

Equity in Tolling and Pricing: Synthesis

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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WSDOT staff. Online and print sources may include newspaper and periodical articles, NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs and related academic and industry research. Internet hyperlinks in the TSRs are active at the time of publication, but host server changes can make them obsolete.

Request for Synthesis:

Anne Criss, Program Lead, WSDOT Climate Change Team, requested a synthesis on economic impacts of tolling or system pricing on small businesses and low-income residents and a brief summary of a current WSDOT study on tolling equity.

Databases Searched:

- Transport
- TRIS Online
- Research in Progress
- Google Scholar

Background:

Tolling and congestion pricing programs are often considered inequitable to low-income members of the population. Such drivers may not be able to afford tolls and are more significantly affected when they do pay. Toll revenues and impacts to congestion and transportation are important factors in determining equity, because overall improvements in travel efficiency may outweigh negative effects for low-income population.

Less is known of the impacts of tolling and pricing to small businesses. Proponents argue that reduced congestion is an economic benefit. Recent congestion pricing in London was found to have no significant effect on numbers of business visitors. In London and Stockholm, tolling districts have experienced improved transportation efficiency and increased retail trade.

Synthesis Summary:

Categories of publications and resources are as follows:

- Research Summary
- Washington State Surveys and Studies
- Economic Impacts
- References from Tolling Equity Study
- Resources Consulted But Not Cited
- Literature Search

RESEARCH SUMMARY:

The Impacts of Tolling on Low-Income and Minority Populations in Washington State

Robert Plotnick—Professor, Jennifer Romich—Assistant Professor, and Jenny Thacker—
Graduate Student, University of Washington

Project Purpose

Washington State's tolling of roads and bridges are part of an overall strategy for funding transportation improvements. This research will provide WSDOT with information on the impacts

of tolling on Washington State's low-income populations specifically those in the Puget Sound area. This information is necessary to inform road and bridge project environmental documents.

This study will help understand who will pay tolls. It will identify the cost of tolls to a typical low-income household compared to middle and high income households. It will help to identify if tolls create economic hardship for low-income populations such as diverting funds away from other needs such as food, housing, or health care. It will identify barriers low-income populations face in acquiring or using the tolling system.

What behavioral changes will low income residents make in response to tolls? Questions that need answers are:

- A. To what extent will low -income residents:
 1. Use non-tolled routes to avoid payment?
 2. Shift their use of highways and bridges to non-peak periods (for time-varying tolls)?
 3. Shift from private cars to public transportation or car pools?
 4. Drive economical vehicles to offset the cost of tolls?
 5. Take fewer trips overall?
- B. For those residents who would use non-tolled routes or shift to public transportation or car pools, will it increase time spent in travel, and if so by how much?
- C. For those who would not shift, is it because other options are not available as non-tolled routes? Does public transportation not fit their needs or is it unavailable? Is lack of awareness of other options or not understanding how to use them a factor? Will potential behavioral changes differ by income status? Will some sub-groups among low-income populations make large changes in behavior; will others be largely unaffected?

Answers to these questions and others require an economic and social analysis of suitable data. Tolls of any kind change the relative costs of using certain travel routes. This research will provide empirical analysis to assess the size and direction of behavioral responses.

The study's four objectives:

1. Conduct a comprehensive review of existing research on the travel behavior of and impact of tolling on low-income populations living in the Puget Sound area.
2. Assess the usefulness of currently available Washington and Puget Sound data for estimating the impact of tolling on low-income populations
3. Develop a preliminary estimate of the impact of tolling on low-income populations living in the Puget Sound area.
4. Suggest data collection and methodological strategies for future research that could yield detailed estimates of the impact of tolling on low-income populations in Washington and the Puget Sound region.

WASHINGTON STATE SURVEYS AND STUDIES:

Equity, Fairness, and Uniformity in Tolling: Background Paper No. 4

Cambridge Systematics, September 2006, In: Washington State Comprehensive Tolling Study, Background Papers: Vol. 2, Prepared for the Washington State Transportation Commission
http://wstc.wa.gov/tolling/FR1_WS_TollStudy_Vol2_Paper04.pdf

Washington State Comprehensive Tolling Study, Final Report: Vol. 1

Cambridge Systematics, September 2006, Prepared for the Washington State Transportation Commission

The culmination of the Comprehensive Tolling Study is a set of recommended policies intended to guide Washington as it develops toll facilities in the State. These policies emerged from the background research and technical analysis that is described in the remainder of this report.

http://wstc.wa.gov/tolling/WS_TollStudy_FinalReport_V1.pdf

Washington State Comprehensive Tolling Study, Background Papers: Vol. 2

Cambridge Systematics, September 2006, Prepared for the Washington State Transportation Commission

These papers are intended to provide the reader some background on national perspectives on various aspects of tolling as well as detail related to tolling in Washington State.

http://wstc.wa.gov/tolling/WS_TollStudy_FinalReport_Vol2_Complete.pdf

Washington State Comprehensive Tolling Study, Part 2

Cambridge Systematics, February 2008, Prepared for the Washington State Transportation Commission

This Tolling Study Part 2 is intended to identify the early actions that might be taken to carry out the “overall direction” described in Tolling Policy 1, which said, “Washington should use tolling to encourage effective use of the transportation system and provide a supplementary source of transportation funding. That policy should evolve over time.”

http://www.wstc.wa.gov/AgendasMinutes/agendas/2008/Feb19/Feb19_BP8a_TollingStudyPhase2.pdf

Tolling Web site of the Washington State Transportation Commission

<http://www.wstc.wa.gov/tolling/>

Pricing Focus Groups, Final Report, December 2007 (King County)

EnviroIssues, January 2008, Prepared for WSDOT, PSRC, and King Co.

