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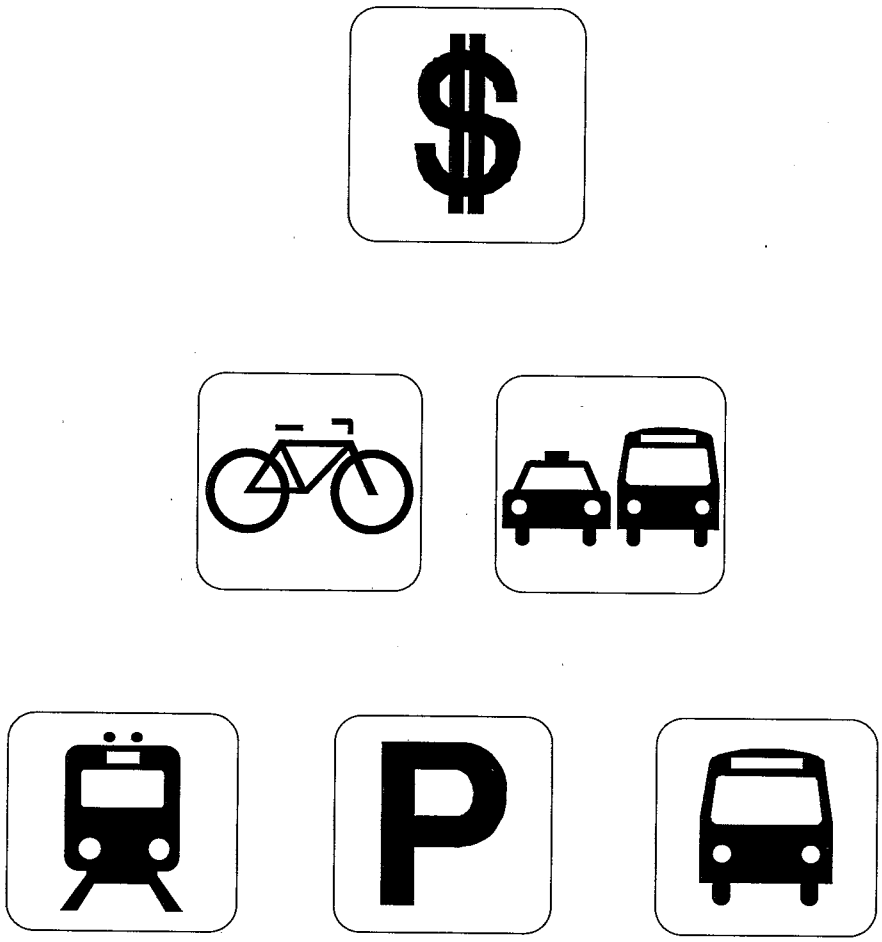
Opportunities to Improve Air Quality through Transportation Pricing Programs



Getting There with Clean Air

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Opportunities to Improve Air Quality through Transportation Pricing Programs

Regional and State Programs Division

Office of Mobile Sources

U.S. Environmental Protection Agency

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NOTICE

This technical report does not necessarily represent final EPA decisions or positions. It is intended to present technical analysis of issues using data which are currently available. The purpose in the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments which may form the basis for a final EPA decision, position, or regulatory action.

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This document benefits greatly from these real examples of transportation programs. Detailed information about each of these programs can be found in Appendix A.

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CHAPTER 1
Why Should I Be Interested in Transportation Pricing?

Question: What do the following have in common?

A. Smog, particulate matter, carbon monoxide
B. Greenhouse gases
C. Traffic congestion

Answer: They are just a few of the many reasons to employ transportation pricing programs.

This document is intended to give state and local air quality and transportation planners, elected government officials, and other interested parties background information on transportation pricing programs. Specifically, this document explains why pricing can make sense, the institutional relationships necessary for pricing measures to work, and some pitfalls to avoid in implementing a program. Examples of pricing programs adopted throughout the country illustrate these points. Our hope is to provide sufficient background information for city, county, regional or state governments to consider using pricing programs to help achieve better air quality, reduced congestion, reduced pollution of all media from the transportation sector, a more livable community, or all of the above.

The term "transportation pricing programs" encompasses a variety of different programs that have a common element: *they attempt to incorporate the costs of transportation decisions into a price that a consumer sees and pays directly.* The current pricing of transportation falls short of this objective.

THE COSTS OF AUTOMOBILE USE

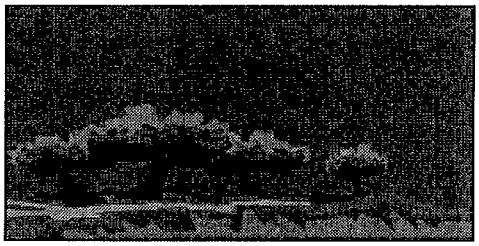
Driving an automobile imposes many different costs on society as a whole. The effects are both direct and indirect and result from the production, use, servicing, and disposal of motor vehicles. Environmental effects include air and water pollution, ozone depletion, effects on climate, hazardous and solid waste production, noise pollution, loss of habitat, species and biodiversity, and reduced visibility. Every car trip creates additional air pollution, water quality impacts, noise, and waste.

Other societal costs include traffic congestion, increased travel time, and money spent to construct, maintain, and monitor the transportation system. In the 50 largest U.S. cities,

traffic congestion and delays in 1991 resulted in estimated total economic losses of over $45 billion.[1] Driving cars also creates a need for additional public services to handle the problems caused by accidents: a significant portion of state and local police, fire, ambulance, and court system's resources are related to automobiles. In 1994, 40,676 lives were lost and 3,215,000 injuries resulted from motor vehicle accidents in the U.S.[2] There are also very high monetary and environmental costs associated with building and widening roads and constructing parking lots. Often, these costs are paid for roads to relieve heavy congestion only in the peak periods, which may only be 5 to 15 hours per week in each direction, or only 3 to 10 percent of the week. The other 90 to 97 percent of the time these large investments may not be in full use. Similarly, high costs are incurred in constructing parking lots. Most cities' parking requirements leave spaces vacant more than 99 percent of the time a shopping center is open for business, and leave at least half the spaces vacant at least 40 percent of the time.[3]

Though some of the costs of automobile use are paid through gasoline taxes, these taxes are not sufficient to cover all of these costs. The remainder of these costs are paid indirectly through property or income taxes, or are borne by society in the form of additional health costs, nuisance, or poor environmental quality. Most of these costs are "hidden" costs that are not directly paid by drivers at the time they make the decision to use their car.

Hidden Costs of Automobile Use



ENVIRONMENTAL
- Air and water pollution
- Ozone depletion and global climate change
- Hazardous and solid waste production
- Noise pollution
- Loss of habitat, species and biodiversity
- Reduced visibility

SOCIETAL
- Increased traffic congestion and travel times
- Increased money spent to construct, maintain, and

[1] U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Statistics Annual Report, 1996, Washington, D.C., 1996.

[2] Ibid.

[3] Shoup, Donald C., "An Opportunity to Reduce Minimum Parking Requirements," Journal of the American Planning Association, Winter 1995, p.19.

Environmental Costs

Automobile use imposes significant costs on society in terms of the environmental impacts. The relationship between vehicle use and air pollution, global climate change, and other environmental concerns is discussed briefly below.

Air Pollution

Despite considerable progress since the Clean Air Act of 1970, unhealthy air pollution levels still plague virtually every major city in the nation. Motor vehicle emissions contribute to four of the six criteria pollutants: volatile organic compounds (VOC) and oxides of nitrogen (NO_x) emissions, which combine to form ozone; carbon monoxide (CO); nitrogen dioxide (NO_2); and PM-10.

Pollution Volumes Resulting from On-Road Transportation Emissions in 1995

- Nearly one-third (27 percent) of VOC emissions;
- Over one third of the NO_x (35 percent) emissions;
- 64 percent of the CO emissions; and
- 12 percent of PM emissions.

Source: U.S. EPA. *National Air Quality and Emissions Trends Report, 1995*

Although today's cars are 70 to 90 percent cleaner than their 1970 counterparts, transportation emissions continue to be a significant cause of air pollution due to the rapid increase in vehicle travel since 1970. Vehicle miles traveled (VMT) have more than doubled in the U.S. from 1970 to 1990,[4] tripled from 1960, and increased even faster in many specific metropolitan areas. For example, VMT in Las Vegas increased 160 percent from 1981 to 1991, and nearly doubled in Phoenix in the same ten years. From 1970 to 1990, VMT increased 120 percent in the Los Angeles region, and 216 percent in San Diego.[5]

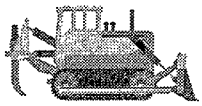
[4] U.S. Environmental Protection Agency, National Air Quality and Emissions Trends Report, 1995, Research Triangle Park, NC, October 1996.

[5] Information compiled by EPA based on reports from local air quality agencies.

Transportation Emission Sources

On Road: Cars, light trucks, motorcycles, and heavy duty vehicles (e.g., trucks, busses)

Non-Road: Recreation, construction, industrial, light commercial and logging vehicles,



From 1960 to 1995, per-mile emissions declined by 82 percent for VOC, 48 percent for NO_x, and 70 percent for CO.[6] Total emissions from on-road vehicles, however, have not fared as well: total VOC emissions declined only 41 percent, total NO_x emissions *increased* by 73 percent, and total CO emissions increased by one percent.[7] The available data for PM-10 show that on-road emissions decreased by 31 percent per mile between 1985 and 1995, but increased 9 percent overall.[8]

The health effects of these air pollutants range from headaches and eye irritation to reduced lung function, lung damage, respiratory disease (such as asthma and bronchitis), and cancer. According to the American Lung Association, the death rate for lung disease has risen faster than that of any of the other leading causes of death in the last decade. According to the American Lung Association, the health effects of air pollution are estimated to cost $50 billion each year.[9]

Global Climate Change

There is no question that the concentration of greenhouse gases in the atmosphere -- most notably carbon dioxide -- has been increasing, nor that the climate is undergoing changes. The questions are (1) how great that change is, and (2) to what extent human activity, such as the burning of fossil fuels, is responsible. The most recent assessment of the United Nations' Intergovernmental Panel on Climate Change (IPCC), made up of about 2,500 distinguished scientists from around the world, sheds light on these questions. In November of 1995, this group of scientists predicted that global temperatures would rise 2 to 6 degrees Fahrenheit over

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[6] Calculations based on data found in: U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, 1997, and U.S. Department of Transportation, Federal Highway Administration, Federal Highway Statistics, 1995, Washington, DC, 1996.

[7] U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, 1997.

[8] U.S. Environmental Protection Agency, National Air Quality and Emissions Trends Report, 1995, Research Triangle Park, NC, October 1996.

[9] American Lung Association web page. http://www.lungusa.org

the next century.[10] The IPCC has concluded that "the balance of evidence suggests that there is a discernable human influence on global climate." In December of 1997, the U.S. and other governments will convene in Kyoto, Japan to establish internationally binding targets for greenhouse gas reductions.

If temperatures rise as predicted, the potential cost of climate change to our environment and economy is enormous. Between September 1989 and September 1994, the world experienced at least 15 separate weather-related disasters in which financial losses exceeded $1 billion.[11] In addition to these weather-related events, predicted effects of large-scale climate change are loss of agricultural and forestry production, and large-scale damage from flooding and drought. According to Franklin Nutter, President of the Reinsurance Association of America, "the insurance business is first in line to be affected by climate change... it could bankrupt the industry."[12]

The combustion of fossil fuels is one of the major contributors to the increase in carbon dioxide emissions and emissions of other greenhouse gases. Our transportation sector alone is responsible for 32 percent of anthropogenic (those caused by human activities) CO_2 emissions in the U.S., which is seven percent of greenhouse gases world-wide. The transportation sector also has the highest rate of growth of CO_2 emissions in the U.S.[13]

Other Environmental Impacts

This introduction has an emphasis on air impacts because protecting air quality is the particular mission of EPA's Office of Mobile Sources. However, transportation activities affect and contribute to a great many environmental and ecological problems corresponding to EPA's mission as a whole. These effects are just as critical to public health and the health of the environment. Some of these environmental impacts are described below.

Water Pollution

Automobiles are a substantial source of water pollution in the form of urban runoff and atmospheric deposition. Urban runoff, loaded with pollutants that leak from or wear off automobiles, is washed off roads and other paved surfaces into surface waters and seeps into groundwater. The paving of land for roads and parking (around

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[10] "Climate Change 1995: The Science of Climate Change," edited by J.T. Houghton, L.G. Meira Filho, et al, Contribution of WG1 to the Second Assessment Report of the Intergovernmental Panel on Climate Change, 1996.

[11] Flavin, Christopher, "Storm Warnings: Climate Change Hits the Insurance Industry," World Watch, November/December 1994, p. 11.

[12] Ibid, p. 12.

[13] U.S. Department of Energy, Annual Energy Outlook 1997, Energy Information Administration, DOE/EIA-0383(97), December 1996.

40 percent of urban areas) increases the amount of impervious surface which in turn increases runoff and reduces groundwater recharge. This has the effect of increasing stormwater flows to sewer systems, which can lead to discharges of polluted water when municipal sewer systems become overloaded. Pollutants originating as air emissions from vehicles are also deposited from the atmosphere into surface waters.

Some of the pollutants associated with automobile use include grease, antifreeze, coolant and other engine fluids that contain tiny metal particles and other toxics; copper, lead and zinc from eroded brake pads; ferrous oxide and other metals from body rust and paint; rubber, steel and zinc from worn tires; motor oil and antifreeze spilled or dumped improperly; nitrogen from deposition of nitrogen oxide emissions; salt used on roads; gasoline from leaking underground storage tanks; and oil and other petroleum products that are spilled in transport.

Solid Waste

Solid waste generated from the construction of vehicles and roadways and the disposal of obsolete vehicles, as well as asphalt, concrete, and other materials, adds to landfills, contributes to air pollution if incinerated, and contaminates water systems. In addition, the improper disposal of materials, such as old tires, lead and acid in batteries, and pavement, remains a serious problem. Of the 242 million tires scrapped in 1990, 77.6 percent of them were landfilled, stockpiled, or illegally dumped.[14]

Land Use and Habitat

In the U.S., paved and unpaved public roads occupy 25,000 square miles of land, an area equal to the size of West Virginia.[15] Transportation infrastructure causes changes in drainage patterns, creation of microclimates, and fragmentation of animal habitat by creating barriers between previously joined areas. In addition, construction has led to the filling in of wetlands and other loss of habitat, which can have deleterious effects on the species that depend on each of those areas.

Widespread reliance on private vehicles has also encouraged low-density suburban sprawl. Such development consumes much larger amounts of land to serve a population than was needed in the past. Low-density development makes it much more difficult to carry out normal activities by walking, bicycling, or using public transit. As a consequence, less land can be protected and preserved, and open space is lost.

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[14] U.S. Environmental Protection Agency, Solid Waste and Emergency Response, Summary of Markets for Scrap Tires, 1991.

[15] U.S. Department of Transportation, 1996.

Pollution Control Costs

In addition to the environmental costs imposed by automobile use, there are also substantial costs to control pollution from mobile sources. According to the U.S. Department of Commerce, consumers, businesses, and governments in the U.S. spent $17.2 billion (in 1994 dollars) on air and water pollution controls for highway transportation in 1993.[16] This is roughly $1,150 per vehicle for emissions control.

ESTIMATES OF THE HIDDEN COSTS OF AUTOMOBILE USE

Several studies by the World Resources Institute, the Natural Resources Defense Council, and others have quantified the hidden costs of automobile use in the U.S.[17] These hidden costs represent the costs or impacts of automobile use borne by society that the individual consumer does not see or pay when choosing to use his or her automobile. In estimating these figures, these studies included the costs of all or some part of the following:

- Police, fire, ambulance, road construction and maintenance, and other related local government expenditures;
- Property taxes lost from land cleared for freeways;
- Parking;
- Air, water, land pollution;
- Noise, vibration damage to structures;
- Global warming;
- Petroleum supply line policing, security, petroleum production subsidies;
- Trade deficit, infrastructure deficit;
- Sprawl, loss of transportation options;
- Uncompensated auto accidents; and
- Congestion.

These studies determined that the total annual hidden costs of automobile usage ranged from $378 to $730 billion dollars (in 1991 dollars). This represents a subsidy of $5.21 to $10.07 per gallon of gasoline or $2,185 to $4,220 per car (in 1991 dollars) to automobile users.[18] Though some of the costs outlined above are paid by automobile users indirectly as

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[16] U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Statistics Annual Report, 1996, Washington, D.C. 1996.

[17] The resulting data from five studies referenced here were compiled by John Holtzclaw, a Ph.D. urban sociologist and regional planner in San Francisco, CA: Ketcham & Komanoff, 1992; Litman, 1992; MacKenzie, Dower, & Chen, 1992; Moffet, 1991; and Vorhees, 1992. The full citations for these studies can be found in the references section at the end of the document.

[18] Holtzclaw used the following estimates to make these conversions: 20 mph average fuel consumption; 72.5 x 10^6 gallons/yr U.S. gasoline consumption; 173 x 10^4 cars in U.S.

taxpayers, the remainder of these costs (or impacts on society through lower quality of life) represent a subsidy to automobile users. That is, the known or direct cost of vehicle use to the individual is *less than* the true or social cost of vehicle use. Thus, the "price" of vehicle use is distorted.

FIXING THE MARKET DISTORTION

As the figures above indicate, driving is severely underpriced because many of the costs are hidden, not incurred at the time of travel, or not paid based on how and when people drive at all. Only a small fraction of the total costs are paid directly by drivers at the time they make their decision use the car. This small fraction is what the driver pays in existing fuel taxes and tolls.

Consumers usually consider only their visible, immediate costs when making decisions about what to consume. Consumers of the roadways -- drivers -- may consider the cost of the gasoline or the wear and tear on their car when they are deciding whether or not to drive, but the other costs such as air pollution, potential effects of greenhouse gases, noise pollution, water pollution, traffic congestion, potential cost of accidents, or the costs of roads are most likely not factored into the decision. People will drive more when driving is cheap, and less when driving is more expensive. The subsidy on automobile usage leads to increased VMT and must be paid for through higher taxes, increased health costs, and increased costs of consumer goods. The current transportation system denies people choice and control over what they pay for and information about the true costs they bear.

Transportation pricing programs seek to remedy that disconnect. These programs use the power of the market by incorporating the cost of driving into consumer decisions. Increasingly, people are realizing that transportation pricing programs make sense: preventing pollution by reducing the incentives for more automobile travel is more efficient than finding expensive ways to clean it up later or imposing additional restrictions on other sources.

Though they have the common purpose of incorporating the "real costs" of driving into a person's travel decision-making process, each market incentive program will yield a different result depending on how it is designed, and at what point the person is aware of the cost of travel. These programs can be targeted towards specific pollutants, specific problems or goals, or particular areas. Though these programs can vary greatly because each one will be tailored for a specific area, transportation-related market incentive programs can be grouped according to which aspect of driving is charged. The types of programs discussed in this document are as follows:

- Fuel taxes or other at-the-pump charges, such as "pay-at-the-pump" insurance;
- Fees based on vehicle use and/or emissions;

- Roadway pricing, including road tolls, premium tolls, and congestion pricing; and

- Paying for parking and parking cash-out.

Also discussed in this document are the following:

- Subsidies for other modes of travel, such as transit and high occupancy vehicle (HOV) lanes. Subsidy programs do not try to incorporate the "real costs" of driving into a person's travel decision making, but instead try to make alternatives more appealing by lowering their price.

ADVANTAGES OF TRANSPORTATION PRICING MEASURES

Some key advantages of transportation pricing measures, which may be used to increase support for their introduction, include the following (adapted from Guidance on the Use of Market Mechanisms to Reduce Transportation Emissions, EPA and DOT, forthcoming):

- Applying pricing measures to achieve program objectives, in contrast to regulatory actions that compel governments or individuals to assume particular courses of action, provides considerable latitude for individual freedom of choice.

- By reducing driving subsidies and shifting costs to those who are responsible for them, pricing measures give individuals more information about their transportation costs and choices and are more fair.

- Consumers can make more rational trade-offs between how much they want to pay and how and when they want to travel under a pricing system based on true costs; the current system of indirect taxes and subsidies obscures the information necessary for such choices.

- Pricing measures can potentially be effective in reducing congestion or emissions much more quickly than building facilities or changing vehicles.

- Transportation pricing measures encourage markets to develop new and more efficient solutions to meet travel and access needs that are currently met mainly through private vehicle travel.

- Transportation pricing measures can be applied to all types of travel and trips, not just employment-related travel. This is in contrast to some TCM programs, which have been criticized as having a limited (and perhaps inequitable) impact because they affect only a portion of travel activity.

- Transportation pricing measures are typically self-financing and, in fact, may provide revenue to support their implementation as well as other transportation improvements.

- Transportation pricing measures can substantially reduce the cost of transportation (both direct and indirect). Reduced vehicle dependency can result in improved travel time and reliability in the movement of people and goods, reduced construction and maintenance costs, lower taxes, and fewer accidents in addition to lower health costs, and less environmental damage and clean up (water, climate, noise, solid and hazardous wastes, loss of open space, and habitat and species).

- Transportation pricing measures can help states and local areas delay or offset the need for expensive new transportation capacity, help finance that capacity, and bring about its most efficient use. They also can help cut costs for maintenance and government services.

- Longer-term, structural changes induced by transportation pricing measures are critical to the sustainability of transportation and air quality plans, and can help areas avoid recurring updates of their SIPs in search of new and stronger (and more expensive) controls to offset VMT growth.

Transportation pricing programs are not required by the Clean Air Act, they are an additional method for nonattainment areas to use in reducing emissions and can be adopted with a large degree of flexibility. Although EPA is enthusiastic about pricing programs, these programs are not necessarily a "quick-fix," or the solution for every area. These programs are another tool in the toolbox of strategies an area can use in the effort to attain better air quality and other benefits for its citizens. The actual results achieved will depend on the quality of the effort invested, as well as other factors, such as the availability of alternatives (e.g., transit or walking) to realistically accomplish trip purposes. But well-designed programs have great potential to reduce air pollution at a lower cost than other approaches, while also reducing a host of other environmental and social problems.

The remainder of this document is organized as follows:

- **Chapter 2** discusses, in more detail, the current price of automobile usage to the individual.

- **Chapter 3** introduces the various types of transportation pricing measures that can be used.

- **Chapter 4** investigates the institutional relationships that are necessary for the successful implementation of transportation pricing programs.

- **Chapter 5** discusses the role of public involvement and acceptance in the success of transportation pricing programs.

- **Chapter 6** examines the issue of equity in the context of transportation pricing programs.

- **Chapter 7** reviews the manner in which existing transportation pricing programs have been funded and identifies potential sources of funding for future programs.

In addition, the document includes appendices containing case studies on specific transportation pricing programs, a list of acronyms used throughout the document, and a list of references for obtaining additional information.

CHAPTER 2
The Current Price of Driving

Automobile drivers experience many costs in our society and must pay for many things. However, as noted in Chapter 1, drivers rarely pay directly for using the road network and rarely pay for the air pollution and other costs they impose on others. Rather, the road network, air pollution costs, and many other driving-related costs are paid for by society in general. Given the current situation, a stronger link must be made between the *price* of vehicle usage and the *costs* to society.

This chapter focuses on the various prices or expenses that drivers (or vehicle owners) must pay in order to drive their vehicles. For each of the costs paid by drivers or vehicle owners, the chapter attempts to divide these costs into those that are "use-related" and those that are "non-use-related." The chapter concludes with a brief discussion of the role that transportation pricing measures can play in making the price of driving more comparable to the costs of driving.

DISTINCTION BETWEEN USE-RELATED AND NON-USE-RELATED FEES

Drivers (or sometimes vehicle owners) pay for a multitude of vehicle-related expenses. These expenses can be broken down into three categories:

- Costs that are incurred at the beginning, during, or at the end of a trip are *use-related expenses*;
- Costs that are related only indirectly to travel (or vehicle use) and may or may not be incurred during travel (trip or driving cycle) are *indirect use-related expenses*; and
- Costs that are incurred regardless of whether the vehicle is actually driven at all are *non-use-related expenses*.

This chapter uses these three categories of expenses to describe the costs paid by travel consumers (i.e., drivers or public transit riders). These costs include vehicle purchase costs; gasoline costs and fuel taxes; automobile insurance costs; sales, property, and income taxes; registration fees; automobile repair and maintenance costs; tolls; parking fees; and transit fares. Recognizing where consumers pay for transportation, and whether these costs depend on the amount of driving done, is helpful in creating effective transportation pricing strategies. Transportation pricing programs can be designed to replace existing costs, such as vehicle

registration fees, sales taxes, or insurance costs. If designed appropriately, a transportation pricing program can yield the same amount of revenue while encouraging cleaner air.

Vehicle Purchase Costs

Most drivers who wish to have unlimited access to a vehicle must pay a price for that privilege, commonly known as the purchase price. The purchase price (primarily a component of the cost of vehicle ownership) is not used to support the transportation infrastructure, is not related to a trip, and thus is a non-use-related expense. The purchase price pays for the materials and resources that were consumed in manufacturing the vehicle, not for developing or maintaining the transportation infrastructure necessary for vehicle travel.

Gasoline Costs and Fuel Taxes

A driver or vehicle owner must buy gasoline (or some other fuel) in order to operate a vehicle. While the cost of gasoline is associated with personal mobility, drivers may not associate it with a specific trip, particularly if the trip is short; most drivers purchase gasoline at regular intervals rather than each time the car is driven. Fuel consumption costs depend on a vehicle's efficiency and how far the vehicle has traveled. Therefore, gasoline costs are use-related.

Gasoline taxes, which are collected by the federal government, are primarily used to subsidize construction and maintenance of the National Highway System and state roads. (This is not to say that fuel taxes fund all of the maintenance and construction costs of roads.)

Automobile Insurance Costs

Part of the responsibility of owning a vehicle is the purchase of automobile insurance. Because a driver's automobile insurance typically covers costs that result from mishaps that occur while driving, one might be tempted to call these costs "vehicle/travel use-related." However, insurance premiums are assessed periodically to cover costs that occur as a result of accidents or risky behavior (e.g., speeding or driving under the influence). While insurance costs may be in part based on yearly mileage, they are not incurred during a trip, and thus represent an indirect use-related expense. Finally, while insurance premiums are sometimes related to the number of miles an individual drives in a year, this relationship is not substantial.

Sales, Property, and Income Taxes

A consumer who purchases a vehicle must also pay sales and property taxes associated with the sale and ownership of the vehicle. Employed vehicle owners also incur income taxes. Each of these taxes supports government operations and pays for public services, including some related to the transportation system. These taxes are non-use-related because the fee (i.e., the tax) and the time at which the fee is incurred by an individual driver or vehicle owner are not associated with an actual trip.

Registration Fees

An additional cost of vehicle ownership is the registration fee. In most cases, registration fees cover the administrative cost of collecting and maintaining automobile and vehicle owner data. Registration fees are non-use-related, since vehicle owners must register their vehicles regardless of use. Registration fees are usually based on automobile market value (which discourages the purchase of newer cleaner vehicles), and not on vehicle miles traveled or time of day during which the vehicle is used.

