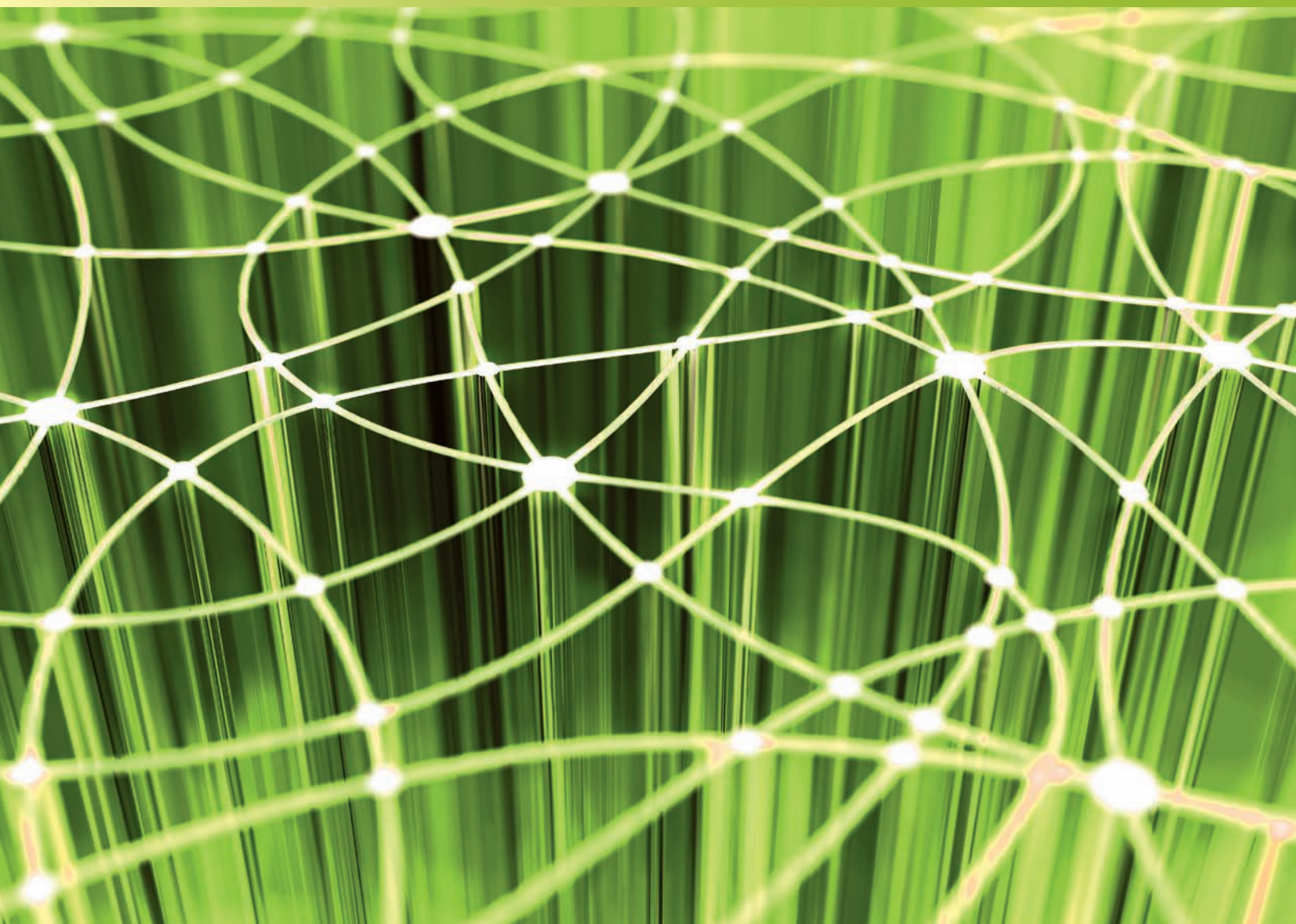
U.S. Department of Transportation
**Federal Highway Administration**

# Income-Based Equity Impacts of Congestion Pricing

## A PRIMER



## Quality Assurance Statement

The Federal Highway Administration (FHWA) provides high quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

**For more information, contact:**

Patrick DeCorla-Souza

Office of Innovative Program Delivery

Federal Highway Administration

U.S. Department of Transportation

1200 New Jersey Avenue, S.E.

Washington, DC 20590

Tel: 202-366-4076

E-mail: patrick.decorla-souza@dot.gov

# Contents

# The Primer Series and the Purpose of This Volume

States and local jurisdictions are increasingly discussing congestion pricing as a strategy for improving transportation system performance. In fact, many transportation experts believe that congestion pricing offers promising opportunities to cost-effectively reduce traffic congestion, improve the reliability of highway system performance, and improve the quality of life for residents, many of whom are experiencing intolerable traffic congestion in regions across the country.

### About This Primer Series

The Congestion Pricing Primer Series is part of FHWA's outreach efforts to introduce the various aspects of congestion pricing to decision-makers and transportation professionals in the United States. The primers are intended to lay out the underlying rationale for congestion pricing and some of the technical issues associated with its implementation in a manner that is accessible to non-specialists in the field. Titles in this series include:

- Congestion Pricing Overview.
- Economics: Pricing, Demand, and Economic Efficiency.
- Non-Toll Pricing.
- Technologies That Enable Congestion Pricing.
- Technologies That Complement Congestion Pricing.
- Transit and Congestion Pricing.
- Income-Based Equity Impacts of Congestion Pricing.

Because congestion pricing is still a relatively new concept in the United States, the Federal Highway Administration (FHWA) is embarking on an outreach effort to introduce the various aspects of congestion pricing to decision-makers and transportation professionals. One element of FHWA's congestion pricing outreach program is this Congestion Pricing Primer series. The aim of the primer series is not to promote congestion pricing or to provide an exhaustive discussion of the various technical and institutional issues one might encounter when implementing a particular project; rather the intent is to provide an overview of the key elements of congestion pricing, to illustrate the multidisciplinary aspects and skill sets required to analyze and implement congestion pricing, and to provide an entry point for practitioners and others interested in engaging in the congestion-pricing dialogue.

The concept of tolling and congestion pricing is based on charging for access and use of our roadway network. It places responsibility for travel choices squarely in the hands of the individual traveler, where it can best be decided and managed. The car is often the most convenient means of transportation; however, with a little encouragement, people may find it attractive to change their travel habits, whether through consolidation of trips, car-sharing, by using public transportation, or by simply traveling at less-congested times. The use of proven and practical demand-management pricing that we freely use and apply to every other utility is needed for transportation.

The application of tolling and road pricing to solve local transportation and sustainability problems provides the opportunity to solve transportation problems without federal or state funding. It could mean that further gas tax, sales tax, or motor vehicle registration fee increases are not necessary now, or in the future. The idea of congestion pricing is a conceptual first step, not a complete plan of action. It has to be coordinated with other policy measures and environmental measures for sustainability.

