

Chapter 16

Pricing

Introduction	16-2
Types of Pricing Projects	16-3
Variable Tolls on Existing Toll Facilities	16-3
Variable Tolls on Added Highway Lanes	16-3
Conversion of HOV Lanes to HOT Lanes	16-4
FAIR Lanes	16-4
Other Pricing Concepts	16-4
The Value Pricing Pilot Program	16-5
The Benefits and Costs of Pricing	16-5

Introduction

As discussed in Chapter 4, congestion on America's highways has been increasing in recent years as the growth in demand for highway usage has exceeded increases in road capacity. One approach to addressing the imbalance between supply and demand is to increase supply through highway system expansion. In recent years, however, there has been increased focus on factors influencing travel demand, particularly on the prices that highway users pay.

As discussed in Chapter 6, highways are funded primarily through a combination of fuel taxes, registration fees, tolls, and other taxes. Highway users also face other costs, such as vehicle operating costs and time costs, when using the roads. If the costs paid by drivers for making a trip are too low relative to the actual costs to society of that trip, however, then highways may be subject to overuse. This “underpricing” of highway use may occur for several different reasons:

- Drivers may not take into account the costs that their highway use imposes on others, such as environmental damage caused by using their vehicles. Also, highway users may only consider their own travel time in their trip-making decision, and not the additional delays that their use of a congested highway imposes on others.
- Highways generally have excess capacity in off-peak periods. The cost of providing the extra capacity needed for peak periods of heavy use can be substantial, however. For example, a 1992 study found that average construction costs for adding lanes in built-up urban areas amount to over 30 cents (in today's dollars) per mile driven on the added lanes during the peak periods that the lanes are most needed. However, variable user charges for highway use in the form of fuel taxes (which do not vary much based on when and where the motorist drives) average only 2 cents per mile.
- Some costs, such as auto insurance, may be paid for in fixed lump sums that do not correspond to actual use of the vehicle. As a result, the incremental cost of additional travel may be very low, thus encouraging overuse of the vehicle.

Road pricing involves adopting market principles to bring transportation supply and demand into balance. It typically entails fees or tolls for road use that vary with the level of congestion, which may be assessed electronically to eliminate delays associated with manual toll collection. It can shift some trips to off-peak times, less-congested routes, or alternative modes, or cause some lower-valued trips to be combined with other trips or be eliminated altogether. This concept of assessing relatively higher prices for travel during peak periods is the same as that used in many other sectors of the economy to respond to peak-use demands. For example, airlines offer off-peak discounts and hotels charge more during peak tourist seasons.

The promise of more rational pricing of transportation facilities is that it will lead to improved service for transportation users, more productive use of existing transportation capacity, and reduced need for future capacity expansion. A shift in a relatively small proportion of peak-period trips can lead to substantial reductions in overall congestion. And while congestion charges create incentives for more efficient use of existing capacity, they also provide improved indicators of the potential need for future capacity expansion. In addition, while pricing can create incentives for more efficient and productive use of highway capacity, it can generate revenues that can be used to further enhance urban mobility. Pricing can also bring about a more equitable distribution of the costs of highway capacity and usage among drivers and taxpayers.

Through pricing, highway officials manage the transportation system more effectively by improving its efficiency. In this regard, pricing may be considered a “demand side” counterpart to some of the highway operations strategies discussed in Chapter 21.

While this chapter focuses primarily on the technical aspects of pricing projects, the public acceptability of such projects is also a key consideration. This topic is covered in a separate biennial report to Congress, the “Report on the Value Pricing Pilot Program”, required by Section 1012 of the Intermodal Surface Transportation Efficiency Act of 1991.

Types of Pricing Projects

There are many kinds of pricing projects. Most of these involve the introduction of variable tolls on existing toll facilities, added highway lanes, or existing free roads. Others include the conversion of high occupancy vehicle (HOV) lanes to high occupancy/toll (HOT) lanes, fast and intertwined regular (FAIR) lanes, and mileage-based pricing. Many of these projects have been implemented in recent years while others are being considered by State and local governments and other highway authorities.