Automotive Repair and Maintenance Costs

Sooner or later, all vehicle owners are faced with automotive repair and maintenance costs. Maintenance might consist of (but is not limited to) tire rotation/replacement, engine oil changes, windshield wiper replacement, replacement of worn brake pads, maintaining proper tire inflation levels, etc. The costs associated with routine maintenance and non-routine repairs are use-related, but only indirectly. Many maintenance activities are not absolutely necessary for vehicle operation, only for extended or enhanced vehicle performance. Also, maintenance costs only occur occasionally and are not associated with individual trips.

Tolls

At some point almost every driver comes across a road, bridge, or tunnel with a toll. Tolled facilities normally have booths set up to charge drivers some set price for utilizing the facility (stretch of road, bridge, or tunnel). The toll only covers a particular portion of the trip, and is encountered during a trip, rather than at the beginning or the end. Normally toll revenues are used to pay for road construction or maintenance or other transportation infrastructure expenses. Because toll road fees are incurred while driving, they are use-related (but are not congestion-related).

Parking Fees

In urban areas, drivers are often confronted with parking fees once they have reached their destination. In most suburban or rural areas, parking fees are extremely rare. Expensive parking charges may affect a driver's ability or willingness to travel to a certain destination. Since parking fees are assessed at the end of a trip, these charges are generally considered use-related. The fees collected normally do not support public road network expenses.

Transit Fares

Some travel consumers choose other options to meet their mobility needs. Many of them use public transportation (buses, light rail, subway, etc.) and are charged a transit fare. In some cases, transit riders are charged for a trip based on its length. In other cases, transit riders pay a fixed fee per use, regardless of the distance traveled. Transit fares are directly use-related because the consumers of public transportation are charged at the time of service, and the fare is used specifically to support the service.

CONCLUSION: THE ROLE OF TRANSPORTATION PRICING MEASURES

As this chapter has demonstrated, there are many costs that drivers must pay in order to own and drive their vehicles. As noted in Chapter 1, driving also imposes many costs on society as a whole, including pollution and congestion, that are not paid for by the individuals who created them. Market-incentive measures, such as transportation pricing, can be used to incorporate these external costs in the prices consumers pay for transportation, and thus can directly or indirectly affect consumer choices for transportation modes, travel times, as well as order and coordination of trips. Transportation pricing can replace other costs consumers face. In addition, transportation pricing can ensure that consumers in the marketplace pay a price that more accurately reflects the true costs of travel.

CHAPTER 3
Examples of Transportation Pricing Programs

In recent years, a growing body of studies, proposals and projects experimenting with transportation pricing measures has begun to emerge. Although many case studies continue to come from abroad, where political and cultural differences cloud some of the lessons those experiences might offer, transportation pricing measures are beginning to be used in the United States as well, particularly in severely congested and polluted areas like Southern California. Currently, FHWA's Congestion Pricing Pilot Project Program appears to provide the greatest impetus for such programs, offering funding, support and the opportunity to explore these measures in an experimental context (relieving some of the political opposition that might otherwise exist). A review of example projects, both hypothetical and applied, can be extremely useful in understanding the future such of market-based incentive measures in the U.S.

Parking pricing, roadway pricing, gasoline taxes, and modal subsidies have all been implemented to some extent while emissions fees and VMT fees have been the subjects of proposals. Other approaches, however, remain theoretical and have not been implemented. Because these measures are still in the early stages of development, there is significant variability and uncertainty as to the projected impact on congestion and air quality from each strategy. This chapter provides a general discussion of each measure, including examples of specific programs where possible, and discusses the projected travel and emissions impacts of these measures.

TYPES OF TRANSPORTATION PRICING MEASURES

There is theoretical and empirical evidence that mobile source pricing and market-based transportation controls can achieve effective and economically efficient greenhouse gas and criteria pollutant emissions reductions via travel demand management. As with any other economic activity that consumes scarce resources, motor vehicle travel involves a cost. Faced with alternative modes of transportation, multiple destination options, and a variety of routes from an origin to a destination, travelers select modes and routes on the basis of monetary cost, travel time, comfort, and convenience. In the case of motor vehicle travel, monetary costs often include operating costs, such as gasoline, parking, vehicle repair, and toll costs, as well as ownership costs, such as vehicle depreciation and insurance. While the latter costs may not seem to factor into each trip decision, the fact that the automobile owner has already invested heavily into that mode may encourage him or her to use it as much as possible rather than pay another set of costs to use mass transit, for example.

Travel demand is inversely related to the costs described above — as costs increase, the demand for motor vehicle travel decreases. The relationship between cost and the demand for motor vehicle travel has served as the underlying rationale for the design, development, and

implementation of strategies that attempt to mitigate the detrimental externalities associated with motor vehicle travel (e.g., air pollution, energy consumption, noise, etc.).

The purpose of this section is to review the types of transportation pricing programs that States and localities can implement to promote a more efficient use of the transportation system. The goal of these measures is to incorporate pricing signals that affect consumer travel decisions to encourage the use of environmentally cleaner modes of transport in an economically efficient manner. More specifically, the cost of travel, or transportation, is adjusted so that consumers in the marketplace pay a price for automobile travel that more accurately reflects the actual cost of driving in terms of air quality (among other societal costs - see Chapters 1 and 2). The pricing programs reviewed here are classified into the following categories:

- Parking management and pricing;
- Fuel taxes;
- Pay-at-the pump charges;
- VMT fees;
- Emissions fees;
- Road pricing; and
- Modal subsidies.

Each of these pricing strategies is discussed below. In addition, Table 3-1 summarizes the major transportation pricing programs in place in the United States and abroad. Detailed case studies are provided for several of these projects in Appendix A.

Parking Pricing

Given that employer-paid parking subsidizes about one-third of all automobile travel, and about two-thirds of all automobile travel in the morning peak,[19] parking pricing has the potential to be one of the most effective measures in reducing peak-hour congestion. Well over 90 percent of American workers receive free parking at their places of employment, an untaxed fringe benefit.[20] Employers and municipalities can reduce the number of automobile trips into a given area with parking strategies, thus reducing congestion, VMT, and vehicle emissions. These strategies can take the form of higher parking prices to account for parking's true cost and a charge to employees for parking. Parking strategies also include allowing employees to cash out of their parking benefits, or the choice of a parking space or a transit subsidy equivalent to the value of the parking space.

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[19] Shoup, Donald, "An Opportunity to Reduce Minimum Parking Requirements," Journal of the American Planning Association, Winter, 1995, p. 15.

[20] Downs, Anthony, Stuck in Traffic: Coping with Peak-Hour Traffic Congestion, Brookings Institute/Lincoln Institute, 1992.

Increasingly, employers are beginning to raise parking costs to bring them closer to market price in order to discourage the use of single occupancy vehicles (SOV), largely due to more stringent air quality requirements. In addition to employer-based policies, some cities and regions are also looking to use area-wide parking strategies to address severe congestion problems, particularly in large central business districts (CBDs). Some analysts encourage the development of these policies on a metropolitan scale in order to prevent overflow parking on residential streets or surrounding lots. Although few region-wide parking pricing programs are in place, the City of Minneapolis, Minnesota, Portland, Oregon, and King County in Washington have made efforts to put in place metropolitan-wide policies.

Despite recent discussions, there has been no action to reduce or abolish subsidized parking's tax-exempt status. There has been recent attention, however, regarding proposals to allow employers to offer transit subsidies, which can work in conjunction with increased parking prices to reduce SOV travel as an untaxed fringe benefit. There has also been recent attention regarding proposals to allow employers to give their employees the option of a parking space or the equivalent monetary value. This is known as "parking cash-out."[21]

Parking cash-out was recently made easier by the Tax Relief Act of 1997, which was signed on August 6, 1997. The new act changes the tax code to permit employees to accept cash in lieu of parking benefits. Effective during tax years beginning after December 31, 1997, employees may choose between receiving parking and taxable salary. And employers who want to offer their employees a choice between free parking or a raise in salary can now do so without losing the parking tax exemption for those employees who choose to keep their parking spaces (previously, the Internal Revenue Code provided that if an employer offered commuters the option to choose cash in lieu of a parking subsidy, the parking subsidy itself ceased to qualify as a tax-exempt fringe benefit).

This change gives employees greater freedom to choose how they commute to work. For employees whose only transportation benefit is parking can now accept a salary enhancement instead and use transit, walk, vanpool, carpool, or ride a bicycle to work. This greater flexibility may shift single occupant vehicles from our highways and contribute to reduced congestion.

Case studies suggest that parking pricing strategies are most effective in areas where transit is already available. However, even where no public transportation exists, higher parking costs would encourage more ridesharing.[22] If rideshare or park-and-ride services are offered in addition to increased parking prices, this would further promote van- and carpooling.

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[21] For more information on parking cash-out, see Shoup, Donald, "An Opportunity to Reduce Minimum Parking Requirements," Journal of American Planning Association, Winter 1995, p. 14.

[22] Downs, Anthony, Stuck in Traffic: Coping with Peak-Hour Traffic Congestion, Brookings Institute/Lincoln Institute, 1992.

Fuel Taxes

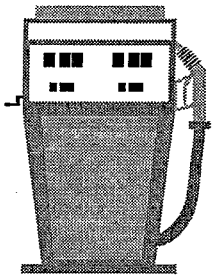
This pricing strategy involves taxing fuel to more accurately reflect the costs associated with single occupancy vehicle highway travel. The primary goal of fuel taxes is to discourage private vehicle (principally single occupancy vehicle or SOV) use by effectively and directly increasing the cost of travel. Fuel consumers (drivers), through their pocketbooks, become more cognizant of the societal costs or externalities (e.g. air pollution) imposed by SOV travel.

Because driving becomes more costly for all travelers, fuel taxes tend to indirectly affect mode shift, as well as the frequency and duration of trips. These impacts often lead to decreases in vehicle miles traveled (VMT). VMT reductions, in turn, can positively impact air quality by reducing emissions. If the primary goal of a pricing strategy is to reduce air pollution, then taxing fuel can be viewed as a means of pricing the pollution associated with fuel use.

Fuel taxes have long been used in this country to recover a portion of road construction and maintenance costs. In recent years, however, federal and/or state fuel taxes have increasingly been viewed as a potential tool for recovering other costs as well as for reducing VMT and encouraging improvements in fuel efficiency. Proposals to tax fuel based on carbon emissions, to increase taxes to cover all road costs, or to use high taxes to discourage driving in general have all surfaced. In 1993, fuel taxes made up approximately 23 percent of fuel prices, but a very small percentage of total car ownership costs.[23] As fuel tax advocates point out, American gasoline prices are a mere fraction of those in other industrialized nations, most notably Japan and Italy. Countries such as Sweden may levy several taxes on fuel alone.

Effect of Fuel Taxes on Motorist Behavior

Advocates of higher fuel taxes point to their ability to levy the costs at the source of the activity. The oil crises of the 1970s are often pointed to as an indication of the enormous response of the American public to radically increased gasoline prices. Some economists argue, however, that scarcity played more of a role in that situation than price. While various estimates for the elasticity of gasoline demand exist (see later discussion on elasticity), it is clear that certain factors can affect a consumer's response to a change in the cost of fuel. One such factor, which is crucial to the success of most transportation pricing measures, is the availability of alternative forms of transportation in the affected region.



There are significant obstacles to increasing fuel taxes to capture more of the social costs of driving (e.g., congestion and pollution costs). Most estimates suggest that prices would have to be raised by more than $1 per gallon to significantly influence driving behavior.[24] Public outrage at higher taxes in itself is probably enough to prevent any proposal from getting very far

[23] U.S. Bureau of the Census, Statistical Abstract of the United States: 1993, 1993.

[24] MacKenzie, James J., Roger C. Dower, and Donald D. T. Chen, The Going Rate: What It Really Costs to Drive, World Resources Institute, Washington, DC, 1992. Also, Downs, 1992.

without a very thorough public education campaign. In addition, border issues can play an important role, unless the majority of fuel taxes were levied on the federal level. For these reasons and others, discussion of higher fuel taxes in this country remains just that for the time being.

Another fuel tax strategy, which could be used as a transportation pricing strategy, is to reduce existing taxes for "clean" or alternative fuels. In fact, until the year 2000, a 5.4 cent exemption from federal gasoline taxes exists for fuels containing at least 10 percent ethanol.

Pay-at-the-Pump Charges

Pay-at-the-pump (PATP) charges are distinguished from fuel taxes in that they are designed to shift the collection of driving-related costs away from the current system of annual or semi-annual lump-sum payments, to payments made when gasoline is purchased. In most scenarios, this measure does not add costs, but simply shifts the point of payment in order to reinforce the perceived relationship between cost and behavior. As noted by EDF economist Michael Cameron, "the longer the period between the time people drive and the time when they must pay the fee, the less impact the fee will likely have on people's decision to drive." The costs shifted to the pump could include insurance premiums, vehicle registration fees, and emissions testing and inspection/maintenance fees. Some proposals also suggest that a surcharge be added to more fully recover the costs of road construction and maintenance. *Although this measure has not been implemented*, it closely resembles the widespread use of fuel taxes to cover a portion of such costs. If implemented, however, this type of PATP charge would factor in the remaining portion of road costs that are currently not paid for through gasoline taxes. The most salient distinction between PATP fees and simpler fuel taxes is that PATP charges could replace emissions testing fees and registration fees, or other costs that drivers must pay, such as automobile insurance.

PATP charges would generally be levied on a per-gallon basis, therefore discouraging fuel use, VMT and vehicle emissions. Traffic congestion and the associated air quality impacts are only indirectly affected (depending on the price of the charge) because peak travel and travel on crowded roadways is not specifically discouraged. Reductions in both congestion and air pollution are expected, however, as some travel would be reduced in response to the change in the collection of the various costs of driving. At least initially, higher fuel prices would result in motorists cutting down on the most unnecessary or lowest value trips. Work trips, which tend to fall during peak hours, would likely be the last to go. PATP charges are also expected to encourage shifts to more fuel-efficient engines, because reducing fuel use could result in a significant amount of savings.

Estimates of the elasticity of fuel use in relation to fuel costs range from -0.2 to -0.3 in the short term, and from -0.05 to -0.22 in the long-term.[25] Short-term responses to higher fuel prices will likely be slight decreases in VMT, while the longer term will bring slightly more reliance on fuel-efficient engines, depending on the magnitude of the price change. (See sidebar for further explanation of price elasticity.)

Price Elasticity

Elasticity is a measure of the sensitivity of demand relative to price. Elasticity indicates how consumers will respond if the price of a product changes. Technically, price elasticity measures the percentage change in demand for a good relative to a one percent change in the price of that good. Thus, a price elasticity for fuel of -0.02 indicates that if fuel prices increase by 10 percent, the demand for gasoline would decrease by 2 percent (-2%/10% = -0.02)

Theoretical estimates for PATP charges, factoring in road construction and maintenance costs, suggest adding an additional 10 cents per gallon fee to cover these costs.[26] If insurance costs were included, the additional fee would rise to 25 cents per gallon.[27] Any large-scale efforts to shift driving costs to pump charges are likely to include insurance reform. States considering automobile insurance reform, such as Florida and California, have in fact, tended to be the ones considering PATP scenarios.

In a PATP insurance scenario, drivers would pay a small premium per gallon of gasoline that would cover the "actual risk associated with driving the distance that a typical car can travel on a gallon of gas."[28] A similar system can be applied based on the number of vehicle miles traveled (see below). High-risk vehicles or drivers would most likely be required to pay a registration or licensing surcharge to make up the difference in their insurance premiums. The process of obtaining insurance would be simplified, and uninsured portions of the population (close to 30 percent of drivers in some areas) would be significantly (if not entirely) reduced. In a California proposal, the money would be collected by the state with the tax money it already collects at the pump.[29] The funds would then be distributed to a series of private insurers proportional to their coverage. Such a program could save many drivers money by reducing costs for uninsured motorists and would provide incentives to increase fuel efficiency.

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[25] Deakin, Elizabeth and Greig Harvey, Transportation Pricing Strategies for California: An Assessment of Congestion, Emission, Energy and Equity Impacts, Technical Report prepared for the California Air Resources Board, June, 1995.

[26] Cameron, Michael, Efficiency and Fairness on the Road: Strategies for Unsnarling Traffic in Southern California, Environmental Defense Fund, Oakland, CA,1994; also Downs, 1992.

[27] Cameron, 1994.

[28] Deakin, 1995.

[29] Deakin, 1995.

Furthermore, PATP charges encourage a reduction in VMT because drivers will be more aware of how much money they actually spend per mile of travel.

One of the greatest barriers to PATP measures are border issues. PATP charges would require state or large regional participation in order to make all of the necessary institutional changes. Residents of jurisdictions that have implemented the program would have significant incentives to cross jurisdictional lines for cheaper gasoline. As a result, implementation on a larger scale, whether county, state or federal level, could be useful in reducing side effects that might result around border communities. Although a growing number of states have begun to consider PATP charges, this type of measure has not yet been implemented. In addition, public acceptance of any type of gasoline price increase might make a PATP program difficult to implement. Thus, any such program would need to be augmented with significant public education efforts.

VMT Fees

Fees based on the number of vehicle miles traveled (VMT fees), which are levied as a surcharge on every mile of travel, generally fall into one of several categories depending on where and when they are levied. If the fees are assessed at the pump as additions to the price of gasoline (assuming that each gallon represents a certain number of miles traveled), they are viewed as PATP charges. If they are assessed as per-mile tolls for the use of specific facilities, they fall under roadway pricing. They may also be attached to registration or emissions fees, in the form of per-mile surcharges that may vary by the emissions class that a vehicle falls into or measured emissions.

However they are levied, VMT fees promote reductions of both congestion and pollution. In contrast to measures such as gasoline taxes, where the costs can be reduced with more efficient engines, the only way to reduce one's costs under this measure is to drive less, thus reducing emissions and traffic. Although VMT fees can impact both pollution and congestion, they are likely to have a lesser effect on either than a fee designed specifically to reduce vehicle emissions or traffic congestion individually. This is primarily because VMT fees charge a flat fee for every mile driven, whereas a more specialized fee would vary based on the emissions characteristics of the vehicle, the air quality conditions during the time of travel or the traffic conditions during the time of travel. The effect of a VMT fee will depend on the size of the fee, the types of vehicles currently driven, how the program is administered, and the availability of travel alternatives in a particular area.

Emissions Fees

Emissions fees (often referred to as "smog fees," particularly in California) propose to internalize the costs of pollution by charging drivers per pound of gaseous emissions they create. These fees directly affect emissions by encouraging a shift to cleaner burning engines and reduced use of higher polluting vehicles. A recent study in Southern California reviewed the

possible impacts of emissions fees and concluded that, when combined with other measures, emissions fees could reduce emissions and congestion significantly. This and other studies showed emissions fees to be very effective for reducing gaseous emissions.

The use of emissions-based fees has been considered by several states including California, where smog fees have been repeatedly proposed, and Maryland, where the state legislature adopted a system of emissions fees in 1994. The Maryland emissions fee plan was overturned, however, on the grounds that it violated the State's constitution. Thus, although emissions tests are required and often associated with testing fees in some parts of the U.S., charges on actual emissions have not been implemented.

It is also possible to vary other related fees and taxes, including taxes on the purchase of an automobile (very high in Scandinavian countries and Singapore) or registration fees, based on the automobile's fuel efficiency, engine type (diesel, gasoline, alternative fuel), engine size or power, or vehicle age or weight. These types of fees are related to emissions fees and could affect the types of vehicles purchased depending on how the fees are determined.

Roadway Pricing

Roadway pricing refers to the use of fees on any road for any purpose. As a transportation pricing strategy, this measure attempts to cover road costs and can serve to reduce congestion or travel on specific facilities, roadways, or in general regions by implementing fees that increase the costs of driving in these areas and/or at specific times of the day. The idea is that drivers will respond by (1) driving during non-peak hours, thus spreading out traffic more evenly throughout the day; (2) driving on other, less-congested and perhaps underutilized roads; (3) telecommuting rather than driving to work; or (4) switching to other modes (such as transit, bicycle, walking, or higher occupancy vehicles). This measure may also be used to fund road construction and maintenance. Generally, roadway pricing falls into one of three categories.

- ***Facility pricing***, under which fees are assessed for travel on a bridge, tunnel, or similarly small, but easily controlled segment of a road. Facility pricing may be easier to implement on a local level than pricing a longer segment of road.

- ***Road pricing***, which is assessed at one or more points (traditionally, toll booths) along a specific roadway. This pricing may be more effective in reducing VMT than facility pricing.

- ***Cordon pricing***, under which fees are assessed for travel within a particular area. Cordon pricing establishes a series of pricing points in a ring around the congested area, whether it be a central business district or a greater metropolitan area. Motorists are then charged as they enter the cordoned area.

Congestion pricing is a type of roadway pricing that refers to the use of fees for the specific purpose of reducing congestion. Under a congestion pricing strategy, the fees for traveling on a congested transportation facility or area may vary by location, time, distance traveled, or vehicle occupancy according to the level of congestion. During periods of congestion, or "peak" periods, the charges will be higher. Travel during "off-peak" periods (i.e., periods of lesser or no congestion) will be less expensive or free.

Roadway Pricing and Technology

The use of roadway pricing has been greatly facilitated in recent years by significant advances in technology, which reduce operational costs, radically improve traffic movement (by eliminating the need to stop at toll plazas), and facilitate toll collection and enforcement. The major innovations include automatic vehicle identification (AVI), which utilizes vehicle-mounted transponders and roadside sensors, and automatic toll collection (ATC), which often uses pre-paid monthly balances to facilitate billing. Such technology is in the process of being implemented in Singapore, and is already in place along California's State Route 91. Opened in December of 1995, the California SR-91 Project operates on a 10-mile stretch of highly-congested highway in the Los Angeles metropolitan area and is heralded as the world's first entirely automated congestion pricing program (see Appendix A for more information on this project). This type of technology is an enormous boost in the practicality, effectiveness, and public appeal of congestion pricing.

Roadway pricing, and particularly congestion pricing, is the market-based measure that appears to be receiving the greatest attention in the United States (particularly as a result of FHWA's Congestion Pricing Pilot Project, which has led to a number of studies, proposals and actual projects). In addition, international experience provides further insights into these concepts. The city-state of Singapore introduced a cordon scheme of congestion pricing in the late 1970s that continues to expand today. In Norway, the three largest cities have used a similar system to raise funds for transportation projects, and Sweden will be following through with a series of measures to combat congestion and pollution in the greater Stockholm area.[30]

Currently, twenty states have roadway pricing in the form of toll roads, bridges or tunnels with costs averaging between $0.02 and $0.10 per mile.[31] Congestion pricing schemes greatly increase those rates, but drivers have demonstrated a fairly strong willingness-to-pay when the fees offer some perceived value, such as time savings or improved road conditions. This is perhaps why congestion pricing is an increasingly popular form of transportation pricing.

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[30] U.S. DOT, Federal Highway Administration, Congestion Pricing Notes, (various from 1996).

[31] Deakin, 1995.

Example: The California SR-91 Project and the San Diego I-15 Express Lanes Project

California SR-91 is the result of a public-private partnership in which a private company sets up, maintains and operates a stretch of toll road for profit. The California Department of Transportation (Caltrans), the main public partner, benefits by gaining additional HOV lanes that could not have been built without private financial support. Early in the development of this project, public support was exceedingly low, based on objections to the pricing of an historically free roadway. After an extensive educational campaign, however, public response improved significantly as road users understood that the tolls would make possible the construction of new capacity, that congestion was likely to decline, and that existing lanes would not be charged. A similar situation exists with San Diego's I-15 Express Lanes Project. Under this project, SOVs may pay for access to underused HOV lanes. Surveys found significant support for the San Diego measure and a widespread willingness-to-pay for reductions in travel time. (See Appendix A for more information on these

Modal Subsidies

Modal subsidies involve providing financial support to alternative modes of transit, including bus, rail, HOV, or alternative fuel vehicle travel. A subsidy represents a situation where the amount users pay for a given transportation mode is intentionally set at less than the cost to the supplier of that service. Subsidies are most often used as a means of encouraging the use of particular transit modes. Providing subsidies to alternative travel modes can serve to support increased transit options for citizens as well as increase air quality and decrease congestion.

Subsidies can take a variety of forms. For example, they can involve the general underwriting of transit costs, selected transit fare discounts, transit matching subsidies, or vanpool and paratransit subsidies. Subsidies can target specific groups or a general lowering in price of a given mode of travel for all citizens. Short term subsidies can be effective by initiating mode shifts that continue once the subsidy is lifted because users find convenient alternatives to SOV travel.

The private sector can also play a role in providing subsidies. The following are examples of private sector subsidies that can serve to promote alternative modes of travel:

- Transit pass subsidies (see discussion on the Milwaukee County "Commuter Check" program);
- Vanpool operating subsidies;
- Rideshare subsidies;
- Parking cash-out; and

- Improved convenience for selected travel modes (for example, bicycle lockers might be provided).

As the summary below indicates, employers in Milwaukee have instituted a "Commuter Check" program to provide employees with subsidies for transit, including bus and vanpool travel. This program illustrates that subsidies can serve to both encourage alternative modes of travel and provide a financial benefit for employees of participating businesses.

Example: Milwaukee County "Commuter Check" Program

Milwaukee County has elected to work with employers to encourage the use of buses and vanpools. Employers can purchase "Commuter Checks" or vouchers which are given to employees and can be applied toward the purchase of bus passes or vanpool fees. The cost of providing the checks is a tax deductible expense for businesses, and the checks are a tax free benefit for employees. The program has benefited over 2000 employees from 75 area employers. Employers also benefit by saving money that would be spent on construction and maintenance of additional parking spaces. (See Appendix A for more information on this program.)

THE EFFECTS OF TRANSPORTATION PRICING MEASURES ON TRAVEL AND EMISSIONS

While market based pricing strategies are gaining viability as transportation control measures, they are still in their infancy in the United States. As indicated throughout this chapter, the projects that are being executed are in very early stages of implementation. As a result, almost no real-world observations of the effectiveness of these measures in reducing congestion and emissions are available. As these projects are completed and enter their evaluation stages, this information should be available.

Despite the lack of case specific information, a number of theoretical studies have attempted to estimate the impacts of transportation pricing measures, particularly in the more congested, heavily-polluted areas of the country. Various integrated modeling techniques have been used to make these projections. Researchers have used travel demand analysis models and demand elasticity estimates to analyze the effectiveness of transportation pricing on travel behavior, traffic flow, and emissions. In addition, inferences from limited real-world experiences with transportation pricing and results of stated preference studies have been used to estimate the benefits of these measures. Table 3-1 provides a brief summary of the estimated effects of various transportation pricing measures on vehicle travel and vehicle emissions.