The Washington State Department of Transportation (WSDOT), Puget Sound Regional Council (PSRC), and King County conducted focus groups to engage King County drivers and transit riders in discussions regarding “congestion pricing.”

[See summary below]

http://www.wsdot.wa.gov/NR/rdonlyres/23A39EFA-EA0D-4A7D-9B71-2B02A7DEF64C/0/2007_Tolling_Pricing_Survey.pdf

Low-Income Equity Concerns of U.S. Road Pricing Initiatives

Equity concerns have often been raised about congestion pricing. When public use of infrastructure assets is deliberately made more expensive at certain times, low-income people and those concerned with their welfare may raise legitimate concerns about equity. With congestion pricing, the truth is much more complicated than it appears and carefully designed congestion-pricing projects will typically improve equity. This paper presents information on the low-income equity issue in two sections: (1) an overview of what is known about the low-income equity issue based upon current literature and (2) what is known about the issue, at this point in time, from the five U.S. Department of Transportation (DOT)-funded Urban Partnership Agreements (UPAs) . . .

Seattle

A King County transportation survey was conducted in December 2007. Many questions were asked of the 501 respondents, a number of them having to do with support for tolling. While 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 as against other alternatives when a specific infrastructure need was presented, with between 78 and 84% (depending upon the order in which answers were presented) preferring electronic tolls over a sales tax increase to fund the 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 such a diversion to occur. A toll of \$2.50 to fund the replacement of the Lake Washington floating bridge was supported by 64% of respondents, while

74% supported a \$4 toll to fund the bridge replacement along with increased transit and bicycling investments in the corridor. Thus, the equity and/or other benefits of increased transportation options were shown to be more important to respondents than keeping the toll rates as low as possible.

With revenues dedicated to replacing the 520 bridge, 69% of respondents indicated support for variable tolling. On another roadway where the need for tolling revenues was not also presented, only 28% of survey participants indicated support for congestion tolling even after the benefits of such tolling were described to them. The bottom line is that the use of revenues is an extremely important determinant in whether the public will support congestion pricing, and indeed is likely to be a more important determinant of support than the level of congestion charges and the design of the congestion pricing scheme.

[This article also summarizes pricing survey and focus group information from Miami, Minneapolis/St. Paul, San Francisco, and New York.]

<http://www.upa.dot.gov/resources/lwincequityrpi/index.htm>

WSDOT Tri-County Survey, 2007

Strategies 360/WSDOT and Don McDonough Associates, January 2008

Telephone survey of tri-county voters on transportation issues and Proposition One.

http://www.wsdot.wa.gov/NR/rdonlyres/5BE9806D-F5B6-476A-BEEA-AF16571F6DBE/0/2007_WSDOT_Survey.pdf

Social, Economic, and Environmental Justice Report: SR 167 8th Street E Vic. to S 277th Street Vic. Southbound HOT Lane

WSDOT, August 2008, Seattle

This report describes the existing conditions and analyses social, economic, and environmental justice effects related to the construction and operation of a southbound HOT lane on SR 167.

This report describes the effects of the proposed project on nearby neighborhoods and their resources as well as any effects on the local economy, how the project might affect minority or low-income populations differently, and whether those effects could be considered disproportionate or not.

Since this is a tolling project, we discuss the effects of the proposed project on social, economic elements and environmental justice populations by examining the effects within a traditional study area as well as effects on users within the travelshed.

<http://www.wsdot.wa.gov/NR/rdonlyres/80352212-F081-4099-A726-9EB932E10146/0/SOCIALECONOMICENVIRONMENTALJUSTICE.pdf>

SR 167 HOT Lanes Pilot Project, Online User Survey, Results Summary, Draft

WSDOT, August 2008

[See attachment]

ECONOMIC IMPACTS:

The Impact of the Congestion Charge on Retail: the London Experience

Mohammed A. Quddus, Alon Carmel, Michael G.H. Bell, January 2007, Journal of Transport Economics and Policy 41(1): 113-133

This paper presents an analysis of the effect of London's congestion charge on the retail sector since its introduction in 2003. The analysis is done using a variety of econometric models applied to a total retail sales index for central London and retail sales data for the John Lewis Oxford Street store, which is within the congestion zone. The paper provides background information about the impact on traffic of the congestion zone, including the immediate reduction of more than 30 percent in time of delay per kilometer. Additional information shows the mode share of

shoppers in Central London before the zone went into effect. A large majority, 78 percent in one survey, traveled there by public transport. Data sources for retail sales and explanatory details are provided, along with the model's specifications. For all of central London, no impact on retail sales was found. However, the particular store in the study did experience a reduction in retail sales. One factor that was not possible to study was the impact of competition with other stores, both within the charging zone and outside it, which may explain part of the drop in sales.

[May be available from Research Library]

San Diego's I-15 Value Pricing Project: Impact on Local Businesses

D. Steffey, J. Supernak, and C. Kaschade, October 2003, Public Works Management & Policy 8(2): 99-110

The I-15 Congestion Pricing Project was a three-year project in San Diego, in which ExpressPass and FasTrak programs offered drivers of single-occupant vehicles the use of I-15 express lanes. This paper presents findings of a business impact study of this project. The study assessed whether businesses recognized and valued the ExpressPass/FasTrak option. Results showed that delivery-based businesses and businesses located along I-15 were more likely to regard the ExpressPass/FasTrak program as important and as having a positive impact. These businesses were more likely to identify themselves as highly dependent on employees or goods and services traveling the corridor. However, the I-15 FasTrak program did not rank especially high in importance as a factor affecting business performance, although respondents assigned relatively high importance to the quality of regional transportation in business performance. Findings also showed that program use by employees was not common.