Against this background, this equity primer was produced to examine the impacts of congestion pricing on low-income groups, public opinion as expressed by various income groups, and ways to mitigate the equity impacts of congestion pricing.

# Introduction

There are three principal types of equity considerations that relate to the distribution of benefits and burdens of toll or congestion-pricing projects:

1. *Income equity:* Are low-income groups negatively affected? Is a system that places the burden of travel-behavior change disproportionally on low-income individuals fair?
2. *Geographic equity:* Are some parts of the region made worse off than other parts? Will traffic diversion from tolled routes negatively impact neighborhoods or reduce performance on alternative toll-free routes?
3. *Modal equity:* Are public perceptions with regard to encouragement of multi-modal transportation addressed? For example, some believe that it is not fair to offer the same travel-time savings to those who pay a toll as to those who "do the right thing" by carpooling or taking transit.


This primer focuses on the first type of equity—income equity. Equity concerns with regard to income have often been raised about congestion pricing. The benefits of congestion pricing may not be distributed equally among all users. High-income users are more likely to remain on the highway, pay the congestion fee, and benefit from a faster trip. Low-income users may be worse off if they choose other less-expensive times, routes, or modes. When public use of infrastructure assets is deliberately made more expensive at certain times, low-income people and those concerned about their welfare may raise legitimate concerns about equity.

Toll roads impact environmental justice in at least two ways: impacts from the alignment and impacts from the ability to take advantage of better service. This primer focuses on the second impact—the ability to take advantage of better service—because the focus is on congestion pricing as applied to existing facilities. This primer presents information on the low-income equity issue in three sections as follows:

1. An overview of what is known about the low-income equity issue on the basis of current literature,
2. Results from studies conducted under the U.S. Department of Transportation's (DOT's) Value Pricing Pilot (VPP) Program, and
3. What is known about the issue, at this point in time, from DOT's urban partners funded under the Urban Partnership Agreement (UPA) Program and the Congestion Reduction Demonstration (CRD) Program.

The VPP Program was established by the U.S. Congress as the Congestion Pricing Pilot Program in 1991. It was subsequently renamed the VPP program under Section 1216 (a) of the Transportation Equity Act for the 21st Century (TEA-21) in 1998, and continued through the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

The UPA Program was announced by U.S. DOT in May 2006 and was followed by the CRD Program, initiated in 2007. Both programs were designed to address congestion problems, with particular emphasis on establishing partnerships with major urban areas to make significant reductions in roadway congestion by using congestion pricing as a key strategy. There are currently six urban partner cities—Miami, FL; Atlanta, GA; Minneapolis, MN; Seattle, WA; San Francisco, CA; and Los Angeles, CA. New York, NY, was originally designated an urban partner but lost its urban partner status in April 2008 after it failed to obtain the legislative authority needed to implement congestion pricing.

**Urban Partners**


**Map showing U.S. Department of Transporation urban partners under the Urban Partnership Agreement and Congestion Reduction Demonstration Programs.**

# Review of the Literature

## ISSUES

The "fairness" question may be viewed within the context of the overall highway financing system, in which, in the absence of congestion fees, the costs of providing peak-period highway service are borne by all highway users, not just by those who travel during congested periods or on congested routes. In this context, placing more of the burden of paying for peak-period highway service on those who make use of peak highway capacity is being increasingly viewed as an equity improvement.

A well-designed value-pricing plan can be less burdensome to low-income citizens than current systems that are based on regressive taxes, such as car-registration fees, sales taxes, and the gas tax. For example, low-income drivers usually drive older vehicles that are not as fuel-efficient as newer models. They therefore must purchase more fuel per mile driven and consequently pay higher fuel taxes for each mile driven than do those who own newer fuel-efficient models.

A report by the U.S. Congressional Budget Office (1990) found that the tax on motor fuels was regressive relative to annual income. In addition, Schweitzer and Taylor (2008) noted in one study that most forms of transportation finance—fuel taxes, sales taxes, and tolls—are regressive forms of taxation in that they burden the poor more than they do the rich. Schweitzer and Taylor (2008) stated that, "Using sales taxes to fund roadways creates substantial savings to drivers by shifting some of the costs of driving from drivers to consumers at large, and in the process disproportionally favors the more affluent at the expense of the impoverished."

Another equity concern is that congestion pricing may make it too difficult or too expensive for low-skilled workers to get to their jobs. Entry-level and unskilled jobs are often not well served by public transit. Even if service routes exist for jobs of this type, the work hours for such jobs often require travel during off-peak service times, making public transit use less appealing as an option. Many low-skilled workers need to drive to retain their jobs; however, any congestion-pricing system can be sensitive to the issue of affordability, as discussed later in this primer.

When congestion pricing relies on an electronic cashless technology, households that do not have credit cards, bank accounts, or cannot afford large deposits may be unable to set up toll accounts, which may limit their use of these facilities. The Auto Express System in Puerto Rico mitigates many of these barriers by allowing users to purchase transponders and replenish their accounts by using cash at numerous retail and convenience stores without the need to provide a checking account or a credit card number. A light on the tag indicates when funds in the prepaid account are running low. Customers then have the option of replenishing their accounts at any number of locations, including gas stations. In Texas, TxTag accounts may be opened with cash. Those replenishing depleted accounts with cash must currently do so at a customer service center, but TxDOT is working with retailers to make TxTag services available at many retail outlets.

Another equity concern is that most tolled facilities that use electronic toll collection offer discounted tolls to those who use transponders rather than using video tolling or booth tolling. In situations in which the purchase of a transponder presents a significant economic barrier, low-income

travelers who cannot afford a transponder will face a regressive toll schedule. It is estimated that between 10 and 20 percent of the population is unable to overcome these barriers to transponder ownership (Parkany, 2005).

## IMPACTS ON LOW-INCOME GROUPS

Congestion-priced facilities currently in operation in the United States include tollways and tolled water crossings with variable tolls and priced lanes along major transportation corridors that experience high levels of congestion (U.S. DOT, 2008). Such congestion-pricing projects are operating in California, Minnesota, Washington, Colorado, Utah, Florida, Texas, New Jersey, and New York. The data from priced lanes have shown that a wide range of income groups use the lanes at different levels of frequency of use.

The use of congestion-priced lanes by both high- and low-income users appears to be selective. If use of priced facilities was solely dependent on income, then low-income travelers would never use such facilities. Studies have indicated that roughly half of the users of congestion-priced lanes do so once a week or less. Weinstein and Sciara (2004) suggested that the impacts of congestion pricing are not necessarily related to income and can also be based on flexibility of time and routes available to users.

A paper by the Rand Corporation and Volpe National Transportation Systems Center (2007) indicated that household surveys suggest that rush-hour travelers who travel in the busier direction—and thus are more likely to pay congestion charges—are the most affluent group within the larger category of street and highway users.

