

## **ITEM 11 - Action**

October 21, 2009

Approval of Submission of a Value Pricing Grant Proposal to the Federal Highway Administration (FHWA) to Study Public Acceptability of Pricing Major Roadways in the Washington Metropolitan Area

### **Staff**

**Recommendation:** Adopt Resolution R10-2010 to approve submitting a Value Pricing Grant Proposal to the Federal Highway Administration (FHWA) to study public acceptability of pricing major roadways in the Washington Metropolitan Area.

**Issues:** None

**Background:** The Board will be briefed on the enclosed draft proposal from the TPB and the Brookings Institution for a Value Pricing grant to be submitted to FHWA by November 3, 2009. The study will seek to answer key questions about the public acceptability of regional road-use pricing.

TPB R10-2010  
October 21, 2009

**NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD  
777 North Capitol Street, N.E.  
Washington, D.C. 20002**

**RESOLUTION APPROVING THE SUBMISSION OF A VALUE PRICING GRANT  
PROPOSAL TO THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) TO STUDY  
PUBLIC ACCEPTABILITY OF PRICING MAJOR ROADWAYS IN THE WASHINGTON  
METROPOLITAN REGION**

**WHEREAS**, the National Capital Region Transportation Planning Board (TPB), which is the metropolitan planning organization (MPO) for the Washington Region, has the responsibility under the provisions of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU) of 2005 for developing and carrying out a continuing, cooperative and comprehensive transportation planning process for the Washington Metropolitan Area; and

**WHEREAS**, the TPB has played a leadership role in recent years in conducting analysis of value pricing and encouraging discussion of pricing options, including the completion in February 2008 of a study of a regional network of value priced (VP) highway lanes, which was conducted with a 2006 grant from the Federal Highway Administration's Value Pricing Pilot (VPP) Program; and

**WHEREAS**, the FHWA on August 5, 2009 issued a Request for Proposals that invited States, along with their local government partners and other public authorities, to apply to participate in the VPP grant program for fiscal years 2009 and 2010; and

**WHEREAS**, staff from the FHWA in September 2009 invited the TPB to submit a grant proposal under the VPP grant program in partnership with the Brookings Institution, which in June 2009 published a report titled "Road-use Pricing: How Would You Like to Spend Less Time in Traffic?"; and

**WHEREAS**, distance-based road pricing has become more technologically feasible in recent years, but questions of public acceptability remain largely unanswered; and

**WHEREAS**, on October 2, 2009, the TPB Technical Committee and TPB Steering Committee were briefed on a sketch proposal entitled: "Public Acceptability of Regional Road Pricing: Can it be Designed to Garner Public Support?;" and

**WHEREAS**, the TPB Technical Committee and TPB Steering Committee were supportive of submitting a potential grant proposal and both committees provided useful suggestions and comments that have been incorporated into the attached draft; and

**WHEREAS**, after receiving the sketch proposal for review, FHWA staff indicated that

they look forward to reviewing the final proposal for VPP program funds if submitted by November 3, 2009 and compliant with all the requirements of the August 5, 2009 Federal Register, and provided the following comment: "This proposal needs to provide a task-by-task budget, and needs to clearly identify Federal funds requested vs. total funds;" and

**WHEREAS**, the proposed study budget is for \$400,000 (\$320,000 federal, \$80,000 local), and the Metropolitan Washington Council of Governments (COG) will provide a match of \$80,000, which is an amount previously authorized by COG for a TPB grant application in October of 2008 to the FHWA Value Pricing Pilot program that was not funded; and

**WHEREAS**, the COG Executive Director has been authorized to enter into an agreement with the FHWA and the Virginia Department of Transportation, for the purposes of conducting a study under the FHWA's Value Pricing Pilot Program on the public acceptability of road pricing; and

**WHEREAS**, on October 21, 2009 the Board was briefed on the attached draft proposal entitled: "Public Acceptability of Regional Road Pricing: Can it be Designed to Garner Public Support?" from the TPB and the Brookings Institution for a Value Pricing grant to be submitted to FHWA by November 3, 2009;

**NOW, THEREFORE BE IT RESOLVED THAT** THE NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD approves the submission of a proposal entitled: "Public Acceptability of Regional Road Pricing: Can it be Designed to Garner Public Support?" to the Federal Highway Administration's Value Pricing Pilot (VPP) by November 3, 2009.

# **National Capital Region Transportation Planning Board**

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## **MEMORANDUM**

TO: Transportation Planning Board

FROM: Ronald Kirby, Director, Department of Transportation Planning

SUBJECT: Approval of a Value Pricing Grant Proposal to the Federal Highway Administration (FHWA)

DATE: October 15, 2009

The TPB will be asked at its October 21 meeting to approve the submission of a study grant application titled “Public Acceptability of Regional Road Pricing: Can it be Designed to Garner Public Support?” to the Federal Highway Administration's Value Pricing Pilot (VPP). The grant application is due November 3, 2009. The attached draft proposal provides a description of the concept and work plan for this project.