Parking pricing has been one of the more popular measures in the U.S., providing more certain information as to its effectiveness. Several studies have found that people are fairly

willing to use alternative modes of travel, such as carpooling and transit, as opposed to SOV trips, in response to higher parking prices. Price elasticities, in terms of SOV trips, are estimated to range between -0.1 and -0.2, indicating that, for example, a 100 percent increase in parking prices would result in a 10 to 20 percent reduction in SOV trips. Therefore, raising parking prices is a fairly effective way to reduce VMT, congestion, and air pollution. The projects cited in Table 3-1, almost all of which were conducted by employers of more than 100 people, showed significant impacts on SOV use, with reductions ranging from 66 to 81 percent at a given worksite. Vehicle trips, a similar indicator, also showed considerable reductions. No emissions information was available for parking pricing, though it is possible to make projections based on estimated VMT reduction figures for a specific area.

Estimates suggest that VMT will decline by 2 to 2.5 percent when VMT fees are raised by 10 percent (representing estimated price elasticity between -0.2 and -0.25). Because they do not encourage a shift to cleaner burning engines (because every car is charged the same rate per mile), the effects of VMT fees on gaseous emissions are smaller and more indirect than would be expected from emissions-based fees. The studies discussed in Table 3-1 found that VMT fees of $0.01 to $0.05 per mile alone would reduce gaseous emissions and VMT by about 4 to 11 percent, while a VMT fee weighted by emissions was estimated to have a significantly greater impact on emissions, particularly for VOC and NO_x.

Congestion fees are similar to VMT fees. However, according to the studies below, they tend to have lower air quality impacts but a greater ability to reduce congestion. The reduced impact on emissions is possibly due to the fact that congestion pricing is more likely to shift travel from congested periods to less congested periods than to have a significant impact on the total number of trips. Although the study summarized in Table 3-1 estimates very limited impacts, congestion pricing programs are being widely embraced under FHWA's Congestion Pricing Pilot Project Program, in part because congestion is of greater concern than emissions in this program. Thus, several projects are expected to provide concrete results regarding the effect of congestion pricing in the next few years.

Just as VMT fees are effective at reducing VMT, emissions fees which vary depending on how much the vehicle pollutes are estimated to be quite effective at reducing pollutant emissions, though not as effective at reducing congestion or VMT. Estimates show that a 10 percent increase in an emissions fee would be expected to reduce emissions by 5 percent, but reduce VMT by only 1.5 percent. One of the primary reasons that emissions fees are not likely to result in a significant VMT effect is because some drivers can substitute a cleaner car to offset fees. As a result, however, emissions fees are expected to lead to improvements in vehicle fleet fuel efficiency over the long term because they give people a financial incentive to buy cleaner cars.

Fuel elasticity estimates vary considerably (ranging between -0.05 and -0.22[32]).[33] In the short term, a driver's response to fuel taxes would be to eliminate unnecessary trips or VMT, while over the long term, drivers would shift towards cars with improved fuel efficiency with a smaller change in VMT. The studies summarized in Table 3-1 estimated very small impacts from fuel taxes on both emissions and VMT.

Modal subsidies have not received significant attention on their own, as they are usually applied in tandem with other measures. The existence of alternative modes of transportation, however, can be extremely important in determining the effect of subsidies on the demand for vehicle travel.

As projections, the studies summarized in Table 3-1 involve a considerable degree of uncertainty, relying on a number of significant assumptions about a variety of factors ranging from shifting demographics to behavioral responses. Nonetheless, the findings of these studies indicate that transportation pricing measures have the potential to offer substantial reductions in air pollution, greenhouse gases, and traffic congestion.

A companion document, "Guidance on the Use of Market Mechanisms to Reduce Transportation Emissions" provides guidance on estimating the emissions reductions and travel demand changes for a specific transportation pricing program.[34]

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[32] Deakin, 1995.

[33] Fuel elasticity is defined as the percentage change in quantity of gasoline purchased for each percentage change in gasoline price.

[34] EPA and DOT, forthcoming.

TABLE 3-1
ESTIMATED EFFECTS OF TRANSPORTATION PRICING MEASURES ON TRAVEL DEMAND AND EMISSIONS (RESULTS FROM VARIOUS STUDIES)

CATEGORY	STRATEGY	SOURCE	SCENARIO	RESULTS
Parking Pricing	**Employee parking fees[35,36,37]:**	Various projects (both short and long term) in which parking fees were raised.	$1.37 to $2.73/vehicle/day increase in parking fees.	• 12 to 39 percent reductions in VMT to a worksite • 66 to 81 percent decrease in SOVs at a worksite
	Differential fees[38]:	Various projects in which SOV parking rates were raised or HOV rates were lowered.	$1.60 to $5 per vehicle/day for SOVs; $0 to $2 per vehicle/day for carpools; up to $42/month transit subsidy; up to $15/month carpool subsidy.	• 19 to 31 percent reductions in vehicle trips community wide

[35] Surber, Monica; Donald Shoup, and Martin Wachs, "Effects of Ending Employer Paid Parking for Solo Drivers." Transportation Research Record 957, 1994.

[36] Williams, Michael E. and Kathleen Petrait, U-Pass: A Model for Transportation Management that Works, Presented at Transportation Research Board Annual Meeting, January, 1993.

[37] U.S. EPA, Office of Policy, Planning, and Evaluation, Guidance on the Use of Market Mechanisms to Reduce Transportation Emissions, Almost Final Draft, May 30, 1996.

[38] U.S. EPA, 1996.

CATEGORY	STRATEGY	SOURCE	SCENARIO	RESULTS
Fuel Taxes	**Fuel tax[39]:**	Study of various rates.	$0.40 to $2 additional charge per gallon.	• 1.4 to 7.2 percent decrease in VMT • 1.2 to 6.7 percent trip reduction • 1.4 to 25.7 percent decrease in CO_2 • 1.4 to 7.1 percent decrease in VOC • 1.3 to 7 percent decrease in CO • 1.2 to 6.9 percent decrease in NOx
Emissions Fees	**Varied by vehicle efficiency[40]:**	Study of various rates.	$0.01 to $0.05/mile on highways.	• 2 to 7 percent decrease in peak period VMT • 2 to 12 percent decrease in peak period vehicle hours traveled (VHT) • 8 to 37 percent decrease in daily VOC • 4 to 17 percent decrease in daily NOx • 8 to 20 percent decrease in daily CO • 3 to 7 percent decrease in daily PM10
	VMT-Weighted Emissions fee[41]:		$200 to $1,200/year per vehicle. Amount depends on the estimated emissions of individual vehicle types.	• 1 to 7 percent trip reduction • 14 to 37 percent decrease in VOC • 14 to 35 percent decrease in CO • 5 to 18 percent decrease in NOx

[39] Puget Sound Regional Council, 1995 Update of the Metropolitan Transportation Plan for the Central Puget Sound Region: Evaluating Congestion Pricing Alternatives for the Puget Sound Regional Council, Technical Paper MTP17a, August, 1994.

[40] Cameron, 1994.

[41] COMSIS Corporation, Draft Pricing Document, 1995.

Table 3-1, continued

CATEGORY	STRATEGY	SOURCE	SCENARIO	RESULTS
At the Pump Charges	**VMT fees[42],[43]:**	Various studies estimating results of VMT fees in West Coast metropolitan areas.	$0.01 to $0.05/mile	• 9.3 to 11 percent decreases in VMT • 8.6 percent decrease in trips; 10 percent shift to transit • 4.5 to 8.6 percent decreases in CO • 4.1 to 9.1 percent decreases in VOCs • 5 to 8.6 percent decreases in NOx • 9.4 percent decrease in CO_2 • 11 percent decrease in PM_{10}
	Pay-as-you-go car insurance:	Study estimating results of a national PATP scheme.	$0.10 to $0.40/gallon surcharge on gasoline.	• Estimated 32 MMT/yr reduction in carbon emissions
Roadway Pricing	**Congestion pricing fees[44]:**	Study of various rates.	$0.05 to $0.30 per mile of road, depending on factors such as the level of congestion, time of day, etc.	• 5 to 10 percent decrease in peak period VMT • No effect to 2 percent decrease in NOx • No effect to 7 percent decrease in VOC • 2 to 3 percent decrease in PM_{10}

[42] Puget Sound Regional Council, 1994.

[43] Cameron, Michael, Efficiency and Fairness on the Road: Strategies for Unsnarling Traffic in Southern California. Environmental Defense Fund. Oakland, CA, 1994.

[44] Puget Sound Regional Council, 1994.

TABLE 3-2
SUMMARY OF TRANSPORTATION PRICING PROJECTS

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
Berkeley TRIP Project	Implemented	Public parking lots and garages	Parking rates raised to market price ($3.20/day) Free for HOV-3s.	N/A	City of Berkeley and University of California at Berkeley.
***California SR 91 Project**	Implemented 1995	10-mile stretch of SR-91 in Orange County; two priced lanes, in each direction, were added in the median of the existing highway.	Congestion pricing fees vary from $.50 to $2.75 per vehicle, depending on occupancy and level of congestion. Frequent Traveler Program gives users a $0.50 discount on each trip for a $15/month fee. Uses ATC.	Express traffic has increased and sales of transponders has exceeded expectations. 20 to 25 percent of the traffic is made up of HOV-3+.	Private funding.
***California's Parking Cash-Out Program**	Implemented 1993	Employers of 50 or more, in non-attainment areas, who subsidize parking	California state law requires development of parking cash-out programs for all employers of 50 or more, located in nonattainment areas.	N/A	Self-funded by employers.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
Coalition for Local Environmental Solutions and a Competitive Economy (COALESCE) Emissions Fee and Coupon Program	Proposal	Southern California	Per-mile emissions fees reflecting true emissions rates of auto. Yearly coupon towards vehicle maintenance or HOV/transit use.	N/A	COALESCE funds.
Dulles Greenway Project	Implemented 1995	14-mile stretch of privately owned and operated toll road in Louden County, Virginia	Built to divert traffic from heavily congested Rt. 7 and 28. Current toll is $1.75 for complete trip ($0.125 per mile). Antennae placed in pavement record tolls for ATC.	Traffic volume for the first three months was 10,500 vehicles/day -- lower than originally expected. Volume is expected to increase as more commercial drivers become aware of the road's benefits.	Toll Road Investors partnership II (TRIP),Virginia DOT. Revenues will fund HOV lane construction.
Fort Myers/Lee County, Florida Variable Bridge Toll Project	Study concluded 1997	Cape Coral and Sanibel Bridges (to be extended to the MidPoint Bridge after completion)	Phase I - Feasibility and impact studies. Phase II - off-peak toll discounts, 33 percent peak toll increase.	N/A	Local funds will make up for potential lost revenue from deferred traffic. Surpluses will fund other congestion mitigation projects.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
Glendale TMA Parking Management Program	Implemented	Glendale, California area; employees of Nestle USA, Inc., and Commonw'lth Land Title Co.	Parking pricing at $40 to $50/month. Carpools park free and receive $3/day subsidy.	N/A	Public-private partnership.
GO Boulder Program	Under study (completion expected in December 1997)	Boulder, CO metro area	Congestion pricing feasibility study. Various strategies, forecasting impacts, public outreach.	Project has been highly successful in soliciting public input and involvement. Not yet implemented.	FHWA Pilot Project, City of Boulder, and Colorado DOT funds.
Katy Freeway Priority Lane Pricing Project, Houston, Texas	Under study (completion expected in 1997)	13-mile stretch of I-10 in Harris County	HOV-2 can buy into HOV-3+ lanes during peak periods.	N/A	Texas DOT and Houston Metro funds. Texas Transportation Institute study.
King County FlexPass Program	Implemented	King County, Washington	Initiatives for employers to offer employees transit subsidies, voucher incentives, and flexpass commuting choices.	After two years, the FlexPass program led to 30 to 175 percent increases in transit use for a number of employers.	Self-funded by employers.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
***Maine Turnpike Authority (MTA)**	Implemented (study)	Maine Turnpike	Coupons distributed for discounts on off-peak tolls during August 1995 and 1996. Educational efforts.	Travel time shifts by tourists were modest, however MTA hopes to take a more aggressive approach this year.	Maine Turnpike Authority.
***Milwaukee County Transit Service (MCTS) Parking Cash-Out**	Implemented 1991	Milwaukee metro area	Monthly transit subsidies up to $60/month from local employers. Tax free benefit for both employers and employees.	Project generated $900,000 in revenues for MCTS. Approximately 2,000 employees at 75 companies participate in the program.	Public-private partnership.
Portland, Oregon Regional Pricing Project	Under study	Portland metro area	Two year congestion pricing feasibility study. Extensive public education.	N/A	Oregon DOT and Portland METRO funds.
Puget Sound, Washington	Study discontinued	Puget Sound Region	Peak-period HOV "buy-in," when SOVs may pay for access to under-used HOV lanes.	N/A	Public-private partnership. Revenue will fund additional 200 miles of HOV lanes.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
***San Diego I-15 Express Lanes Project**	Implemented 1996	I -15 in North San Diego	SOV and HOV-2 can buy into HOV-3+ lanes for a fixed monthly fee; fees varying with level of congestion will be implemented in late 1997. Uses ATC.	May lead to decreases in congestion. Since other cars can buy-in to HOV-3+ lanes, this project may not decrease SOV VMT greatly.	FHWA Pilot Project. Revenue will fund additional mass transit in the corridor.
San Francisco - Oakland Bay Bridge	Expected to be implemented 1997	San Francisco - Oakland Bay Bridge	$3 peak period toll, keeping off-peak at current $1 for SOV and HOV-2 vehicles (constitutes 80 percent of peak traffic). Uses AVI.	N/A	FHWA Pilot Project. Revenue will fund transit alternatives and improvements.
***Southern California Association of Governments**	Under study	Los Angeles metro area	Pre-project study of 24 congestion pricing, VMT, emissions fees, and other pricing strategies. Extensive social research/outreach. Coordination between a number of government and private agencies and institutions.	Study found that a number of strategies can achieve significant pollution and congestion decreases, especially a modest approach of am/pm peak period congestion pricing coupled with emission fees.	FHWA Pilot Project, SCAG, and COALESCE funds.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
Tacoma Narrows Public-Private Bridge Project	Under study	Tacoma Narrows Bridge	Congestion pricing.	N/A	Public-private partnership with Washington DOT. Tolls will finance enhancement of bridge and other mobility issues in corridor.
Tappen Zee Bridge Variable Toll Project	Under study	Tappen Zee Bridge, New York	Congestion pricing feasibility study. Various tolls and transit improvements. Outreach.	N/A	FHWA Pilot Project, New York State Thruway Authority and New York DOT funds.
Twin Cities Congestion Pricing Study	Under study	Proposed Highway 212	Study of mechanisms such as VMT fees and congestion pricing. Studying Highway 212 peak-hour fees.	N/A	FHWA Pilot Project and Minnesota DOT funds.
***Washington State Commute Trip Reduction Law**	Implemented 1991	Washington State	Employers of 100 or more persons in counties with populations over 150,000 must make good faith efforts to reduce SOV/VMT to the workplace.	By 1995, two thirds of the sites reduced SOV/VMT; one third by 15 percent. Approximately 80 million VMT were eliminated; CO_2 emissions decreased by 33,000 tons/year and gas consumption by 4.5 million gallons/year.	Some state funding to help localities design guidelines. Individual programs are privately funded.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
INTERNATIONAL PROGRAMS					
A1 Lille-Paris Motorway Project	Implemented April 1992	A1 from Paris to Lille (120 miles)	Tolls are 25 percent higher than normal during peak periods (Sunday, 4:30 to 8:30 pm); before and after peak periods, tolls are 25 percent lower than normal.	Up to 15 percent of normal peak Sunday evening traffic has shifted to off-peak hours.	SANEF (quasi-commercial government-owned toll road operator).
Cambridge, England Congestion Pricing Project	Study discontinued	Cambridge's city center	Cordon pricing with real-time congestion pricing; zone fees considered.	N/A	United Kingdom DOT.
Greater London Congestion Pricing Proposal	Proposal	Inner and central London	Three year research project looking at technology, public opinion and travel behavior.	N/A	United Kingdom DOT.
Hong Kong Road Pricing Experiment	Implemented and discontinued	City of Hong Kong	Two year experiment with electronic number plates and automatic tolling.	N/A	Government of Hong Kong.

Table 3-2, continued

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
Melbourne City Link, Australia	Under development	Melbourne metro area	Will link 3 major freeways. Uses ATC and traffic management equipment. Tolls will vary for passenger and commercial vehicles.	N/A	Private funding.
Norwegian Toll Roads	Implemented Bergen:1986 Oslo: 1990 Trondheim: 1991	Downtown Trondheim, Bergen and Oslo	Toll rings using advance vehicle identification (AVI) to assess fees during peak hours. 70 percent of motorists in Oslo and 80 percent in Trondheim use AVI. Users are charged as they cross the ring.	After implementation, traffic decreased by 10 percent in Bergen (not taking into consideration outside factors). Traffic fell by 4 percent in the first four months in Oslo, but has since returned to original levels. Relatively little impact on traffic levels in Trondheim. Overall, experts argue that the tolls collected are too low to successfully decreasing traffic levels in these areas.	Local governments. Toll rings are primarily revenue-generating schemes.
Randstadt Peak Charging Proposal, The Netherlands	Proposal	Main arterial road system in Randstadt region	Daily license for travel within system at $2.85/day. Fees assessed between 6 and 10 a.m.	N/A	Dutch government.

PROJECT	PHASE	COVERAGE	DESCRIPTION	RESULTS	FUNDING
Singapore Area License Scheme	Implemented 1975; Updated 1989	Two square mile area in Singapore (eventually will cover entire island)	Cordon pricing during peak periods: Monday to Friday morning and evenings; Saturday mornings. Daily fees are approximately $2.00 to enter the zone during peak periods; monthly pass available for approximately $50. Soon fees will vary with congestion.	Peak hour vehicle trips into the city center have decreased from 23 to 56 percent and have remained at this level since the project was updated.	Singaporian government.
Stockholm's Dennis Package	Proposal	Stockholm metro area	Public transit improvements, bypass roads, and road pricing. Toll ring road in city with fees at $2.50 per day or $50 per month. Eventually will use AVI and vary fees by time of day and vehicle emissions.	N/A	Swedish government. Goal is to generate revenues, 70 percent of which will be used for transit improvements and 30 percent for auto travel improvements.

CHAPTER 4
Institutional Relationships

Transportation pricing programs often require the cooperation of various public and private sector entities. Most of the programs that have been implemented thus far in the United States are highway- or corridor-specific, although parking management strategies are often implemented on a regional basis. The geographic coverage of programs often dictates the institutional relationships that must be developed and fostered during the design, development, testing, implementation, monitoring, evaluation, and enforcement phases of the program, as do the sources of funding used to finance a project.

The relationships necessary for successful program implementation depend on the type of program, how that program is initiated, and the manner in which the program is executed during the implementation and management stages and the legal structure in that area. Implementing agencies often face institutional barriers as a result of jurisdictional authority related to program implementation, monitoring, and enforcement. An important aspect of many of the successful programs is the active solicitation of program partners, both public and private.

The purpose of this chapter is to review the types of institutional issues that must be addressed during the various phases of project design and implementation. Often, institutional issues that arise in the early stages of program development are driven by dynamic and pre-established relationships among local agencies and can set the stage for the program's outcome during the implementation and operation phases.

This chapter reviews the relevant institutional issues associated with program initiation, the selection of a lead agency, and the coordination of effort between multiple agencies and levels of government in the design, development, and implementation of a successful transportation pricing program.

PROGRAM INITIATION

Although economists have promoted the use of market-based incentive programs to address transportation problems and reduce pollution from mobile sources for some time, public officials have only recently considered using these approaches. In the case studies reviewed, there were generally two methods by which market-based incentive programs were introduced:

(1) The local or state legislature passed laws mandating the program; or

(2) The local transportation and/or air authority developed the program to address transportation problems related to congestion, air quality, or other issues.

The method by which a program is introduced sets its tone and influences the institutional issues that a program may encounter.

Programs initiated at the state legislature usually involve the introduction of new laws that require regions to develop strategies for addressing transportation problems. State-mandated programs have the benefit of requiring public agencies and private entities to comply with the law. Yet, when these laws are developed into programs, the participation of other agencies, local governments, and private entities is critical for success.

In other cases, the program concept was initiated in the local legislature or regulatory body in response to a specific transportation need or related issue, such as air quality. For instance, San Diego I-15 Express Lanes Project was initiated on the suggestion of a local legislator to address congestion on the interstate.

SELECTING A LEAD AGENCY

As programs are initiated by state-mandated laws or local efforts, the first step is to identify a lead agency, agencies, or parties to implement and manage the program. In many cases, a number of different agencies participate throughout the program, and often more than one agency will lead the program at different stages. In determining which agency should lead a project, many factors need to be considered, including, but not limited to:

- Jurisdictional lines;
- Level of government or other parties/agencies that would have the best success in implementing the program;
- The possibility that a new authority might better administer the program; and
- Levels of government that should participate.

In selecting a lead agency, a key question is the agency's authority to conduct the program. The lead agency will most likely need to have the authority to implement and enforce the program, collect revenue, and spend funds. If an agency does not have the necessary authority, enabling legislation may need to be considered, or another agency might be considered to serve as the lead agency.

The jurisdictional authority of the lead agency should correspond to the scope of the measure being implemented. For example, a state-mandated program is probably best implemented by a state-level agency, which can ensure consistent implementation of the measure across the state. An area-specific measure, on the other hand, might best be developed and implemented by a local authority who might better understand the specific concerns and constraints of the area. It is possible to have a state-level agency or a regional-authority mandate a program in a specific area, such as a nonattainment area. However, more often than not, the geographic scope of the problem being addressed, such as congestion or air quality in a nonattainment area or areas, will determine the scope of the measure to be implemented and, thus, jurisdictional authority of the lead agency.

Determining the appropriate level of government to lead a program can be a difficult process, particularly in governmentally-fragmented and decentralized metropolitan areas. Over the last 35 years, government institutions at the municipal and special district levels have increased in number, resulting in more government entities managing the same geographic area. This not only complicates the selection of a lead agency but also increases the number of institutions that must be considered and included in the decision-making process.

Potential Lead Agencies and Participating Agencies/Organizations

- ***State Agencies:*** The benefit of having a state agency serve as the lead agency is that it can apply a program across a broad geographic area, often covering a complete metropolitan area (with exceptions for metropolitan areas that span more than one state) or an entire state. This helps to ensure that a program is consistently implemented across different jurisdictions. A second benefit comes in the state's authority (either legislative or regulatory authority) to mandate a program. A mandated program might have greater success than a voluntary program implemented at the local or regional level. A state-level agency will have limited success implementing a transportation program, however, if the program is inflexible in its consideration of local concerns. The Washington Commute Trip Reduction (CTR) program incorporated local concerns by organizing a task force, which included local government representatives, business leaders, and citizens, to develop the program guidelines.

- ***Local and Regional Agencies or Special Districts:*** These agencies are often in touch with local perspectives and can customize a transportation pricing program to the region. A benefit of the metropolitan planning organization (MPO) being the lead agency is that they are the agency responsible for transportation planning and understanding the transportation needs of the region. Local or regional agencies may be at a disadvantage, however, if they lack legislative or regulatory authority.

- ***New Public Entities:*** The option of creating a new entity to implement, operate, and manage a program has primarily been discussed in the literature on transportation pricing programs. A new entity is suggested when existing local agencies do not have authority over the jurisdiction of the project area. In actuality, no new entities have been created, but this continues to be an option as institutional arrangements are explored.

- ***Private Companies:*** Using a private company to manage a program resolves authority issues, in particular with respect to collecting revenues across local and regional jurisdictions. A state may need to establish a franchise to allow private entities to manage a portion of an interstate or state road. There may also be restrictions on the type of funds available for the development and implementation of certain projects, as some state and federal funds may not be

used to finance roads that restrict access. However, there might be public concern about a private firm seeking to raise revenues and increase profit as opposed to a state or local governmental agency.

California Private Transportation Corporation's (CPTC) Role in Transportation Pricing Projects

A private entity, the California Private Transportation Corporation (CPTC), has played an important (if not crucial) role in two of the case studies:

- Under a partnership with the California Department of Transportation (Caltrans), CPTC planned, constructed, and runs the California SR 91 Project. It did extensive public education, outreach, and marketing work, organizing meetings with local legislatures and community groups to solicit input from and educate the different interest groups about the projects components and goals.

- Under a partnership with another private entity, United Infrastructure, CPTC is responsible for the management of the San Diego I-15 Express Lanes Pricing Project, including such activities as toll collection, billing, and other day-to-day management duties.

In both cases, the public-private partnership has proven to be beneficial for all involved parties, however, initially there were concerns about the objectives of CPTC (to raise revenues) in relation to those of the State of California (to reduce congestion, and maximize non-paying HOV traffic). According to CPTC, the goals of all the involved parties have been aligned and all groups are realizing the maximum benefits. (See Appendix A for more information on these projects)

- ***Federal Agencies:*** Although federal agencies do not have the authority to develop and implement transportation pricing programs, federal participation could lead to the designation of a project as a model or pilot program, which could provide additional funding.

- ***Affected Businesses/Parties:*** Participation of the affected parties in the initial stages of a transportation pricing project can help the project avoid pitfalls later and lends support. Examples of affected parties may including businesses with a certain number of employees, companies that own parking facilities, gas stations, and businesses along a priced route.

PROMOTING COORDINATION AMONG MULTIPLE AGENCIES, ORGANIZATIONS, AND LEVELS OF GOVERNMENT

Regardless of which entity serves as the lead agency, a successful program will require coordination with institutions at multiple levels of government, including state and local legislators and regulators, as well as state and local industry and citizen groups. (See also Chapter 5 - Public Involvement and Acceptance.) Involving all potential stakeholders in the development and implementation of a program and partnering with agencies at multiple levels of government serves many goals in that it:

- Ensures broader support for the project;
- Facilitates funding;
- Provides access to additional staff to help implement the program; and
- Helps to identify and resolve problems.

Coordination Promotes Support. Establishing strong institutional relationships during the early stages of a project can help in building support for a program by ensuring that the needs and concerns of different parties are identified and addressed. The lack of coordination between different institutional entities can have a devastating impact on a transportation pricing program.

Coordination Provides Access to Additional Staff. If multiple organizations are involved, each entity may take responsibility for a distinct aspect of a project, thus distributing the program resource requirements among staff of multiple agencies. Access to staff within different agencies or levels of government can be particularly helpful by providing access to

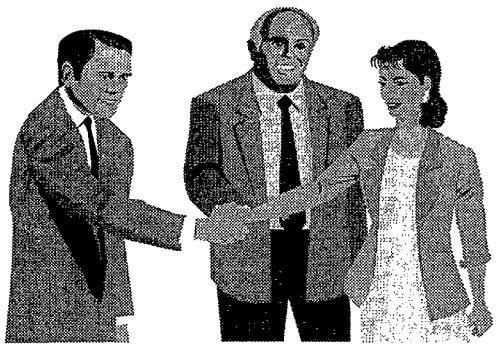
Coordination Between Agencies, Organizations and Government Promoting Support for Transportation Pricing Projects: Case Studies

After the Maine Transportation Authority proposed to increase peak-hour tolls on the turnpike to reduce congestion, the tourism industry pressed the state legislature to prevent toll increases. Consequently, the program now offers discounts during off-peak hours, but has left peak-hour tolls unchanged. The unfortunate result of the program was an increase in off-peak travel and no change in congestion during peak periods.