Variable Tolls on Existing Toll Facilities

On existing toll facilities, the tolls paid by drivers have typically varied by vehicle type and by trip length. Under pricing, however, these tolls may be varied by the time of day as well, to account for higher levels of congestion in peak periods. Recent examples of this approach include:

- Midpoint and Cape Coral bridges in Ft. Myers, Florida
- New Jersey Turnpike and Garden State Parkway, New Jersey
- Port Authority of New York and New Jersey bridges and tunnels
- San Joaquin Hills Toll Road in Orange County, California

The New Jersey Turnpike Authority and the Port Authority of New York and New Jersey launched variable tolling strategies in 2000-2001. The Turnpike program provides for tolls about seven percent lower during off-peak hours than during peak periods for users of the electronic toll collection system, while the Port Authority charges off-peak tolls 20 percent less than peak period tolls on its bridges and tunnels.

Early results from these two projects indicated that variable tolling has had an impact on travel behavior. In New Jersey, recent traffic increases on the Turnpike have been smaller in the morning and evening rush hours than in off peak periods. In New York, traffic has been reduced in the morning and afternoon peak, and has especially increased in the “shoulder period” just prior to 6:00 AM when the tolls are increased.

Variable Tolls on Added Highway Lanes

Pricing may be especially appropriate on new lanes added during a highway capacity expansion. The prime example of this strategy is SR 91 in Orange County, California. The SR 91 Express Lanes 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. Tolls on the Express Lanes vary by direction, time of day, and day of the week. The tolls are set to reflect the level of congestion delay avoided in the adjacent free lanes, and to maintain free-flow traffic conditions on the toll lanes. Tolls are collected electronically, and vehicles with three or more occupants pay a reduced toll.

Conversion of HOV Lanes to HOT Lanes

Another pricing strategy is to establish high occupancy toll (HOT) lanes on existing underutilized high occupancy vehicle (HOV) lanes. Under this approach, peak period tolls are charged to drivers of vehicles who choose to use the HOV lanes but do not meet the occupancy requirements. Examples include the HOT lanes on I-15 in San Diego, California, and I-10 and U.S. 290 in Houston, Texas.

Under San Diego's I-15 pricing program, customers in single-occupant vehicles pay a fee each time they use the I-15 HOV lanes. Toll revenues support express bus service in the corridor. The pricing policy has been effective in spreading traffic over the peak period and in shifting some traffic out of the peak into the off-peak periods.

Another advantage of the pricing schemes on SR 91 and I-15 is that they provide an option for premium service that a motorist can use when needing to be on time for a business or personal appointment, or when a parent needs to avoid day care late fees. Studies have found that such users of the two toll facilities include significant numbers of low- and medium-income drivers, and that there is broad support among all highway users in the corridors for the toll policies.

FAIR Lanes

A new pricing concept called Fast and Intertwined Regular (FAIR) lanes was developed by FHWA to overcome equity concerns that sometimes surround efforts to implement variable tolls on previously untolled highway capacity. FAIR lanes involve separating congested freeway lanes into two sections, fast lanes and regular lanes. The separation may be done with methods as simple as using plastic pylons and lane striping. The fast lanes would be electronically tolled, with tolls set in real time to ensure that traffic moves at the maximum allowable free-flow speed. Users of the regular lanes would still face congested conditions, but would be eligible to receive credits if their vehicles had electronic toll tags. The credits would be a form of compensation for giving up the right to use the lanes that had been converted to fast lanes. The credits could be used as toll payments on days when a traveler chooses to use the fast lanes, or as payments for transit or paratransit services, which would be subsidized using toll revenues from the fast lanes.

Other Pricing Concepts

In addition to road-use charges, there are other pricing concepts which rely on market principles to reduce peak period driving. For example, **mileage-based pricing** involves varying normally fixed vehicle use costs by extent of usage. Such strategies provide an incentive to motorists to save money by reducing their use of private vehicles. Examples of this type of pricing concept are "pay-as-you-drive" automobile insurance and car sharing (which involves substituting car ownership for variably-priced car usage). "Pay-as-you-drive" automobile insurance has been implemented on a pilot basis in Houston. Car sharing has been implemented in Boston; Seattle; Portland, OR; Washington, DC; and San Francisco. Other pricing concepts include parking policies, such as **parking "cash-out."** Parking cash-out involves providing employees who use free or subsidized parking at their worksites an option to receive from their employers the value of the parking benefit in cash if they choose not to drive to work. Parking cash-out has been implemented in Los Angeles and other metropolitan areas in California.