The FHWA issued a Request for Proposals on August 5, 2009 inviting new applications for grants under the Value Pricing Pilot Program. The applications are due November 3, 2009. Knowing the TPB's track record of research and interest in the subject of value pricing, FHWA staff in August invited the TPB to submit a proposal in partnership with the Brookings Institution. Earlier this year, Brookings released the attached report recommending that the Washington region should implement an area-wide road-pricing demonstration project.

TPB staff on September 21 submitted a “sketch proposal” to FHWA. The announcement for this grant program suggested that interested parties submit such a sketch proposal in order to receive preliminary feedback on the proposal. Following the submission of this sketch proposal, the following developments have occurred:

- FHWA staff provided comments to TPB staff on October 8 noting that “This proposal needs to provide a task-by-task budget, and needs to clearly identify Federal funds requested vs. total funds.” The attached draft proposal addresses these comments.
- Staff from the Virginia Department of Transportation indicated on September 29 that VDOT has agreed to submit the proposal on behalf of the TPB.
- The TPB Technical and Steering Committee discussed the sketch proposal on October 2. Comments and suggestions from those meetings have been incorporated into the attached draft proposal.
- The Metropolitan Washington Council of Governments Board of Directors on October 14 approved the required 20% match in the amount of \$80,000.

If the TPB agrees on October 21 to submit a proposal based upon the concept and work plan described in the attached draft proposal, TPB staff will develop a formal application that will be submitted by the deadline of November 3.

**Public Acceptability of Regional Road Pricing:  
Can it be Designed to Garner Public Support?**

Draft Proposal  
For a Value Pricing Pilot Program Grant  
From the Federal Highway Administration

The National Capital Region Transportation Planning Board (TPB)  
Working in Partnership with the Brookings Institution  
To be Submitted by the Virginia Department of Transportation on behalf of the TPB

October 15, 2009

**Overview**

While distance-based road pricing has become more technologically feasible, questions of public acceptability remain largely unanswered. How can road pricing be politically viable? Can decision makers effectively address concerns about privacy and equity? What would it take to convince voters that road pricing is “worth it”? What would it take to convince political leaders that it’s worth supporting such a policy?

This research project will investigate these concerns in a comprehensive and objective manner. Using the metropolitan Washington region as a case study, the project will employ focus groups and public opinion surveys to test a variety of pricing options and assess opportunities and obstacles to implementation.

**Background**

The Washington region’s pattern of rapid growth is forecast to continue in the coming decades. The Metropolitan Washington Council of Governments projects that the metropolitan area will add 1.6 million new residents and 1.2 million new jobs by 2030. These new people and new jobs will increase the stress on an already burdened transportation system. At the same time, transportation funding is tight and the future funding forecasts are bleak. Revenue sources have simply not kept up with needs, in large part because fuel tax revenues have not been increased with inflation.

TPB travel demand forecasts reveal a disturbing mismatch between demand and capacity. Between 2008 and 2030, vehicle miles of travel (VMT) are anticipated to increase 23 percent, while freeway and arterial lane miles will only increase 13 percent increase. The number of lane miles of peak-hour congestion will grow by 41 percent in the same period.

As congestion grows and funding shrinks, decision makers have increasingly turned to transportation pricing mechanisms. Today, three out of the five most expensive projects planned for the next six years are toll projects—Virginia’s two HOT lanes projects (on the

Beltway and I-95/39) and Maryland's Intercounty Connector. Toll revenues are also a key funding component for the Dulles rail project. The TPB's 2006 long-range financial analysis found that tolls and private sources can be expected to provide seven percent of anticipated revenues between now and 2030. A similar analysis in 2003 found that toll and private money accounted for just one percent of anticipated revenues.

In 2003, the TPB convened more than 200 elected officials, community leaders, planners and academics for a conference that was the region's first major public event to discuss value pricing. The conference helped to galvanize regional interest in pricing as a solution to the region's perpetual transportation funding shortfall.

In 2008, the TPB released a study funded by the FHWA Value Pricing Pilot Program that analyzed the potential effects of widespread pricing in the Washington region. The study "Evaluating Alternative Scenarios for a Network of Variably Priced Highway Lanes in the Metropolitan Washington Region" outlined several different scenarios for adding new priced lanes, pricing existing highways, and enhancing bus services.

