



Vehicle Miles Traveled (VMT) & Congestion Pricing Programs

Introduction

The federal government is faced with transportation infrastructure funding challenges and continues to look for mechanisms to address the issue of the Highway Trust Fund's future insolvency. The federal motor fuel excise tax is currently the main funding source for federal highway investment in the United States. These revenues are exclusively dedicated for the Highway Trust Fund (HTF), which Congress established in 1956. Because the federal gasoline and diesel fuel taxes are not indexed to changes in inflation, they have subsequently decreased in purchasing power over the past twenty years.

Recently, there have been other funding mechanisms suggested at the state and national level. This analysis will evaluate the vehicles miles traveled and international congestion pricing models along with the United States' current federal gasoline tax system.

Evaluation Criteria

- Extent of tax collection points with respect to fraud
- Efficiency of tax collection system
- Level of Bureaucracy/ Administrative Burden
- Security/Hacking (Privacy Concerns)
- Financial Cost of Implementation
- Invasive Nature of Tax
- Equity

Current System: The Federal Motor Fuels Collection

Federal motor fuels excises are not calculated or collected at the point of purchase; rather, these excises involve a simple calculation and a bimonthly electronic deposit transaction between about 1,250 collection points—registered motor fuel terminal facilities—and the United States Treasury. The facilities also file a quarterly excise tax return showing liability for the excises paid. This is significant because the limited number of collection points in the motor fuel excise tax collection system helps to minimize fraud throughout the system. Moreover, this current collection system ensures that there is not a bureaucracy in the federal motor fuels collection protocol. Overall, at the federal level, the motor fuel excise tax collection protocol can be characterized by its efficiency, security, and non-invasive nature.

Case studies in this analysis include:

- Oregon: Vehicle Miles Traveled (VMT)
- London: Congestion Pricing Systems
- Singapore: Digital Congestion Charging System
- Stockholm: Congested Pricing System
- New York City

1. Oregon's VMT Program

The Oregon Department of Transportation administered two pilot programs to experiment with the VMT technology over the last ten years. In a 2007 study, the report concluded that ‘a mileage fee could be implemented to replace the gas tax as the principal revenue source for road funding...nine in ten participants in the study said they’d support a V.M.T. program moving forward’ (Jaffe, 1/18/13).

In November 2012, the Oregon Department of Transportation performed a mileage-based user fee pilot program that focused on giving drivers choices to choose from for reporting and paying the VMT chargers. The Oregon Department of Transportation also focused on transparency, ensuring the technology was easy to use, and protecting the privacy of drivers. Participants were given a choice between five different tracking plans where two were managed by the ODOT and three were managed by a third-party vendor. Participants also had the opportunity to pay in different ways; some drivers created online accounts and paid with credit or debit, while other participants received monthly bills in the mail and paid with checks.

Lastly, participants varied in the tracking systems. Oregon’s previous pilot programs gave participating drivers the opportunity to choose between a menu of options; drivers chose to either track their miles driven through a smartphone app, a GPS device, a reporting device that did not have GPS capabilities, or to record their miles without a device. However, if they chose the advanced plans with mileage data and GPS capabilities, the drivers would only pay for public roads within the state and would not be required to pay for driving on private or out of state roads. The more rudimentary plans included odometer-type devices without GPS tracking, and drivers could pay more in fees but as a trade-off, they also receive more privacy. The final plan was designed for drivers who wanted the most privacy, and this plan did not have any tracking device. Instead, the participants would pay a flat fee that would cover monthly mileage. Eventually, the car would receive an official inspection where the inspector would assess the odometer to see if there was a discrepancy between the miles driven and miles paid and if there was, the difference would be settled.

Overview of 2013 Legislation

This new road usage charge system in Oregon will be the first in the nation. Senate Bill 810 establishes a new program in which drivers can voluntarily participate in a mileage-based user fee system instead of paying the traditional fuel excise tax in Oregon.

More specifically, 5,000 Oregon drivers can opt-in to this new system when it will be operational in July of 2015; these participants will pay 1.5 cents for each mile they drive and they will be reimbursed for the Oregon gasoline tax they will pay at the gas station.

Proponents of this legislation argued that charging drivers per-mile was the fairest policy because it would include fuel efficient vehicles that also drive on Oregon's roads.

Opponents to the legislation argued that the high-mileage requirement was attempting to be directed at electric cars. Representative Greg Matthews (D-Gresham) expressed apprehension about charging highly fuel-efficient vehicles because it could create a dis-incentive for drivers to invest in fuel-efficient vehicles in the long-run.