Coordination Between Agencies, Organizations and Government Promoting Support for Transportation Pricing Projects: Case Studies, continued

The Washington State (CTR) Law, which requires all affected employers to make a "good faith" attempt to try to the reduce both the number of employees who commute in single occupancy vehicles (SOVs) and the total vehicle mile traveled (VMT) by employees, was successful in developing support among local agencies. Under the CTR program, a task force composed of county, city, and transit personnel, private employers, state agencies, and citizens, was formed to develop the guidelines that each local agency would follow to implement and manage the program. The task force held regular public meetings to receive input. The guidelines were so well-received by all public agencies that they were approved as written. After completing the guidelines, the state named a technical assistance team to aid local governments in implementation. Finally, the task force continues to help the state by making additional recommendations as the guidelines are tested in practice.

Likewise for the San Diego I-15 Express Lanes Project, partnerships were formed in the early stages between Federal, state, and local agencies, leading to a smooth implementation and transition of responsibilities. Those involved in the project team included the San Diego Association of Governments (SANDAG), Caltrans, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the California Highway Patrol, local politicians, and local transit agencies. In the early stages of program development, the process was open to all agencies interested in participating. The open process encouraged participation and helped divide the responsibilities of program implementation. Ultimately, program management will be handled by a private entity. (See Appendix A for more information of all of these projects).



different agencies with different areas of expertise. It can also aid in the enforcement of a program and the collection or distribution of funds. Often some activities required under the transportation pricing program can be conducted at the same time as other enforcement (e.g., inspections) or collection (e.g., registration or toll collection) activities.

Coordination Can Identify and Resolve Problems. There is always the potential for problems associated with any new program, including a transportation pricing program, many of which will be unique to the specific program and area implementing the program. Coordination between the various interested parties involved and affected by the proposed pricing program can help to ensure that potential problems are identified early and resolved in a way that ensures success of the program.

Coordination Between Geographic Areas

Competition between affected rural, urban and metropolitan areas for economic development is a potential problem that can affect how transportation pricing programs are developed and implemented. A jurisdiction that might otherwise have been interested in a transportation pricing program may be apprehensive if it believes that economic development would be slowed or that existing businesses may relocate to other locations. In cases where neighboring cities, towns and other urban areas have competing goals, a regional authority with power over the local jurisdictions might be a better choice as the lead agency to implement the program and resolve disputes between the local jurisdictions.

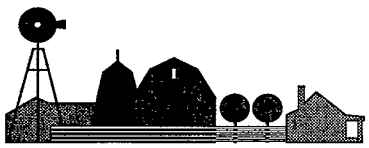


Table 4-1 discusses the likely institution(s) for initiating and implementing each major type of transportation pricing measure and identifies institutions and groups with which the lead agency should coordinate and develop an institutional relationship to facilitate the development and implementation of the program. Table 4-2 provides this information for several specific projects (also discussed in Appendix A).

Problems due to Lack of Coordination: California's Parking Cash-Out Program

The California's Parking Cash-Out program is an example of a program that had limited coordination between agencies and private participants. Initially, the program was well-received by employers, who could deduct any expenses associated with the program from their State income tax. However, under the previous Federal tax code, once employers allowed employees to cash out, all parking subsidies became taxable. As a result, employers lost their incentive to implement the program. Although all affected employers are required by law to comply with the cash-out program, the program is designed to be self-enforcing, and many employers are not actively participating. A recent change to the tax code made in 1997 has resolved this problem (see the section in chapter 3, "Parking Pricing" and Appendix A for more information).

TABLE 4-1
POTENTIAL LEAD AGENCIES AND INSTITUTIONAL RELATIONSHIPS FOR VARIOUS TRANSPORTATION PRICING MEASURES

TRANSPORTATION PRICING MEASURE	POSSIBLE INITIATING AGENCIES	POSSIBLE LEAD AGENCIES	POTENTIALLY USEFUL INSTITUTIONAL RELATIONSHIPS
Fuel Taxes/Pay-at-the-Pump Charges	Federal/State Legislation	State/Regional Agency	State/local politicians, Fuel industry regulators and representatives, Citizen/stakeholder groups.
VMT/Emissions/Use Fees	State/local Legislation, State/local Regulatory Body	State/Regional Agency	State/local politicians, State agencies (including DOT), Citizen/stakeholder groups.
Road Tolls/Congestion Pricing	State/local Legislation, State/local Regulatory Body	Regional/local Authority, State DOT, Private Company	Regional/local transit authorities, State DOT, Regional/local politicians, Citizen/stakeholder groups.
Parking Pricing/ Parking Cash-Out	State/regional/local Legislation, State/local Regulatory Body	Regional/local Authority	Regional/local transit authorities, Regional/local politicians, Regional/local companies (workplaces, shopping centers), Citizen/stakeholder groups.
Transit Subsidies	State/regional/local Legislation, State/local Regulatory Body, Transit Authority	Regional/local Authority, Transit Authority	Regional/local transit authorities, Regional/local politicians, Regional/local companies (workplaces, shopping centers), Citizen/stakeholder groups.

TABLE 4-2
EXAMPLES OF INSTITUTIONAL RELATIONSHIPS IN TRANSPORTATION PRICING PROGRAMS

TRANSPORTATION PRICING PROGRAM	LEAD AGENCY(IES)	OTHER INVOLVED AGENCIES/GROUPS	INSTITUTIONAL RELATIONSHIPS
San Diego I-15 Express Lanes Project	SANDAG	Caltrans, FHWA, FTA, California Highway Patrol, local politicians, local transit agency officials, CPTC (private firm); Citizens Advisory Committee.	All of the agencies were involved in the project from its onset, and each agency was assigned specific responsibilities. This measured ensured that everything got done and that there were no disagreements over who had what roles.
California's Parking Cash-Out Program	California State Law	CARB	The law is meant to be self enforcing, with minimal oversight and involvement from CARB. There were no institutional relationships associated with this program.
California SR-91 Project	Partnership between Caltrans and CPTC (private firm)	FHWA; FTA; California Polytechnic State University; local Chambers of Commerce, legislatures, city councils, transportation organizations, citizens groups, etc.	The public-private partnership has proven to be beneficial for the development and implementation of the program, however there have been differences in what CPTC and Caltrans see as the objectives and goals of the program. Public outreach and marketing efforts solicited input and involvement from a wide variety of local and state agencies in addition to the general public.

Table 4-2, continued

TRANSPORTATION PRICING PROGRAM	LEAD AGENCY(IES)	OTHER INVOLVED AGENCIES/GROUPS	INSTITUTIONAL RELATIONSHIPS
Southern California Association of Governments (SCAG) Study	SCAG	Caltrans, SCAQMD, COALESCE, REACH Task Force	The involved agencies have had to learn to work with and trust each other in experimenting with new ideas and in guiding the development of the project through a number of different phases. This preliminary work should facilitate the development of institutional relationships with local governments and agencies and private interests in the future when the studied projects are implemented.
GO Boulder Program	City of Boulder	Colorado DOT, key staff from both the City of Boulder and other local governments	The agencies are working together to define the congestion problems in Boulder, and to organize and implement innovative public outreach and involvement activities.
The Dulles Toll Road	Toll Road Investors Partnership II (TRIP) (private partnership)	The State of Virginia	The public-private partnership made the development, implementation and maintenance of the road financially feasible. The road was the first privately built and operated highway in modern times in the United States.

TRANSPORTATION PRICING PROGRAM	LEAD AGENCY(IES)	OTHER INVOLVED AGENCIES/GROUPS	INSTITUTIONAL RELATIONSHIPS
San Francisco-Oakland Bay Bridge Project	Metropolitan Transportation Commission (MTC), Caltrans	Focus groups, community and media outreach	No institutional barriers were encountered between MCT and Caltrans, however MTC learned that it is essential for any governmental entity proposing congestion pricing to build a coalition of non-governmental support groups in the beginning of the program so the application has broad-based support.

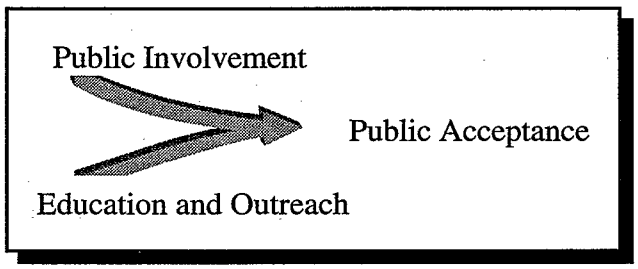
CHAPTER 5
Public Involvement and Acceptance

A large part of the success of a project aimed at changing existing patterns and behaviors, including those related to transportation issues, depends on the level of public acceptance and support for the project. One common thread running through successful transportation pricing programs has been an aggressive public education, awareness and involvement program. An expert from the Hubert Humphrey Institute of Public Affairs goes so far as to state that "citizen understanding and support will be essential to introducing transportation pricing in an urban area."[45] The ability of planners and developers to recognize and involve the public in the development and implementation phases of a program is crucial for the success of a program.

This chapter discusses the role of public involvement in the success of a transportation pricing program by defining the elements of a successful public education and outreach program, examining specific initiatives, and reviewing current research in this area. The first section defines public involvement and discusses the benefits of gaining strong public involvement and acceptance for a program. The next section identifies and discusses the various elements of a successful public education and outreach initiative, drawing on the experience of several initiatives and current research. The third section explores the various techniques that can be employed to involve the public and gain acceptance for a program. Finally, this chapter considers methods for measuring the success of a public education and outreach campaign.

WHAT IS PUBLIC INVOLVEMENT AND WHY DOES IT MATTER?

Public involvement is two-way communication between the public and transportation planners aimed at incorporating the views, concerns, and issues of the public in the decision-making process. A public outreach campaign might also involve one-way communication in the form of public education, public relations, and marketing. Public education can be a vital component of public involvement by informing the public of critical issues to ensure that their input is



[45] Munnich, Lee, et al, Institutional and Political Issues in Congestion Pricing: New Models for Federal, State and Local Cooperation in Infrastructure Investment, Hubert Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis, Minnesota, p. 6.

most effective. Public relations and marketing can be used to identify the means of interaction that work best for a given sub-group of the population, identify the issues of greatest concern, and influence the public's perception or opinion on a subject and possibly lead to behavioral changes.

Effective public education and involvement is important in the transportation planning process because it results in decisions and programs that are generally more acceptable to the public and therefore, more easily implemented. People are more likely to accept a new program or plan when they understand it and have had a part in its development and implementation. In addition, several laws, regulations, and agencies require that the public be involved in transportation planning.

Initially, many planners do not have a clear idea of the kind of public outreach or education program that should be implemented in conjunction with a proposed transportation pricing program. Determining the most appropriate and effective methods for addressing and publicizing the goals of the pricing project can be difficult. All public outreach and education programs should have clearly defined goals and a strategy to meet them. A program must also be flexible so that it can be modified and adapted to address new developments or problems. The following sections describe a number of factors which must be taken into consideration when developing and implementing a public outreach and education program. These factors can also be used to help determine what kind of public education program best compliments a proposed pricing project. By recognizing and addressing these same factors, planners can better define the goals, audience and other elements of their pricing program. This in turn will facilitate the selection of a public education program that will work with the proposed transportation pricing project.

Lessons on Public Acceptance

Based on lessons learned from the Twin Cities Congestion Pricing Study in Minneapolis-St. Paul, Minnesota, and other congestion pricing programs, Lee Munnich of the Humphrey Institute emphasized a number of key issues which any congestion pricing program must address.

- Elected officials' support, not necessarily as advocates, but as enablers is essential.
- The public, including the business community, environmental organizations and neighborhood groups, must understand the proposals and be involved in the process.
- A great deal of attention must be paid to marketing and media strategies, involving the media in the process from the onset and fostering a positive relationship.

Source: Munnich, Lee, Summary of Proceedings: FHWA Midwestern Region Congestion Pricing Workshop, Chicago, IL, 1995.

ELEMENTS OF A SUCCESSFUL PUBLIC EDUCATION AND OUTREACH CAMPAIGN

Perhaps the single most important component of a successful public outreach campaign is *credibility*, both institutional and personal. The public must trust that their concerns are being taken seriously and that they have a significant role in the decision-making process. In addition to credibility, a number of other factors must be taken into consideration when developing a public involvement and outreach campaign. These include:

- Defining the audience;
- Defining the area of concern;
- Recognizing the present situation;
- Defining the goals of the project;
- Educating all interested and affected parties;
- Involving the public; and
- Anticipating common issues and concerns.

This section discusses these factors which are central to determining the success of a public involvement and education program.

Define the Audience

It is important that the "public" be correctly defined. The "public" includes any person or group that is affected by the transportation program (even if they are not aware that they are affected) as well as any person or group that thinks that they are affected (even if they are not actually affected). Thus, exactly who represents the stakeholders or the "public" with respect to a public education and involvement campaign will depend, to a great extent, on the nature and scope of the program and the area for which it is being developed. The stakeholders may also vary depending on the phase (such as planning or development) of the decision-making process.

It is also important to recognize that the "public" is not a single entity with one uniform opinion. In reality, it consists of a wide variety of persons, each with their own opinions, needs, wants, and motivations. These individuals come from all walks of life and have varied levels of education and income. It is essential to recognize these differences and to address them accordingly because they will influence people's reactions to and concerns about a proposed transportation pricing project. The public or stakeholders can include:

- Residents of the affected geographic area;
- Non-governmental organizations, such as environmental, health, citizen, neighborhood, and civic groups;
- Businesses;
- Traditionally under-served communities, including low-income, racial and ethnic minorities, people with disabilities, the elderly, and youth;

- Transportation professionals and service providers;
- Members of academia;
- Government agencies, including transportation and air agencies; and
- Politicians.

Planners must also recognize that the residents of the immediate community are not the only people who may be affected and, therefore, need to be informed of the program's goals. Persons who live outside the metropolitan area but who use the transportation system on a

Example: Twin Cities Congestion Pricing Study

The benefits of soliciting the support of various groups have been realized by a number of successful transportation pricing programs. Under this program, the Minnesota Department of Transportation (MNDOT) conducted a feasibility study of different congestion pricing programs, including a proposal for the construction of a new Highway 212 with peak-hour fees. The project included a great deal of public outreach efforts to different special interest and other affected groups. For the Twin Cities Congestion Pricing Study, each group was able to identify specific benefits from the project:

- Local community and environmental groups viewed transportation pricing as a tool which could be used to help reduce the probability of future congestion problems as the region's population growth led to increased urban sprawl and therefore increased traffic problems.

- Businesses found benefits in the increased transportation efficiency and decreases in taxes that would result from such a program.

- Community leaders focused on the opportunities that the project provided for improved transit services.

- Transportation professionals were interested in using transportation pricing as a tool for managing traffic problems and influencing modal shifts.

- Local elected officials recognized all of the above benefits, as well as the potential for such a program to increase revenues while, at the same time, improving the efficiency of land and energy usage.

Source: Munnich, Lee, et al. p. 3.

semi-regular to regular basis for commuting or other travel purposes should also be included in the definition of the "public." For a public outreach campaign to be successful, it must be able to connect with all of the affected groups and integrate their concerns, needs and wants into the program.

Businesses: The support of and leadership from the business community can be extremely important for the success of a transportation pricing program. Businesses tend to be concerned about issues related to the movement of goods, access to delivery

and services, accessibility to and from other suburban-based operations, access to skilled labor, and reducing the commuting time for employees. The planners must, therefore, convince businesses that the proposed mechanisms will not adversely affect business and that the changes will reduce current traffic problems, such as reducing the costs of time delays. In the past, business leaders have generally favored transportation programs and funding that will increase the efficiency and reliability of travel on the area's highways and transit system, and contribute to the area's economic productivity.

Community Groups: Groups such as environmental organizations, neighborhood groups and transit advocates, are another public sector whose support must be gained for a transportation pricing project to be successfully adopted. At the local level, these organizations are concerned with improving traffic problems, reducing pollution, increasing the accessibility of public transit for all population groups, and improving community vitality and the overall quality of life. If planners can show them that these ends can be achieved through the means of a market-based transportation program, they will most likely be able to gain broad-based local community support.

Government Officials: The leadership and support of local elected governmental officials and their staff are also necessary for a transportation pricing program to move forward. Despite the uncertainty surrounding such mechanisms, Lee Munnich of the Humphrey Institute of Public Affairs found that state and local officials from many government agencies tend to be interested in, and occasionally strong supporters of, transportation pricing programs.[46] Senator Sandra Pappas, a political advocate of transportation pricing who has been directly involved in the Twin Cities Congestion Pricing Study, stressed the need for "coalition building of legislators" and broad-based political support. At the Federal Highway Administration's (FHWA's) Chicago Workshop, she stated that, "while it is important to have the support of an elected official, congestion pricing needs more than one champion."[47]

Define the Area of Concern

As part of identifying the full audience for a public outreach campaign, it is essential to define the geographic area that will be affected. As with defining the public, planners should not ignore any sectors of the population who might be affected by these proposed changes. It is essential to look not only at the metropolitan area which will be directly affected, but also at suburban or other adjoining areas whose traffic and residential patterns could be affected by changes in transportation policy. These parameters will help to shape both the audience and the definition of the public.

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[46] Munnich, Lee, et al, p. 6.

[47] Midwestern Region Congestion Pricing Workshop: Summary of Proceedings, *Developing Political and Public Support,* Chicago, IL, May, 1996, Hubert H. Humphrey Institute of Public Affairs web site: http://www.hhh.umd.edu/Centers/SLP/Conpric/chicago.htm.

Recognizing the Present Situation

For a transportation pricing program to be successful, it has to be compatible with the current transportation structure. This includes infrastructure (e.g., the current roadways, bridges and tunnels), availability of public transit, any transportation pricing programs currently in effect, and the attitude of the public towards the status quo. Planners must recognize the limitations that the present structure would place on certain program possibilities and be able to identify those sections where transportation pricing mechanisms could be successfully implemented.

Define the Goal of the Outreach Effort

Public education and outreach programs will differ considerably from place to place as well as over the life of a project. The aim of the education and outreach program will depend on several factors:

- The ultimate goals and scope of the program;
- How the public is defined (i.e., who is the intended audience - this may vary for each activity under the outreach program);
- The stage of the project (e.g, scoping, planning, development or implementation); and
- To what extent the public is already a participant in the overall process.

In some cases, planners may be more concerned with keeping the public informed of developments through education and outreach efforts. Other projects may rely heavily on the use of education and public involvement to change public opinion on certain issues or promote the acceptance of controversial solutions. Planners might also want the public to be actively involved in the development of goals and criteria, and the design and implementation of the program, and therefore might want to solicit feedback or input through more interactive approaches.

Educate the Interested Parties

Define the Problems with the Current Transportation System

Before solutions can be developed to deal with access problems affecting an area, current and possible future concerns must first be clearly identified and defined. For people to be willing to accept changes in their behavior and in the pricing associated with travel, they must first be aware that problems exist within the present system. The problems associated with traffic, congestion and air pollution tend to be regional, and may differ considerably between metropolitan areas. In some areas, citizens may believe that the present transportation system is adequate or, when viewed in relation to other urban areas, believe that traffic and air

quality are not major issues. Other areas may face major deficiencies in air quality, the current transportation system, or increased levels of traffic. It is also important to:

- Identify how affected interest groups view the current transportation structure;
- Determine the major issues which a proposed program would need to address; and
- Identify all barriers to the implementation of a proposed program.

This information may help to identify people's willingness to accept changes in the transportation system and potential problems that might arise in the future with implementing new programs.

Explain the New Policy or Program and How it Addresses Specific Problems or Concerns

The reasons for pursuing a transportation pricing program over other available options must be made clear to all segments of the public. Judson Bryant, a citizen activist from Houston, Texas, stressed the need for transportation pricing advocates to "define and thoroughly explain the overall benefits of [transportation] pricing to the public and the press."[48] The potential benefits of many transportation pricing programs are not widely understood because these techniques are relatively new and have not been widely implemented. As a result, planners will need to educate people on the true costs of transportation and the benefits of a market-based method. One approach is to explain market-based pricing mechanisms using a familiar context to illustrate that these methods are currently used to determine the prices of a number of goods and services. Examples include long distance telephone service, whose fees vary depending on the time of day, and airline ticket prices, which vary depending on when the ticket was purchased and the time of day, the day of the week, and the time of year.

Example: Twin Cities Congestion Pricing Study

In the Twin Cities Congestion Pricing Study, the Metropolitan Council, Citizens League and other task forces published newsletters featuring articles and studies explaining the concepts of market-based transportation policies and advocating their benefits. These publications helped educate the public, shape the views of policy makers, and inform interested parties on the issues.

The goals of any new transportation pricing program must be clearly defined and planners should demonstrate how the proposed changes will specifically address those problems that citizens and all other affected parties view as important. In addition, the relationship between the transportation pricing program and any other programs currently in effect must be established. For example, it may be necessary to consider and explain how the new pricing program will mesh with the scope and level of tolls currently collected, how the new program will affect the availability of alternate modes of transportation or whether there is enough infrastructure

[48] Midwestern Region Congestion Pricing Workshop: Summary of Proceedings, *Developing Political and Public Support,* p. 7.

available to handle the increased demand for alternatives. The level of acceptance for a new technique, policy, or program will depend greatly on how well it addresses current problems, to what extent it makes use of the available infrastructure, and how it works with programs already in place. The proposed use or return of any funds collected under the transportation pricing program should also be detailed so the public understands exactly how and where its money is being spent. By educating the people about a project, planners can clear up a great deal of uncertainty and the public will tend to be more receptive to the approach.

Involve the Public in the Decision-Making Process

Transportation planners or other agencies, such as air quality management agencies, looking at the use of transportation pricing measures, should, whenever possible, involve all segments of the public in the development and decision-making processes. It is appropriate to involve the public in the very initial stages of planning and development of a transportation pricing project. Structured public involvement and input will result in improved decisions that take into account the concerns of diverse interests, produce decisions that are generally more acceptable and therefore more easily implemented, and improve relations between the public and the transportation agency. Involving the public in the planning process of a transportation pricing program will help to clarify the public's concerns for planners and help to avoid delays during implementation.

Anticipate Common Issues and Concerns

Planners must be able to anticipate concerns that the public may have concerning new transportation policies and be prepared to address them directly. There are several common issues that are likely to arise with any transportation pricing program, regardless of the metropolitan area or region. This section highlights several common issues and concerns as identified in three recent studies examining the reaction of different groups to different transportation pricing mechanisms. The three studies include:

- A study on public perceptions of various transportation pricing strategies conducted for the California Air Resources Board.[49] This study involved over 100 individuals on eight focus groups held in four different metropolitan areas.

[49] Deakin, Elizabeth and Greig Harvey, Transportation Pricing Strategies for California: An Assessment of Congestion, Emission, Energy and Equity Impacts, Technical Report prepared for the California Air Resources Board, June, 1995, p. 10-2.

- A case study on the pricing program for the San Francisco-Oakland Bay Bridge Project.[50]

- A citizen jury created to evaluate and comment on traffic congestion pricing in the Twin Cities Congestion Pricing Study.[51]

Issue: *"Roads should be free"*

People in general often feel that an implied or specific covenant exists that roads should be free, because they are already paid for through gasoline and other taxes, and that if tolls are being collected, they should be removed once construction costs have been repaid. Members of all three study groups believed that other techniques should be able to decrease congestion problems without making people pay to travel. To address this issue, planners need to educate people on the full costs of vehicle transportation, illustrate the inefficiencies of cost vs. use inherent in the current system, and demonstrate that transportation pricing is the best approach for correcting these problems.

Issue: *"The public should vote for any new fees"*

The public may generally believe that any increases in taxes or fees, as well as the allocation of any collected revenues, should be decided on by the voters, not by elected officials. It may be possible to provide the public the opportunity to vote on the design of a transportation pricing program. Alternatively, planners could look for other methods for obtaining and incorporating the public's opinions into program decisions.

Issue: *"There are inadequate alternatives to single-occupancy vehicles"*

Few people believe that adequate alternatives to commuting by single occupant vehicles (SOVs) are available. This issue may be addressed by the transportation pricing program by increasing awareness of the current alternatives to single-occupancy vehicle travel, and by making additional funds available to increase the availability of transit and other travel alternatives.

Issue: *"These policies benefit the rich at the expense of the poor and middle class"*

Pricing proposals are often seen as disproportionately benefiting the wealthy, who can afford to pay for special services, at the expense of the poor and middle class. To address this

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[50] Dittmar, Hank, Karen Frick, and David Tannehill, "Institutional and Political Challenges in Implementing Congestion Pricing: Case Study of the San Francisco Bay Area," Curbing Gridlock: Peak Period Fees to Relieve Traffic Congestion, National Academy Press, Washington D.C. Special Report 242, Volume 2, 1994: pp. 300-317.

[51] Van Hattum, David; Sether, Laura. Citizen Jury on Traffic Congestion Pricing, Saint Paul, Minnesota June 6-10, 1996. *Context*. Hubert H. Humphrey Institute for Public Affairs web site. http://www.hhh.umn.edu/Centers/SLP/Conpric/citjur.htm.

concern, planners need to pay special attention to potential inequities of all transportation decisions and educate the public on how a specific transportation pricing strategy would also benefit the poor, disadvantaged, other under-represented group as well as the middle class. For example, by offering access to special uncongested lanes for a fee, some drivers will opt to pay for the use of those lanes. This will help to reduce congestion levels on the normal lanes, thereby indirectly benefiting all drivers who either choose not to, or are not able to buy into the special lanes.

Transportation pricing programs can remove or mitigate the inequity found in the current transportation system, especially if the fees collected through the program replace revenue generated in other ways. For example, fuel taxes are a more equitable way of paying for road construction and maintenance than a general sales tax. People who pay a fuel tax will be certainly drive on roads, and therefore are paying for road use. They will pay more the more they drive. In contrast, if a general sales tax is used to pay for roads, a person must pay them regardless of whether that person owns a car. Proponents of a planned transportation pricing program need to think about whether the program will mitigate current inequities, and if so, inform the public of the benefits. Planners could also tailor the program to directly benefit underprivileged groups to counteract any inequity brought about by the program itself.

Issue: ***"Certain fees might be okay if they address specific problems and improve transportation efficiency"***

Although people are rarely enthusiastic about paying more for goods or services, several studies have found that people are often more open to such suggestions when it can be shown that such increases would most likely lead to decreases in undesirable factors. In general, the participants of the focus groups in California were willing to consider paying higher transportation prices if they could be assured that the funds raised would be devoted to improving transportation efficiency, and that the persons administering these funds would be accountable to the public. In relation to congestion pricing or other market-based pricing mechanisms, participants said that, on occasion, they would be willing to pay a fee during peak periods to avoid congestion, however, very few people stated that they would be willing to pay such a fee on a regular basis, as part of their daily commute.