[May be available from Research Library]

Benefits of Congestion Pricing - USDOT

Benefits to Businesses

Growing congestion and unreliability threatens truck transportation productivity and ultimately the ability of sellers to deliver products to market. Additionally, when deliveries cannot be relied on to arrive on time, businesses must keep extra "buffer stock" inventory on hand. This can be expensive. Pricing of the nation's major thoroughfares to guarantee free flow of traffic will ensure that reliability is restored to the transportation system, keeping business and transportation costs low. Lower costs will increase the competitiveness of U.S. businesses in international markets and boost the U.S. economy.

<http://www.etc.dot.gov/benefits.htm>

Congestion Pricing: Equity - USDOT

Studies have shown that lower income individuals face the greatest financial harm when they are denied adequate choices. For example, lack of choice can result in lost wages or late fees for day care that could have been avoided had they been provided a viable choice. Surveys conducted on priced lanes have concluded a broad spectrum of income groups express approval of the priced projects because they are given a choice of choosing a tolled route, an alternative route, or a different transportation mode. Furthermore, transit riders, many of whom are low-income users, actually experience faster and more reliable transit trips when lanes are managed with pricing.

- Data collected along facilities currently operating on major transportation corridors in California, Minneapolis and Texas show a wide range of income groups use the value priced lanes at different levels of frequency.
- Impacts of congestion pricing are not necessarily related to income and can also be based on flexibility of time and routes available to users according to research from San Jose State University and the University of California, Berkeley.
- In San Diego, support for the "FasTrak" congestion pricing program on I-15 was 60% among those with incomes less than \$40,000.

- Studies on SR-91 in southern California have shown that at any given time about three-quarters of the vehicles in the toll lanes belong to low and middle income individuals with only one-quarter of the vehicles belong to high income individuals. According to data collected on "express lanes" in California, low-income drivers are as likely to approve of the lanes as drivers with higher incomes. In fact, over half of the commuters (51%) with household incomes under \$25,000 a year approved of providing toll lanes.
- A 2006 survey on the I-394 MnPass revealed MnPass usage was reported across all income levels, including 79% of higher income respondents, 70% of middle income respondents and 55% of lower-income respondents. The survey also revealed support for the lanes to be high across all income levels including 64% of lower-income respondents.
- Lower income residents are more likely to be transit riders who would benefit from both reduced congestion and increased transit investments from pricing revenues. A 2007 King County Washington survey revealed support for tolling grew substantially if a portion of revenues is dedicated to transit, even if tolls had to be significantly higher to allow such a diversion to occur.

<http://www.etc.dot.gov/equity.htm>

Central London Congestion Charging Impacts Monitoring, Fifth Annual Report

Transport for London, July 2007

Economic analysis has revealed no discernable significant effects, positive or negative, from congestion charging. Microeconomic analysis indicates a net positive impact (p. 81 of PDF). The large majority of participants evaluated for social impacts analysis were not significantly or directly affected by the pricing scheme (p. 231 of PDF).

<http://www.tfl.gov.uk/assets/downloads/fifth-annual-impacts-monitoring-report-2007-07-07.pdf>

Congestion Pricing and Its Effect on Small Business

Office of David Yassky, New York City Council, Chair, Small Business Committee, July 2007

This paper reviews congestion pricing programs in London, Singapore, Norway, and Stockholm in order to attempt to predict the economic impacts of such a program to New York's central business district.

<http://www.dbpartnership.org/documents/?id=44>

Four Ways New Yorkers Will Benefit From Congestion Pricing

Environmental Defense Fund, September 2008

Congestion pricing is good for business

London and Stockholm have both adopted congestion pricing systems and their examples tell us a great deal about the benefits we can expect to bring to small businesses:

- **Significant traffic reductions.** In London, traffic delays decreased by 30%. Businesses in Stockholm were able to make 25% more deliveries.
- **Cost savings and greater productivity.** Retail trade in Stockholm increased both inside and outside the charge zone, while retail sales in London are growing faster than in the rest of the U.K.
- **Approval from business.** Most London businesses surveyed (91 percent) in 2003 were either positive or neutral about the congestion charge.
- **No decrease in number of customers.** In London, there was no significant change in the number of visitors to central business district.

Reducing traffic through congestion pricing is expected to reduce travel time on New York's major corridors, allowing for faster deliveries.

Congestion pricing is a fair solution

Transit is used by the majority of New Yorkers with only 5 percent of commuters driving into the central business district. Four out of five of those drivers have access to time-comparable mass

transit. Furthermore, those who choose to drive have a median income 30% higher than transit riders.

Nevertheless, the Traffic Congestion Mitigation Commission has also recommended that the state consider a tax credit to safeguard against any unfair impacts on low-income drivers. While the wealthier minority of motorists will pay, the vast majority of New Yorkers will benefit; revenue from congestion pricing will go to transit improvements that ensure more reliable and timely commutes for all citizens.

Congestion pricing is equitable regionally, too, since transit and traffic benefits are widespread throughout each of the boroughs and surrounding areas. The NYC Department of Transportation is currently studying the option of residential parking permits as a solution to combat any park-and-ride activity in the surrounding neighborhoods.