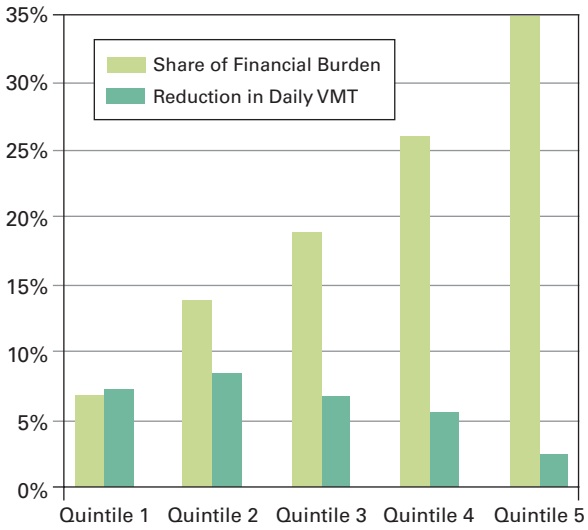
Congestion pricing clearly will create economic hardship for some households. Svadlenak and Jones (1998) found that of adult residents in the Portland, OR, area who travel during peak hours in single-occupant vehicles, approximately 3 percent are low-income commuters. Of all Portland-area commuters, 38 percent travel during peak hours in single-occupant vehicles and have relatively high incomes. Svadlenak and Jones (1998) suggested that of this 38 percent, most can afford tolls and would welcome tolls if they resulted in a commensurate improvement in travel time.

**Commuting pattern by income group in the Portland, OR, area.**

| | Less Than Poverty Guideline | 100%–200% of Poverty Guideline | More Than 400% of Poverty Guideline |
|---|---|---|---|
| Not Employed | 58.7% | 43.2% | 16.7% |
| SOV-Peak | 17.1% | 14.6% | 35.4% |
| SOV-Off-Peak | 4.3% | 13.4% | 19.2% |
| Carpool-Peak | 5.7% | 7.2% | 9.8% |
| Carpool-Off-Peak | 5.7% | 2.3% | 2.2% |
| All Other Modes | 8.5% | 19.2% | 16.6% |
| Total | 100.0% | 100.0% | 100.0% |
| Number of Cases | 109 | 229 | 575 |
| Missing Cases* | (16) | (21) | (63) |

*Missing data concerning mode of travel were allocated proportionately across five commuter categories.

SOV = single-occupancy vehicle.




**Equity implications of hypothetical Los Angeles 5-cent vehicle-miles-traveled (VMT) fee, 1991.**

Deakin and Harvey (1996) found that, if a 5-cent vehicle-miles-traveled fee were to be imposed in Los Angeles, CA, the lowest income quintile (i.e., 20 percent of users) would bear only 7 percent of the financial burden, whereas the highest income quintile would bear 35 percent of the financial burden.

Safirova et al. (2003) estimated the impacts of a high-occupancy toll (HOT) lane network in the Washington, DC, area. They found that the lowest income quartile would pay 5.2 percent of tolls, whereas the highest income quartile would pay 50.3 percent of tolls.

**Welfare changes and equity impacts by income group under high-occupancy-toll (HOT) lane network policy in the Washington, DC, area.**

| Quartile | Tolls paid by income group ($000/year) | Percentage of tolls paid by income group | Welfare change* ($000/year) | Percentage of welfare change accruing to quartile | Welfare change as percentage of income |
|---|---|---|---|---|---|
| 1 | 3,412 | 5.2 | 3,047 | 2.9 | 0.028 |
| 2 | 7,822 | 12.0 | 12,172 | 11.5 | 0.037 |
| 3 | 21,073 | 32.4 | 32,717 | 30.9 | 0.050 |
| 4 | 32,728 | 50.3 | 57,935 | 54.7 | 0.042 |
| Total | 65,035 | 100.0 | 105,870 | 100.0 | 0.045 |

*Before counting the value of toll revenues.

*Source:* Welfare and Distributional Effects of Road Pricing Schemes for Metropolitan Washington, DC. Elena Safirova, Kenneth Gillingham, Ian Parry, Peter Nelson, Winston Harrington, and David Mason, October 2003—Discussion Paper 03-57.

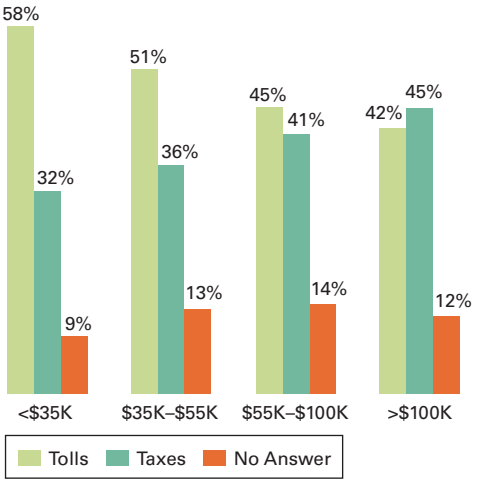
Transek (2006) found that, in the case of the Stockholm city center congestion-pricing scheme, affluent men in the inner city pay the most in congestion-pricing charges. Because high-income individuals use their cars more frequently, it was found that high-income households were more likely to incur the congestion charge compared with the average household. This analysis indicates that, if the revenues are used for public transportation, those who gain the most from the pricing scheme are young people, low-income individuals, single people, women, and residents of the inner suburbs. These groups pay relatively little in congestion charges on average and use public transportation more often than do other groups.

## PUBLIC OPINION

Taniguchi (2008) provided results from a survey of public opinion on paying for transportation infrastructure with tolls versus taxes. The survey found that support for tolls was higher among low-income individuals (58 percent support for tolls) than among high-income individuals (42 percent support for tolls). Support for taxes was 32 percent for low-income individuals compared with 45 percent for high-income individuals.

Morallos (2006) found that, although limited, evidence from the successfully operating VPP projects clearly demonstrates that the most valued feature in tolling and pricing projects is that of providing people with a choice of whether to use priced lanes. Studies have shown that lower income individuals face the greatest financial harm when they are denied adequate travel choices. Lack of choice to pay a toll in exchange for reliable travel times can result in lost wages or late fees for daycare that could have been avoided.

Even when priced lanes are seen to be used more heavily by high-income users than by low-income users, a broad spectrum of income groups still express approval of the projects (as documented later in this primer) because they are given the choice of choosing the tolled route, an alternative free route,




**Support for tolls versus taxes in King County, Washington. Low-income households prefer tolls over taxes.**

or a different transportation mode. Although high-income motorists do use the priced lanes more often, all income groups value the choice of a reliable trip travel time that is now available to them, serving their needs when they absolutely have to get to their destinations on time (e.g., getting to a daycare center before late fees kick in).