The Value Pricing Pilot Program

TEA-21 authorized the Value Pricing Pilot Program (VPPP), a successor of the Congestion Pricing Pilot Program (CPPP) authorized under ISTEA. As an experimental program, its objective is to learn the potential of different pricing approaches for reducing congestion. The grant program supports efforts by State and local governments or other public authorities to establish, monitor, and evaluate pricing projects, and to report on their effects.

Two important findings resulting from the operation of the early pilot projects are that drivers do alter their behavior in response to variable pricing, and highway users are receptive to pricing if it can be shown to provide them with improved transportation services. Direct impacts on highway system operations experienced as a result of operational pricing projects include:

- Improved utilization of available HOV lane capacity, thus allowing more people to be moved through the travel corridor
- Generation of revenues to support express bus service
- Shifting of trips out of the peak-congestion period into the shoulders of the peak, leading to more efficient use of available capacity
- Improved service for users by maintaining free-flow traffic conditions through the use of value priced priority lanes

There may often be political controversy associated with efforts to establish a new way of charging for highway use. This means that special emphasis must be placed on educational efforts before pricing projects are introduced. If a pricing project is to be successfully implemented, its benefits must be clearly defined to users, either directly in the form of reduced travel delay and enhanced travel options, or indirectly through targeted uses of toll revenues.

Introduction of pricing will need to be gradual, through pilot tests involving pricing on single lanes—such as converting underutilized HOV lanes into HOT lanes, or on single highway bridges or other facilities—before more comprehensive pricing initiatives can be launched. Also, pricing may need to be combined with some form of compensation provided to those who pay pricing fees or who give up the right to use facilities that formerly were provided without charge. Such compensation can take a number of forms, including highway capital improvements that benefit users of the corridor where pricing is occurring, provision of alternative transportation services such as transit, “life line” toll credits similar to credits provided to low income public utility customers, or toll credits provided to those who choose not to use value priced lanes.

The Benefits and Costs of Pricing

As the SR 91 example suggests, pricing can be politically acceptable in the U.S. when combined with highway capacity expansion. A recent study evaluated three future pricing scenarios involving the introduction of pricing in combination with adding a lane to a severely congested urban freeway:

- *Scenario A:* Higher tolls in peak periods on existing toll facilities and new tolls in peak periods on *all* lanes of existing toll-free highways when they are expanded. New tolls of 10 cents per mile would be charged. This is estimated to be equal to the incremental capital and operating cost per mile driven on *all lanes* during the peak periods;

- *Scenario B*: Peak period tolls on added lanes only, with tolls set high enough to ensure free flow of traffic in the added lanes; and
- *Scenario C*: FAIR lanes involving peak period tolls on two lanes only (i.e., one added and one existing lane) with tolls set high enough to ensure free flow of traffic in the fast lanes, and with toll credits provided to users of the remaining regular lanes.

A prototypical example involving the addition of a lane in each direction of a severely congested 10 mile long, six-lane urban freeway facility was used in the analysis. Benefits include the value of time savings from reduced traffic delays and reductions in other social costs. Exhibit 16-1 provides estimates of the annualized costs and benefits for each strategy for the 10-mile prototypical example. Costs include annualized capital costs for tolling infrastructure and annual toll operation costs. The results of the study indicate that substantial net benefits may be gained from implementing pricing in conjunction with highway capacity improvements.

Exhibit 16-1

Annual Net Benefits of Alternative Pricing Strategies in Conjunction with Expansion of a Prototypical Highway (Millions of Dollars)

SCENARIO	DESCRIPTION	COSTS	BENEFITS*	NET BENEFITS
A	Peak Period Toll on Entire Facility (10 cents/mi)	\$2.00	\$16.40	\$14.40
B	Tolling of Added Lanes	\$1.00	\$11.90	\$10.90
C	FAIR Lanes	\$2.00	\$21.20	\$19.20

* Benefits are estimated relative to a base case involving adding a lane in each direction with no value pricing.