<http://www.edf.org/page.cfm?tagID=19960>

REFERENCES FROM TOLLING EQUITY STUDY:

The Welfare Effects of Congestion Tolls with Heterogeneous Commuters

Richard Arnott, Andre de Palma, and Robin Lindsey, May 1994, *Journal of Transport Economics and Policy*: 139-161

Abstract. Recent success in introducing road pricing, as well as recent polls, suggest that road pricing schemes are politically viable if a large majority of drivers benefit. In this paper we analyze the welfare effects of an optimal time-varying toll imposed during the morning commute. The toll tends to benefit drivers with high unit values of travel time and schedule delay. Other drivers can become worse off even with an equal per-capita rebate. A capacity expansion benefits drivers in proportion to their trip costs. If initial capacity is sufficiently small, a toll-financed expansion leaves all drivers better off.

http://www.bath.ac.uk/e-journals/jtep/pdf/Volume_XXV111_No_2_139-161.pdf

Equity Analysis of the Houston, Texas QuickRide Project

Mark W. Burris and Robert L. Hannay, 2004, *Transportation Research Record* 1859: 87-92, Transportation Research Board of the National Academies

Abstract. The equity considerations involved with the QuickRide program along the Katy Freeway in Houston, Texas, are examined. QuickRide allows two-person carpools to use the Katy Freeway high-occupancy vehicle lane during peak periods for a \$2 fee. Survey data gathered on QuickRide enrollees, along with 1998 QuickRide usage data, were analyzed for potential equity issues that might exist with the QuickRide program. QuickRide usage did not vary significantly by respondent income, occupation, age, or household size. Additionally, the difference between respondents' stated and actual use of QuickRide did not vary significantly by the respondents' income, occupation, age, or household size. However, QuickRide enrollees had significantly higher incomes and were significantly younger than drivers on the Katy Freeway main lanes. Therefore, although income was not an indicator of the amount of QuickRide use among enrollees, it was a significant indicator of whether an individual enrolled in the program. This result raises some equity concerns about the ability or interest of low-income individuals to enroll in the program. However, no drivers were made worse off as a result of the program. Additionally, once enrolled, the QuickRide program is a benefit to most travelers, as long as the occupants of the vehicle value their travel time at a rate that exceeds \$3 per hour each.

[See attachment]

Puget Sound Regional Council 2006 Household Activity Survey Analysis Report

Cambridge Systematics, Inc., April 2007, Prepared for PSRC and WSDOT

The purpose of 2006 PSRC Household Activity Survey project is to provide data for the Puget Sound Region travel demand models, for the assessment of the current activity and travel

patterns, and for the estimation of future activity and travel within the region under various policy scenarios.

<http://psrc.org/data/surveys/hhsurvey/index.htm>

Social and Environmental Justice Issues in Urban Transportation

Devajyoti Deka, 2004, In: The Geography of Urban Transportation, Susan Hanson and Genevieve Giuliano (ed.), New York, New York: Guilford Press

Abstract. This chapter describes how transportation-related expenses constitute a significant portion of household income and an especially large proportion of the incomes of low-income households. Despite these expenditures, some segments of society lack adequate access to employment, health care, shopping and recreation. Although government subsidizes components of the urban transportation systems, there is an increasing concern that the subsidies are not reaching those citizens in need. Recent years have also shown a growing recognition that certain segments of society are disproportionately affected by transportation-related pollution. Because of these concerns, a study of the social and environmental justice issues in urban transportation is important, and this chapter addresses these concerns.

[May be available from Research Library]

Equity Effects of Congestion Pricing: Quantative Methodology and a Case Study for Stockholm

Jonas Eliasson and Lars-Groan Mattsson, 2006, Transportation Research Part A 40(7): 602-620

From abstract. We develop a method for detailed, quantitative assessment of equity effects of road pricing and apply it to a real-world example, namely a proposed congestion-charging scheme for Stockholm . . . We conclude that the two most important factors for the net impact of congestion pricing are the initial travel patterns and how revenues are used. Differences in these respects dwarf differences in other factors such as values of time. This is accentuated by the fact that the total collected charges are more than three times as large as the net benefits. With respect to different groups, we find that men, high-income groups and residents in the central parts of the city will be affected the most. If revenues are used for improving public transport, this will benefit women and low-income groups the most. If revenues are used for tax cuts, the net benefits will be about equal for men and women on the average, while it naturally will benefit high-income groups. Given that it is likely that the revenues will be used to some extent to improve the public transport system, we conclude that the proposed congestion-charging scheme for Stockholm is progressive rather than regressive.

[Published article may be available from Research Library; for a related online report see

http://www.vv.se/fud-resultat/publikationer_000001_000100/publikation_000063/equity%20effects%20vinnova%2031%20dec.pdf]

Decomposing the Distributional Effects of Roadway Tolls

Joel Franklin, 2007, Paper submitted for the 2007 Annual Meeting of the Transportation Research Board

Abstract. Roadway tolling has been espoused by many transportation economists as an optimal solution to roadway congestion, largely due its aggregate welfare benefits. However, concerns remain about the regressivity of tolls' benefits and burdens. This paper uses a modeling approach that explicitly represents the effects of income on choice behavior, making the model more consistent with economic theory of choice behavior. In measuring the welfare effects of a toll, I use a recently developed specification for the equivalent variation that allows for non-linear income effects in the choice model, enabling the welfare effects to be quantified without bias at every point along the income spectrum. I then compute the welfare measure for both the policy as a whole, and for each of three components of the policy's effects: 1) the toll itself; 2) the travel time reductions due to changes in mode choice; and 3) the social benefits that accrue from the use of the collected toll revenue. I interpret the welfare effects using graphical depictions of the

net welfare effect across the income quantiles, as well as using the Gini Coefficient and Theil's Entropy measures of inequality. The findings indicate that the bulk of a toll policy's regressivity stems from the burden of the toll itself, although the benefits of the expected travel time savings are also likely to be regressive. This regressivity can be compensated by returning toll revenue to the affected travelers in equal, lump sum payments.