## ADDRESSING EQUITY CONCERNS

Research has identified strategies for addressing equity concerns through redistribution of toll revenues. These include distributing rebates or credits, or revenue transfer to transit and carpooling services in the priced corridor. To ensure that at least some surplus toll revenue is used to improve transit, some areas have passed legislation to dedicate a portion of the surplus revenue to transit, whereas others have created special transit accounts.

A particularly important consideration in evaluating congestion-pricing options and their equity implications is the use of revenues generated by tolls. Toll revenues can be used to compensate those who might otherwise consider themselves "losers" as a result of congestion pricing. Compensation can come in a variety of forms. Toll revenues may be used to finance highway improvements (particularly in the corridor where the tolls are levied) or to pay for improvements in transit service. In cases in which effects on low-income drivers are felt to be particularly severe, toll exemptions or toll rebates may be offered to eligible drivers, or other forms of monetary compensation may be offered, such as tax rebates that provide reimbursment for tolls paid or income supplements.

Each of these approaches has been used or considered for use in congestion-pricing programs. For example, revenues from area pricing in Central London were used in part to improve bus service into the priced area, thereby enhancing transportation services to low-income groups and other users of those systems. The statutes in California mandate that 18 percent of toll revenues from the Bay Area Toll Authority be transferred into three accounts controlled by the Metropolitan Transportation Commission, a multimodal planning agency for the region. The Port Authority of New York and New Jersey likewise uses surplus toll revenue to subsidize transit services. When New York City considered a cordon-pricing scheme, it proposed a tax rebate for drivers who qualified for the federal-earned income tax credit. In the case of a proposed congestion-pricing scheme on the San Francisco Bay Bridge, tolls were to be raised from $1 to $3 per trip, but the proposal called for a reduced "lifeline" toll rate of $1 for low-income users.

Schweitzer and Taylor (2008) suggested that if policymakers are worried about low-income, peak-period commuters paying tolls, one way to address this would be to provide discounted "lifeline" pricing based on income levels, as is done by utility companies for qualifying customers. As an alternative, they could provide travel credits to low-income commuters.

# Evidence From VPP Program Projects

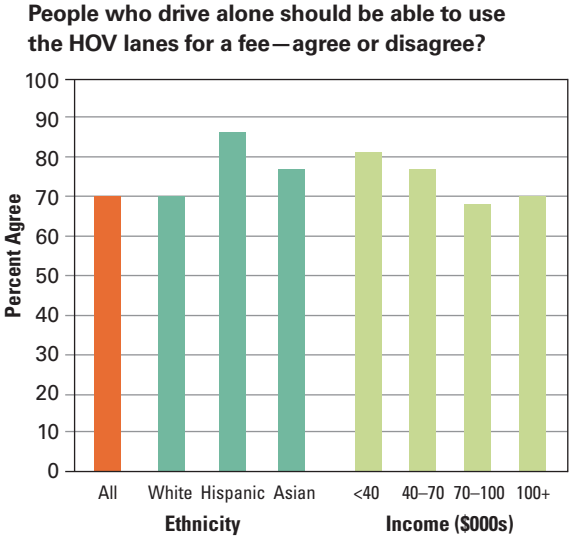
The perception that value pricing is "unfair" to low- and perhaps even middle-income drivers has been a concern for many VPP program projects. Since the inception of the VPP program, equity has been a key issue of interest, with particular attention given to mitigating possible adverse effects of projects on low-income drivers. Project experiences are summarized in FHWA's report on lessons learned from the program (KT Analytics and Cambridge Systematics, Inc., 2008). Project experience has shown, particularly for the most common projects funded under the early phases of the program (e.g., HOT lanes), that the perception of unfairness may be exaggerated. Data from the various cities that have implemented projects or have projects underway are discussed below. Most of the data have been obtained from projects involving "partial" pricing on one or more lanes of a freeway facility. Equity impacts relating to income have not been evaluated in the case of "full facility" pricing projects, such as those implemented on tollways and tolled water crossings. Overall, the perception that congestion pricing is an inequitable way of responding to the problem of traffic congestion does not appear to be borne out by experience.

## EXPERIENCE FROM "PARTIAL" PRICING PROJECTS

### San Diego, CA

For the I-15 HOT lanes in San Diego, CA, user and stakeholder concerns about the potential elitist character of the project arose in the first year but diminished with time as users across income groups used the facility. By the final evaluation, such concerns were minimal. In the case of the planned expansion and extension of the I-15 HOT lanes, a telephone survey of all facility users of I-15 found that most consider the extension fair to regular-lane users (71 percent approval) and to HOT-lane users (75 percent approval). There were very few differences in attitudes about the fairness of the lanes based on ethnicity or income; however, half of respondents felt that tolling solo drivers was an unfair double taxation. HOT-lane users paying tolls were less likely to feel that way than were other corridor users.

When considering the statement, "People who drive alone should be able to use the I-15 express lanes for a fee," 80 percent of the lowest income motorists using the I-15 corridor agreed with it, and




**Public acceptance of I-15 high-occupancy toll lanes by income group and ethnicity. There is wide support for value-pricing concepts, which are viewed as "buying time" for a premium level of service.**

low-income users were more likely to support the statement than were the highest income users.

Users of San Diego's I-15 HOT lanes were more likely to have higher incomes than were drivers in regular lanes, but lower income drivers sometimes did use the HOT lanes. I-15 drivers showed a broad approval of the HOT-lane program and felt that it was fair and had reduced congestion. Equity issues are addressed by dedicating the HOT-lane revenues to bus service in the corridor. I-15 was the first project to demonstrate that implementing tolls as a demand-management measure can play a major role in paying for transit and reducing the negative impact of this strategy on low-income individuals.

### Denver, CO

For the I-25/US-36 HOT lanes in Denver, CO, public outreach leading to implementation of HOT lanes did not uncover critical concerns regarding equity or other social impacts, nor have such concerns arisen since implementation.

### Minneapolis, MN

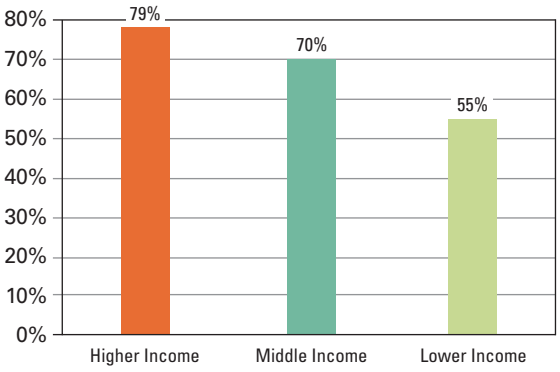
On I-394 in Minneapolis, MN, the first attempt at implementing HOT lanes in1997 met resistance in large part because of public belief that only high-income users would benefit. A second attempt approximately 9 years later succeeded in part because advocates made the case that all income groups value time savings and reliability for certain trips. Worsening congestion and a shortage of transportation funds were also important to the success of the second attempt, according to evaluators. Surveys of corridor users found a relatively small difference in income between those who do and those who do not own transponders: 25 percent of owners had annual incomes of $50,000 or less compared with 32 percent of non-owners. However, concerns about equity have not been significant since start up.