Privacy concerns about the government tracking the mileage of vehicles were successfully mitigated by making this VMT program voluntary. The ACLU initially was critical of the privacy issue, but the Oregon DOT's decision to get rid of the GPS data after 30 days and to require law enforcement to have a warrant before viewing the information helped to ultimately win over the ACLU's support.

Oregon Analysis

Advantage:

- **Addressed Privacy Concerns.** In Oregon, the government was able to address privacy concerns and ultimately secure the support of the ACLU. Additionally, this new VMT system benefits from current technology which is able to accomplish the stated objectives of the pilot program.

Disadvantages:

- **VMT Fee Not Tied to Inflation.** Oregon's current VMT program does not tie the fee per mile to inflation, which will likely have long-term financial implications.
- **Potential for Fraud.** Given the VMT collection point will be at the individual level and thus very high, this can be potentially ripe for fraud and cheating.
- **Bureaucracy and Administrative Burden.** This program will also likely require a larger bureaucracy in order to implement and operate this system. Although the projected implementation and administrative costs have not explicitly been documented, this challenge is something that the GAO recently noted. In a December 2012 GAO report, they wrote that creating and maintaining a system that will collect VMT fees from 230 million drivers "is likely to greatly exceed the costs of collecting fuel taxes."

Summary of Recent Polling Data on Mileage Taxes in United States

SPONSOR	DATE	SAMPLE	CONCLUSIONS
Mineta Transportation Institute (Agrawal)	2009	CA Residents	50% "supported" 1 cent/mile driven fee instead of gas tax; fee rate would depend on how much the vehicle pollutes. 28% supported all cars paying 1 cent/mile.
Washington State Transportation Commission (EMC Research)	2012	Washington State Residents	44% thought that a mileage-based fee was either "definitely" or "probably" a good way to support more investment in transportation.
Mineta Transportation Institute (Agrawal, Nixon, Murthy)	2012	US Residents	41% of residents "supported" a tax of 1 cent/mile and a spectrum where drivers whose cars pollute less would pay less.
HNTB Corporation (Kelton Research)	2010	US Residents	30% of respondents supported this proposal: "the U.S. should try to reduce transportation greenhouse gas emissions by reducing the number of miles that vehicles travel through a mileage use tax."
Mineta Transportation Institute (Agrawal & Nixon)	2011	US Residents	36% of respondents were in favor of a 1 cent/mile tax and that had a scale where cars that polluted less would pay less. 22% of respondents believed that all vehicles should pay the same flat fee (1 cent/mile).
Rockefeller Foundation (Hart Research Associates)	2011	US Registered Voters	34% of respondents said that it was "acceptable" to substitute the gas tax with a new "fee based on the number of miles driven per year." 40% supported a pilot program to experiment with this proposal.
Mineta Transportation Institute (Agrawal & Nixon)	2010	US Residents	33% were in favor of a tax for cars to pay 1 cent/mile driven each year and cars that polluted less would pay less. 22% of respondents supported a flat fee system of one cent/mile.
Fiscal Research Center, Andrew Young School of Policy Studies, Georgia State University (Ellen, Sjoquist, and Stoycheva)	2012	Georgia Adult Drivers	39% supported VMT tax of 1.60 cents/mile if it replaced the gas tax. 36% supported a VMT tax of 2.10 cents/mile as replacement for gas tax where miles would be determined, and 33% supported a VMT tax of 1.35 cents/mile as replacement for gas tax without determining the mechanism for how miles will be established.
<i>Wall Street Journal</i>	2012	WSJ Blog- Respondents to Invitation	28% said that would support a tax for miles driven instead of the gas tax.
HNTB Corporation (KELTON Research)	2012	US Residents	23% of respondents said that they would "most prefer" a vehicle miles driven user fee when they had to choose between tolls or a higher federal gas tax in order to support the United States'

			interstate projects.
Mineta Transportation Institute (Weinstein et al)	2006	CA likely voters	23% said that they would vote for a mileage fee system to replace the state gas tax; the fee would be 1 cent/mile driven in the state of California. Participants were told that the cars would electronically track the miles driven and the mileage fees would be paid when buying gas.
Rasmussen Reports	2009	US Residents	18% favored a mileage tax that would “help fund the building and repair of roads and bridges.”
MassINC Polling Group	2013	Massachusetts Registered Voters	17% of votes said that they would support a new mileage fee system, where the miles driven would be recorded during yearly inspections and the drivers would pay the fee during the inspection.
Rasmussen Reports (Pulse Opinion Research)	2012	US Residents	12% supported a mileage tax as a “good way to raise funds for highway maintenance.”
Civitas Institute	2009	North Carolina Registered Voters	12% of voters viewed a mileage fee system “favorably,” and the survey question did not include what the state’s current system of taxation was at the time.