[See attachment]

Equity and Fairness Considerations of Congestion Pricing

G. Giuliano, 1994, In: *Curbing Gridlock: Peak Period Fees to Relieve Traffic Congestion*, Transportation Research Board Special Report 242, Vol. 2: 250-279, Washington, D.C.: National Academy Press

Abstract: The purpose of this paper is to address equity and fairness issues associated with congestion pricing. Changing policy imperatives in the United States make congestion pricing an increasingly attractive policy alternative. However, serious barriers to implementation remain, and equity concerns have emerged as one of the most significant. The paper begins with a discussion of equity and its many dimensions. The types of equity and fairness issues associated with congestion pricing are examined, and the difficulties of assessing equity impacts are discussed. Second, findings from previous research are summarized. Third, the equity of current policy with respect to the highway system is addressed, and fourth, the aspects of equity and fairness in the context of the travelers who would be subject to congestion tolls are discussed. Data primarily from Southern California are used to show that most travel on congested facilities is work related, and various commuter groups are examined to see how they might be affected by congestion tolls. Specific examples are used to illustrate how congestion tolls in Southern California might affect various commuter groups. The paper concludes with a discussion of the extent to which equity and fairness issues can be resolved and of the impact of these issues on the feasibility of implementing congestion pricing in the United States.

[See attachment]

The Political Economy of Highway Tolls and Congestion Pricing

Jose A. Gomez-Ibanez, July 1992, *Transportation Quarterly* 46(2)
[May be available on order from Research Library]

Transportation Pricing and Travel Behavior

G.W. Harvey, 1994, In: *Curbing Gridlock: Peak Period Fees to Relieve Traffic Congestion*, Transportation Research Board Special Report 242, Vol. 2: 89-114

Abstract: This paper summarizes and critically interprets the current status of knowledge about the effects of transportation system pricing on daily activity patterns and travel behavior. The paper is written in the context of heightened interest in pricing instruments as tools for financing transportation investments and for addressing externalities in the transportation system (particularly the highway system). In making judgments about the desirability of pricing and in developing specific pricing policies, it is important to have as much information as possible about impacts on the amount, location, and timing of travel in affected areas, both in total (for determining aggregate revenues and other systemwide impacts) and among specific facilities, jurisdictions, and population subgroups (for evaluating distributional consequences). An assessment of how well the current status of knowledge can address these information needs is made.

[See attachment]

Daily Travel by Persons with Low Income

Elaine Murakami and Jennifer Young, October 1997, Paper submitted for the National Personal Transportation Survey Symposium, Bethesda, MD, October 29-31
<http://nhts.ornl.gov/1995/Doc/LowInc.pdf>

Environmental Justice Issues Related to Transponder Ownership

Emily Parknay, 2005, Transportation Research Record 1932: 97-108, Transportation Research Board of the National Academies

Abstract: Electronic transponders used on toll roads often reduce delays at toll facilities and sometimes offer customers a discount in the toll. Nonetheless, many people avoid using toll roads or acquiring electronic transponders. Their reasons include a dislike for toll roads based on a belief that roads should be a public good or on infrequent use of the roadway. Obtaining a transponder requires an application process and an initial prepayment of tolls as a minimum requirement. In worst cases, applications must be mailed (rather than obtained at a distribution center, online, or through a phone call), transponder deposits are demanded, and credit cards are required for automatic replenishment of tolls. In addition to the impediment of submitting an application, at least 20% of U.S. households do not have a credit card, and 10% do not have a bank account; such households would essentially be barred from obtaining transponders from most U.S. toll authorities. This paper analyzes these barriers by presenting the costs and benefits of the various toll transponder "tags" available in the United States in addition to models of toll road corridor users. Results show that higher-income households are more likely to have transponders and to use toll roads frequently. Other demographic and trip characteristic variables have less influence on toll road frequency choices but do influence transponder acquisition. Several agencies insist on large transponder deposits and initial prepayment amounts and require payment methods that are not available to a large percentage of the U.S. population.

[See attachment]

Wealth and Welfare

A.C. Pigou, 1920, New York: MacMillan

Identifying, Measuring, and Mitigating the Environmental Justice Impacts of Toll Roads

Jolanda Prozzi, Isabel C. Victoria, C. Michael Walton, and Jorge A. Prozzi, 2007, A paper submitted to the 2007 Annual Meeting of the Transportation Research Board

Abstract: In 2004 the Texas Department of Transportation (TxDOT) funded the Center for Transportation Research at The University of Texas at Austin to develop a methodology to evaluate the environmental justice (EJ) impacts of toll roads given four scenarios: (a) the construction of new toll road(s), (b) converting existing non-toll roads to toll roads, (c) the tolling of capacity enhancements (e.g., additional main lanes or frontage roads to existing facilities), and (d) the conversion of planned non-toll roads to toll roads upon completion. This document presents the EJ Evaluation Methodology (EJEM) developed to identify, measure, and mitigate disproportionately high or adverse impacts imposed on minority and low-income (EJ) communities by toll roads compared to non-toll roads.

[See attachment]

Traffic Choices Study: Summary Report

Puget Sound Regional Council, April 2008

A Global Positioning System based pricing pilot project: Evaluating traveler response to variable road tolling through a sample of volunteer participants.