Patterson and Levinson (2008) stated that "the [HOT] lanes are Lexus Lanes in the sense that increased income predicts increases in three of the four metrics used to measure direct benefit.... Individuals with higher incomes receive more direct benefits from the lane than those with lower incomes." However, according to the University of Minnesota and NuStats (2005), HOT-lane usage with MnPass was reported across all income levels, including by 79 percent of high-income respondents, 70 percent of middle-income respondents, and 55 percent of low-income respondents.

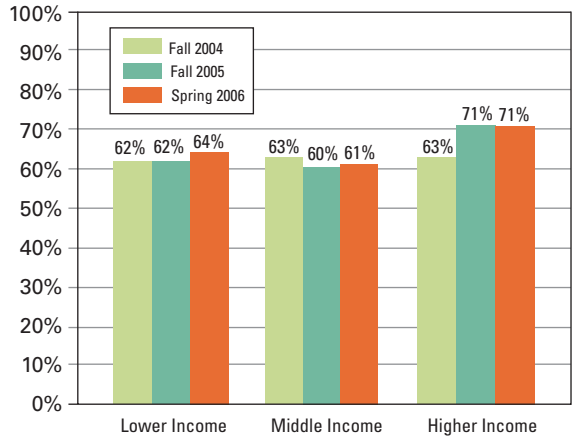
Patterson and Levinson (2008) sought to determine whether the higher levels of MnPass use found among wealthier drivers was attributable to their residential location (specifically along the managed-lanes corridor) or to their income. Both factors were found to be significant. The highest income motorists paid the most (in average and total tolls) and received the most benefit.

Patterson and Levinson (2008) cited specific equity benefits of managed lanes:

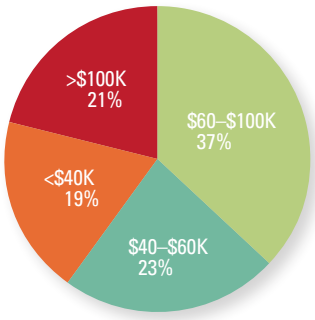
- Vehicle shifts away from general-purpose lanes lead to improved travel conditions on such lanes,
- A high-quality transit alternative is generally part of a managed-lanes project,
- Unused transponders may be considered to provide high-value travel-time insurance to their owners, and
- When social benefits are paid for by those who choose to drive, situational equity is generally improved.




**Users of I-394 MnPass high-occupancy toll lanes as a percentage of Minneapolis, MN, population.**




**Percentage of Minneapolis consumers surveyed who approve of allowing single-occupant drivers to use the carpool lane for a fee.**




**Annual household income of SR-91 peak-period travelers in 1999.**

Approximately 65 percent of respondents to a survey conducted in spring 2006, a year after initial implementation, thought that HOT lanes were a good idea. Support for the lanes was also found to be high across income levels, including by 71 percent of high-income respondents, 61 percent of middle-income respondents, and 64 percent of low-income respondents.

### Houston, TX

For the I-10 and US-290 HOT lanes in Houston, TX, focus groups held during project planning did not find concerns about social equity among either corridor users or the public at large. The general reaction was that all would benefit if congestion were reduced. There also have been no equity concerns raised during operations. It should be noted, however, that these HOT lanes are somewhat different from other examples, that is, single-occupant vehicles are not permitted in the HOT lanes—tolls are used to manage two-person carpool demand. Burris et al. (2007) found that even in the lowest income group, over two-thirds of respondents were interested in paying to use the HOT lanes.

### Seattle, WA

For SR-167 HOT lanes in Seattle, WA, evaluators found through outreach efforts that low-income drivers are as supportive of the HOT lanes as are drivers from other income groups.

### Orange County, CA

SR-91 in Orange County, CA, was the first project to implement congestion pricing on new lanes and until 2008 was the only operating example of congestion pricing on new lanes. FHWA's *A Guide for HOT Lane Development* report (FHWA, 2005) provides data from studies of SR-91 express toll lanes in California. At any given time, about one-quarter of the vehicles in toll lanes are driven by high-income individuals, whereas the remaining cars are driven by low- and middle-income individuals. It is estimated that 19 percent of the peak-period users of the SR-91 express lanes make less than $40,000 a year, and 42 percent make less than $60,000 a year. Low-income drivers do use the express lanes and are as likely to approve of the lanes as drivers with higher incomes. In fact, over half of commuters with household incomes less than $25,000 a year approved of providing toll lanes.

An evaluation of the SR-91 express lanes (Sullivan, 2000) found a "moderate" income effect, with the percentage of trips on the express lanes for the lowest and highest income groups (20 percent and 50 percent) staying the same over the 3-year evaluation period. Evaluators also found that the use of express lanes increased over time for both those who carpooled and solo drivers across all incomes. Low-income and moderate-income travelers appeared to be more selective and used the tolled route for less than half of their trips.

When prices rose, people in the lowest income group did not reduce their travel, but people of moderate income did. This suggests that people with lower incomes have less flexibility in the time they travel (Kuehn, 2008), or that low-income individuals have very high values for reliable travel when they need it.

## EXPERIENCE FROM "FULL FACILITY" PRICING PROJECTS

### Lee County, FL

In Florida, proposals to raise peak-period tolls on Lee County's bridges were rejected as inequitable to those with inflexible schedules and led to a program of reduced off-peak tolls instead. Income equity was not raised as an issue in planning or in evaluation focus groups and surveys.

### New York, NY

The Port Authority of New York and New Jersey did not uncover major equity issues in planning for variable tolls, nor did they evaluate equity effects after program implementation.

## PLANNING STUDIES CONDUCTED UNDER THE VPP PROGRAM

Studies funded under the VPP program have included innovative approaches designed specifically to address equity issues. The authors of one study evaluated the equity impacts of a regional value pricing program, which are discussed below.

### Fast and Intertwined Regular (FAIR) Lanes

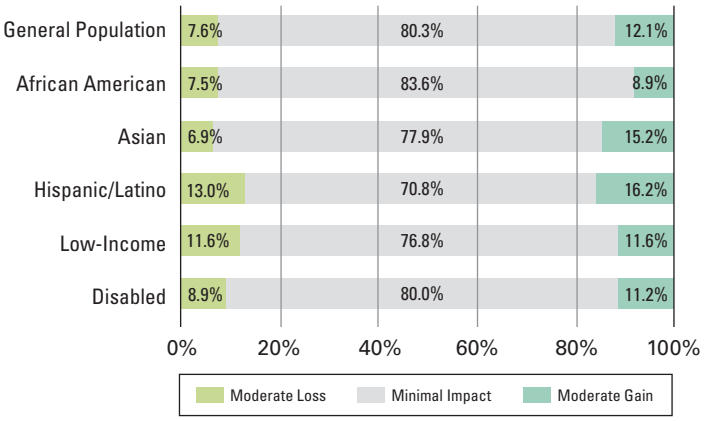
This approach was studied in Alameda County, CA, and involved providing toll credits to qualified low-income users on the basis of their monitored usage of free regular lanes located adjacent to HOT lanes. Accumulated credits allowed for periodic free use of the HOT lanes by these motorists.