2. London’s Congestion Charge Program

Background

Congestion Charging was introduced in London on February 17, 2003 in order to decrease congestion and traffic in the city. Congestion pricing in London charges £10 (about U.S. \$15), where cars and trucks pay in order to obtain access to the “charging zone” between 7 am and 6 pm on weekdays. This “charging zone” is in the commercial and financial hub of London, which is 8 square miles.

London drivers pay for the congestion charging zone by registering Vehicle Registration Number (VRN) on a database. A camera-intensive system, with 1,360 closed-circuit cameras within this charging zone, tracks and records the license plates of the cars that drive into the zone; license plates are also verified by checking the database that tracks the cars each month. After the VRN is matched, the images of the vehicles are erased. There is also a “Congestion Charging Auto Pay” system that provides a discounted price for drivers who register for this service.

How Congestion Charge funds are spent: “By law, for the first 10 years of its operation, all net revenue earned from Congestion Charging has to be invested in improving transport in London, so everyone can benefit. In 2009/10 Congestion Charging generated £148m that was put towards making improvements to transport in London, such as bus network improvements, road safety measures and better walking and cycling facilities. “

Advantages:

- **Initial Traffic Outcomes.** When this system initially was introduced in London, it overwhelmingly reduced traffic congestion. In 2005, there was a 30% decrease in congestion delays in London. Additionally, there was a 15-20% increase in car and bus commute times. This decrease in congestion was attributed to “reduced queuing time at junctions, rather than increases in driving speeds” (Congestion Charging: Third Annual Monitoring Report 2003, Page 13).
- **Alternative Means of Transportation.** The city has also seen increases in bus usage and biking, along with bus line expansion.

Disadvantages:

- **Return of Traffic Congestion.** Although there was initially a reduction in traffic congestion, 10 years later, Transport for London has reported that these positive traffic outcomes have begun to greatly diminish. In 2003, congestion fell by 30%, but this dramatic decrease soon increased again, and as of 2011, traffic congestion in London was almost at the pre-congestion charge levels. According to the 2012 “Travel in London” report, the traffic outcomes are, in part, due to traffic management changes in London.
- **Financial Cost.** This congestion pricing system has been costly; in 2005, it cost £190 million (approximately \$376 million U.S. dollars) to initially install the system. From 2005 to 2006, the operational and administrative costs of setting-up the system captured 42% of the congestion pricing system’s revenues (NYC Executive Summary, page 3). Because of the expensive operating cost, drivers consequently experienced increases in the congestion pricing fees; in 2003, the congestion pricing fee was initially £5 (\$9.89 in U.S. dollars), and by 2007, the price was £25 (\$49.43 in U.S. dollars).

3. Singapore’s Electronic Road Pricing (ERP)

Background

In 1975, Singapore introduced the first congestion charging system called the Area License System (ALS), and in 1998, Singapore started the Electronic Road Pricing (ERP) system. The ALS system resulted in a 45% decrease in traffic and a 25% reduction in vehicle crashes. Although ALS effectively decreased congestion in Singapore, the system was highly dependent on human-operated tollbooths; moreover, the system was problematic for drivers waiting in line to pay tolls and the system did not have the ability to modify road prices.

In 1998, Singapore switched to the ERP system, which created a new electronic toll collection process. ERP now charges drivers different prices depending on various road times of the day. For example, the ERP system can modify prices depending on the current traffic patterns, time, location, and type of car;

the system is also updated quarterly to guarantee that the system is maximizing both road space and optimal speeds.

After Singapore replaced the ALS system with ERP, the traffic has reduced another 15%, and 65% of commuters in Singapore utilize public transportation, which is an increase of 20%. In addition to decreasing the number of solo drivers on the road, the ERP system has also changed driving trips from “peak” to “non-peak.” This means that there have been 24,700 fewer vehicles during “peak” hours and also a 22% increase in traffic speeds. During “charging” times, there has been a 14% drop in traffic levels. Overall, the ERP system has reduced traffic, congestion and fuel usage, and it decreased pollution and emissions as well.

Advantage:

- **Streamlined collection.**

Disadvantage:

- **Electronic systems have potential for hacking/privacy issues.**

4. Stockholm

In 2006, Stockholm started a 6-month pilot program for congestion pricing. During the “peak” time period, all cars were charged the same price (2 euro) for entering and leaving Stockholm, and during non-peak hours, the pricing structure decreased at different levels. Once the pilot program was completed, 53% of the electorate confirmed a referendum which proposed extending the congestion pricing system in Stockholm. However, even though the public voted in support of this congestion pricing program, the voters also simultaneously ousted the same political party that had proposed the congestion pricing system.