An increase in fuel taxes was the strategy most widely accepted by the California focus group. The focus group and other recent studies suggest that people are more willing to support transportation pricing strategies if they are familiar.

There was also consistent agreement among focus group members that any revenues generated from a transportation pricing program should be earmarked for improvements in alternative modes of transportation, especially transit systems. Thus, if planners take into account how the public would like to see the additional funds spent and provide adequate assurances regarding the use of these funds, the public is likely to be more willing to accept a transportation pricing policy.

Issue: ***"How will fees and fuel taxes affect driving behavior and emissions?"***

People will often have a difficult time seeing the connection between fuel consumption and traffic conditions or emissions levels. People are also likely to have difficulty understanding how some transportation pricing strategies would achieve their goals. For example, participants in the California focus groups did not think vehicle emissions reduction fees would be a plausible or efficient mechanism for reducing congestion and improving air quality. Some participants thought that an at the pump gasoline tax could, in the short run, alter drivers behavior. Most members of the focus groups, however, believed that an increase in the price of gasoline would have to be significant, upwards of fifty cents a gallon, to have any noticeable impact on consumption. Overall, the focus group members believed that at the pump charges could be an effective tool to increase revenues, but that they would not be an effective instrument in reducing levels of congestion, emissions, and improving air quality.

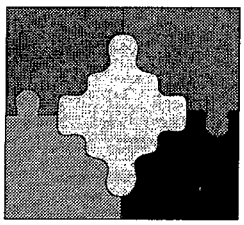
Although the public generally has difficulties seeing the connection between transportation pricing measures and decreased levels of congestion and pollution, they tend to have a basic understanding of some issues (e.g, that appropriate pricing measures must be applied to affect the behavior of targeted groups). Planners must recognize and build upon these basic understandings, engaging different interest groups in discussions to clarify the objectives of transportation pricing programs, and identifying and communicating the potential impacts any program might have on the current transportation structure. This will give the people the necessary tools to reach informed conclusions about the different transportation pricing mechanisms. Focus groups or community meetings can provide a forum where the public can articulate their views and perspectives to planners and decision makers.

Issue: "*Such a program is unnecessary and/or would not be cost-effective*"

The reactions of the study participants towards transportation pricing policies varied widely; those persons who lived in areas which tended to be highly congested with poor air quality thought the transportation pricing policies might possibly be effective, while those living in areas with only slight congestion and relatively better air quality thought such policies had little importance.

Given the current state of the technology and the levels of enforcement and surveillance that would be necessary to implement some transportation pricing programs, the public may believe that such a program would not be cost-effective or feasible. Although opinions will differ between metropolitan regions, the participants in the Twin Cities Congestion Pricing Study's "citizens jury" suggested that planners would "need to quantify the monetary benefits of congestion relief under a [congestion] pricing scenario relative to imposition of a gas tax increase or a mileage-based tax" in order for people to accept the program.

A Successful Public Involvement Program:



- Defines the audience and the area of concern;
- Recognizes and addresses current issues and concerns;
- Clearly defines the goals of the project;
- Educates all interested and affected parties;
- Involves the public in the decision-making process;
- Incorporates public feedback; and
- Anticipates and addresses common issues and concerns.

TECHNIQUES FOR EFFECTIVE PUBLIC EDUCATION AND INVOLVEMENT

Planners should seek out and make use of a variety of tools to educate and inform different interest groups of the program's goals and developments. This section identifies a number of different techniques that have been used by planners to inform and educate the public. These techniques are broken into two general categories: (1) techniques primarily intended to educate, inform, or persuade those affected by the program; and (2) techniques designed to actively involve the public in the decision-making process. It is important to realize, however, that some forums used to educate and inform people can also be used to receive feedback, and many techniques used to research the opinions or obtain input from different interest groups also serve to educate. In addition to the information provided here, planners might also consult the U.S. Department of Transportation's *Public Involvement for Transportation Decision Making* or the Hubert H. Humphrey Institute for Public Affairs website.[52,53]

Education and Outreach

The availability of substantial and accurate and relevant information enhances peoples' understanding of a project or a plan and encourages more people to participate in the planning and decision-making process. In addition, well-informed individuals bring issues and concerns to planners that are thoughtful and insightful, and that often lead to better decisions by those implementing the program.

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[52] U.S. Department of Transportation, Public Involvement Techniques for Transportation Decision Making, Federal Highway Administration; Federal Transit Authority, Pub.#FHWA-PD-96-31; HEP-30/9-96(4M)QE, September 1996.

[53] Hubert H. Humphrey Institute of Public Affairs web site: http://www.hhh.umd.edu/Centers/SLP/Conpric/conpric.htm.

Written Informational Materials

Written materials are one of the best techniques for educating your audience and providing detailed information on a transportation pricing plan or program. Examples of written materials include:

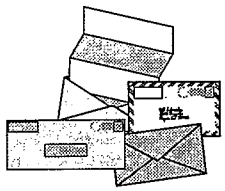
- Fact Sheets or Brochures
- Newsletters
- Public Notices
- Letters to Specific Individuals or Organizations
- Surveys

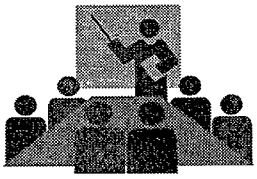
Providing written materials allows planners to deliver a uniform message to all stakeholders and also helps to alleviate the spread of misinformation that can create a barrier to successful implementation of a transportation pricing project. Written materials should be written in simple language and format and in appropriate languages to ensure that all affected individuals can understand the information. Graphics should be used to enhance any written materials distributed to the public. Charts, graphs and other illustrations can be helpful in describing the organization and goals of a program, emphasizing key concepts and points, or showing expected changes and benefits to the present transportation system.

In addition, materials targeted at a specific group of stakeholders that explain how a program would benefit, impact or address the special needs of their constituency can also be beneficial. By narrowing the audience, planners can address, in detail, those issues that are most relevant to special interest groups or their community as a whole. When used in conjunction with uniform messages, such slightly different, targeted messages can contribute to a program's success.

Example: California SR 91 Project

The California Private Transportation Corporation (CPTC) conducted an extensive public education and involvement campaign for the congestion pricing project on California SR-91. The project consists of tolls on four new express lanes, opened in December 1995, which vary by congestion level and vehicle occupancy; no tolls on existing lanes (see appendix for more information). The tolls are assessed with the use of transponders mounted in the cars. Six weeks prior to the projects' implementation, the CPTC undertook a massive media campaign, which included direct mailings to residents, radio announcements, billboards and print advertisements. These efforts helped to keep the public informed of events, educate them on the issues and benefits associated with the proposed project and gain their support for the project.





The California SR 91 Project also held public meetings as part of their public outreach program. Significant marketing and outreach efforts were made both to local governments, including Chambers of Commerce, and citizen organizations as early as two years prior to the adoption of the program. These parties were invited to and hosted a series of presentations on the project throughout its development stage. The primary goals of these meetings were to assess the knowledge and perceptions of affected tax payers on the issue of toll roads and to educate them on the benefits of the SR-91 project.

Mass Media

Forms of mass media, such as radio, television and print, have proven to be very influential in educating and informing the general public. Through the publication of press releases or purchase of air time on local television and radio stations, planners can reach out to a wide base of people. Planners should concentrate on the following when dealing with the media:

- Develop a good relationship early on;
- Maintain open and honest communications; and
- Always have useful facts available.

Example:
GO Boulder Project

The City of Boulder and Colorado DOT are working together to conduct a study on the feasibility of congestion pricing in the metropolitan area. The Congestion Relief Study, which is part of the GO Boulder Project is expected to be completed in December, 1997. A combination of several public outreach strategies and techniques are being used in this program to involve the citizens of the Boulder region in resolving issues related to traffic congestion. In addition to general forms of public education, a large number of neighborhood meetings have been held throughout the affected area, and local residents have been polled on their opinions. These techniques are being used to create a foundation of public awareness and support and to gather continuous public feedback. In addition, the City is proposing to leverage existing regional opportunities, such as the Boulder County Consortium of Cities and the Boulder County Health Communities Initiative, to further engage neighborhood communities in discussions of regional transportation problems and potential solutions.

Source: 1995 Listserv Discussions. Boulder, CO--Congestion Relief Study Update. Hubert H. Humphrey Institute of Public Affairs. www.hhh.umn.edu/Centers/SLP/Conpric/1995.htm

Of the different types of media, the press is one of the most influential and visible to the general public. It is important to develop a good relationship with the press early on in a project's development. Due to the controversial nature of transportation pricing policies, the press may initially be hostile to the proposed policy. If planners have "the facts" available, and deal honestly and openly with the media and other groups which raise concerns about the program, the support of such groups should not be difficult to secure.[54] Not only would such a relationship help to guard against the release of biased or false information about the program, but it can also help to ensure that the major concerns of all potentially affected parties are addressed. If the support of the press and other forms of media can be secured, the planners will have an influential tool with which they can inform and educate a broad base of people on all aspects of a transportation pricing project.

[54] Munnich, Lee et al., p. 7.

Public Forums

In addition to keeping the different interest groups informed through the use of informational materials and mass media, it is also essential to connect with groups on a more personal level. Public forums, such as transportation fairs, open houses, public and neighborhood meetings, and public hearings, provide the opportunity for planners to speak directly to the persons potentially affected by changes in transportation patterns. These types of activities allow the public to learn about the project and ask questions. Public forums also provide an avenue through which planners can collect a great deal of uncensored feedback, both positive and negative, on the proposed changes. By soliciting input through public meetings and other forums, and incorporating such feedback into a proposed project, developers can help to ensure the successful adoption and implementation of a transportation pricing program.

Obtaining Public Input

This section discusses some techniques available, in addition to public meetings, for involving the public and obtaining their input. As discussed earlier, involving people in the decision-making process increases the chances of successfully implementing a transportation pricing project.

Citizen surveys

Citizen surveys can be a helpful tool for planners to gain a better understanding of what people think about a proposed transportation pricing project and what the citizens think are the primary issues of concern with respect to implementing such a project. In using surveys, it is important to remember that the information received will be more useful if the citizens have a better understanding of the current situation and the proposed project. Thus, surveys most often will be combined with some sort of educational technique, such as enclosing written informational materials or distributing the survey to attendees at public meetings. It is also important to recognize, however, that surveys are subject to bias, depending on the selection of participants, the educational materials distributed, how the questions are framed, and the overall aim of the survey.

Focus Groups

Focus groups provide an environment in which planners and group members can focus on specific issues of concern. As a result, focus groups are often used to identify specific issues with respect to the development or implementation of a program or to educate the public on more detailed or technical topics. For example, the GO Boulder project is working to

The Family Budget Trial

The GO-Boulder Project has embarked on an innovative case-study program called the Family Budget Trial. Under this program, six households in the Boulder area were selected to work with a "personal trainer." The trainer works together with the family to calculate the present costs of travel incurred by the family and to estimate how these costs would change under different transportation pricing scenarios.

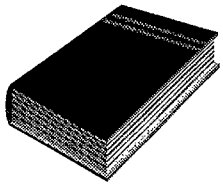
educate the citizens and other affected parties on the more technical issues associated with transportation pricing strategies, namely how market-based techniques can affect driver behavior, traffic flow, and the environment through a combination of small focus groups and specific case studies.[55] Planners hope to use the results of the case study program (see sidebar) to directly educate the citizens on the impacts of transportation pricing and illustrate how travel behavior can be altered by using market-based approaches to address transportation problems.

Task Forces

Task forces and citizen or civic advisory committees provide a formal opportunity to bring together representatives from the many stakeholder groups affected by a transportation pricing program to identify, discuss, and resolve issues regarding the design, development, implementation, and operation of such a program. Task forces and similar groups have been used successfully in many situations, including a variety of transportation issues.

Example: Washington Commute Trip Reduction Task Force

The State of Washington solicited a great deal of public input when it was developing the framework for its Commute Trip Reduction (CTR) Law in 1991 (see appendix for more information). The state relied heavily on the input from a 22-member task force, made up of County, City, and Transit Agency personnel, private employers, State agencies and citizens at large, all appointed by the Governor of Washington. This task force was responsible for the guidelines of the program and played an important role their implementation. The task force held meetings with City Chambers of Commerce and employer groups, set up focus groups for citizens and employers, and held forums where the issues could be discussed with affected parties. The task force used this input to formulate guidelines for a model local ordinance, from which local governments could mold their individual programs. They were so successful in integrating the public's feedback into their proposed guidelines that almost every local government adopted the model with few changes. Now that the program has been successfully implemented, the role of the task force has changed. At this time, they are working in a review capacity, making recommendations to the State legislature on guidelines which are not working or that need to be amended as well as proposing changes which should be made.



In addition to the success of the Commute Trip Reduction (CTR) Task Force in Washington state (see sidebar), the City of Boulder has also set up a task force and other interactive community groups to address the issues and concerns associated with its proposed transportation pricing program. To date, the City of Boulder has set up over 45 focus groups and formed a Transportation Advisory Board, made up of representatives from a variety of

[55] Midwestern Region Congestion Pricing Workshop, Boulder Project.

stakeholder groups.[56] The goal of these efforts is to bring together public officials, private citizens, businesses and other groups to discuss difficult and controversial issues, build consensus between otherwise disparate groups, and reach compromises on appropriate solutions and approaches.

Reporting Back to the Public

Planners should report back to the public on a regular basis to keep them informed of new developments, changes in plans, and ultimately the end result of the program. The Task Force created to develop the Washington State CTR Law was particularly successful in achieving this goal. Not only were people informed of changes being made to the guidelines, but their feedback was solicited after the law was passed and is being integrated into improvements to the current guidelines.

In addition to using a variety of approaches to involve the public, the GO Boulder Project, in Boulder, Colorado also published "A Cost of Travel Report" at the beginning of 1996, to help keep people informed on the development of the project. This report, which included information collected from a number of community meetings and focus groups held throughout the development phase of the project, also helped to assure the public that their input was valued and being taken into consideration.

Utilizing Coalitions and Partnerships

In addition to working with the public to gain broad-based support, developing a coalition of community and government leaders can help ensure a project's successful development and implementation. As Lee Munnich advises, a coalition should, at a minimum, include the major institutional advocates from three areas: transportation policy, business, and community organizations.[57] Task forces, initially formed to obtain public input and involvement, may lead to the building of new consensus between groups that have traditionally had diverse interests and different objectives.

In addition to coalitions between local interest groups, existing coalitions and partnerships between like organizations should be targeted. Transportation organizations, such as the State DOTs, metropolitan planning organizations (MPO), and other authorities, are more likely to support transportation pricing mechanisms if the revenues realized from such programs could be used to help finance the improvement of current roads and transit routes. Air quality and other environmental offices and organizations should be targeted due to the environmental benefits derived from decreased levels of travel. Organizing and involving various stakeholder organizations in the program's technical, financial and institutional issues

[56] 1995 Listserv Discussions, Boulder, CO--Congestion Relief Study Update.

[57] Munnich, Lee et al., p. 5.

as early as possible will help ensure that all parties understand the potential benefits and pitfalls associated with the program. Chapter 4 provides a more in-depth discussion of the important role of institutional relationships.

EVALUATING THE SUCCESS OF THE PUBLIC OUTREACH AND INVOLVEMENT EFFORT

An important component of a public education and involvement campaign that is often neglected is the evaluation of the success of the campaign. It is important to decide upon the structure of the evaluation component of a public outreach and education program before the program is undertaken. One should also plan to evaluate the public involvement effort throughout the process and to make adjustments as necessary to improve the public outreach campaign. These actions will help establish a baseline by which to measure the success of the program.

There are two key elements to evaluating a public outreach campaign:

(1) Defining the success criteria; and
(2) Building in milestones during the public involvement process to review the status of the public outreach and involvement activities against the objectives of the process and the success criteria.

By building in evaluation components into a public education and involvement plan, transportation planners can determine how successful the program has been and make any adjustments that might be necessary to improve the program.

Approaches for evaluating a public outreach and involvement effort include:

- Obtaining feedback from the people on their satisfaction with the decision-making process and their understanding of and involvement in that process;
- Documenting how the participants influenced the decision(s), highlighting areas where public input changed the final decision;
- Repeating some of the steps undertaken initially to define the audience and issues to determine if the outreach and involvement program is effectively reaching the full audience and addressing all of the relevant issues;
- Summarizing the lessons learned and providing feedback to participants that demonstrates what input was received and how it was used; and
- Conducting before and after surveys to assess changes in public attitudes toward the transportation pricing initiative.

Public input can be obtained through a number of means including mail-in responses distributed through newsletters, and evaluation forms completed by participants of focus groups, public meetings, and peer review panels. The amount and scope of feedback obtained will depend on the nature and/or structure of the evaluation form used.

CONCLUSION

In general, people are wary of any new techniques or mechanisms that will claim to reduce inefficiencies through unfamiliar practices. How people ultimately respond to any proposal to change existing transportation patterns and regulations will, to a large extent, depend on how successful the public outreach program is in educating and involving all affected groups and individuals.

Numerous studies and demonstration programs have shown that for a market-based transportation program to be successful, the citizens and potentially affected parties must be involved in the planning process, they must be educated on the issues at hand and the proposed solutions, and their input must be taken into consideration in developing a final plan. The level of public acceptance for a transportation pricing initiative will vary considerably depending on what changes have been proposed, the transportation system presently in place, and how well the project planners have adapted to and incorporated the public's views. Only through broad based support from all affected groups can a transportation pricing program successfully achieve its goals.

CHAPTER 6
Equity and Transportation Pricing

Equity is an important consideration in any transportation pricing program, whether it be a parking cash-out program, an emissions-based vehicle fee, or any other pricing strategy. The recognition that various groups and individuals are affected differently by such measures is vital to the success of any transportation pricing program. However, equity can be enhanced greatly by pricing programs. Since the aim of these programs is to have people pay the costs they create, they are likely to be inherently more fair than current financing systems. This principle has been characterized as "paying for what you get, getting what you pay for" (in *California's Transportation Future*, December, 1995, California Market-based Transportation Strategies Working Group). EPA considers this a highly appropriate principle to follow.

Some people assume that if anyone has to pay more under a new pricing program that this indicates inequity. That is not the case. Many people are subsidized now while many others pay a disproportionate share of the costs. Reducing subsidies and increasing the connection between the costs people create and what they pay should create a fairer system.

This chapter examines equity in transportation pricing programs. The first section presents an overview of the equity issue. In order to provide a baseline against which transportation pricing programs can be weighed, the second section briefly assesses the equity and inequities of the current transportation financing system. The third section discusses various equity issues relevant to transportation pricing programs. The last section discusses specific ways to increase equity through new transportation pricing systems.

OVERVIEW OF THE EQUITY ISSUE

Equity with respect to a transportation system is both an issue of the distribution of costs and benefits among groups and a question of access and mobility for all individuals. Developing and implementing an equitable transportation system only means that all groups should be treated fairly. It also means that each individual should be able to adequately meet his or her transportation needs while paying for them fairly. Paying for them fairly needs to include the recognition that not everyone can necessarily pay their full share and that society benefits if they are assisted. Realizing these goals in an efficient manner is at the heart of the equity issue. Equity has traditionally been defined in terms of the allocation of benefits and costs between income classes and races. But considering the equity of the transportation system for other groups may be just as important. These other groups include the disabled, the elderly, the young, women, those who drive little or not at all, those who live near traffic, businesses, rural and urban residents, current and future travelers, peak-period users and those who do not travel at the peaks.

Equity is very difficult to define. Different people may have different ideas. These include some of the following possibilities:

1. Equal shares: everyone gets an equal share of the benefits.
2. Greatest good: seek the "greatest good for the greatest number."
3. Minimize inequities in outcome: seek to ensure satisfactory benefits first for those with the least.
4. Fair share: each person gets what s/he pay for and pays for what s/he gets, without concern for those who are disadvantaged.

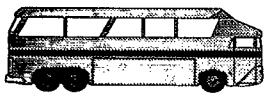
It should be noted that we have a transportation pricing system now that it has its own equity impacts. Creating new fees to improve the extent to which prices reflect costs imposed will not initiate pricing or equity issues. Another important point is that new fees do not necessarily mean more charges. Many studies have included options for returning the new fees by lowering taxes that are inequitable, lowering other fees, providing tax rebates, etc. Just changing the way in which costs are paid can significantly reduce air pollution by connecting consumers' choices with the actual fees they pay.

As noted above, the distribution of costs and benefits between individuals or between groups is central to the equity issue. Pricing programs are intended to link payment more closely to those choices which create costs.

Also central to the issue of equity is the ability of each individual to achieve his or her desired level of mobility while paying for it fairly. Although equity concerns are often expressed in ethical or moral terms, society as a whole also benefits socially and economically when each person has access to transportation. Milwaukee's bus system provides an interesting example of the benefits that can result when transportation accessibility is improved.

Example: Milwaukee County Transit System

Society's economic prosperity may well be enhanced through improved equity in the transportation system. In the Milwaukee area, public transit limitations often kept individuals from accepting certain jobs. A number of employers in the suburbs of Milwaukee had difficulty hiring the workers they needed, largely because of limited public transportation. To alleviate this problem, the county worked with employers to extend the Milwaukee bus system into underserved areas. The net result of this action was that individuals who resided in the city could take public transportation to a place of work in the suburbs, increasing both the availability of labor for these businesses and the availability of employment for people living in the city.



EQUITY AND THE CURRENT TRANSPORTATION SYSTEM

The current transportation financing system in the United States is inequitable for a variety of reasons:

Social Costs. As noted earlier in this document, some of the costs of automobile use (particularly some of the costs of the public road network) are paid by drivers through

gasoline taxes and tolls. However, these payments are not sufficient to cover all of the costs of automobile use. The remainder of the costs are paid in several different ways. The additional direct costs of building and maintaining roads are paid indirectly through property, sales and income taxes. Indirect costs of supporting vehicles by local governments are paid for in the same way. These include the costs of providing police and fire services, public works and more general government operations that support private vehicles (planning, etc.) The more general social costs of pollution, nuisances, etc. are borne by people and society in the form of additional health costs, poor environmental quality, disease and discomfort, congestion, and other unpleasant effects. As a result, the current transportation system unfairly forces those members of society who do not drive or drive relatively little to help pay for the cost of heavy automobile use by others. Subsidies also encourage a level of driving that exceeds what people would actually choose if they had to pay the costs. This increases costs and negative effects for everyone above a desirable level. Some people pay a disproportionate share of those costs.

It is worth noting, that *everyone* benefits from the public road network, as well as suffering from the use of it. This is because most goods and services are available to consumers as a result in part of the public road network and because buses and bicycles also use the roads.

Marginal Costs. Besides the issue of getting drivers to pay more of the costs they are responsible for, there is an issue that some drivers are responsible for much more cost because of when and where they drive. Those who drive in congested areas at peak periods impose heavy costs on others by the delays they contribute to. They also create demand for widening roads, which is has very high economic and environmental costs. It is more fair that those who drive at peak periods should pay for the costs of widening roads and of delaying others. Congestion pricing seeks to enhance equity by charging those who create the costs these "marginal" costs, as opposed to averaging the costs of road building over all drivers or taxpayers, even those who do not create much of the demand.

Private Costs. In the U.S., households spent an average of $6,044 on transportation-related services in 1995.[58] While those with lower incomes may pay less than this per year, they still may not be able to afford an automobile. Without a car, such individuals and families often achieve limited mobility because other options are not readily available.

Access. Not all individuals have equal access to employment and services. This is due, in part, to a lack of access to transportation sources and to land use patterns that are auto-supporting and that arise from current transportation pricing policies. This denies people economic opportunities, as well as access to shopping, services, social opportunities, etc.

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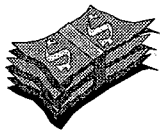
[58] U.S. Department of Transportation, Bureau of Transportation Statistics, Transportation Statistics Annual Report, 1996, Washington, D.C., 1996, p. 45.

Parking. The current system provides free or reduced prices for parking at most work places, shopping and public areas. This subsidizes automobile travel and provides a disproportionate benefit to upper- and middle-income individuals who are more likely to drive. It penalizes those who do not drive by charging them higher prices to cover the costs of parking. Parking spaces cost money: one report indicated a cost of $2,500 to build a surface space and $1,066 per year to maintain it, with the comparable costs of $18,000 initially and $1,300-4,600 a year for multi-level spaces.[59] Underground spaces can be much more expensive. "Free" parking mandated by city ordinances with minimum parking requirements is also likely to have negative effects on lower-income residents because of the hidden costs associated with meeting the requirements. Minimum parking requirements raise the price of housing because more land and materials are consumed. Developers, in turn, often respond to such parking requirements by building larger and more expensive units.[60] This results in a smaller supply of housing at increased prices. If there are fewer and larger units due to minimum parking requirements, low-income people are hurt, as are many middle-income people. Because housing is made more expensive as a consequence of minimum parking requirements, the poor pay for parking even if they do not own cars. In addition, lower housing density also tends to lower transit feasibility, thereby hurting the poor and many others. Lower density has many costs for society as a whole, including the additional costs of government and utilities in lower-density areas.

Transportation-Related Expenditures by Households in 1994 (1997 dollars)

All Transportation:	$6,044
Vehicle Purchases:	$2,725
Gas and Oil:	$986
Other Vehicle Expenditures:	$1,953
Purchased Transportation Services:	$389



Source: U.S. Department of Transportation, 1996, p. 45.

The Elderly, Disabled and Young. The elderly, disabled, and the young are particularly affected by limited public transit and reliance on the automobile for mobility. Unless they live near a public transit stop with good, affordable access to key destinations, these individuals often have to depend on family, friends, and neighbors for transportation and/or be deprived.

Minorities. Minority groups are often disproportionately affected by the inequity of the current transportation system because they tend to represent a relatively large percentage of the lower income population. In addition, they may be more likely to be subject to the health risks and annoyance of having major roads near their homes.

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[59] Parking costs are for Stanford University, referenced in Blueprint for a Sustainable Bay Area, Urban Ecology, 1996.

[60] Shoup, Donald C., "An Opportunity to Reduce Minimum Parking Requirements," Journal of the American Planning Association, Winter 1995, p. 25.

Geography. Geographic disparities are another significant factor in the current system. Urban residents are often exposed to higher levels of mobile source pollution than suburban residents because many people drive into the city from the suburbs for work. Although it may be desirable to base the "price" of driving, at least in part, on the number of vehicle miles traveled, it may be necessary to consider issues such as a driver's contribution to congestion and air pollution as well. For example, although those living in rural areas are particularly reliant on the automobile for travel and also tend to drive more miles than urban residents, these individuals may have little impact on air quality or congestion in urban areas.