While leaders in the Washington region have increasingly responded to the transportation funding shortfall with toll-lane projects, the national debate has shifted in recent years to the inadequacies of the gas tax as a transportation funding mechanism. Many leading experts have called for the gas tax to be replaced by a system of user fees based on vehicle miles of travel (VMT). If fees could be based on location and time of day of vehicle travel, such a system could increase revenues and improve system performance by reducing congestion and emissions, including greenhouse gases.

In February, the National Surface Transportation Infrastructure Financing Commission issued its final report to Congress. The report recommended moving to a VMT charge within a decade because the fuel tax is "likely to erode more quickly than previously thought." National transportation policy makers expressed interest earlier this year in further investigation of a VMT tax, but political sensitivities on Capitol Hill and the Administration seem to have thwarted outright endorsement of such a major policy shift. Nonetheless, distance-based road pricing has been the subject of numerous public discussions and reports, including a study released in June 2009 by the Rand Corporation on behalf of the American Association of State Highway and Transportation Officials (AASHTO), which evaluated the effectiveness and practicality of nine different VMT fee mechanisms.

In June 2009, the Brookings Institution linked the concept of distance-based pricing to the Washington region with a bold proposal for an area-wide demonstration project that would replace state gas taxes in our region with a system of road pricing. The proposal, titled "Road-use Pricing: How Would You Like to Spend Less Time in Traffic?" called for a GPS-based pricing system that raise new revenues from vehicle travel while simultaneously providing a means to reduce traffic congestion and pollution and improve public transportation.

## The Proposal

Research on road pricing is already extensive. Leading proponents have articulated a rational and persuasive case in support of pricing policies. Experts are confident that technological challenges can be addressed. But our understanding of the political implications of such policies often seems to be based upon limited information and poorly grounded assumptions.

The TPB and the Brookings Institution intend to submit a proposal to the FHWA Value Pricing Pilot Program that will seek to answer key questions related to the public acceptability of road pricing. Our project proposes to study the pricing of all or most roadways in the Washington metropolitan area, as defined by TPB's planning area.

In an iterative process, the project will develop and refine estimates of social, economic, and equity effects of a pricing program. An initial technical assessment will be made of several viable options for regional road-use pricing and the various ways in which they could be implemented. A telephone survey will be used to evaluate public attitudes toward a menu of pricing options. Focus groups will build on that work and explore how various options address public concerns and political challenges. Findings will be summarized and presented to the TPB. Members of the TPB, which includes key elected officials from throughout the region, will be invited to participate actively throughout the study process.

The project will proceed according to the following phases:

1. The TPB and Brookings and will convene a working group of 10-14 regional experts on transportation and road-use pricing. This working group will develop a menu of implementation options for comprehensive regional road-use pricing. These options will fall under three main categories: geography, technology, and pricing strategy. For example, the geographic area priced could be determined by relative proximity to transit and/or level of congestion; the technology used to assign prices to motorists could be GPS-, cell phone tower-, or camera-based; while pricing strategy might vary by time of day or ability to pay.
2. The TPB will contract with a private consultant for a telephone survey that presents respondents with a basic road-use pricing scenario and then asks them, given the scenario, to rate each of the pricing menu items based on their effect on the respondents' willingness to support road-use pricing. The TPB will identify a consultant with an extensive level of expertise in both public opinion research and public policy. Preference will be given to firms with experience in transportation planning or policy.
3. The TPB, Brookings and the working group will develop a series of alternate road-use pricing scenarios, with an emphasis on menu items most likely to garner public support based on survey response.
4. The TPB will contract with a private consultant to convene stakeholder focus groups to discuss, evaluate, and refine the pricing scenarios.

5. The scenarios produced by the focus groups will be subjected to a deeper technical and benefit/cost analysis performed with the assistance of an outside contractor. This analysis will focus on engineering feasibility and cost, effect on congestion, economic impact including productivity, and impact on equity (including spatial equity).
6. Based on the survey and focus groups, and the analytic work, the working group will summarize public feedback on pricing scenarios. The results will be presented to the National Capital Region Transportation Planning Board.

### **Schedule**

The project is anticipated to last a period of 12 months, beginning in January 2010 and finishing in December 2010.

### **Funding**

Total funding for the project will be \$400,000. Given the 80:20 match requirement, the COG/TPB funding request from FHWA will be \$320,000. COG/TPB will provide a match of \$80,000, which was approved by the COG board on October 14, 2009.