### "FAST Miles"

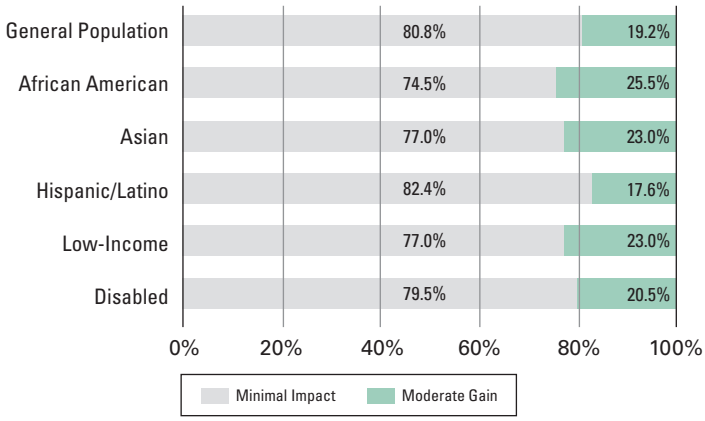
The FAST Miles approach being studied in Minneapolis would allocate a fixed amount of toll credits to all area motorists, similar to the limited number of free peak-period minutes allocated by cell phone companies to their customers. Total credits allocated to all motorists would be limited by the peak-period capacity available on the roadway system. This would ensure that demand would not exceed supply of road space (i.e., roadway capacity) and guarantee congestion-free travel for all motorists in exchange for use of their free credits to "pay" for roadway use.

### Network of Variably Priced Lanes in the Washington, DC, Metropolitan Area

An analysis was performed for three scenarios involving a network of priced lanes (National Capital Region Transportation Planning Board, 2008). With respect to transit, because transit service was added between the base case and the scenarios, only gains in accessibility were noted. With regard to highways, one scenario had no losses in accessibility; thus, no population group experienced losses. The pattern of losses and gains for the other two scenarios were very similar, with no one population group receiving a large share of the benefit and no one population group shouldering a disproportionate share of the losses. Gains and losses in accessibility to jobs by highways across population groups for one scenario is presented in the figure "Demographic assessment of the change in accessibility to jobs by highways," and the distribution of gains in accessibility to jobs by transit for the same scenario is presented in the figure "Demographic assessment of the change in accessibility to jobs by transit."




**Demographic assessment of the change in accessibility to jobs by highways.**




**Demographic assessment of the change in accessibility to jobs by transit.**

# Equity Implications of Urban Partnership Agreements

FHWA conducted a survey of the UPA cities (including New York) to gather information about the real and perceived equity implications of their projects. In addition to equity by income, regional geographic equity was also considered in some instances, because the costs of congestion pricing and the distribution of benefits (typically in the form of new transit and ferry services funded from toll revenue) may be distributed unequally, as with any transportation policy that does not involve tolls or pricing. The comprehensive evaluations that take place in the UPA cities will each, to some degree, provide further examination of equity issues after the projects are in operation. Details about the projects are available on FHWA's Web site at http://www.upa.dot.gov/index.htm

## MIAMI, FL

Focus groups were conducted in 1995 in regard to South Florida's managed lanes on I-95. The focus groups discussed potential traffic-improvement strategies, including managed lanes. Of the nine focus groups of approximately 10 participants each, five were conducted in English, three in Spanish, and one in Creole. Although focus groups by their nature do not present a statistically valid representation of public opinion, their results may nevertheless be indicative of such opinion. Focus groups also have the benefit of ensuring that people fully understand the aspects of an issue before voicing their opinions.

A key finding from the focus groups is that the perceptions of benefits from managed lanes did not divide along any apparent demographic boundary, including ethnicity and income. The managed-lanes concept was found to be difficult to communicate, but after sufficient time was taken to convey the concept clearly, participants generally perceived that both personal and regional benefits would result from managed-lanes implementation. As could be expected, participants said that they would use managed lanes less frequently as the price to use these lanes rises. It is interesting to note, however, that many individuals had been unaware of toll increases that took place in the region shortly before the focus groups were conducted, suggesting that those who participated in the focus groups might be overestimating their price sensitivity.

## SAN FRANCISCO, CA

A 2007 survey asked 600 residents of the San Francisco, CA, region (JD Franz Research, Inc., 2007) about support for studying congestion pricing. Support was found to be slightly higher among very-low- and low-income residents of the region relative to other residents. San Francisco's UPA project managers offered a theory for this result: Lower income residents are more likely to be transit riders who would benefit from both reduced congestion and increased transit investments from pricing revenues. For low-income drivers, their increased likelihood of having less scheduling flexibility (e.g., due to having to punch a time clock) and concern about daycare late fees may cause them to more highly value reduced congestion and greater travel time reliability.

## SEATTLE, WA

King County, WA, conducted a transportation survey in December 2007 (EMC Research Inc., 2007). Many questions were asked of the 501 respondents, a number of them pertaining to support for tolling. Although the survey report did indicate the percentage of respondents in each income group, survey responses were not broken out by income. Among the findings was high support for tolling when compared with other alternatives when a specific infrastructure need was presented. Between 78 and 84 percent (depending on the order in which answers were presented) of respondents preferred electronic tolls over a sales tax increase to fund the SR 520 bridge replacement.

Support for tolling grew substantially if a portion of revenues was dedicated to transit, even if tolls had to be significantly higher to allow for such a diversion of revenue to occur. A toll of $2.50 to fund the replacement of the Lake Washington floating bridge was supported by 64 percent of respondents, whereas 74 percent supported a $4 toll to fund the bridge replacement along with increased transit and bicycling investments in the corridor. Thus, the equity and other benefits of improved transportation options were shown to be more important to respondents than was keeping the toll rates as low as possible.

With revenues dedicated to replacing the SR 520 bridge, 69 percent of respondents indicated support for variable tolling. In regard to another roadway, in which the need for tolling revenues was not presented, only 28 percent of survey participants indicated support for variable tolling, even after the benefits of such tolling in terms of relieving congestion were described to them. The bottom line is that the use of revenues is an extremely important determinant of public support for congestion pricing and is likely to be a more important determinant of support than the level of congestion charges and the design of the congestion-pricing scheme.

## NEW YORK, NY

An analysis was conducted for the New York City Traffic Congestion Mitigation Commission with regard to the regional equity implications of three cordon pricing and tolling scenarios and supporting transit services (New York City Traffic Congestion Mitigation Commission, 2008). Results from the analysis are discussed below.

