network;
- HOT lanes with multiple ingress/egress points;
- Pricing of an entire corridor;
- Region wide pricing.

Although value pricing is being tested in a number of locations and contemplated in many more, value pricing is still a new and innovative concept, one that requires careful planning, coalition building, public education and participation, and sufficient time and resources for the development of well designed and locally acceptable project plans.

The Value Pricing Pilot Program has funded a large number of "localized" or facility-specific pricing proposals involving single highway facilities or travel lanes. However, further efforts are needed for more comprehensive region wide applications of road pricing such as toll rings or toll zones on the scale of projects in Norway, Singapore and London. According to one study, in a typical large metropolitan area such as Washington, DC, introduction of region wide pricing with added freeway capacity could generate $400 million in toll revenues annually and $4 billion in net additional economic benefits from reductions in travel delay, fuel consumption, accidents and other social costs. Yet, there are large technical and political risks involved in piloting such a major path-breaking effort. Large U.S. metropolitan areas are likely to continue to be reluctant to take the risks involved in piloting a region wide pricing project unless political risk-sharing and financial incentives are available.

Transportation experts envision a long-term scenario involving radical changes in the current funding and institutional arrangements in highway transportation. Opportunities for value pricing projects would be enhanced as movements are made toward increased privatization of highway infrastructure. Value pricing could play an important role as part of a new financing mechanism for highways as existing funding sources become less effective with the advent of more fuel efficient vehicles and vehicles fuelled by alternative sources of energy.

The Administration believes that road pricing is an important tool that should be available to all states to address congestion and air quality problems. However, clearly, road pricing is not an appropriate tool to address every congestion problem. The Administration's Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA) reauthorization proposal, includes several proposals that will provide states and local governments the authority they need if they chose to implement road pricing. These proposals include the Variable Toll Pricing Program, the ability to convert HOV Lanes to HOT lanes, greater flexibility under the Interstate System Reconstruction and Rehabilitation Pilot Program that provides the ability to charge tolls on existing Interstates that are rehabilitated or reconstructed, and additional innovative financing proposals, including facilitation of Public-Private Partnerships.

The Administration is not proposing to mandate the use of road pricing, nor advocating the wholesale implementation of road pricing. The decision to consider or implement road pricing is a local decision. We do believe, however, that this tool should be available to those who choose it. The Variable Toll Pricing Program would be a broad, permissive program that would mainstream road pricing. Under current law, new tolls are generally not permitted on Interstate highways, except under the Value Pricing Pilot Program and the Interstate System Reconstruction and Rehabilitation Pilot Program. SAFETEA proposes that the authority to use variable tolls to reduce congestion be available to all 50 states, the District of Columbia, and Puerto Rico, on any highway, bridge, or tunnel – including Interstate facilities – with certain conditions. It also proposes that air quality non-attainment or maintenance areas be allowed to use variable tolls on any facility – including Interstates – to reduce emissions.

In conclusion, value pricing holds the promise of reducing congestion, enhancing mobility and economic productivity, and reducing environmental and energy costs. Despite the promise and potential shown in early value pricing projects and the prevalence of value pricing in other sectors of the economy (e.g. peak hour electricity use charges and peak-season air fares and hotel rates), the concept of value pricing is not without controversy. It involves what for many people is an unfamiliar approach to dealing with congestion problems and a new way of charging for road use.

Congress has provided the mechanism for achieving these important goals by authorizing Federal assistance to State and local efforts to incorporate pricing approaches into their congestion mitigation efforts. The Federal Government should continue to provide States and local governments with flexibility to consider and introduce value pricing to address their transportation needs.

# ATTACHMENT

**TEA-21 Pilot Program Authorizing Legislation**

*Section 1012, Public Law 102-240, as amended by P.L. 105-178(ə1216(a)), with technical corrections (P.L. 105-206, ə9006(b))*

(b) Value Pricing Pilot Program. -

(1) The Secretary shall solicit the participation of State and local governments and public authorities for one or more value pricing pilot programs. The Secretary may enter into cooperative agreements with as many as 15 such State or local governments or public authorities to establish, maintain, and monitor value pricing programs.

(2) Notwithstanding section 129 of title 23, United States Code, the Federal share payable for such programs shall be 80 percent. The Secretary shall fund all preimplementation costs and project design, and all of the development and other start up costs of such projects, including salaries and expenses, for a period of at least 1 year, and thereafter until such time that sufficient revenues are being generated by the program to fund its operating costs without Federal participation, except that the Secretary may not fund the preimplementation or implementation costs of any project for more than 3 years.

(3) Revenues generated by any pilot project under this subsection must be applied to projects eligible under such title.

(4) Notwithstanding sections 129 and 301 of title 23, United States Code, the Secretary shall allow the use of tolls on the Interstate System as part of any value pricing pilot program under this subsection.

(5) The Secretary shall monitor the effect of such programs for a period of at least 10 years, and shall report to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives every 2 years on the effects such programs are having on driver behavior, traffic volume, transit ridership, air quality, and availability of funds for transportation programs.

(6) HOV Passenger Requirements- Notwithstanding section 102(a) of title 23, United States Code, a State may permit vehicles with fewer than 2 occupants to operate in high occupancy vehicle lanes if the vehicles are part of a value pricing pilot program under this subsection.

(7) Financial Effects on Low-Income Drivers- Any value pricing pilot program under this subsection shall include, if appropriate, an analysis of the potential effects of the pilot program on low-income drivers and may include mitigation measures to deal with any potential adverse financial effects on low-income drivers.

(8) Funding-

(A) Availability- Funds allocated by the Secretary to a State under this subsection shall remain available for obligation by the State for a period of 3 years after the last day of the fiscal year for which the funds are authorized.

(B) Use of Unallocated Funds- If the total amount of funds made available from the Highway Trust Fund to carry out this subsection for fiscal year 1998 and fiscal years thereafter but not allocated exceeds $8,000,000 as of September 30 of any year, the excess amount--

(i) shall be apportioned in the following fiscal year by the Secretary to all States in accordance with section 104(b)(3) of title 23, United States Code;

(ii) shall be considered to be a sum made available for expenditure on the surface transportation program, except that the amount shall not be subject to section 133(d) of such title; and

(iii) shall be available for any purpose eligible for funding under section 133 of such title.

(C) Contract Authority- Funds authorized to carry out this subsection shall be available for obligation in the same manner as if the funds were apportioned under chapter 1 of title 23, United States Code; except that the Federal share of the cost of any project under this subsection and the availability of funds authorized to carry out this subsection shall be determined in accordance with this subsection.