### **Preliminary Budget**

Task 1: Initiate working group, months 1-2	\$50,000
Task 2: Conduct public opinion survey, months 3-4	\$100,000
Task 3: Identify scenarios based upon survey, months 5-7	\$75,000
Task 4: Test scenarios in focus groups, months 8-9	\$50,000
Task 5: Conduct further analysis, months 10-11	\$75,000
<u>Task 6: Summarize findings and present to TPB, month 12</u>	<u>\$50,000</u>
<b>Total</b>	<b>\$400,000</b>

### **Grant Implementation**

The Transportation Planning Board at COG will act as lead agency responsible for grant implementation, while the Virginia Department of Transportation (VDOT) will be the direct recipient of the grant. TPB staff will be responsible for project management and oversight, technical analysis, and outreach with stakeholders in the region. Brookings Greater Washington will provide support in convening experts, conducting project research, and providing project guidance. The TPB staff and Brookings will jointly develop the final research report, including the articulation of findings. Additional tasks will be performed by consultants, including survey development and administration and focus group moderation.



GREATER WASHINGTON RESEARCH AT BROOKINGS

# Road-use Pricing: How Would You Like to Spend Less Time in Traffic?

Benjamin K. Orr and Alice M. Rivlin

*Severe congestion and underfunded public transportation systems in the Washington, D.C. region and nationwide call for a more sustainable way of pricing transportation. This brief proposes replacing state gas taxes with regional road-use pricing that takes into account the effects of vehicle travel while simultaneously providing incentives to reduce traffic congestion and pollution and improve public transportation.*

*To achieve this, a demonstration project should be launched in the Washington region that uses GPS transponders to categorize motorists' travel based on distance, level of congestion, and type of vehicle. The transponder would calculate the totals for each category and drivers would be charged accordingly when they purchased gas. Tourists and other motorists lacking the GPS device would continue to pay the full gas tax. At an average price of between 9 and 15 cents per mile, such a policy could reduce congestion by 75 to 80 percent.*

“The national capital region should serve as an example of what truly sustainable transportation policy looks like for the rest of the nation.”

## I. Introduction

According to the Texas Transportation Institute, Washington D.C. area commuters on average wasted a workweek and a half (60 hours) due to traffic congestion in 2005, the second worst in the nation.<sup>1</sup> The cost to the average commuter in terms of time and gas wasted was the equivalent of almost \$1100. Since 2000 this delay has increased by an entire workday. For comparison, in 1982 area commuters were only delayed 16 hours, amounting to barely \$143 (in 2005 dollars) in losses.

Additionally, over a quarter of area workers 16 or older not working at home had one way commutes longer than 45 minutes in 2007. Three percent had commutes longer than 90 minutes.

More recently, traffic has eased slightly as vehicle miles traveled fell three percent in the spring of 2008 versus a year earlier in a study conducted by the Metropolitan Washington Council of Governments. However, this reduction was due to the poor economy and last year's record gas prices. The price of gas has since fallen and the recession will not last forever; therefore the decrease in traffic is almost certainly temporary.

And there are more of us every year. From 2005 to 2007 the Washington area added 88,877 people over the age of 16 to the commuting labor force (those who do not work from home). The Metropolitan Washington Council of Governments projects that the metropolitan area as a whole will add 1.6 million new residents by 2030, working 1.2 million new jobs—a recipe for ever-increasing congestion.

The traditional response to traffic congestion has been to build more and bigger roads. Increasing road capacity seemed like a reasonable response, and yet congestion kept getting worse. The problem was that the demand for roads always rose to meet (and quickly exceed) capacity and congestion kept getting worse.

Economists suggest the reason: Except for a few toll roads, motorists do not directly pay to use the road. If something is free—or appears to be—demand tends to outstrip supply. Motorists do pay gas taxes, which roughly relate to the miles they drive, but once they have a full tank the price of using any road is zero, whether it is a country lane or a congested commuter route. However, as roadways reach capacity each additional motorist imposes costs on everybody else. A motorist who enters I-95 at rush hour, thereby adding to traffic

congestion, does not pay more for imposing this cost on others. In a very real sense our transportation policy has been to subsidize ever worsening congestion.

Moreover, the gas tax is proving to be an inadequate source of revenue for transportation needs. As vehicles become more fuel-efficient, revenue from gas taxes falls. A more sustainable solution to financing transportation, both here and in the nation as a whole, is road-use pricing.

## II. What is Road-Use Pricing?

**R**oad-use pricing is a way of charging motorists both for distance traveled and for the costs they impose on others, especially by using heavily traveled roads at times of high congestion. Charging for vehicle miles traveled (VMT) is straightforward. VMT tolling schemes charge motorists a set fee for each mile traveled. The price per mile may vary with the weight or other characteristics of the vehicle to reflect wear and tear on the road and environmental impact. Road use pricing adds congestion fees to VMT charges. Congestion pricing is a form of tolling in which people pay more to drive on congested roads. The combination of VMT charges and congestion fees provides motorists and other travelers with information about the total costs they impose on the transportation system and other travelers (including increased congestion, pollution, likelihood of accidents, and infrastructure maintenance) by adding another vehicle to the roadway. In principle, travelers then are able to decide which mode and time of travel is really the best option.