Transit Fees. Most transit fees do not vary by income level and, thus, represent a greater percentage of income for those with lower incomes (this is true for many goods and services purchased). In addition, individuals at the lowest income level use public transportation nearly three times as much as those at the highest income levels, yet because transit fares do not vary greatly with distance traveled, higher-income individuals generally pay less per mile to use public transportation. (This result is largely due to the fact that higher-income individuals rely more heavily on commuter transit services, which provide travel over longer distances and are often more heavily subsidized.)[61]

THE EQUITY EFFECTS OF TRANSPORTATION PRICING PROGRAMS

Although transportation pricing programs can be used to address the inequities of the current transportation system (and also to reduce traffic congestion and improve air quality), it is important to consider their equity effects as well. While many of these programs may not be entirely equitable, they may nevertheless improve upon the current system and generate significant benefits for society if carefully designed and implemented.

There are a number of important equity considerations that should be taken into account when designing and implementing a transportation pricing program:

- How will individuals in different groups be affected?
- Have individuals in these groups been given a voice in the program development process?
- Will the program increase mobility?
- How will funds generated from the program be utilized?
- Is there a more equitable means of achieving the program's goals?

Addressing these questions, particularly during the program development stage, will provide for a more equitable policy and ensure that individuals in different classifications (urban, rural, minorities, different income levels, etc.) are treated fairly.

[61] U.S. Department of Transportation, 1996. p.14.

In evaluating a transportation pricing program from an equity perspective, one must keep in mind that higher-income people tend to drive more than lower-income people. Those in the lowest income levels tend to use the highway system very little and to drive very little during congested periods. As a result, transportation pricing programs aimed at highway travel will likely affect a greater proportion of higher-income people than low-income people. In discussing the impact of pricing programs on low-income people, it is also important to note that minorities, women, and young people tend to be disproportionately represented in lower-income categories.

The remainder of this section discusses specific equity issues of transportation pricing measures. To simplify the discussion, transportation pricing measures are divided into two general categories: (1) taxes, tolls, and fees, and (2) direct subsidies and parking cash-out programs. These two categories differ in that one takes money away from transportation consumers while the other gives money to certain consumers.

Tolls, Fees, and Taxes

Tolls, fees and taxes will affect different income groups in different ways. Under a pricing scheme, those with high-incomes enjoy the benefits of less congested roads (e.g., shorter commutes) and may only need to eliminate "discretionary" driving. Higher-income groups are much more likely to be affected by new transportation fees, but also have the greatest ability to pay for them. In general, road users who value time savings over increased expense, such as commercial delivery services, are likely to benefit from reduced congestion.[62] Furthermore, in the case of peak-pricing or time-of-day tolls, higher-income people are often better able to alter their travel schedules and take advantage of less expensive fares.

While lower-income individuals tend to drive (and park) less than higher-income individuals, transportation pricing measures such as tolls, fees, and taxes have a greater impact for low-income groups if they do have to pay them. Low-income people may be forced to forgo "necessary" trips. Those most likely to be hurt are those who are employed in 9-to-5 jobs with inflexible schedules. Those who are unemployed, or who work during later shifts will not be affected to the same degree.

In addition to tolls, fees, and taxes that are designed to reduce congestion (i.e., by reducing trips), pricing programs that are based on the emission rates of vehicles, such as an emissions fee program, can potentially have differential effects on individuals at different income levels. This is because individuals with lower incomes are somewhat more likely to drive older vehicles that pollute at relatively high levels and they have less ability to repair them. As a result, an emissions-based vehicle tax may impact lower-income individuals more significantly if they do not have other options for achieving their required level of mobility.

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[62] Congestion costs (i.e., potential value of time savings) to an individual depend on the amount of time spent in traffic delay and the value of his or her time. Congestion costs, therefore, are higher for high-income individuals ($1,570 per year) compared to low-income individuals ($60 per year) because high-income individuals generally spend more time traveling and because their wage rate is higher. U.S. Department of Transportation, 1996. p. 16-17.

For this reason many such proposals include lifeline components, where the charge is based on the ability to pay.

Pay-at-the-pump charges represent somewhat of an exception to the general rule that is applicable under tolls, fees, and taxes. A pay-at-the-pump insurance program,[63] for example, would clearly benefit lower-income individuals if they currently have insurance. Since they drive less, their total cost per trip would decrease if insurance costs are based on miles driven.[64] The same is true for other drivers who currently drive less than average. Drivers who travel long distances, such as higher-income people and commercial drivers, may pay more for insurance than they currently pay, which is more equitable. They may, however, receive some benefit from the program, particularly in terms of reduced congestion and pollution, as well as a reduction in the number of uninsured motorists.

The lower- and middle-income sectors of the population may be most likely to respond to transportation pricing measures such as tolls, fees, and taxes by switching to mass transit. (See sidebar.) Individuals who already rely on mass transit for transportation may benefit from transportation pricing programs if they lead to increased transit ridership. This is because increased ridership could make transit more efficient and therefore less expensive, and/or it could facilitate an increase in transit options and service frequency.

In addition to examining the relative effects of transportation pricing on different income groups, it is also important to consider the equity implications based on geographic distribution. If transportation pricing is implemented on a region-wide basis, those who live in denser, urban core areas have more options to avoid the new charges than their suburban counterparts. Urban dwellers generally have greater access to transit, and to a larger variety of services and amenities that can be reached via walking, bicycling, transit, and short drives. For example, it has been estimated that there are at least 700 restaurants within walking distance of residences in the North Beach neighborhood of San Francisco.

Tolls and parking fees may affect people and businesses in downtown areas differently than those in suburban areas. If tolls are instituted on highways that link people to inner cities, people may choose to avoid the added travel expense and shop in suburban areas. Downtown businesses may also experience a loss of employees to suburban competitors due to the added cost of tolls or parking for employees. Suburban areas may therefore see more congestion if people avoid tolls and choose to shop in less congested areas. Additionally, these businesses may benefit from drawing employees out of downtown areas because they can offer a cheaper commute. This may adversely impact people who live in urban areas if their employers move their businesses to suburban areas. Only six percent of welfare recipients have cars, yet two-

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Instead of paying a fixed rate for insurance that is largely independent of the number of miles traveled, a pay-at-the-pump program would allow motorists to "pay as they go" when they fill up their tank with gas.

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The total cost of driving on a per-mile basis includes the fixed cost of insurance divided by total mileage driven.

thirds of the new jobs being created are outside of the urban core.[65] In addition, roughly a third of the population is not licensed to drive, and 13 percent of the driving age population do not have driver's licences.[66]

On the other hand, if transportation pricing revenues are used to reduce other taxes in downtown areas, downtown businesses could be more competitive. Parking pricing would be likely to free up parking, making more available for shopping and also reducing the costs of doing business and increasing the number of destinations accessible via transit and walking. Reducing space devoted to parking tends to enhance the attractiveness of downtown areas and make them more appealing for both shopping and businesses.

Parking fees and transit infrastructure are important considerations in any transportation plan. While charging for parking in urban areas may serve to limit congestion and pollution, alternative forms of transportation should be made available to ensure easy access to downtown areas. Increasing parking fees in congested downtown areas may also have a "spillover effect," as people park in unregulated areas if those areas do not price their parking appropriately. Regional parking pricing may offer the potential to level the playing field between downtown and suburban areas.

Direct Subsidies and Parking Cash-Out Programs

Adding new subsidies is not necessarily more equitable. Allowing even more travel without paying the full costs is not a particularly desirable approach. Nevertheless, given the current transportation system, subsidies may be an appropriate step to level the playing field for individuals with limited mobility and income. Transportation pricing programs that subsidize public transit may improve the overall equity of the area's transportation system because lower-income and minority individuals are more likely to benefit from such programs. Of course, how such a subsidy program is funded may undermine the benefits to lower-income and minority individuals if it relies on regressive fund-raising mechanisms such as sales taxes. However, the pricing ideas discussed in this report are all designed to increase the equity of financing, perhaps in part by replacing unfair taxes and fees.

One transportation pricing measure that may benefit lower-income and minority people in both downtown and suburban areas is the employer parking "cash-out" system. This policy gives employees the option of receiving cash instead of subsidized parking. Although not everyone will choose the cash instead of free parking, it is predicted that many people would

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[65] Linton, Gordon, Administrator, Federal Transit Administration, spoken remarks at Southeastern Michigan Council of Governments' conference "Building Livable Communities Through Transportation," University of Detroit - Mercy, June 3, 1997.

[66] U.S. Department of Transportation, Highway Statistics 1991, Federal Highway Administration, 1992, p.31.

select the taxable cash in a cash-out program.[67] If this is the case, cash-out programs may benefit low-income employees the most, because the cash allowance would be larger in proportion to their income than it would be for employees earning a higher income and they are more likely to forego parking. A cash-out policy would also benefit disabled workers who are unable to drive a car to work.

USING TRANSPORTATION PRICING TO ADDRESS EQUITY CONCERNS

As noted earlier in this chapter, the current transportation system is inequitable for a variety of reasons. In addition, there may be equity concerns associated with a specific transportation pricing program. If carefully designed with equity as a particular consideration, however, transportation pricing programs can be made more equitable and at the same time can be used to actually reduce the inequities found in the current transportation system. Examples of how this can be achieved are discussed below.

Lifeline Pricing and Similar Variable Pricing Options

Lifeline pricing is the concept that, rather than charging all individuals the same rate, those with lower incomes should get a lower rate for at least some of their costs. Often the lower rate applies for a limited service. Lifeline fees are already used to provide heating and telephone and other basic services to low-income families. Using this type of pricing scheme for transportation services would serve to provide at least a basic level of mobility and accessibility to many people.

Improvement of Alternative Transportation Services

Another means of employing transportation pricing in an efficient and equitable manner may be to use the funds generated from such measures to improve or increase transit service. This is a simple yet effective method of addressing some of the equity concerns raised by pricing mechanisms. By increasing or improving the level of service or by lowering the cost of transit, individuals with lower incomes benefit. In addition, people who cannot drive a car, such as some disabled and elderly individuals and those too young to drive benefit as well. However, one of the other virtues of equitable pricing programs is that they encourage the market itself to provide alternatives. If driving subsidies are reduced, then it improves the

[67] The recent tax code legislation has changed the tax status of cash received in programs such as parking cash-out.

opportunities for private companies to provide shuttle service, deliveries, telecommunications alternatives, neighborhood stores and other alternatives to driving.

Rebates or Subsidies to Lower-Income Individuals

Another transportation pricing approach that could be successful in addressing equity concerns is a voucher system whereby individuals with lower incomes receive a voucher or rebate for transportation services. The U.S. currently provides food stamps for low-income individuals and families to ensure that all citizens have a basic level of sustenance. The same concept might be applied to mobility. One recent study strongly supports the idea of a rebate system, noting that the way transportation revenues are distributed significantly impacts the equitableness of a transporation fee.[68] This study compared the distributional impact of five uses of revenue from a hypothetical $0.05 per mile VMT fee (see sidebar).

Alternative Revenue Distribution Policies Examined

1. Retain the status quo or current transportation system;
2. Distribute fee revenues to drivers in each income quintile proportional to VMT fees paid by that quintile;
3. Distribute a per-capita rebate where each income quintile would receive twenty percent of the fee revenues;
4. Eliminate and pay for transit fares through VMT-fee revenue; and
5. Use fee revenues to eliminate existing transportation taxes.

When the impacts of these five alternatives were compared across income quintiles, the study found that all of the alternatives to the status quo led to increased benefits for the lowest income quintile. The second lowest income quintile also fared the same or better under all scenarios except the revenue neutral scheme (using fees to eliminate existing transportation taxes). A VMT-fee rebate system where rebates are made or fees eliminate other charges would create an incentive to drive less, thereby reducing pollution levels, and depending on how it is structured, can also result in increased benefits for lower income groups. Open discussion of the merits and drawbacks of various fee-rebate scenarios, how they compare to the current transportation financing system, and their potential impacts on different groups should lead to the best choice for each area. Those whose current benefits would be reduced by a transportation pricing program will likely reject such a program. Public education could play an important role by illustrating that much of the true costs of automobile transportation, including pollution and congestion, are currently not paid by consumers, and that a per-capita VMT-fee rebate would help to remedy this situation.

[68] Cameron, Michael. Efficiency and Fairness on the Road: Strategies for Unsnarling Traffic in Southern California. Environmental Defense Fund. Oakland, CA. 1994., p. 42.

CONCLUSION

While issues such as feasibility, economics, and political realities play a vital role in the design of any transportation pricing program, it is important to include considerations of equity as well. Incorporating equity concerns early on in the development of a pricing program, as opposed to addressing them as they arise in the course of implementation, will result in a more effective program. In short, if equity concerns are addressed up front, a transportation pricing program will be more successful at resolving the equity problems inherent in the current transportation system.

The significant amount of revenue that may be generated by a transportation pricing program will be sought after by many agencies and groups. The use of revenues from pricing programs may be one of the most important factors affecting equity. Without making provisions to insure accessibility for all individuals, regulatory and market-based strategies run the risk of excluding a substantial segment of the population. Yet one of the key advantages of market-based transportation pricing programs is that they allow a great deal of flexibility and therefore provide the opportunity to address equity concerns. Prices can be varied to increase opportunities for low-income individuals and others who are not served well by current transportation policies. Revenues can be used to improve transportation accessibility, increase efficiency, and reduce the cost of public transit.

CHAPTER 7
Funding Sources

Earlier chapters of this report have focused on issues that drive the feasibility of implementing transportation pricing programs for a specific highway, corridor, locality, or region. For example, Chapter 4 investigated the institutional relationships that are necessary for successful program implementation, while Chapters 5 and 6 discussed the importance of public acceptance and the need to account for equity in program design, development, testing, and implementation. Although these issues are critical to the successful implementation of transportation pricing programs, public and private sector decision makers will also need to address issues related to program funding. Without sufficient funds to design, develop, test, and implement transportation pricing measures, issues such as institutional relationships, public acceptance, and equity may not be adequately addressed in the process, thereby compromising the overall success of the project.

The objectives of this chapter are (1) to review the manner in which existing transportation pricing programs have been funded, and (2) to identify potential funding sources available to new transportation pricing initiatives. The chapter is organized into three general sections. The first section reviews federal funding sources stemming from the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) that have been (or could be) employed to fund existing programs. The second section address other funding sources and discusses the role of state and local governments in financing the design, development, testing, and implementation of such programs. This section also discusses private sector funding initiatives and innovative financing strategies available to the public sector that can be used to fund future transportation pricing programs. The third section presents a summary table of possible funding sources.

FEDERAL FUNDING SOURCES

General federal financial assistance for the planning, development, and improvement of the nation's surface transportation system is provided to states and local governments through several programs, including, for example, the Surface Transportation Program (STP), the Transit Block Grant Program, and the Bridge Replacement and Rehabilitation Program. The funding programs for highway activities are known collectively as the Federal-Aid Highway Program (FAHP), through which funds are distributed to the states. Funding for the FAHP is made available through periodic surface transportation legislation, the most recent of which is ISTEA. It is important to note that ISTEA is up for reauthorization in 1997 and, although the potential outcome of this reauthorization is still uncertain, early indications are that at least some of the flexible funding opportunities provided under ISTEA will remain under its successor. Therefore, this section discusses the current funding options under ISTEA. Later, the chapter discusses some specific changes proposed under the reauthorization.

ISTEA authorized $121 billion for highway related activities under Title I (Surface Transportation). This title contains various funding provisions that states and localities potentially could use to finance transportation pricing initiatives. Likewise, Title III (Federal Transit Act Amendments of 1991) and Title VI (Research) of ISTEA include funding programs that could potentially be used to finance transportation pricing programs. For instance, the Federal Transit Administration (FTA) has been actively involved in various pilot projects, such as the California SR-91 Project and the San Diego I-15 Express Lanes Project. The major federal-aid programs under Titles I, III, and VI that can be used to finance transportation pricing projects are discussed below.

Title I -- Surface Transportation

Congestion Pricing Pilot Program

Authorized under Section 1012(b) of ISTEA, the objective of the Congestion Pricing Pilot Program was to encourage the testing and evaluation of congestion pricing projects in a variety of settings nationwide on an experimental, or pilot, basis. Under the Pilot Program, the Federal Highway Administration (FHWA) was authorized to enter into cooperative agreements with up to five state or local governments, or other public authorities, to establish, maintain, and monitor congestion pricing projects. Up to three of these cooperative agreements could involve the use of tolls on the Interstate Highway System. In addition, pre-project studies, including public outreach, project design, and related activities, could be supported with Pilot Program funds.

The Pilot Program gave special attention to formulating plans for monitoring and evaluating the impacts of congestion pricing projects, including those related to travel behavior, environmental quality, equity, and economic development. Federal funds were available to support pilot projects for a period of at least one year, or until such time as the project was generating sufficient revenues to fund its operations without federal participation. However, no pilot project could be funded by FHWA for more than three years after implementation. Revenues generated by congestion pricing pilot projects were to be used for project operating costs and other Title 23 United States Code purposes, such as costs associated with expanding travel alternatives in the affected area.[69]

Originally, ISTEA funded the Pilot Program at an annual stipend of $25 million over the period from 1992 to 1997. However, Congress rescinded $50 million of the unused balance of Pilot Program funds in FY 1995. The National Highway System Designation Act of 1995 rescinded the remaining balance of the Pilot Program funds authorized through 1995, and transferred authorizations for 1996 and 1997 to other purposes. Thus, unless additional funds are made available for congestion pricing projects, there will be no further funds available to current Pilot Program participants for activities planned under future phases, or to new applicants.

[69] Title 23 of the United States Code is titled "Highways" and includes most of the laws that govern the Federal-Aid Highway Program.

Funding of Implementation Projects Under the Congestion Pricing Pilot Program

- **San Diego I-15 Express Lanes Project**. Categorized as an implementation project, this project was accepted under the Pilot Program in 1995 and will receive $7.96 million over the course of three years (1995, 1996, and 1997). Other project funds include $1.99 million in local matching funds and $115,000 in Phase I funding from FTA (these funding sources are discussed in more detail in other sections of this chapter). (See Appendix A for more information on this project.)

- **Fort Myers/Lee County, Florida Variable Bridge Toll Project**. This project involves the implementation of off-peak toll discounts in combination with the 33 percent increase in tolls already implemented on the Cape Coral and Sanibel Bridges in Lee County, Florida. This pricing scheme will also apply to the MidPoint Bridge, which is currently under construction. The innovative financing element of this implementation project is the use of Pilot Program funds to support the establishment of a "revenue reserve fund" that will be available to replace potential revenue loss associated with the adoption of the congestion pricing strategy. Current funding for this project is $20 million, of which 80 percent is federal, 10 percent is from the State of Florida, and 10 percent is from Lee County.

- **California SR-91 Project**. This implementation project is a partnership between the California Department of Transportation (Caltrans) and the California Private Transportation Corporation (CPTC), a private company that planned, constructed, and operates the variable tolls facility. Since this is not a federal-aid highway project, however, it is not formally a pilot project under the Pilot Program. Nevertheless, because the operation of this private facility will provide many valuable lessons for the rest of the country, Pilot Program funds are being used to support a monitoring and evaluation study of the project in the post-implementation phase. (See Appendix A for more information on this project).

Since 1992, approximately $31 million in Pilot Program funds have been obligated to support local congestion project planning and implementation activities. Two projects were initiated during the period between 1992 and 1994, and eight new agreements were negotiated in 1995. Of the ten projects, three are classified as implementation projects (see box above). In addition to the implementation programs being partly funded by the Pilot Program, seven pre-project studies have been supported with these federal funds:

1. The *San Francisco-Oakland Bay Bridge Project* developed by a consortium of public and private entities headed by the Metropolitan Transportation Commission;

2. The *Twin Cities Congestion Pricing Study* conducted by the Minnesota Department of Transportation, which relied on $640,000 from the Pilot Program;

3. The *Southern California Association of Governments (SCAG) Study* under a partnership of the SCAG, Caltrans, the South Coast Air Quality Management

District (SCAQMD), and the Coalition for Local Environmental Solutions (COALESCE), which is being funded primarily with Pilot Program monies ($1.5 million) and by a local match of $300,000 from SCAG and COALESCE (see Appendix A for more information on this study);

4. The *GO Boulder Congestion Relief Project* (part of the GO Boulder Program) being developed by the City of Boulder and the Colorado Department of Transportation and funded with $492,000 from the Pilot Program, $221,400 from the City of Boulder, and $50,000 from the Colorado Office of Energy Conservation;

5. The *Portland, Oregon Regional Pricing Project* headed by the Portland Metro and Oregon Department of Transportation;

6. The *Houston, Texas Express Lanes Pricing Project* led by the Texas Department of Transportation, with support from Houston Metro, and funded with $400,000 from the Pilot Program; and

7. The *Tappen Zee Bridge Variable Toll Project* being conducted by the New York State Thruway Authority in cooperation with the New York Department of Transportation.

The future of these pre-project studies is uncertain, given that Congress rescinded the unused balance of the Pilot Program funds through passage of the National Highway System Designation Act. The result is that only two of the projects discussed above, the San Diego I-15 Express Lanes Project and the Fort Myers/Lee County, Florida Variable Bridge Toll Project, will have sufficient Pilot Program funds available to fully implement their congestion pricing programs (note that the National Highway System Designation Act does not affect Pilot Program disbursements for the evaluation study of the California SR-91 Project). However, the FY 1997 Department of Transportation (DOT) budget proposes to reserve $15 million in obligation limitation to be used for congestion pricing projects.[70]

Surface Transportation Program (STP)

The STP is a new block grant program authorized under Title I of ISTEA that may be used by states and localities for any roads, including the National Highway System, that are not functionally classified as local or rural minor collectors. These roads are now collectively referred to as federal-aid roads. Potential uses of funds under the STP include the following:

- Construction or improvement of roads and bridges;
- Construction of bicycle facilities and pedestrian walkways;
- Development and implementation of carpool and vanpool projects;

[70] The term "obligation limitation" refers to the limit to which states can commit federal-aid highway dollars to their transportation improvement program (TIP) projects resulting from the ceiling imposed by the annual appropriations bill.

- Funding of capital and operating costs for traffic management and control;
- Funding of projects related to safety improvements; and
- Funding of wetland mitigation projects.

The total funding authorized for the STP over the period from 1991 to 1997 is $23.9 billion.

To date, states and localities have not used this financing vehicle to partly or fully fund a transportation pricing project. Various issues related with the formula for the distribution of funds and constraints on the use of such funds may diminish the attractiveness of this financing vehicle for such projects. Specifically, the formula for distribution of funds is based on each state's FY 1987 to 1991 share of total national funding, with an appropriate adjustment for Interstate Maintenance and Bridge apportionments. Once the funds are distributed to the states, the following restrictions govern the types of projects that these monies can fund:

- Each state must set aside 10 percent for safety construction activities and 10 percent for transportation enhancements, which encompass a broad range of environment-related activities;

- A state must divide 50 percent of the funds by population between each of its areas with populations greater than 200,000 and the remaining areas of the state (i.e., areas with populations less than 200,000);

- The remaining 30 percent of the funds can be used in any area of the state; and

- Areas with populations of 5,000 or less must receive at least 110 percent of the amount apportioned to the state in FY 1991 for the old federal-aid secondary highway system (i.e., rural arterial and collector roads).

Given these constraints, the types of projects that these monies are targeted for, and the limited financial resources at the state and local levels, states have not used STP funds to fund transportation pricing projects.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

CMAQ directs funds toward transportation projects in Clean Air Act nonattainment areas for ozone, carbon monoxide, and particulate matter. If a state does not contain any nonattainment areas for ozone, carbon monoxide, or particulate matter, the funds may be used as if they were STP funds.

Total funding for the CMAQ program is $6 billion over the period from 1991 to 1997. Funding is distributed based on each state's share of total population located within an air quality nonattainment area weighted by the severity of the air quality problem in each area. A minimum of one-half of a percent apportionment is guaranteed to each state. States with ozone or carbon monoxide (and, under certain conditions, PM10) nonattainment areas may only use CMAQ funds for projects that are likely to contribute to the attainment of the national ambient air quality

standards (NAAQS). CMAQ projects can generally be classified in one of the categories described below.

- ***Transit Improvements***. Possible projects in this category relate to system/service expansion for bus and rail services, operational improvements, or demand/market strategies to increase the attractiveness of transit.

- ***Shared-Ride Services***. Typical shared-ride projects include the establishment of vanpool or carpool programs, parking areas for travelers using these services, and programs to match drivers and riders.

- ***Traffic Flow Improvements***. Eligible highway/road projects include those that improve air quality by reducing congestion without adding lane mileage. Examples include signalization to improve traffic flow; traffic management/control, such as incident management and ramp metering; improvements at intersections, such as the addition of turn lanes; and the construction or dedication of high-occupancy vehicle (HOV) lanes. However, increasing concern has developed that flow improvements are not good CMAQ investments because they encourage more vehicle use and make walking and bicycling more dangerous and unpleasant.

- ***Demand Management Strategies***. Typical projects under this category include employee trip reduction programs and "auto-free zones." Projects under this category most closely resemble transportation pricing strategies. (See sidebar for an example project.)

- ***Pedestrian and Bicycle Programs***. Possible programs for CMAQ funding include the creation of trails and bicycle storage facilities, as well as promotional activities designed to encourage the use of non-motorized modes of transportation.

- ***Inspection and Maintenance Programs***. CMAQ funds can be used for activities related to emissions testing and control programs that detect and repair high-emitting vehicles. Funds can be used for projects related to updating quality assurance

Example: Demand Management Project Under CMAQ

In a public-private partnership with the Glendale (California) Transportation Management Associates (TMA), Nestle USA and Commonwealth Land Title Company participated in a demonstration program that rewarded employees who voluntarily chose alternatives to driving alone (e.g., carpools, vanpools, transit, walking, etc.). The program combined a graduated parking charge for all employees with incentives such as prizes, awards, and guaranteed rides home for participating employees. Ultimately, the demonstration project (of which $48.7 thousand was funded using CMAQ funds and $55.3 thousand was matched by the private sector) will produce information that planners can use to compare parking management strategies with other transportation demand management strategies.

software, developing mechanic training curricula, constructing high-tech diagnostic facilities, and other related activities.

- ***Other Projects and Programs***. For example, feasibility studies necessary to provide environmental documentation for a project are eligible for CMAQ funding, although general planning studies, traffic data collection activities, and similar assessments are not.

In this manner, improvements to transportation system efficiency, reductions in vehicle use or travel, and most other measures that directly or indirectly reduce motor vehicle emissions may be funded under CMAQ by documenting the projected air quality improvement. In addition, transportation projects that already are part of an approved state implementation plan (SIP) are eligible for CMAQ funding. No projects that provide new capacity for single-occupancy vehicles (SOVs) may be funded with CMAQ funds unless the project is an HOV facility open to SOVs solely during off-peak travel times.

Assuming that CMAQ maintains its funding under the new ISTEA legislation, states and localities will continue to be able to use CMAQ funds to help finance transportation pricing projects. Although to date CMAQ funds have not been used extensively in the area of transportation pricing, projects such as the Glendale TMA Parking Management Program (see box, previous page) have shown that CMAQ can be an effective mechanism for funding transportation pricing projects.