<http://psrc.org/projects/trafficchoices/reports.htm>

Socioeconomics of Urban Travel: Evidence from the 2001 NHTS

John Purcher and John L. Renne, Summer 2003, Transportation Quarterly 57(3): 49-77

Abstract: The 2001 National Household Travel Survey (NHTS) confirms most of the same travel trends and variations among socioeconomic groups documented by its predecessors, the Nationwide Personal Transportation Surveys (NPTS) of 1969, 1977, 1983, 1990, and 1995. The private car continues to dominate urban travel among every segment of the American population, including the poor, minorities, and the elderly. By comparison, public transport accounts for less

than 2% of all urban travel. Even the lowest-income households make only 5% of their trips by transit. The most important difference in the 2001 NHTS is the doubling in modal share of walk trips in cities, due to a much improved survey technique that captured previously unreported walks. While the private car dominates travel, there are important variations in auto ownership and travel behavior by income, race, ethnicity, sex, and age. Overall, the poor, racial and ethnic minorities, and the elderly have much lower mobility rates than the general population. Moreover, the poor, blacks, and Hispanics are far more likely to use transit than other groups. Indeed, minorities and low-income households account for 63% of the nation's transit riders. Different socioeconomic groups also have different rates of carpooling, taxi use, bicycling, and walking. In addition, they travel different distances and at different times of day. Many of these socioeconomic variations in travel behavior have important consequences for public policy.

<http://www.vtpi.org/TQNHTS.pdf>

The Equity Impacts of Road Congestion Pricing

Harry B. Richardson and Chang-Hee Christine Bae, 1998, In: Road Pricing, Traffic Congestion and the Environment: Issues of Efficiency and Social Feasibility, edited by Kenneth J. Button and Erik T Verhof: 247-262, Cheltenham: Edward Elgar Publishing

Abstract. This paper presents an analysis of some of the key issues that focus on equity consequences of road congestion pricing. This is followed by an examination of the FASTRAK road pricing project on SR 91 in California. The analysis addresses equity objections to road pricing.

[May be available from Research Library]

Are HOT Lanes a Hot Deal? The Potential Consequences of Converting HOV to HOT lanes in Northern Virginia

Elena Safirova, Kenneth Gillingham, Winston Harrington, and Peter Nelson, May 2003, Resources for the Future Urban Complexities Brief 03-03

http://www.gobrt.org/Are_HOT_Lanes_A_Hot_Deal.pdf

Choosing Congestion Pricing Policy: Cordon Tolls vs. Link Based Tolls

Elena Safirova, Kenneth Gillingham, Winston Harrington, Peter Nelson, and Abram Lipman, 2005, Transportation Research Record 1932.: 169-177, Transportation Research Board of the National Academies

From abstract. This paper compares welfare effects of two second-best cordon pricing schemes with those of secondbest link-based tolls for the Washington, D.C., transportation network. START, a strategic and regional transport planning model that features elastic travel demands as well as mode, time period, and route choice, is used to analyze the impacts of the two pricing approaches. Distributional effects of cordon and link-based tolls are also examined in the hope of understanding why one scheme might be preferred over another. Because Washington, D.C., in many respects resembles a European city, cordon policies are more likely to be effective there than in more typical North American cities. Although overall net welfare benefits achieved by the three schemes are found to be similar, their dependence on revenue recycling and distributional impacts are quite different. Although the small cordon puts a higher share of costs on low-income travelers than do other pricing schemes, in absolute terms these costs are lower. The exact distributional impact of a larger cordon is uncertain because it depends on the revenue recycling method employed.

[See attachment]

Distributional Impacts of Road Pricing: The Truth Behind the Myth

George Santos and Laurent Rojey, February 2004, Transportation 31(1): 21-42

Abstract. This paper shows that road pricing can be regressive, progressive or neutral, and refutes the generalised idea that road pricing is always regressive. The potential distributional impacts of a road pricing scheme are assessed in three English towns. It is found that impacts

are town specific and depend on where people live, where people work and what mode of transport they use to go to work. Initial impacts may be progressive even before any compensation scheme for losers is taken into account. When the situation before the scheme is implemented is such that majority of drivers entering the area where the scheme would operate come from households with incomes above the average, it can be expected that, once the scheme is implemented, these drivers coming from rich households will continue to cross the cordon and will be prepared to pay the charge. In such a case the overall effect will be that on average, rich people will pay the toll and poor people will not.

[May be available from Research Library]

Using the Revenues from Congestion Pricing

Kenneth Small, June 1992, Paper prepared for the Congestion Pricing Symposium, Sponsored by the Federal Highway Administration, June 10-12

Abstract. The economic theory behind congestion pricing relies on using the revenues to help compensate highway users. But can practical methods of using revenues come close to achieving this compensation, and still have salient appeal to important political groups? This paper investigates the possibilities for designing a package of revenue uses that can achieve these twin goals. The suggested approach returns two-thirds of the revenues to travelers through travel allowances and tax reductions, and uses the rest to improve transportation throughout the area, including affected business centers. By replacing regressive sales and fuel taxes, this approach offsets the tendency of the prices alone to have a regressive distributional impact. By lowering taxes, funding new highways, improving transit, and upgrading business centers, the package provides inducements for support from several key interest groups. The potential amounts of money involved are discussed using nationwide data, and in more detail using a case study of ubiquitous facility pricing throughout the Los Angeles region. Illustrative calculations of the effects on various individuals confirm that such a package can create net benefits for a wide spectrum of people and interest groups.

<http://www.uctc.net/papers/480.pdf>

The Incidence of Congestion Tolls on Urban Highways

Kenneth Small, 1983, Journal of Urban Economics 13: 90-111

Abstract. The incidence of an optimal short-run congestion toll is investigated using an equilibrium model of modal choice and congestion on a highway corridor served by express bus transit. It is argued that for an externality tax the usual equi-revenue analysis of burdens is inappropriate; instead, welfare effects are computed under three alternative assumptions about redistribution of toll revenues. In almost all cases the net result is benefits for all income groups. It is concluded that congestion tolls should not be rejected on grounds of income distribution, but that an explicit package of tolls and revenue uses is probably a political prerequisite for adoption.