There are several different ways to implement congestion pricing (see table below for specific examples). Individual roads (or lanes) may be tolled; or individual facilities. Vehicles might be charged to enter a specific cordoned off area (an idea which has been successfully implemented in central London, while New York rejected a similar idea for downtown Manhattan). Or a comprehensive pricing plan can be introduced covering an entire regional road network.

Types of Congestion Pricing	Description (all four types of tolls may vary by level of congestion and type of vehicle)	Examples
Road pricing	Toll is charged to drive along a specific road or lane at specific times; adjacent roads or lanes are free. Similar to VMT pricing, tolls are calculated based on the distance traveled.	Virginia HOT lanes (under construction) New Jersey Turnpike California State Route 91
Facility pricing	Toll is charged to pass through a point. Toll does not consider the distance which the vehicle travels to get to the facility or after leaving it.	Delaware Memorial Bridge
Cordon pricing	Toll is charged to enter a specific area. Does not vary by distance traveled	Central London New York City proposal
Comprehensive pricing	All roads are tolled. Similar to a cordon charge, in that it only applies to a specific (though usually much larger) region. Toll may include distance traveled calculations.	Singapore

A comprehensive road-use pricing initiative in the Washington metropolitan area would be an extremely ambitious experiment. It would require Maryland, Virginia, and the District’s transportation authorities to work closely together—never an easy assignment. Leadership and upfront investment from the federal government would also be essential to get the experiment off the ground and ensure comprehensive implementation. Some recent indications of interest at the federal level suggest that this might be possible. Transportation Secretary Ray LaHood has recently stated that, due to the failure of the Manhattan congestion pricing initiative, the U.S. Department of Transportation still has funds available for pilot congestion pricing programs. He has also floated the possibility of transitioning from the gas tax to a VMT tax (though this met with White House resistance). Rep. James Oberstar (D-MN), chairman of the House Committee on Transportation and Infrastructure, has also come out in favor of switching to a VMT tax—and soon. Other members of Congress,

notably Rep. Earl Blumenauer (D-OR), also appear favorably disposed toward alternative transportation financing mechanisms.

The Congressional Budget Office (CBO) recently published a report weighing the benefits and costs of congestion pricing at the national level. CBO found that congestion could be substantially reduced (by as much as 30 percent in the London cordon example). Reduced congestion in turn would produce shorter and more reliable travel times (particularly benefiting delivery, freight, and other logistics companies, as well as individuals). Finally, governments are able to make more efficient infrastructure investments: As VMT falls so do maintenance costs, while persistent demand along certain routes in the face of pricing provides planners with information about which roads are most in need of future investment.

CBO also found that congestion pricing creates serious challenges. Foremost among these is the unequal distribution of benefits (prior to any mitigating use of the revenues generated). Higher-income drivers are most able to afford the peak charges, and the time saved is more valuable to those drivers with higher incomes (because their hourly wage is higher). Lower income drivers are more likely to have to change their behavior so that they drive when charges are less, or switch to other modes of travel. Low-income motorists are also more likely to own less-fuel efficient vehicles, so any congestion pricing policy that takes vehicle type into consideration will fall upon them disproportionately.

Other challenges include protecting drivers' privacy, the cost and difficulty of implementation (though the Oregon example discussed below suggests that the cost need not be prohibitive), and the operating costs associated with toll collection (these are falling all the time as technology improves and becomes more widespread).

The CBO suggested four broad areas of opportunity where the federal government could make it easier for local jurisdictions to implement congestion pricing.

First, states could be allowed to toll federally-financed highways (they are currently barred, with a few exceptions), and specifically allowed to introduce congestion pricing outside of the extremely limited Value Pricing Pilot Program of the U.S. Department of Transportation. Second, the mechanism through which federal transportation funds are disbursed could be modified to promote congestion pricing. Third, Congress could establish a framework for mitigating inequality issues. This could be accomplished through requiring that toll revenues from federally-funded roads be used to support alternate modes of travel—especially transit—or by reimbursing low-income users directly. Finally, the federal government could take the lead in reducing toll collection costs by mandating electronic toll collection and supporting a national standard for transponder toll collection systems.

Congress will have a chance to consider new ways of pricing transportation this fall, when the surface transportation bill is up for reauthorization. Given Congress and the administration's interest in greener, more efficient transportation policies (as demonstrated in the stimulus package and budget proposals), road-use pricing is likely to figure in the debate. A national shift to road-use pricing would be far too radical a change to evoke wide support, but trying the idea out in a major metropolitan area with serious congestion problems would have substantial appeal, and the large federal presence in the Washington area makes it a natural venue. The Washington region has an opportunity to lead the way toward improved transportation for the rest of the nation by taking steps now to plan a comprehensive road pricing pilot in our area.