Special Financing for Toll Roads

Under Title I of ISTEA, toll roads on federal-aid facilities (i.e., roads, bridges, and tunnels) are permitted to a much greater degree than in the past. The types of toll road project work that can be funded under ISTEA authorizations include the following:

- Initial construction of toll facilities (except on interstate highways);
- Rehabilitation, restoration, resurfacing, and reconstruction highway projects on toll facilities;
- Reconstruction or replacement of free bridges or tunnels and their conversion to toll facilities;
- Reconstruction of free highways (except interstate highways) to convert to toll facilities; and
- Preliminary studies to determine the feasibility of the work described above.

For the first time, federal legislation allows ownership of toll facilities by private entities. However, the applicable public authority, regardless of ownership, must ensure that the Title 23 requirements are being carried out. A state may loan the federal share of a project's cost to another public or private entity constructing the project. Funds repaid to the state under the loan

agreement may be used for any of the purposes that fall under the original category from which the loan monies were drawn.

In addition to the toll road financing opportunities discussed above, FHWA launched a new initiative in 1995 to allow the use of Pilot Program funds by toll authorities to replace lost revenue resulting from a pilot test of variable pricing. The fact that the Pilot Program is the only federal program under which localities can introduce tolls on interstate highway segments is likely to generate continued interest and participation in this program. The availability of funds for this purpose will help to assure toll authorities that the revenue stream associated with a toll facility will not be jeopardized by the adoption of a transportation pricing toll strategy. As in the case of the Fort Myers/Lee County, Florida Variable Bridge Toll Project, reserve funds remaining after completion of the congestion pricing pilot test may be used for other congestion relief projects. This serves to further induce the adoption of variable toll strategies.

Perhaps even more significant, however, is ISTEA's promulgation of policies that provide private sector entities with the ability to own toll facilities. This facilitates public/private sector partnerships that help to diversify the financial risks that may be associated with transportation pricing programs. Such relationships can also help to generate much needed funds for the development and implementation of projects that (because of constraints) cannot be fully funded with public sector resources. This change in policy contributed significantly to the success of the California SR-91 Project, which is generally heralded as not only the first congestion pricing project in the United States, but also as the first fully automated congestion pricing project in the world. In fact, the California Private Transportation Corporation's franchise was the first awarded by Caltrans under the provisions of Assembly Bill 680, California's innovative program to encourage public/private partnerships to finance needed transportation improvements.

Title III -- Federal Transit Act Amendments of 1991

Under ISTEA, the transit formula and discretionary program requirements and structure remain basically unchanged from previous law. ISTEA achieves important objectives, however, such as providing additional transit and highway funding flexibility, thereby facilitating the use of FTA funds for transportation pricing projects. ISTEA also allows for identical matching shares of federal funds by states, rail modernization funding via a specified formula, increased use of the trust fund for multimodal projects, and an expanded research program (e.g., the Transit Cooperative Research Program). A total of $31.5 billion has been authorized over the six-year period of ISTEA for these programs. Of this amount, $18.2 billion is to come from the Mass Transit Account of the Highway Trust Fund, while the remaining $13.3 billion is to come from the general fund.

The most significant change in the law from the perspective of transportation pricing programs is greater flexibility in the use of funds under ISTEA for transit-related activities and highway-related activities. For example, it is theoretically possible for state and local governments to use up to 70 percent of the highway funds for transit projects and/or about one-third of the transit funds for highway projects.

Example of Increased Flexibility in the Use of Funds Under ISTEA

An example of how ISTEA introduces flexibility into the use of funds is the *Transit Block Grant (Section 9) Program.* The basic transit program provides capital and operating assistance to urbanized areas with populations of 50,000 or more. Section 9 funds are apportioned by a statutory formula based on population and population density for areas under 200,000 in population and on population, population density, and transportation data for areas over 200,000 in population. Section 9 capital-only funds can be used for highway projects in Transportation Management Areas (TMAs) if the metropolitan planning organization (MPO) approves and requirements under the Americans with Disabilities Act have been met. Funds used from the matching share can be used for either highway or transit projects.

Flexibility in the use of transit-targeted funds presents an additional financing option to states and localities interested in developing, testing, and implementing transportation pricing programs. For example, FTA has actively participated in the financing the San Diego I-15 Express Lanes Project and the California SR-91 Project.

Title VI -- Research (Part B, Intelligent Vehicle Highway Systems Act)

ISTEA established an Intelligent Vehicle-Highway Systems Act, now commonly referred to as Intelligent Transportation Systems (ITS), requiring the promotion of compatible standards and protocols to streamline widespread use of ITS technologies, user services, and products. ISTEA authorized approximately $660 million for this purpose.

To date, federal ITS funds have been predominantly used to fund field operational tests and research related to the direct and indirect impacts of technology deployment. Various ITS technologies, especially advanced vehicle identification (AVI) systems and smart cards, can help to enable transportation pricing measures. The California SR-91 Project, for example, uses FastTrak transponders programmed with individual account numbers and real time variable message signs to facilitate the fare setting and collection aspects of the program. Although the California SR-91 Project did not rely on ITS-designated funds, states and localities can use ITS funds for technology testing and deployment to help finance transportation pricing measures.

ISTEA Reauthorization

The future of many of the federal transportation programs reviewed above is uncertain depending on the outcome of the ISTEA reauthorization process slated for 1997. For instance, many states view the CMAQ program to be problematic and support its elimination from the new transportation legislation. Likewise, the future of FHWA's Congestion Pricing Pilot Program is

uncertain, particularly given the decision by Congress to rescind remaining funds in 1995. Currently, transportation stakeholders are jockeying for position to influence the types of programs that will be supported by the next version of ISTEA. At this stage, however, it is difficult to assess with any degree of certainty how the new transportation law will affect the design, evaluation, and implementation of transportation pricing programs.

As part of the ISTEA reauthorization process, the Clinton Administration proposed the National Economic Crossroads Transportation Efficiency Act (NEXTEA) in March 1997. NEXTEA is a six-year, $175 billion plan that attempts to improve on ISTEA while keeping the general intent of ISTEA intact. The future of transportation pricing looks promising under NEXTEA, as the proposal includes an 11 percent overall increase in ISTEA funding and an a 30 percent increase in CMAQ funding. In addition, CMAQ funding eligibility would be expanded under NEXTEA, and an ITS Incentives Program would be created to promote integration of ITS in both urban and rural areas.

In addition to NEXTEA, several other proposals are being considered in the ISTEA reauthorization process. These proposals, some of which have not yet been formally introduced, include the following:

- The "Truth in Budgeting Act," which would place the Highway Trust Fund and three other trust funds "off-budget" in order to authorize more expenditure in the reauthorization of ISTEA;

- The "Surface Transportation Authority and Regulatory Streamlining Act (STARS 2000)," which would increase annual highway spending from the Highway Trust Fund to $26 billion;

- The "ISTEA Integrity Restoration Act," which would replace ISTEA's funding categories with two programs, the Streamlined Surface Transportation Program and the National Highway System, which would receive 60 percent and 40 percent of funding, respectively;

- A shift of the portion of the 18.3-cent federal gasoline tax that is dedicated to deficit reduction (i.e., 4.3 cents) to the Highway Trust Fund; and

- A proposal that aims to (1) retain most of the principles and programs of ISTEA, (2) base the funding formula on need, system usage, and historic distribution patterns, (3) allocate the maximum feasible funding amount to ISTEA programs, (4) maintain the partnerships developed under ISTEA, and (5) reduce "unnecessary regulatory burden" at both the federal and state levels.

State, Local, and Private Financing

In addition to funds available through the various federal programs described above, states, localities, and private organizations have been actively involved in the provision of financing for transportation pricing programs. As highlighted in Chapter 3, most programs have relied on cooperative agreements between state, local, and federal agencies for the development, implementation, evaluation, and funding of projects.

Transportation Pricing Programs Funded Through Cooperative Agreements Between Different Government and Private Agencies

- The California SR-91 Project, which is being funded by FHWA, FTA, Caltrans, and CPTC, a private organization.
- The SCAG study, which is being funded by FHWA, SCAG, and COALESCE, an organization comprised of private businesses.
- The San Diego I-15 Express Lanes Project, which is being funded by FHWA, FTA, and local matching funds.

As discussed in Chapter 4, a project's geographic coverage and stage of implementation often dictate the types of institutional relationships that must be developed. Geographic coverage and institutional relationships, in turn, may also determine the funding pool available for implementation and management of a project. In general, those projects that involve roadway pricing, such as congestion pricing, must rely on a consortium of funding sources for the various facets of implementation and enforcement. Other transportation pricing programs, however, often rely solely on state or local funding or on the private sector.

Parking management programs have traditionally relied on private businesses to provide the necessary financing for project implementation. However, most of these programs also incorporate incentives (e.g., tax credits) for businesses that offset, at least partially, their expenditures on these programs. In this way, state agencies indirectly subsidize parking management programs through reductions in state revenues (e.g., tax revenues).

Transportation Pricing Programs Using State, Local, or Private Funding

- The Maine Turnpike Authority Project is funded entirely by the Authority, which in turn is funded by toll revenues.
- The Washington State Commute Trip Reduction (CTR) program is funded entirely by state funds appropriated through Clean Air Act provisions.
- California's parking cash-out program relies on the private sector and the State's tax code to provide the necessary funding for the program.
- The California SR-91 Project relies exclusively on the private sector to finance the construction, operation, and management of facilities.

(See Appendix A for more information on these programs.)

TE-045 Innovative Financing Project Initiative

Under traditional funding procedures, the share of federal funds for a surface transportation project is not differentiated by the stage of the project (i.e., pre-construction, construction, and operation). As a result, a state may have difficulty funding certain elements of a project (e.g., feasibility studies, environmental assessments), which could be problematic if the state hopes to bring the project to the private capital markets. One of the principal objectives of innovative finance is to attract capital to transportation infrastructure from new sources. Often, debt instruments can capitalize the necessary funds to undertake a project, but only if the potential investors are confident that the project will be completed on time and on budget and that the revenue stream dedicated to service the debt will materialize. The closer a project is to actual construction, the lower the risk to potential investors, especially if engineering, environmental, and other potential hurdles have already been cleared. Consequently, before a project reaches this stage, the state will have difficulty attracting financing and will rely more on available grant monies, such as federal assistance.

The *TE-045 Innovative Financing Project* initiative is the first stage of a new effort by FHWA to move the current transportation financing process from a "grant reimbursement" basis to a diversified approach that provides new options drawn from the most innovative financing concepts developed by both the public and private sectors. By creating incentives and removing barriers, FHWA hopes to increase states' use of the flexibility introduced under ISTEA and to allow states to leverage capital for needed investments more effectively across funding sources. As a result of this initiative, a number of states have proposed innovative financing strategies that will improve both physical and operational investments on highways and bridges. The various financing innovations developed to date include the following:

- ***Innovative management of federal funds.*** New consideration is being given to innovations that will remove procedural barriers to project finance, with the goal

of improving the ability of state and local governments to leverage federal funds more effectively, thereby accelerating projects and avoiding increasing costs. For instance, phased funding allows states to begin projects before they have accumulated the full budget capacity to cover the federal reimbursement of total project costs. Likewise, tapering allows states to more effectively manage federal contributions by allowing these contributions to vary from year-to-year.

- ***Bonds and other forms of debt financing***. Increasingly, states are using federal apportionments as a secondary source to support revenues pledged for bond payments (e.g., tolls and fees). The use of federal apportionments as credit enhancements would make it easier for states to raise private capital for projects.

- ***Expanded matching opportunities***. In an effort to maximize the use of all available resources, projects in the innovative financing program may count private donations and local in-kind contributions toward the 20 percent non-federal matching requirement. Furthermore, local capital, in addition to cash, is considered for non-federal matching purposes. A number of state proposals also use private capital as the required match.

- ***New leveraging tools, including revolving funds***. Under the innovative financing initiative and ISTEA Section 1012, federal funds can now be used for eligible projects, which include facilities with revenue-generating potential such as toll highways, tunnels, and bridges; loans made to projects regardless of whether the sponsor is a public, quasi-public, or private entity; and other credit enhancement arrangements, such as lines of credit or contingent loans.

- ***Innovative income generation schemes***. To shift the burden of transportation funding away from traditional funding generated from taxes, states are being encouraged to identify and capitalize on available commercial income resources. States can now earn revenue through a variety of methods, including (in some cases) leasing public facilities and/or rights-of-way to private entities, profit sharing, and the sale of advertising space.

The implications of innovative financing mechanisms for the development and implementation of transportation pricing programs are significant. Although these mechanisms do not represent formal funding sources *per se*, they provide state and local governments with a completely new array of financing options that are especially well suited for such programs. For instance, the flexibility to better leverage federal funds and develop income generation schemes with private sector participation creates an attractive environment for transportation pricing projects that may have been previously viewed as low-priority and risky endeavors. State and local agencies can now employ innovative mechanisms to minimize the risk inherent in such projects, such as by entering into partnerships with private organizations. The California SR-91 Project is the best example of this type of arrangement and will likely be the first of many similar projects in the future.

SUMMARY

This chapter has reviewed the funding sources that have been used to finance existing transportation pricing programs, and has identified other sources of funds that potentially may be used for transportation pricing programs in the future. The funding sources discussed in this chapter are summarized in Table 7-1 below.

TABLE 7-1
SUMMARY OF FUNDING SOURCES

TYPE OF FUNDS	FUNDING SOURCE
Federal	Title I of ISTEA • Congestion Pricing Pilot Program (no longer available) • Surface Transportation Program • Congestion Mitigation and Air Quality Improvement Program • Special Financing for Toll Roads Title III of ISTEA Title VI of ISTEA
Non-Federal	State Financing Local Financing Private Financing Cooperative Agreements TE-045 Innovative Financing Project Initiative

APPENDIX A
Case Studies

CALIFORNIA'S PARKING CASH-OUT PROGRAM

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I. GENERAL DESCRIPTION

California's parking cash-out program, which became effective in January of 1993, requires certain employers to offer commuters the option of receiving cash in lieu of any parking subsidy offered. Its goal was to level the commute subsidy playing field between people who drive alone to work and people who rideshare or take public transit. The theory is that when an employee has the choice between cash and a subsidized parking space, some employees will take the cash and not drive to work alone. All California employers who are located in a nonattainment area, have 50 or more employees, and subsidize employee parking are required to establish a parking cash-out program. The law applies only to employers who do not own the parking spaces they are subsidizing. It does not apply to employers with parking spaces subject to existing leases as of January 1, 1993, unless the terms of the lease allow the number of leased spaces to be reduced. With the exception of several counties in Northern California, nearly all of California is in nonattainment for at least one criteria pollutant.

Employers who offer parking cash-out may deduct program expenses as ordinary and necessary business expenses on their state income tax returns. Any cash allowances received by employees, except for any portion of the allowance used for tax-exempt ridesharing purposes, are considered gross income and therefore subject to state income taxation.

II. INSTITUTIONAL ISSUES

Donald Shoup, a professor of Urban Planning in the UCLA School of Public Policy and Social Research, developed the concept behind this law. His initial theoretical study on parking cash-out was funded by the U.S. Department of Transportation (DOT). Shoup passed the idea on to Assemblyman Richard Katz, the chairman of the Assembly Transportation Committee. Katz liked the idea and crafted a bill, AB 2109, which made the cash-out program a law under the California Health and Safety Code, under the General Administration of the California Air Resources Board (CARB).

The parking cash-out statute is self-implementing, meaning that no action is required of administrative agencies in order to implement the law. Actual enforcement by CARB is limited to the filing of a civil suit for penalties. CARB has not exercised its authority to seek civil penalties, nor has it been requested to do so by any party. A recent California Attorney General opinion excludes enforcement of the parking cash-out law by local air districts. One important result of the law is that an increased focus was placed on parking and, in particular, the effects of free parking on transportation and environmental issues.

III. BARRIERS

Although the program offers State tax benefits for employees, it conflicted with the previous federal tax code. This was the largest barrier to implementation. Under the previous tax code employee parking subsidies qualified as a tax-exempt fringe benefit. However, if an employer offered employees the option to choose taxable cash in lieu of a parking subsidy, the parking subsidy itself became taxable income to employees who continue to take parking. (This is because the parking subsidy was provided in lieu of, and not in addition to, compensation otherwise payable to the employee.) Therefore, if an employer offered cash as an alternative to a parking subsidy, commuters who continued to take the parking had to pay income tax on the full market value of the parking. This negative tax consequence deterred employers from offering the option to cash out a parking subsidy.

However, recent tax code legislation (August 1997) has eliminated this problem. Beginning in 1998, employers will be able to offer the choice between subsidized parking and cash without the disincentive of making all parking benefits taxable. Hopefully this change will increase the program's implementation in 1998 and beyond.

IV. EQUITY

One of the primary reasons the law was passed is that it was viewed as leveling the playing field between drivers and individuals who take public transit, carpool or walk to work. The tax revenues generated from the program are placed in the state's general tax fund and therefore do not disproportionately benefit any one group. Although downtown areas are most affected by this law, the structure of the program is such that they tend to participate in the program to the greatest degree and realize the largest benefits.

V. PUBLIC EDUCATION, OUTREACH AND MARKETING STRATEGIES

The Air Resources Board has developed an implementation guide for employers, has spoken to many rideshare and employer groups, and has staff available to answer employer inquiries. Parking cash-out is also promoted by many local air districts and ridesharing agencies as an effective transportation demand management tool.

VI. EFFECTS AND BENEFITS

The parking cash-out law includes many exemptions which limit its scope. One survey of employers in Southern California in 1993 indicated that about 13 percent had some parking subject to the law. A more detailed survey in 1995 found that only three percent of the employers surveyed were subject to the law. In addition, most employers with cash-out eligible parking have put the implementation of parking cash-out "on hold" due to the unfavorable tax implications, estimated administrative costs, and lack of enforcement of the provision.

The only emission or vehicle miles traveled (VMT) reduction estimates are from Shoup's study of eight employers currently participating in the program, conducted in 1996. Although these eight employers may not be representative of all employers, Shoup found that, on average:

- VMT, per employee, per year decreased by 12 percent; the greatest single decrease was realized by a company in Downtown LA whose VMT decreased by 24 percent.
- Single occupancy vehicles (SOVs) decreased 13 percent, from 76 percent of employees to 63 percent.
- Carpooling increased from 14 percent to 23 percent of employees.
- CO_2 emissions were reduced by 12 percent.
- 26 gallons of gas, per employee, per year, was saved.

The program has a number of important advantages. First, it shows commuters that there is an opportunity cost for free parking, i.e., the cash they decline in return for continued use of the parking space. Since parking costs tend to be higher in areas where congestion is also high, the option to receive cash instead of subsidized parking creates a strong incentive to rideshare or use public transit in areas where this is most needed.

Secondly, the program was viewed favorably by employees because it provides them with a new choice. This offer clearly benefits those who select the cash, but not at any direct cost to those that elect to use subsidized parking. The number of employees who opted to take the cash-out rather than the subsidized parking tended to increase with time. This is largely attributed to the fact that new employees tended to take the cash-out because they did not have to undergo a major behavioral change (e.g., they had not yet fallen into a routine of driving so they did not feel like they were giving up a great deal of convenience).

Third, the program costs the eight employers very little, if anything. The employer is required to offer the cash-out option only for spaces which are not owned and not part of a preexisting lease. Therefore, affected employers must simply lease fewer spaces and transfer the money directly to employees who do not use the parking subsidy. In the Shoup study, employers saw a 3 percent average increase in total subsidy costs, with the individual costs ranging from a 59 percent increase to a 74 percent decrease. Most firms indicated that the administrative costs of overseeing the program were negligible.

A number of other benefits may result from the program as well. Cashing-out would tend to benefit low-income and disabled employees because many such employees already take public transit to work. Urban employees may benefit because it will be easier for them to switch to public transit since such areas tend to have better access to public transportation. The cash-out program also may strengthen central business districts and urban areas by leveling the playing field with suburban areas. Downtown employers would offer more money in return for employees giving up the parking subsidy, thereby opening up parking spaces to shoppers, tourists, or other development. Finally, tax-windfall that results from the program would benefit both the State and Federal government. When a commuter chooses cash instead of the parking space, this cash is taxable.

CALIFORNIA SR-91 PROJECT

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I. GENERAL PROJECT DESCRIPTION

The transportation pricing project on California SR-91 is generally heralded as the first program in the United States where tolls vary by the level of congestion. Opened in December of 1995 under the Federal Highway Administration's (FHWA's) Congestion Pricing Pilot Project Program, this project covers a 10 mile stretch of highly congested road in the Los Angeles metropolitan area. The road is now fully functional and evaluation is underway.

The stretch of road, which connects the Riverside County suburbs to the Los Angeles employment centers, was built as a two-way, four-lane toll road where HOV-3+ originally were exempt from paying tolls. Effective January 1, 1997, single occupancy vehicles (SOVs) and HOV-2s must pay anywhere from $0.50 to $2.75 to access the lanes, while HOV-3+s get in free. An optional "frequent traveler" program gives users a $0.50 discount on each trip made for a flat monthly fee of $15. Existing non-tolled lanes will not be affected by the pricing program, therefore people have a choice. Price varies by congestion, with fees calculated on the basis of time saved at a rate of $0.22 per minute for a SOV during peak periods. Westbound, the price peaks at $2.75 at 5 a.m., drops to around $1.50 at 9 a.m., drops again at 11 a.m., until the afternoon peak period. The price bottoms at $.50 between 10 p.m. and 4 a.m. For eastbound traffic, an inverse schedule exists, with a $2.75 charge during the afternoon peak period. FastTrak transponders, programmed with individual account numbers can be "rented" from CPTC by motorists who maintain a positive pre-paid account balance of $30. Antennas on the road mark the time of entry on the transponders and exit sensors at the midpoint facility read the transponders, calculate the toll and transfer the account number to a business management system that deducts the charge.

The California Private Transportation Corporation (CPTC) has installed a facility at the road's mid-point from which compliance is constantly monitored. In addition, 35 cameras along the road monitor traffic levels.

II. INSTITUTIONAL ISSUES

The California SR-91 Project is the product of a partnership between Caltrans and the CPTC, the private company that planned, constructed, and maintains the program. Fees are adjusted to maintain consistent movement and volume along the road. FHWA and Federal Transit Administration (FTA) are participating in, and financially supporting, the post-implementation evaluation studies of the road, which are being conducted by researchers at the California Polytechnic State University. However, the road itself is entirely privately funded and the owners are permitted to collect a maximum return of 17 - 23 percent in revenues,

depending on vehicle occupancy and travel volumes. As a result, CPTC reserves the right to extend charges to HOV-3+s as well (at a discounted rate) if costs are not being recovered by the proposed fare structure. State money can not be used for road construction or operation (though local funds are allowed). In thirty years, CPTC's franchise on the road will expire and operation rights will be transferred to the State.

This public-private partnership clearly provides benefits to both parties - Caltrans gets the HOV lanes it cannot afford to otherwise build, and CPTC gets to run a profitable business. However, there is some disparity in the objectives of the two main parties. CPTC's primary goal is to increase revenue by maximizing tolled traffic. Meanwhile, Caltrans' goal is to maximize HOV (non-paying) traffic. It is not clear how these goals will play out in actual practice. According to Michelle MacDowell of CPTC, the goals of the two organizations are perfectly aligned at this time.

Within the next few years, another toll road will be constructed nearby which should reduce SR-91 traffic considerably. It is not clear if the economic viability of SR-91 will be jeopardized as a result.

III. BARRIERS

No federal or state funds were available to fund this project, which led the project developers to look to private sources for funds. The greatest public awareness barrier to this project seems to have been the perception on the part of taxpayers that they were double-paying for this road. Education seems to have been a successful response. The greatest barrier to road usage seems to be the $30 deposit price of the transponder, which some users who pay in cash find to be excessive.

IV. EQUITY

According to CPTC, equity was an integral consideration in the development of this program. A number of different account options are offered so that motorists with different incomes can participate in a way in which they are comfortable. Accounts for disabled persons, disabled veterans, motorcyclists, HOV-3s are all offered in addition to standard accounts. Because no federal or state funds existed for the improvement of this extremely congested road, CPTC views its role in reducing congestion in the area as an asset to all motorists, whether or not they will use the express lanes themselves. According to MacDowell, no one is forced to use the toll portion of the road, yet all lanes benefit from the reduced congestion. Mass transit from metro buses to private shuttles and carpools, all ride free in the express lanes.

V. PUBLIC EDUCATION, OUTREACH, AND MARKETING STRATEGIES

CPTC has done extensive work in this area. Marketing efforts in the form of public perception research began two years before the project opened. The goal of early surveys was to assess the views of tax-paying voters in the affected area with respect to toll roads. Value of time studies and traffic modeling research were also conducted to help determine appropriate

pricing strategies. Significant outreach was made to local legislatures, city councils and local transportation organizations. These groups as well as local Chambers of Commerce and other citizens' organizations were invited to and hosted a series of presentations on the project. Six weeks before the project completion, a mass media campaign was introduced by CPTC which included direct mailings, radio advertisements, on-road signage, as well as print advertisements. Since then, CPTC has been deluged with speaking requests from community organizations, citizens, engineering firms, and a gamut of other interest groups.

Support for the project came from the state legislature (which promulgated the enabling legislation) as well as the city councils in the area of the project. Two fundamental sources of resistance were the Riverside County Transportation Commission, which was concerned that the private company's franchise over the median lanes of SR-91 would preclude the County extending HOV lanes from Orange County, and from residents of Riverside County, who thought they were being tolled on a road that had been paid for with their taxes. CPTC responded with extensive education campaigns explaining that no tax dollars were going into this project and that private funding was the only way to add capacity to this stretch of road. MacDowell claims that the outreach was successful. Rather than the projected 30,000 customers, SR-91 currently has over 70,000 customers in only 10 months of operation.

In general, it seems that voters support this measure since it was the only way to get funds for the construction of HOV lanes. Earlier attempts to issue bonds and introduce a special tax for that reason were rejected. Currently, surveys of the public are being conducted primarily to investigate travel patterns and demand. Cal Poly's research team is conducting a 2.5 year study (beginning with a pre-implementation baseline). The research will include surveys of area businesses regarding their attitudes toward the project.

VI. EFFECTS AND BENEFITS

The stated goal of the project is to guarantee a smooth-flowing 50 mph ride. Although it is too early to tell how successful it will be, express traffic has increased weekly from the onset of the project, and transponder sales have significantly out paced projected rates. After only 10 months, over 70,000 transponders had been sold. The road's location in a severely congested corridor (with no alternate routes nearby) bodes well for its success. Cal Poly's study will include observations of traffic conditions, transit ridership, factors that influence day-to-day use, origin-destination studies, and comparisons to traditional toll facilities. In addition, CPTC and Caltrans will conduct on-going studies. They have already determined that 20 to 25 percent of daily trips made on this portion of the road are HOV-3+s. This project has also been endorsed by a prominent environmental organization.