### Geographic Equity

The analysis of the regional equity implications of the scenarios under consideration started by emphasizing the regional inequities from existing toll policies, in which 45 percent of toll revenues collected from drivers bound for Manhattan's central business district (CBD) are paid by New Jersey residents, even though New Jersey vehicles constitute only 24 percent of the total drivers heading into the CBD. This 45 percent figure can be compared with Manhattan drivers, who currently pay only 7 percent of collected toll revenues, and residents of the other four boroughs of New York City, who pay a total of 29 percent.

Three scenarios were considered: (1) the mayor's cordon pricing plan, (2) an alternative modified cordon pricing plan, and (3) tolling of existing free bridges into Manhattan. For new tolls under the various scenarios, Manhattan residents would pay between 28 and 31 percent, residents of the other four boroughs would pay between 38 and 49 percent, and New Jersey residents would pay only an additional 7 to 17 percent. The new toll revenues would be dedicated to subsidizing transit, and the new transit would primarily serve New York City residents. The new bus routes would be along the corridors where there is substantial car commuting, further relieving congestion along these routes and thus directly benefiting those who continue to commute by car.

The analysis concluded that between 22 and 24 percent of revenues for the transit subsidies would come from Manhattan drivers, and 41 percent would come from drivers from other boroughs, which would appear to be fair. Both the mayor's

congestion-pricing plan and the alternative congestion-pricing plan were found to "allocate transit subsidies among drivers largely in proportion to the percentage of CBD-bound drivers in each geographic area." The toll plan, which added tolls to bridges that are currently toll-free, "allocates transit subsidies less proportionately as compared to the two congestion pricing plans."

## Income Equity

Councilwoman Melissa Mark-Viverito's blog posting on January 30, 2008 (Mark-Viverito, 2008), partially excerpted on this page, speaks for itself.

The New York City mayor's proposed congestion-pricing plan, the alternative congestion-pricing plan, and the toll plan all included the imposition of new fees and tolls. To better understand the impacts of these costs on different socioeconomic groups, agency staff examined the income profiles of those groups most likely to pay the fee or toll. This analysis raised several issues for further consideration, as discussed below.

The fee and toll plans most impact those who drive to the CBD on a daily basis; the vast majority of trips into the zone are not made by automobile. Therefore, individuals who typically walk, bike, or take transit to the CBD would not be financially affected by the fee or toll options. Of motorists, those who drive into the CBD every day for work would be most impacted. For example, under the mayor's plan, a daily auto commuter who travels from Upper Manhattan to the Financial District would pay about $2,000 in congestion fees each year (vs. $912 a year for those who use transit). By comparison, a motorist who drives into the zone on weekdays once or twice a month for shopping or entertainment would pay about $100 to $200 a year in congestion fees under the mayor's plan.

Those who commute by car to the CBD earn comparatively higher incomes: New York City DOT staff analyzed the income levels of city and suburban residents who use the automobile as their primary mode to reach Manhattan jobs. Staff found that of the 2.14 million workers in Manhattan, about 292,000, or 14 percent, drive to work each day. These workers have a median annual income of $60,941, compared with a median annual income of $46,416 for all workers in Manhattan, including the 1.85 million workers who take transit, walk, or bike to work. In aggregate, the fee would most impact commuters who earn 31 percent more than the median income of all Manhattan workers. Taking into account other income earners in the household, workers who drive to work in Manhattan have a median household income of $103,700. This compares with a median household income of $89,379 for all Manhattan workers.

A small proportion of low- and moderate-income commuters who drive would be dispropor-

> "In the East Harlem and South Bronx communities that I represent, we are automatically skeptical when business interests and politicians from outside our communities claim to be watching out for us—because nine times out of 10, they're doing just the opposite.
>
> "So it is with congestion pricing. For months, some suburban elected officials from wealthy areas, as well as a coalition backed primarily by the American Automobile Association and Manhattan garage owners, have tried their best to cloak themselves as guardians of New York's poor and middle-class residents.
>
> "…The truth is that just 5 percent of commuters in Brooklyn, Queens, Staten Island and the Bronx travel to Manhattan by private car. People who drive their cars to work also earn 30 percent more a year than those of us who use mass transit. It is our poor and middle-class families who would benefit from congestion pricing—as the fees charged to drivers would be used to improve the bus and subway system.
>
> "Critics have also tried to whitewash congestion pricing's health benefits to communities such as Harlem and the Bronx, where kids are hospitalized for asthma attacks far more often than in Westchester, Nassau and Suffolk counties…
>
> "Unlike those who falsely claim to speak for the best interests of my constituents, the commission ought to recognize it would be irresponsible not to pursue a policy that could provide immediate and measurable relief of traffic congestion while improving the air that all of my constituents breathe and the buses and subways that they ride daily."

**Councilwoman Melissa Mark-Viverito's blog posting on January 30, 2008.**

tionately impacted by a fee or toll: Most low- and moderate-income commuters who travel into the CBD take transit or walk and would not be impacted by a fee or toll. Of all New York City residents who commute to work, only 5 percent drive to the CBD. Of that 5 percent, most (80 percent) have a feasible transit alternative to get to work that would take no more than 15 minutes longer than their auto trip. Therefore, only 1 percent of Manhattan workers lack a viable alternative to paying a congestion fee or toll. The low- and moderate-income workers disproportionately impacted by a fee or a toll represent a further subgroup within this 1 percent. Legislation that was proposed for consideration by the State legislature would have provided tax credits to compensate low-income motorists for amounts that they would have to pay in excess of the round-trip transit fare.

A large number of low- and moderate-income residents would benefit from improved transit services under any of the three revenue-generating plans: As a group, low- and moderate-income New York City residents rely more on transit for their travel needs when compared with higher income residents. Therefore, these low- and moderate-income residents would benefit more from the short-term transit enhancements that would precede a toll or fee imposition and from the expansion of the transit system made possible by increased revenues for transit investment.

# Conclusions

Any change in the way charges are made for road use will benefit some individuals more than others. Those who have higher incomes will tend to use congestion-priced facilities more often, which leads to a perception that wealthy people are favored; however, income-related equity concerns may not be entirely warranted. Although data from priced lanes that are operated in the United States show that high-income motorists do use the lanes more often, the lanes are used by all income groups, serving drivers' needs when they absolutely have to get to their destinations on time (e.g., getting to a day-care center before late fees kick in). Moreover, approval ratings are equally high for all income groups, in the 60–80 percent range, because all income groups value the "insurance" of a reliable trip time when they absolutely need it.