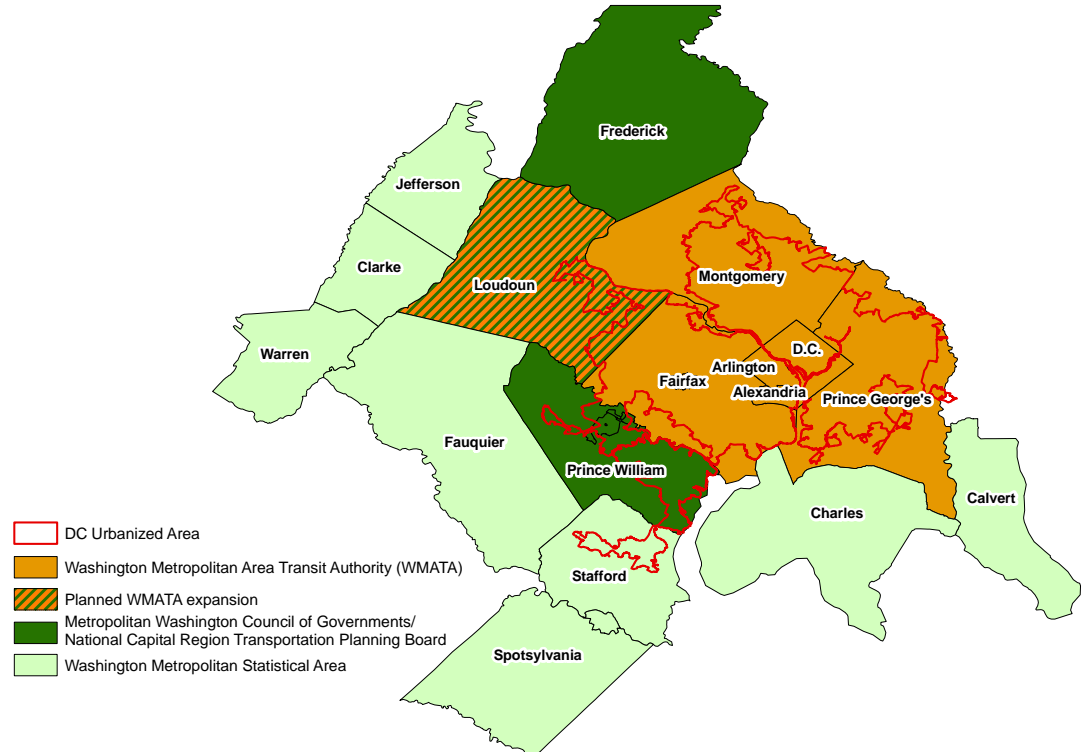
This idea might seem radical, but it is not new. Fifty years ago the economist William Vickrey, in testimony before Congress, called for the introduction of comprehensive congestion pricing in metropolitan Washington using radio transmitters. New technologies such as GPS and E-ZPass make this idea far more feasible today than it was fifty years ago—and the growth of traffic congestion in the area has made it far more appealing. In fact, according to analysis by Resources for the Future (RFF), a D.C.-based think tank, a road-use pricing system that incorporated all of the external costs of congestion would be the most effective and efficient way to reduce its effects in the national capital region—more effective than a simple tax on vehicle miles traveled, and far more effective than freeway tolls or a London-style cordon.

### III. Implementing Road-Use Pricing In the DC Area

**R**FF modeled the effects of congestion pricing in the Washington area and found very significant reductions in congestion. They estimated that almost all (94 percent) of the reduction in vehicle miles traveled would be attributable to individuals shifting from cars to mass transit. If this is true, using toll revenues to improve transit in this region would be well targeted toward those who are forced to change their behavior. We therefore propose that a pilot introduction of road-use pricing should

first encompass the 1,500 square mile Washington Metropolitan Area Transit Authority (WMATA) service area. Contingent areas served by other transit systems could also be added on a case by case basis. As transit service expanded the tolled area could be enlarged.

## The Geography of Transportation in Metropolitan Washington



Motorists registered within this area would be charged based on how far they drove, how congested the roads were when they were driving, and what type of vehicle they drove. Vehicles would be classified in terms of fuel efficiency, safety, and how much wear and tear they cause the roadway (i.e. trucks would be charged more than compact cars).<sup>2</sup> RFF calculated that charges over the larger metropolitan area as defined by the federal government would likely average 9.3 cents per mile. The Federal Highway Administration's own analysis of congestion pricing along several freeways in the Washington region suggested charging 15 cents per mile. Charges in the smaller, more congested, area proposed here would likely be within that range. It should be noted that motorists driving at peak times on highly congested roads would face a higher price. At the same time, charges for driving in uncongested parts of the region would be much lower, perhaps approaching zero in rural areas for certain types of vehicles.