MAINE TURNPIKE AUTHORITY PROJECT

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I. GENERAL DESCRIPTION

In response to congestion on the Maine Turnpike and to 1991 legislation requiring the evaluation of alternatives before adding capacity to state roads, the Maine Turnpike Authority conducted a two-summer demonstration with congestion pricing. The original proposal involved a $2 peak-period toll surcharge as well as off-peak toll discounts. However, the state legislature, responding to protests from the tourism industry in the State, precluded the Authority from increasing tolls on the Turnpike. Instead, the Authority implemented a pricing scheme which maintained peak-period prices but introduced coupons to be used toward off-peak tolls. This scheme, which was in effect during a five-week period in the summer of 1995, involving distributing coupons worth $1.60 (the price for driving from exit 1 in York through 7 in Portland, the most congested leg of the road). Millions of coupons were given out at toll plazas, in newspapers, and in mailings. The project was repeated again for five weeks in the summer of 1996. In 1996, however, the coupons were replaced with a reusable "Summer Smart Pass," which could be scanned at toll booths. Off-peak periods (when the discounts applied) were defined as 11 a.m. to 1 p.m. and 7 to 9 p.m. on Fridays; 8 to 10 a.m. and 3 to 5 p.m. on Saturdays; and 10 a.m. to 12 p.m. and 7 p.m. to 9 p.m. on Sundays.

The results of this program are now being studied, along with other measures which are under consideration for future study. A number of other transportation alternatives were studied and implemented as well, including ridesharing programs and reviews of the viability of rail and transit in the corridor. In general, this study was found to have very limited success in influencing drivers' choices of travel times.

II. INSTITUTIONAL ISSUES

Although the Turnpike Authority is almost solely responsible for the Turnpike's management, it lost considerable power over its own domain with the State legislature's preclusion of surcharges. Conflict with the State's prominent tourism industry appeared to be the greatest institutional barrier in this case. It is not clear if the Authority will make future efforts to coordinate with potential partners in the public or private sectors. According to Mr. Paradee, some economic measures will most likely be incorporated into future projects.

This project was funded entirely by the Turnpike Authority, which in turn is funded by toll revenues. The project was originally intended to be a congestion measure, whereby prices were raised during peak travel periods in an effort to reduce the number of cars traveling along the road, thereby reducing the amount of tolls collected and the Authority's revenue and budget.

III. BARRIERS

No relevant data was given on the barriers associated with the project.

IV. EQUITY

Equity was not a major issue for this project. According to Mr. Paradee, this project was merely a study to investigate whether financial incentives could change driver's habits. He suggested that equity would have come up later if the decision were made to actually implement a full-fledged pricing program.

V. PUBLIC EDUCATION, OUTREACH, AND MARKETING STRATEGIES

Public outreach for this project primarily involved promotion of the program to local residents and tourists. Brochures were distributed to everyone driving on the turnpike during peak hours, advertisements were placed throughout the Boston and Maine areas, and coupons were widely available. Since upwards of 40 percent of the people driving into this area on weekends do so every weekend (during the summer), this tourist market was seen as one for whom this offer would be worthwhile. However, the 1995 study met with limited success. Educational and promotional efforts were increased in 1996.

VI. EFFECTS AND BENEFITS

The first summer of testing resulted in an increase in off-peak travel, but no noticeable decrease in peak traffic. A survey of 5,000 peak period weekend travelers found that over two-thirds were regular weekend users of the Turnpike. Studies for the second summer were projected to be available at the end of 1996. Over 35,000 Smart Cards were sold in the summer of 1996. Because the cards represent personal accounts, the follow-up research will include information regarding origin and destination, how many times each card was used, what time of day it was used, as well as data on travel habits that will be collected through phone interviews with card holders. The priority of the study, however, will be to determine how many drivers moved from peak to non-peak hours.

MILWAUKEE COUNTY TRANSIT SYSTEM "COMMUTER CHECK" PROGRAM

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I. GENERAL DESCRIPTION

The Milwaukee County Transit System (MCTS) initiated the "Commuter Check" program in 1991 as a result of policy direction after County board members became aware of the success of a similar program in New York City. The program has been implemented throughout the MCTS service area. Participating businesses provide employees with a voucher, or "Commuter Check," that can only be applied to the purchase of bus passes or tickets, and VanPool fees. Employers decide which employees are eligible to receive vouchers and how often they receive them. Each voucher is worth $9 and is mailed directly to employees who may use them to purchase transit tickets at 300 locations throughout the metropolitan Milwaukee area. The cost of providing Commuter Checks to employees is a tax deductible expense for businesses, and the checks are a tax free benefit for employees.

II. INSTITUTIONAL ISSUES

The MCTS was solely responsible for instituting the program, which is run through a private contractor, Commuter Check Services Corporation; no other government or private sector entities participated in its implementation. Initial marketing efforts and the printing of vouchers constituted most of the up-front costs which totaled approximately $30,000. Milwaukee County supplied the budget for the program.

III. BARRIERS

The most difficult obstacle that the program encountered were recruiting more businesses for participation and convincing managers that transportation subsidies are an attractive benefit for their employees. The most common reason for companies choosing not to participate in the program is the cost of supplying the benefit to employees.

IV. EQUITY

Because individuals with lower incomes tend to use public transit more than those with high incomes, the program may have the side affect of improving the level of equity of transportation in the area. This will, however, be largely dependent on how employers use the transit vouchers. Because businesses choose which employees receive vouchers, not all employees may be treated similarly.

V. PUBLIC EDUCATION, OUTREACH AND MARKETING STRATEGIES

The business development coordinator of the MCTS is responsible for marketing the program and encouraging businesses to participate. Three main strategies have been used to increase sales: direct mail, on-bus marketing, and business reply cards; advertising in news media has not been used. It is important to emphasize that the program was created and implemented for purely economic reasons -- air quality improvement, congestion mitigation, and equity concerns were not considered.

VI. EFFECTS AND BENEFITS

MCTS instituted the program after experiencing budget cuts as an effort to help generate much needed revenue. Over the past five years, the program has generated about $900,000 of revenue for the MCTS (these revenues from the program are not separated from the general transit fare revenue). Over 2,000 employees from nearly 75 companies have benefited from the program, and participation increases each year. The success of the program depends on the participation of large businesses, as evidenced by the fact that 20 percent of the participating companies account for 80 percent of the volume of vouchers. In addition to the financial benefits, the program has likely reduced highway congestion during rush hour and improved air quality -- one full bus takes the place of 44 automobiles and eliminates nearly 3,300 pounds of air pollutants annually.

Employers benefit from the program by saving money in construction and maintenance costs ordinarily spent on providing parking. Employees, especially those who have used transit in the past, benefit by receiving the tax-free vouchers. According to the MCTS, employees who use transit also tend to arrive at work less stressed and more productive than employees who drive. In addition, the commuter check program is an easy way to provide transit subsidies in an environment where a number of different transit carriers operate. Under the program, employers provide the financial support, while leaving the decisions concerning modes of transit to employees.

SAN DIEGO I-15 EXPRESS LANES PROJECT

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I. GENERAL DESCRIPTION

In 1988, two reversible high occupancy vehicle (HOV) lanes were built in the median of I-15, near San Diego, to address the area's severe congestion problem. Use of the lanes by HOV-3s was so low that the San Diego Association of Governments (SANDAG) decided to initiated a HOV buy-in demonstration project in an effort to address the under use of the lanes. The project, which was anticipated to be implemented in December, 1996, would allow single occupancy vehicles (SOVs) and HOV-2s to pay for access to the existing HOV-3 lanes on an 8.5 mile stretch of I-15. Although this program weakens the incentive for motorist to rideshare, the San Diego I-15 Express Lanes Project is an example of a congestion pricing program currently in effect.

The first phase of the project was a six month long process, including the preparation of environmental clearance documents, selection of electronic tolling technology, and development of a preliminary pricing strategy. The second phase, which began in December, 1996, includes the installation of electronic tolling equipment and the implementation of a temporary pricing scheme. During this phase, a fixed monthly fee, based on motorist demand for access to the lanes, will be charged.[71] Observations made during the preliminary months will be used to develop an even more sophisticated pricing scheme during the second and third years, with fares varying by the time of day and level of congestion. Revenue generated from the program will be used for transit expansion on I-15, beginning with two new bus routes and more frequent bus trips through the corridor.[72]

The technology used to run the project will also be implemented in phases. Brightly colored decals (similar to those used in Singapore's area licensing scheme) will initially be used to indicate which motorists have paid the monthly fee for access to the lanes. The summer of 1997 will act as a transitional phase, with transponders for electronic toll collection being mounted on automobiles, while maintaining a monthly fee system. During the second year of implementation, the entire system will be automated, with charges being assessed on a per-trip basis. At that time, variable message signs will be used to communicate current fares to motorists, depending on time of day and level of congestion.

[71] The access fee for the month of December was set at $50, with the lanes open Monday through Friday, 6:00 - 9:00 am southbound, and 3:00 - 6:30 pm northbound.

[72] Projections suggest that revenues will total $3 to 6 million during the three-year experiment.

II. Institutional Issues

SANDAG has partnered with the California Department of Transportation (Caltrans), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), California Highway Patrol, as well as local politicians and transit agency officials to plan and implement this project. Each participating institution has specific responsibilities:

- SANDAG acts primarily as the contract administrator for the project;
- Caltrans administers the project's design specifications and equipment installation;
- The California Highway Patrol is responsible for law enforcement, with minimum fines for traffic violations set at $271;
- The Metropolitan Transit Development Board is responsible for implementing related transit improvements; and
- The Project Management Team, which is made up of members from each of the institutions involved in the project, reviews and comments on all planning and implementation issues and concerns.

In addition, a Citizens' Advisory Committee, made up of interest groups and elected officials, was developed in an effort to both educate and involve the public in the planning of the San Diego I-15 Express Lanes Project. Private sector firms and organizations are also involved in the project. The primary private sector partners are:

- Consultants who aided in the planning process;
- United Infrastructure/CPTC, a private firm, also responsible for the SR-91 project, who was selected to manage the road. This will include toll collection, billing, and other day-to-day management duties.
- A second private firm will conduct ongoing monitoring and evaluation of the project.

According to Michelle King, Project Coordinator at SANDAG, coordination among the various partners and participants has largely been successful, although time-consuming and challenging. She stressed the importance of establishing relationships between interested and affected institutions early in the process, and of keeping the project's planning and development open to anyone who wants to participate. She stated that all of the participants in the San Diego I-15 Express Lanes Project were involved from the beginning. This turned out to be an important factor, particularly given the speed at which the project took off.

An early barrier in this project involved the legality of congestion pricing. Because I-15 is an interstate road, this pricing measure could only be introduced under the provisions of the Intermodal Surface Transportation Efficiency Act of 1991(ISTEA). Within the State of California, SANDAG had to secure state-level project authorization through enabling legislation passed in 1994. The project was accepted as a FHWA Congestion Pricing Pilot Program in 1995, providing $7.96 million over the course of three years. Other project funds include $1.99 million in local matching funds, and $115,000 in Phase I funding from FTA.

III. BARRIERS

This measure is likely not to create much public opposition because it takes nothing away from the average motorist. SOVs are offered a premium service at a reasonable cost. If they do not wish to pay, they can continue to use the congested lanes. At the very least, those users will benefit to the extent that congestion is reduced by the availability of the nearby lanes. HOV users will continue to have access to uncongested lanes at no cost. In addition, the facts that this project began at the local level and that revenues would be used for transit improvements meant that it already enjoyed public support.

IV. EQUITY

While equity has not been a specific component of program development, it will be addressed as the project continues, particularly in the use of revenues for transit improvements. Furthermore, three workshops were held to encourage participation of low-income and other historically under-represented groups.

Area residents who do not have access to automobiles are likely to benefit from the new transit that will be funded by revenue from this project. In addition, drivers that can afford to pay the fee for use of the HOV lanes will enjoy some time savings. The average driver should also experience some improvement in travel time.

V. PUBLIC EDUCATION, OUTREACH, AND MARKETING STRATEGIES

A Citizens' Advisory Committee, made up of interest groups and elected officials, was created under this program. The committee, which currently holds well-publicized monthly meetings, has received relatively high participation from the public. The Board of Director meetings have been open to the public and well-publicized, and "press kits" have been mailed to area residents to further market the program. The greatest amount of public outreach involves focus groups and the distribution of surveys, both aimed at estimating potential demand for the use of the road. Local SOV motorists were the main target of these outreach efforts. In general, these techniques found significant support for the proposed measures, and a widespread willingness among motorists to pay for reductions in travel time. Efforts were also made to inform current express lane users on how the proposed program and the associated changes would affect them.

VI. EFFECTS AND BENEFITS

Prior to the program's implementation, the existing HOV lanes were extremely under used. By offering all motorists access to these lanes for a fee, the San Diego I-15 Express Lanes Project greatly reduced the incentives for motorists to carpool. Therefore, while the program may lead to reductions in congestion and traffic, it is unknown whether it will lead to decreases in VMT, the number of trips taken, or vehicle emissions.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG) STUDY

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I. GENERAL DESCRIPTION

For the past two years, the Southern California Association of Governments (SCAG) has conducted an ongoing pre-project study of 24 pricing strategies that have the potential to reduce both congestion and pollutant emissions in five counties in southern California. The study area, made up of Ventura, Los Angeles, Orange, San Bernadino, and Riverside Counties, and populated by 15 million people, is one of the nation's most congested areas. It is also home to SR 91 and other market-based transportation control measure (TCM) initiatives. The SCAG study looked at various combinations of a peak-period congestion fee and an emissions fee (a vehicle miles traveled (VMT) fee weighted for actual vehicle emissions). The study, concluded in January, 1997, has been sent to the SCAG Regional Council for approval. It is anticipated that, feasibility studies will be conducted and an implementation plan produced for the chosen measures.

According to Deborah Redman of SCAG, the study found that a number of strategies can achieve significant pollution and congestion reductions. One of the more modest proposals was a combination of an a.m. and p.m. peak period congestion pricing fee of $0.05 per mile on less congested portions of roadway and $0.10 on more congested portions, as well as an emissions fee of (on average) $0.016 per mile (weighted by actual vehicle emissions). In addition, "HOT lane" demonstration projects (like SR-91) are recommended as a short term trial stage which will allow fine-tuning of the policy and a chance for the public to experience the benefits of pricing.

II. INSTITUTIONAL ISSUES

This project is being conducted under a partnership of SCAG, Caltrans, the South Coast Air Quality Management District (SCAQMD), and the Coalition for Local Environmental Solutions and a Competitive Economy (COALESCE). These partners have met monthly to develop and direct the project through such processes as technology review, workshops, and strategy subcommittee sessions. Redman describes the partnership as a "very complex, deep involvement," stressing the importance of this "trust-building effort." Essentially, that effort has meant that the various partners have had to learn to trust each other in guiding the development of the project and experimenting with new ideas.

In addition to the major partners, a stakeholder taskforce, known as the REACH Task Force (Reduce Emissions and Congestion on Highways), consisting of 75 elected officials,

business and environmental representatives, as well as other interested parties, has participated in project development over the last year. Once the project moves beyond its study phase, new partnerships will need to be created with local governments and agencies such as transportation commissions and the California Highway Patrol.

Funding for this program comes primarily from FHWA's Congestion Pricing Pilot Project, which contributed $1.5 million. A local match of $300,000 came from SCAG and COALESCE. If the proposed project is implemented, it is expected to net $3.5 billion per year (after a 10 percent deduction for administrative costs). It is not yet clear who will be responsible for the management and implementation of the scheme, but some private participation seems likely. In any case, some of the revenue will likely be returned to localities to be used for transit improvements and the creation of other transportation alternatives on priced corridors. Furthermore, this study investigates possible scenarios for returning money to local communities. Some possibilities are coupons for discounted car repair, maintenance, or emissions improvements; transit funding or transit discount coupons; state tax credits; or reductions in other taxes. Another possible benefit could be that regulations such as the Commuter Law could be rendered unnecessary in light of the gains made by this program.

While operational and management issues have only begun to be considered, SCAG hopes to work out many of the details through the trial "HOT lanes" project.

III. BARRIERS

In Ms. Redman's opinion, the greatest barrier to future implementation will be the fact that some carpoolers who now ride for free will suddenly be charged. Outreach efforts for these individuals are now being planned. Another barrier is finding places where a "HOT lane" project can be implemented without disrupting the State's existing network of high occupancy vehicle (HOV) lanes. This issue is raising a lot of concern and will have to be addressed if a "HOT lane" project is approved. Finally, there have been equity concerns, but Ms. Redman feels they have been dealt with and that most groups will actually benefit from the project

IV. EQUITY

Equity has been an important consideration throughout this project. Populations that have been specifically considered have been the area's Latino community, low-income groups, and the population of 2-person carpoolers who now ride for free but who might have to pay under some HOT lane scenarios.

Ms. Redman maintains that, while equity concerns have been seriously considered, this project will actually benefit all groups, particularly since money is proposed to be returned to individuals in communities in a variety of ways. In addition, transit will be further developed in the area, and a light rail project is already underway.

V. PUBLIC EDUCATION, OUTREACH AND MARKETING STRATEGIES

The SCAG study has involved extensive public outreach from its inception. Early focus groups examined a variety of issues, such as the way people think about congestion pricing, what they know about it, and whether or not they like it. Information gathered in the focus groups was used in developing the survey. In January, 1996, a baseline survey was conducted, followed by a second in August. Both surveys questioned 1700 people in 20 minute interviews. The August 1996 survey addressed attitudes regarding emissions fees and congestion fees. Respondents were asked about their driving habits, then shown with the aid of a computer model how these fees might impact them personally. Each respondent learned what her/his costs would be as well as what the time savings would be.

The surveys were held both in English and Spanish in order to include the large Latino population in Southern California. The survey efforts also covered every region within the five-county area, particularly outlying areas where residents drive the most. Greatest support for the program was found among Democrats and Independents, as well as Asian and Latino populations. Women were found to have less fixed positions than men, making up somewhat of a "swing vote."

The results of these surveys indicated that, in general, area residents liked emissions fees better than congestion fees; not surprisingly, they liked to receive money back in the form of some of the rebates discussed above; they had a fairly specific range of optimal costs (with clear boundaries); and they liked the HOT lanes options, primarily because it is optional.

The REACH Task Force recommendation for HOT lane demonstration projects dovetails nicely with SCAG's incremental approach of phasing in congestion pricing in such a way that the public can acclimate to it with minimal difficulty. The existence of projects in the five-county area, such as SR91, should aid in building public acceptance.

VI. EFFECTS AND BENEFITS

The study's specific goals were to maintain 1990 levels of mobility given a projected 40 percent increase in population. The emissions goal at the beginning of the study was to achieve the same pollutant reductions that the SCAQMD's Commute Reduction Law (originally Regulation XV, now Rule 2202) would achieve.

WASHINGTON STATE
COMMUTE TRIP REDUCTION (CTR) PROGRAM

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I. GENERAL DESCRIPTION

In 1991, Washington State passed the Commute Trip Reduction (CTR) Law, which set the parameters and framework for the CTR program. The Law affected major employers (those with 100 or more full time employees) in counties with populations greater than 150,000. In all, nine counties were affected, and sixty-two local jurisdictions therein. The goals of the program are three fold: to reduce air pollution, to decrease energy consumption and to decrease traffic flow, especially in terms of single-occupancy vehicles (SOV) and vehicle miles traveled (VMT). Using 1992 as a traffic baseline, the program hopes to achieve a 15 percent reduction in SOV/VMT by January 1, 1995, 25 percent by 1997, and 35 percent by 1999. Approximately 1/3 of the sites achieved the 15 percent goal in 1995, and 2/3 of the sites realized reductions. The program planners have been more concerned with progress in reducing the SOV/VMT than with achieving set numbers.

A lead agency was appointed at the State level to administer the program. Originally this was the State Energy Office, however, responsibility was turned over to the State Department of Transportation (DOT) when the Energy Office was disbanded. A 22 Governor appointed member task force, made up of County, City, and Transit Agency personnel, private employers, State agencies, and citizens at large developed the guidelines of the program, which were to be used by local officials to develop their own local ordinances. A State technical assistance team worked with the affected counties and jurisdictions to assist them in developing and implementing local programs. CTR has approximately a $3 million annual budget, 80 percent of which is passed onto counties for administrative costs and 20 percent which is used for administrative purposes at the State level. All of the funding for the CTR program comes from the State Air Pollution Control Account, which is made up of the proceeds from a $2 motor vehicle registration tax.

Under the CTR program, employers are free to develop trip reduction programs which compliment the needs and characteristics of their individual worksites. This led to a number of variations in the CTR plans for different employers, some of which include transportation pricing measures. For example, some employers are offering preferential parking terms (e.g., lower fares) to those employees who carpool or vanpool to work, while others are subsidizing the cost of mass transit for their employees. Local jurisdictions and transit agencies have also gotten involved in the program, offering incentives such as discounted mass transit fares or passes, and subsidizing the costs associated with the formation of vanpools.

II. INSTITUTIONAL ISSUES

The CTR Law requires employers to make a "good faith" attempt to try to reduce the number of employees who commute to work in SOVs and reduce the overall number of VMT. In addition, each affected work site is required to fill out a survey once every two years that measures the progress of the program and details any changes in employee commute behavior. An annual report of each individual program must also be completed. These requirements allow the employers, jurisdictions, and State task force to identify problems with the program, follow trends, and use successful programs from one jurisdiction as models for others. As long as employers have made a "good faith" attempt, and have completed the required surveys and reports, regardless of whether they have met the goals of the program, they have complied with the law. If, however, employers refuse to comply with the law, the local jurisdictions have the authority to sanction fines.

III. BARRIERS

The State of Washington ran into some barriers during development and implementation of the CTR program. Although the program is heavily supported by employers, they find it difficult to encourage their employees to participate because of the lack of available public information. The general public must be informed of the program's goals, why these issues are important, and why CTR is part of the solution. The project developers realize that a more aggressive, statewide, public education and outreach program must be developed. The State also recognizes that, in order to do this, it must involve the media. However, funds for a large scale public outreach program are not available at this time.

Every affected employer is required to appoint a transportation coordinator to oversee the implementation of a CTR plan in the office place. The State has developed a training program, which has been adopted by a number of local jurisdictions, and many employers try to ensure that their employee transportation coordinators (ETC) receive this training. However, factors such as employee turnover can lead to difficulties in ensuring that an employee ETC is properly trained and understands the CTR program. The State is trying to encourage employers to ensure that their employee ETC is properly trained by getting the media involved and recognizing those employers who have successful instituted CTR programs in the workplace. They hope to reward people who are dedicating time and resources to the project and, in this way, get other employers more involved in programs, thereby increasing their effectiveness.

Another barrier that the CTR program encountered was the lack of infrastructure in some areas of the State. Public transit lines do not always cross county boundaries, which can make cross county commuting very difficult and time consuming. Some areas of the State do not have extensive transit alternatives to automobile travel. The State DOT is addressing this issue and is trying to find ways to redirect resources to target specific regions that are experiencing these sort of problems. They are relying heavily on employer feedback to tell them where barriers such as these exist and what, at the local level, needs to be done to help alleviate the situation.

IV. EQUITY

A number of equity issues are relevant to this CTR program. Geographic location has been a big concern. The population density of nine counties affected by the Law range from rural to urban. The more rural areas do not have the same transit, congestion, or pollution problems as the more urban areas, and therefore question why they must comply with the same law. In addition, rural areas do not have the same level of transit infrastructure to accommodate commuters who chose not to drive to work. This makes the task of reducing SOV/VMT difficult because alternatives to automobile travel do not always exist. The State is dealing with this by creating zones in each county, based on 1992 population, transit, air quality and other data, and creating goals which are appropriate for each zone.

All employers with over 100 full time employees must participate in CTR programs, however much concern has been voiced about smaller firms in close proximity to one another who are not affected by the CTR Law (e.g., a number of firms whose individual work forces are below the threshold, but whose combined, concentrated work force is well over 100). A number of institutional barriers are associated with requiring small employers to implement CTR programs. Studies found that implementing the CTR program at smaller employers would lead to increased administrative costs which, in many cases, would offset any benefits.

V. PUBLIC EDUCATION, OUTREACH AND MARKETING STRATEGIES

The 22-member task force played an important role in the development and implementation of the program. They held meetings with City Chambers of Commerce and employer groups, set up focus groups for citizens and employers and held forums where the issues associated with the Law could be discussed with affected parties. The input collected from these meetings was used to formulate guidelines for a model local ordinance from which local governments could mold individual programs. The focus groups and meetings were so successful in soliciting and incorporating feedback that almost every local government adopted the model ordinance with only minor changes. The Task force is currently working in a review capacity, making recommendations to the State legislature of changes which should be made.

There has not been any broad, statewide public outreach or acceptance program associated with the CTR Law. The State DOT is in the process of developing a statewide public outreach and education program to try to increase awareness and participation. Due to budgetary constraints, however, they cannot implement anything at this point. The program developers never experienced any major opposition to the program, its goals, or its content. Employers liked the fact that they were given the guidance of the State, and local governments but had the flexibility to model a CTR plan to fit the needs of their workplace.

VI. EFFECTS AND BENEFITS

So far, the CTR law has been very successful. Approximately 900 employers participate in the program, with 325,000 employees who are directly affected by the CRT program. To date, only one work site out of the 900 who participate in the program has refused to cooperate. The jurisdiction fined the employer approximately $6,000, but instead of collecting the funds, required the firm to use the monies to develop and implement a work place CTR plan. The aim of the program is not to raise revenues, but to reduce SOV/VMT.

In 1995, a number of reductions were realized:

- 80 million VMT were eliminated;
- 12,000 vehicles were removed from the roads during commute times;
- CO_2 emissions were reduced by 33,000 tons per year; and
- gasoline consumption was reduced by 4.5 million gallons.[73]

These numbers do not show drastic reductions or changes in commuter behavior, but they do show that the program is in the process of achieving its goals.

The task force is responsible for performing a cost-benefit analyses of the program. They have collected information from work sites and used State data to determine that the CTR program costs, on average, $9 per year, per employee. In the future, they hope to be able to compare the CTR program to other, more traditional transportation policies, in order to gauge its effectiveness and success.

[73] Telephone interview with T.J. Johnson, November 5, 1996.

APPENDIX B
List of Acronyms

ATC	automated toll collection
AVI	advanced vehicle identification
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBDs	central business districts
CMAQ	Congestion Mitigation and Air Quality Improvement Program
COALESCE	Coalition for Local Environmental Solutions
CPTC	California Private Transportation Corporation
CTR	Commute Trip Reduction
DOT	Department of Transportation
EDF	Environmental Defense Fund
EPACT	Energy Policy Act of 1992
ETC	employee transportation coordinator
FAHP	Federal-Aid Highway Program
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HOV	high-occupancy vehicle
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	intelligent transportation systems
MCTS	Milwaukee County Transit System
MNDOT	Minnesota Department of Transportation
MPO	metropolitan planning organization
NAAQS	national ambient air quality standards
PATP	pay-at-the-pump
REACH	Reduce Emissions and Congestion on Highways
SANDAG	San Diego Association of Governments
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SIP	state implementation plan
SOV	single-occupancy vehicle
STP	surface transportation program
TCM	transportation control measure
TMA	transportation management area
VHT	vehicle hours traveled
VMT	vehicle miles traveled

APPENDIX C
List of References

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