Low-income travelers who take transit more frequently will benefit from transit-service improvements that generally accompany congestion pricing. Toll revenues can be used to compensate those who might otherwise consider themselves "losers" as a result of congestion pricing. Low-income transit riders can benefit significantly from toll-financed transit improvements, which are generally included in any pricing package. In cases in which effects on low-income drivers are perceived to be particularly severe, such drivers could be provided with toll exemptions, rebates, or other forms of monetary compensation, such as tax rebates or income supplements. Pricing schemes may include protections for low-income individuals, such as toll credits.

# References


Burris, M., Sadabadi, K. F., Mattingly, S. P., Mahlawat, M., Li, J., Rasmidatta, I., & Saroosh, A. (2007). Reaction to the managed lane concept by various groups of travelers. *Transportation Research Record : Journal of the Transportation Research Board, 1996*, 74–82.

Deakin, E., & Harvey, G. (1996, November). *Transportation pricing strategies for California: An assessment of congestion, energy and equity impacts.* Sacramento: California Air Resources Board.

EMC Research, Inc. (2007, December 15–20). *King County transportation survey.* (Conducted on behalf of the King County Department of Transportation.) Retrieved February 9, 2009, from http://www.metrokc.gov/exec/news/2008/pdf/3798apx.pdf

Federal Highway Administration. (2005). *A guide for HOT lane development*. Retrieved February 9, 2009, from http://www.its.dot.gov/JPODOCS/REPTS_TE/13668_files/images/13668.pdf

Hubert H. Humphrey Institute, University of Minnesota, & NuStats. (2006). *Panel survey for MnPASS HOT lanes evaluation*. Retrieved February 9, 2009, from http://ganymede.nustats.com/nustats_dot_com/templates/yet_again_new-menu/docs/case_studies/panel_survey_for_mnpass_hot_lanes.pdf

JD Franz Research, Inc. (2007 August). *Poll about congestion pricing.* (Conducted on behalf of the San Francisco County Transportation Authority.)

KT Analytics, Inc., & Cambridge Systematics, Inc. (2008). *Value pricing pilot program: Lessons learned.* (Prepared for the Federal Highway Administration.) Retrieved February 9, 2009, from http://ops.fhwa.dot.gov/publications/fhwahop08023/vppp_lessonslearned.pdf

Kuehn, D. (2008). *Environmental justice and the distribution of benefits from highway pricing programs.* Paper presented on behalf of the Federal Highway Administration at the 2009 Annual Meeting of the Transportation Research Board, Washington, DC.

Mark-Viverito, M. (2008, January 30). Voices: Congestion pricing fairest for the poor. *New York Metro Newspaper.*

Morallos, D. (2006, August). *Social equity issues with tolling and pricing.* Unpublished manuscript, Summer Transportation Internship Program for Diverse Groups, Federal Highway Administration, Washington, DC.

National Capital Region Transportation Planning Board. (2008, February). *Evaluating alternative scenarios for a network of variably priced highway lanes in the metropolitan Washington region*. Retrieved February 11, 2009, from http://www.mwcog.org/TPB/VPTF/docs/RVPS_Final_Report.pdf

New York City Traffic Congestion Mitigation Commission. (2008, January). *Report to the Traffic Congestion Mitigation Commission and recommended implementation plan*. Retrieved February 11, 2009, from https://www.nysdot.gov/portal/page/portal/programs/congestion_mitigation_commission/final-recommendation

Parkany, E. (2005, January). *Environmental justice issues related to transponder ownership and road pricing* (No. 05-2274). Paper presented at the 84th Annual Meeting of the Transportation Research Board, Washington, DC.

Patterson, T. M., & Levinson, D. (2008, March). *Lexus lanes or Corolla lanes? Spatial use and equity patterns on the I-394 MnPASS lanes.* Unpublished manuscript, Department of Civil Engineering, University of Minnesota. Retrieved February 11, 2009, from http://nexus.umn.edu/Papers/MnPASSEquity.pdf

Rand Corporation & Volpe National Transportation Systems Center. (2007, January 31). *Congestion pricing: Revenue potential* (Commission briefing paper 5A-08). Prepared for the Section 1909 Commission, U.S. Department of Transportation, Washington, DC.

Safirova, E., Gillingham, K., Parry, I., Nelson, P., Harrington, W., & Mason, D. (2003, October). *Welfare and distributional effects of road pricing schemes for metropolitan Washington DC* (Discussion paper 03-57). Resources for the Future, Washington, DC.

Schweitzer, L., & Taylor, B. (2008, November). Just pricing: The distributional effects of congestion pricing and sales taxes. *Transportation*, 35(6), 797–812.

Sullivan, E. (2000, December). *Continuation study to evaluate the impacts of the SR 91 value-priced express lanes.* Cal Poly State University, San Luis Obispo, CA. Retrieved February 11, 2009, from http://ceenve3.civeng.calpoly.edu/sullivan/SR91/final_rpt/FinalRep2000.pdf

Svadlenak, J., & Jones, B. (1998). Congestion pricing and ability to pay: Income levels and poverty rates of peak-hour, single-occupant vehicle commuters in Portland, Oregon. *Northwest Journal of Business and Economics.*

Taniguchi, H. S. (2008). *Tolling in Washington state.* King County Department of Transportation, Washington. Presentation retrieved February 11, 2009, from http://www.nga.org/Files/pdf/0806TRANSPORTATIONTANIGUCHI.PDF

Transek. (2006). *Equity effects of the Stockholm trial.* Retrieved February 11, 2009, from http://www.stockholmsforsoket.se/upload/Sammanfattningar/English/Equity%20Effects%20of%20the%20Stockholm%20Trial.pdf.

University of Minnesota & NuStats. (2005, March 4). *I-394 MnPASS project evaluation attitudinal panel survey final report.* Retrieved February 11, 2009, from http://www.mnpass.org/systemstudy.html

U.S. Congressional Budget Office. (1990, August). *Federal taxation of tobacco, alcoholic beverages, and motor fuels: A CBO study.* Washington, DC. Retrieved February 11, 2009, from http://www.cbo.gov/ftpdocs/79xx/doc7951/90-CBO-039.pdf

U.S. Department of Transportation. (2008). *Report to Congress on the value pricing pilot program*. Washington, DC.

Weinstein, A., & Sciara, G-C. (2004, November). *Assessing the equity implications of HOT lanes: A report prepared for the Santa Clara Valley Transportation Authority.* Retrieved February 11, 2009, from http://knowledge.fhwa.dot.gov/cops/hcx.nsf/All+Documents/645B4DEABB13D7F085256FA30064485E/$FILE/ASSESSING%20THE%20EQUITY%20IMPLICATIONS%20OF%20HOT%20LANES.pdf?OpenElement

U.S. Department
of Transportation

**Federal Highway
Administration**

Office of Transportation Management

Federal Highway Administration

U.S. Department of Transportation

1200 New Jersey Avenue, S.E.

Washington, DC 20590

Tel: 202-366-6726

www.ops.fhwa.dot.gov/siteindex.htm

December 2008

FHWA-HOP-08-040