Vehicles would be fitted with a GPS transponder device similar to an E-ZPass, perhaps as part of the registration process. If the program expanded nationally, manufacturers might even integrate transponders into new vehicles, similar to General Motors' OnStar system. Insurance companies could also encourage motorists to use transponders as the companies transition to their own VMT-based risk model, as some have already begun to do.

This device would record the type of vehicle, the distance traveled, and the time and location of travel. The transponder would sort the data into various toll categories (peak/off-peak, car/truck, highway/arterial/rural, etc.). Patterned after the recent Oregon pilot program (see box below), when the motorist refueled the transponder would transfer these totals (not the actual location tracking data) to the gas pump. The pump would calculate the amount owed by comparing the vehicle totals with a periodically updated rate schedule. The pump would then deduct the state gas tax charged and add the appropriate road-use fees to the fuel bill. Private motorists lacking the transponder, such as tourists or commuters from further afield, would pay the full gas tax. Travel outside the area would not be recorded by the GPS transponder. Implementation costs would likely be close to Oregon's \$33 million estimate for expanding their pilot program to the entire state. These costs could be partially offset by charging vehicle owners a small fee for each transponder.

## Oregon's Road User Fee Pilot Program

In April of 2006, Oregon began its year-long Road User Fee Pilot Program.<sup>i</sup> While designed to test a VMT-based replacement for the gas tax, the program model is highly applicable to congestion pricing as well and therefore to road-use pricing.

The Road User Fee Pilot Program installed GPS devices in volunteers' cars that tracked how far they drove, as well as in which of two zones. This information was stored on the device itself; no location information was transmitted while driving. When refueling at participating gas stations, the devices communicated the total mileage within each zone to the fuel pumps. The pump computer deducted the state gas tax from the bill, replacing it with the appropriate VMT charge.

Oregon found that replacing the gas tax with the VMT tax was relatively seamless and that revenues collected were roughly the same as they would have been using the gas tax. Survey results showed that 91 percent of pilot participants supported expanding the VMT tax statewide. While the participants' overwhelming support for expanding the program is likely partly due to selection bias, it does suggest that participating in the program was a positive experience. The Oregon Department of Transportation estimated that the cost of implementing the program statewide would be roughly \$33 million, far less than the \$440 million London's camera-based congestion cordon cost.<sup>ii</sup> Though the Oregon program focused on charging for vehicle miles traveled within the two zones, the devices could be modified to also record time of travel and type of vehicle. It demonstrates the viability of an innovative comprehensive pricing infrastructure that also provides particular benefits in terms of protecting motorists' privacy.

<sup>i</sup> Whitty, J. M. (2007). Oregon's mileage fee concept and road user fee pilot program: Final report. Salem Or: Oregon Department of Transportation. Retrieved April 7, 2009, from [http://www.oregon.gov/ODOT/HWY/RUFPP/docs/RUFPP\\_finalreport.pdf](http://www.oregon.gov/ODOT/HWY/RUFPP/docs/RUFPP_finalreport.pdf).

<sup>ii</sup> Santos, G. (2008). London congestion charging. In G. Burtless & J. R. Pack (Eds.), *Brookings-Wharton Papers on Urban Affairs 2008* (pp. 177-234). Washington D.C.: Brookings Institution Press.

RFF found that a similar comprehensive congestion pricing policy in the Washington metropolitan area would result in 19.4 million fewer vehicle miles traveled per day, a reduction of more than 11 percent. The Federal Highway Administration found that a reduction in traffic on congested freeways in the Washington region of 10 to 14 percent would result in a 75 to 80 percent reduction in travel delay. RFF also found that emissions of volatile organic compounds would be reduced by 18.7 percent and of carbon monoxide by 16.8 percent. When RFF calculated and priced all of the social welfare benefits (time saved as well as reduced congestion, pollution, accidents, climate change, oil dependency, noise, etc.) of this reduction in driving, they found that residents of the metropolitan area as a whole would gain the equivalent of \$1.1 billion in value—even before the revenues were disbursed.

## IV. Privacy

One of the most common criticisms of road-use pricing plans (whether they use cameras or a GPS based system) is that they are intrusive and violate motorists' right to privacy. This is a valid concern as tolling systems do collect significant information about where individuals are, but not an insurmountable one. Part of the solution lies in extending the current legal framework for tolling systems. At a minimum the information collected should receive the same privacy protections as E-ZPass records. While these vary by state, in general E-ZPass records are only released upon court order. Individuals should be allowed to access their own travel records, both for bill auditing purposes and to defend themselves in court.