[May be available from the Research Library]

Continuation Study to Evaluate the Impact of the SR 91 Value Priced Express Lanes: Final Report

Edward Sullivan, 2000, Department of Transportation, State of California

Preface: This is the final report for the continuation phase of a Caltrans and U.S. DOT-sponsored study to evaluate the impacts of the value-priced express lanes located in the median of the Riverside Freeway (State Route 91) in Orange County, CA. The express lanes have been in service since December 27, 1995. The overall objective of the study was to develop information and insights for understanding changes in traffic, travel behavior, and the public's reactions to market-based road pricing and other innovative features of this unique facility.

http://ceenve3.civeng.calpoly.edu/sullivan/SR91/final_rpt/FinalRep2000.pdf

San Diego's Interstate 15 Congestion Pricing Project: Attitudinal, Behavioral, and Institutional Issues

Januz Supernak, et al., 2002, Transportation Research Record 1812, Transportation Research Board of the National Academies

From abstract. Attitudinal, behavioral, and institutional findings are summarized from the evaluation of the Interstate 15 (I-15) congestion pricing project, a 3-year demonstration that allowed single-occupant vehicles to use the existing I-15 high-occupancy-vehicle lanes, known as the I-15 express lanes, for a fee. The project was part of the FHWA Congestion Pricing Pilot Program and was managed by the San Diego Association of Governments. San Diego State University conducted an independent, multielement evaluation of the project . . . Equity issues did not emerge despite the fact that FasTrak users came from the highest income groups.

[See attachment]

This Land is Your Land, This Land is My Land: Addressing Equity and Fairness in Tolling and Pricing

David Ungemah, 2007, Transportation Research Record 2013: 13-20, Transportation Research Board of the National Academies

National experience has shown that perceived inequity to disadvantaged communities can derail the consideration of proposed toll and pricing projects. Even in areas with existing toll facilities, new proposals are not immune from fairness criticisms. Left unanswered, fairness issues may overwhelm public opinion and potentially elicit legal concerns. Five general types of equity apply to toll and priced facilities: geographic, income, participation, opportunity, and modal equity. The first two issues are generally more important in the planning process. Issues with geographic equity are largely reflected in public opinion, which in turn reflects participation and modal equity. Income equity also incorporates elements of opportunity equity and modal equity. Through the careful and deliberate planning process, issues pertaining to income equity can more easily be mitigated or alleviated than geographic equity, fulfilling the requirements of environmental justice. As toll and pricing policies are developed, planners and policy makers should address key questions designed to identify (a) potential income equity concerns and (b) ways to mitigate those concerns that may occur. Although no assessment can completely address all potential issues of equity and fairness, the principle of environmental justice requires transportation professionals to evaluate proposed projects with an open eye and an open mind. Ultimately, no project needs to be delayed or tabled because of issues of equity. Rather, correctly identifying concerns and addressing them through deliberate and transparent policy and action can help further the case for tolls in a broad transportation financing and planning context.

[See attachment]

Congestion Charges and Welfare

W.S. Vickrey, 1968, Journal of Transport Economics and Policy 2: 107-118

http://www.bath.ac.uk/e-journals/jtep/pdf/Volume_11_No_1_107-125.pdf

Assessing the Equity Implications of HOT Lanes: A Report Prepared for the Santa Clara Valley Transportation Authority

Asha Weinstein and Gian-Claudia Sciara, 2004, Santa Clara Valley Transit Authority

Since the earliest days of road improvement and construction in the United States, questions of fairness and equity have shaped decisions about how to finance transportation infrastructure and services. Today, equity debates are once again surfacing as state and regional governments consider a new mechanism for raising transportation dollars, so-called "HOT lanes" (or high-occupancy/toll lanes), where carpools drive for free, but single-occupant vehicles pay a toll to use the lanes. HOT lanes have been received skeptically in some corners and enthusiastically in others because they distribute transportation costs and benefits in new ways, thus forcing us to rethink what we believe to be a "fair" system of paying for transportation infrastructure. This report sets out strategies that policy makers, planners, and citizens can use to understand the equity

implications that a particular HOT lane project might have, as well as techniques for designing the most equitable HOT lane projects possible.

http://www.vta.org/projects/hot_lanes/hot_equity.pdf

RESOURCES CONSULTED BUT NOT CITED:

Travel Patterns of People of Color

Battelle, Prepared for the US Department of Transportation and the Federal Highway Administration

<http://www.fhwa.dot.gov/ohim/trvpatns.pdf>

Beyond the Spatial Mismatch: Welfare Recipients and Transportation Policy

Evelyn Blumberg and Michael Manville, November 2004, Journal of Planning Literature 19(2): 182

[May be available on order from Research Library]

Understanding Automobile Ownership Behavior of Low-Income Households: How Behavioral Differences May Influence Transportation Policy

Alissa D. Gardenhire and M. William Sermons, In: TRB Transportation Research Circular E-CO26: Personal Travel, the Long and the Short of It: 179-195

http://onlinepubs.trb.org/Onlinepubs/circulars/ec026/05_gardenhire.pdf

Using Road Pricing Revenue: Economic Efficiency and Equity Considerations

Todd Litman, Transportation Research Record 1558, Transportation Research Board of the National Academies, Washington, D.C.