Although public opinion was initially skeptical of this congestion pricing system, some polls have shown that some people now support the pricing program. For example, a May 2011 poll found that 70% of Stockholm residents supported the pricing program. However, there is also healthy uncertainty surrounding the accuracy and validity of the recent changes in public opinion polling. Therefore, the more recent conditions in Stockholm present a mixed assessment of the congestion pricing system.

Advantage:

- **Traffic Congestion Decreased.** After the system was implemented, traffic congestion dropped by 20%; this decrease was largely attributed to commuters who started riding public transportation in place of driving. In addition, because fuel-efficient vehicles are exempt from paying for the program, the number of fuel-efficient vehicles purchased has increased.

Disadvantages:

- **Non-Compliance Problems.** From December 2011 until July 2012, there were 13,200 outstanding congestion payment cases, according to The Swedish Enforcement Authority. This was significant because this figure was higher than the number of cases of individuals who had failed to pay their parking fines.
- **Rising Travel Costs.**
- **Contradictory Public Opinion Poll Results.** Initial public opinion was strongly against the adoption of this program, and since the program's implementation, public opinion has remained inconsistent and varied. Moreover, the fact that the public ousted the party that proposed the congestion pricing program also adds to this skepticism.

5. New York City

This unsuccessful New York City cordon pricing attempt serves as a case study of the United States' reaction to congestion pricing programs abroad.

Background

In 2007, New York City Mayor Michael Bloomberg introduced a congestion pricing system proposal in order to help decrease congestion and fund public transportation improvements within the city. Bloomberg's plan aimed to reduce traffic by 6.3% within a designated zone. This plan included a 3-year congestion pricing system, where drivers would pay a specific fee when driving into Manhattan below 86th Street— there would be a cordon designated by bridges and tunnels across from 60th Street. Bloomberg's plan was estimated to bring in \$420 million annually, and if the congestion pricing system had moved forward, New York City was also selected to receive \$354 million from the U.S. Department of Transportation's Urban Partnership Agreement grant funds. The city of New York would still be responsible for funding approximately \$223 million for the congestion pricing system because only \$10 million from the Urban Partnership Agreement grant would be allowed to be used for the initial set-up of the congestion pricing system.

Although this proposal was supported by Mayor Bloomberg as well as by a broad coalition of business, environmental, and civic organizations, the State Assembly needed to approve of the plan in order to be implemented (Orski, 13). State Assembly Speaker Sheldon Silver would not allow the Assembly to vote on the proposal because he said that too many policymakers opposed it; as a direct result, Bloomberg's plan officially failed on April 7, 2008. Outer borough assembly members as well as suburban assembly members were not on board with the Mayor's proposal, and Assembly member Richard Brodsky (Westchester County) publicly opposed the plan on the grounds of economic inequity and that the fee would be regressive in nature.

Advantages:

- **U.S. Department of Transportation’s Urban Partnership Agreement Grant.** Although New York City secured federal funding, this funding was never sent to New York City because the congestion pricing plan was not implemented. This federal grant would have supported the city’s transit improvement projects

Disadvantages:

- **Public Opinion.** In a 2006 Quinnipac University poll, 62% of New York voters opposed congestion pricing, while 31% supported it (Congestion Pricing in the Manhattan CPD, 17).
- **Failure to Achieve Political Traction.** Despite the fact that Mayor Bloomberg was a champion of this proposal, support for the plan never gained traction in the state legislature. Political rivalries and clashing personalities were part of the problem as well; Speaker Silver and Mayor Bloomberg remained at odds with one another and were unable to overcome the policy differences dividing them. This consequently resulted in stronger opposition to this congestion pricing system in the State Assembly.
- **Inequity and Fairness (Economic and Interregional).** Some members of the State Assembly opposed this congestion pricing program because they believed the fee-based system would be regressive in nature to low-income drivers and would thus increase inequity in New York City. Residents from Queens, Brooklyn, and the Bronx all opposed this plan because this new fee would be especially harmful for low-income residents who drove to and from work (Orski, 13). Other policymakers opposed this plan on the grounds that it would create interregional inequity; critics called this fee a “commuter tax in disguise.”
- **Overstatement of Traffic Congestion Relief.** Some opponents argued that this plan was exaggerating the traffic benefits that would result from the congestion fee. More specifically, these critics posited that the central causes of traffic would not be improved; for example, traffic congestion was also caused by “double-parked vehicles, truck deliveries, lane-blocking utility repairs, taxicabs discharging and picking up passengers, rampant violations of the block-the-box prohibition, and pedestrian-vehicle conflicts at street intersections” (Orski, 14).

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