In general, motorists should be given as much control over their own data as reasonably possible. Cameras (particularly in the numbers required for an area-wide system such as this) are inherently more invasive than transponders; they tell you not only where the vehicle was and when, but who was driving it and what was going on nearby. Transponders are a much better choice, but their use must also be well thought out. As mentioned above the only data communicated to the governing agency via the pump should be the totals in each category. Motorists should be able to download the underlying location specific data through a physical connection so that they can audit their travel and charges. Law enforcement should be able to do this as well—but only if they have a warrant. Neither party should be able to upload or delete data from the device.

The device will likely have to automatically delete the data periodically to free up memory, but should not do so too frequently. Updating the maps would be handled by the governing agency and would require opening up the device so as to connect to an internal input—possibly achieved by exchanging the transponder so as to minimize inconveniencing motorists. Paired with tamper-detection technology, cheating should be minimized and personal information protected.

## V. Revenues

State gas taxes raise approximately \$420 million in the Washington urbanized area every year. Revenues from the road-use pricing scheme described above would be between \$2.96 billion and \$4.79 billion, depending on the average fee. While this seems wildly out of proportion to the gas tax it is very much in line with total local and state transportation spending in the region, which amounts to \$3.75 billion annually (not counting transit fare revenue or the federal contribution). If road-use pricing revenue replaced the property and sales taxes used to pay for local roads, jurisdictions could reduce the local tax burden or redirect the funding to education or other purposes. Intriguingly, replacing property and sales taxes with road-use pricing could improve equity, as motorists are more able to control this expense through their own behavior.

The revenue generated should be used to mitigate road-use pricing's inequitable distribution of benefits and improve transit options. Net revenues could be split between improving mass transit (particularly buses), a need-based refund or discount, and roadway maintenance. Improving the frequency, convenience and quality of transit is particularly important. Secure funding would also reduce WMATA's vulnerability to fluctuations in state and local government funding (which currently accounts for 42.4 percent of its annual budget).

The need-based refund for low-income motorists could be administered in a number of ways. Low-income motorists could receive a tax credit, which might plausibly be extended to all low-income travelers regardless of mode. Alternatively, low-income motorists could pay a discounted road-use fee. Another option might be to help them upgrade to lighter, more fuel efficient vehicles that qualify for lower road-use rates. Such a program could build on federal and state programs, or local nonprofits that already help low-income households purchase vehicles.

Regardless of how they are spent, a significant portion of the revenues should be returned to the jurisdictions in which they were incurred. Not only is this more equitable, it is also more politically viable—especially if revenues from road-use pricing are intended to replace local transportation revenue. Revenue transfers could take the form of cash transfers to those jurisdictions so that they could disburse them in the ways outlined above. However, jurisdictions might reallocate the funds to uses unrelated to transportation. A better policy would be to return the funds in-kind; using them to directly improve mass transit, assist low-income motorists or travelers, and maintain roadways and bridges within the jurisdiction.

## VI. Conclusion

A full-scale regional pilot of road-use pricing in the Washington area would be a bold, ambitious undertaking that would test the ability of public leaders to work together and of citizens to adapt to change. However, if successfully implemented, the pilot might demonstrate to the nation the potential road-use pricing has to reduce travel times, decrease greenhouse gas emissions, and make public transportation more convenient. Over time, residential patterns in the area might shift in ways that produce denser, more walkable neighborhoods and reduce sprawl.

The region is already implementing or planning some innovative solutions based on congestion pricing principles, including Virginia's HOT lanes and Maryland's Inter-county Connector. Perhaps the most familiar example is the Metro system, which already charges fares determined by the time of day and distance traveled. These are good ideas, but they must be expanded if the region is to continue to grow and be a leader in sustainable development. The nation's capital region should serve as an example of what truly sustainable transportation policy looks like to the rest of the nation. Piloting the implementation of road-use pricing would do just that.



## Notes

<sup>1</sup> The Annual Mobility Report looks at the Washington, DC-VA-MD Urbanized Area, which is roughly 185 miles across. The American Community Survey data reported here also uses this geography.

<sup>2</sup> While a complete technical discussion of tolling by type of vehicle is beyond this paper, it should be noted that setting appropriate toll levels for large trucks and tractor-trailers can be tricky. In many tolling systems these vehicles are charged based on the number of axles they have in an attempt to charge for the additional damage their greater weight does to the road surface. Yet charging per axle gives truck drivers an incentive to minimize the number of axles on their vehicles, resulting in the opposite effect of that intended. As the vehicle's weight is concentrated on fewer axles the road surface is subjected to ever greater pressure. A better policy would be to charge trucks based on their average weight per wheel. Better built roads could also improve this situation.

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