[See attachment]

Techniques for Assessing the Socio-Economic Effects of Vehicle Mileage Fees: Final Report

B. Starr McMullen, Kyle Nakahara, Smita Biswas, Lei Shang, and Divya Valluri, June 2008, For the Oregon Transportation Research and Education Consortium, the Oregon Department of Transportation, and the Federal Highway Administration

http://www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/2008/ODOT-VMT_Fee_Impacts.pdf

Mobility and Mode Choice of People of Color for Non-Work Travel

Steven E. Polzin, Xuehao Chu, and Joel R. Rey, In: TRB Transportation Research Circular E-CO26: Personal Travel, the Long and the Short of It

http://onlinepubs.trb.org/Onlinepubs/circulars/ec026/18_chu.pdf

State Route 91 Value Priced Express Lanes: Updated Observations

E.C. Sullivan, 2002, Transportation Research Record 1812, Transportation Research Board of the National Academies, Washington, D.C.

[See attachment]

Making Urban Road Pricing Acceptable and Effective: Searching for Quality and Equity in Urban Mobility

Jim Viegas, October 2001, Transport Policy 8(4): 289-294

[May be available from Research Library]

Unraveling Equity in HOT Lane Planning: a View from Practice

Asha Weinstein and Gian-Claudia Sciara, 2006, Journal of Planning Education and Research 26: 174-184

[May be available from Research Library]

LITERATURE SEARCH:

Just pricing: the distributional effects of congestion pricing and sales taxes

Lisa Schweitzer and Brian D. Taylor, November 2008, Transportation 35(6): 797-812

From abstract: This paper compares the cost burden of a value-priced road, State Route 91 (SR91) in Orange County, California with the cost burden under Orange County's local option transportation sales tax, Measure M. We find that although the sales tax spreads the costs of transportation facilities across a large number of people inside and outside Orange County, it redistributes about \$3 million (USD) in revenues from less affluent residents to those with higher incomes. The entire Measure M program redistributes an estimated \$26 million from low-income residents to the more affluent. Low-income drivers as individuals save substantially if they do not have to pay tolls, but as a group low-income residents, on average, pay more out-of-pocket with sales taxes.

<http://www.discovery.org/scripts/viewDB/filesDB-download.php?command=download&id=2581>

Does Urban Road Pricing Cause Hardship to Low-Income Car Drivers? An Affordability-Based Approach

Alasdair Cain and Peter M. Jones, January 2008, Transportation Research Board 87th Annual Meeting, 20080113-20080117, Washington, D.C.

From abstract: A congestion charging proposal in Edinburgh, Scotland, was used as a case study to assess the potential for road pricing-related hardship. A definition of hardship was developed, based partly on an affordability measure derived from the utilities sector. Using this definition it was demonstrated that households in the lowest income quintile already spend an unaffordable proportion of their income on motoring costs, as much as around 40 percent, compared to an affordability threshold of 32.5 percent. The impact of a £2 charge (approximately \$4) on these low-income households would be negligible if the charge was paid less than once a week, but would have a significant impact (up to a 10 percent increase in motoring costs) if paid four or more times a week, taking aggregate motoring costs to above 50 percent of total disposable income. A simple regression analysis showed that, of the five different basic needs identified in the research literature, work trips were the most likely to be linked to frequent congestion charge payment among low income car users, and thus the most likely to be linked with hardship risk. Overall, it was estimated that approximately 3,700 low-income Edinburgh households would be at risk of road pricing-related hardship, around 9.0 percent of that group (though among these will be some exempt groups such as disabled Blue Badge holders and motorcyclists). However, offsetting this it is anticipated that a large majority of low-income households would gain directly from the reductions in traffic levels and the public transport improvements that were planned as part of the scheme.

[See attachment]

Moving Beyond Lexus Lanes: Equity Considerations for Managed Lanes

Richard Tremain Baker, David H. Ungemah, Ginger D. Goodin, and Tina Collier Geiselbrecht, January 2008, Transportation Research Board 87th Annual Meeting, 20080113-20080117

From abstract: One of the most popular and often quoted charges leveled against priced managed lanes facilities is that they only benefit the rich. The term "Lexus Lanes" is a popular pejorative used by critics of such facilities that has proven particularly effective at eliciting populist sentiment and severely hindering, and even halting, the implementation of managed lanes projects across the nation. While upper income drivers may use such facilities at a higher rate than lower and middle income travelers, the facilities nonetheless offer benefits to all travelers. Managed lanes can offer strong incentives to utilize public transit and carpooling and help users avoid significant penalties due to delay. Payment options can be modified to better accommodate low income residents without access to credit cards or checking accounts. In addition, the cost of use associated with managed lanes projects are typically borne by higher income travelers; as such facilities are generally located in high income areas.

[See attachment]

Distributional effects of infrastructure pricing rules

A. Kopp (OECD, Paris, France), 2005, Proceedings of ETC 2005, Strasbourg, France, 18-20 September 2005 - Research to Inform Decision-making in Transport Innovative Methods in Transport Analysis - Planning and Appraisal II, London Association for European Transport [May be available from Research Library]

Road user charging and social exclusion: the impact of a range of charging schemes on at-risk groups

P. Bonsall and C. Kelly, 2003, Proceedings of the European Transport Conference (ETC), 8-10 October 2003, Strasbourg, France, Association for European Transport, London

Abstract: The importance of social exclusion in the context of congestion charging is discussed, and the groups most particularly at-risk identified. A new technique, based on generation and investigation of a synthetic population is introduced and used to establish the impacts on at-risk groups of six congestion charging schemes in Leeds. The distribution and severity of impacts are seen to depend crucially on the precise definition of the charge area, the basis of the charges and exemptions provided. Using the new technique, it can be seen how the impact on at-risk groups could be minimized without compromising the overall objectives of congestion charging. Further potential applications of the new technique are outlined.

[May be available from Research Library]