Tolling and Congestion Pricing Research and Policy Support

Congestion Pricing White Paper

prepared for

Oregon Department of Transportation

prepared by

Cambridge Systematics, Inc.

June 21, 2017

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report

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Table of Contents

List of Tables

Executive Summary

This Executive Summary provides an overview of the most feasible types of tolling applications and describes the technological, financial, political, and social tradeoffs between tolling, current funding methods, and the different applications of tolling. Included is an overview of tolling, how it relates to congestion pricing, the Federal and state authorization of tolling, an overview of four types of tolls, and the major considerations and issues for implementing tolls. The attached white paper provides more detailed descriptions of tolling methods, trade-offs and case studies.

Tolling as a Potential Funding Source

Tolling involves charging a direct fee to a vehicle for using a highway, bridge or tunnel. Tolls were historically implemented to help recoup the cost of road construction or maintenance and to divert vehicles from using congested roadways. Tolling differs from fuel taxes as a funding source because tolls may be applied to a specific facility (road segment, bridge, or area). When tolls are used to change travel demand for that facility by charging higher tolls during peak travel, the term congestion pricing is often used.

Tolling

A toll system allows drivers to access a public or private roadway for a fee (or toll) and is a form of road pricing typically implemented to help recoup the cost of road construction or maintenance. A toll road should have adequate traffic willing to pay a high enough toll to address construction, maintenance, and toll collection costs to be financially feasible. Tolling is a flexible funding mechanism that can be used as part of a congestion pricing strategy, with the potential of reducing congestion and optimizing performance.

Congestion Pricing

Congestion pricing, or value pricing, manages demand by applying higher charges during peak periods or more congested conditions for use of the roadway. This pricing strategy can reduce congestion without adding capacity to the roadways because more price sensitive drivers shift their travel during rush hour to less congested times, other routes or different transportation modes, or decide not to make the trip. Removing a small percentage of vehicles from the congested roadways enables the system to function much more efficiently. There are four main types of congestion pricing strategies as shown in Table 1:

Table 1. Congestion Pricing Strategies

Variably Priced Lanes	Cordon Charges
Variable tolls charged to use separated lanes within a highway, such as express toll lanes or high occupancy toll (HOT) lanes	Either variable or fixed charges to drive within or into a congested area
Variable Tolls on Entire Roadways	**Areawide Charges**
Pricing strategy that changes toll rates on toll roads according to a variable schedule. Toll rates are higher during peak travel hours, encouraging motorists to use the roadway during less congested periods.	Per-mile charges on all roads within an area that may vary by level of congestion

Federal and State Laws

There are four Federal programs that allow tolling to support highway construction activities as well as to facilitate road pricing strategies for congestion management. Two "mainstream" Federal programs include: Section 129, which details the permitting of new tolls, and Section 166, which discusses High-Occupancy Toll (HOT) and High-Occupancy Vehicle (HOV) Lanes. Tolls can also be implemented under the Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP) and Value Pricing Pilot Program (VPPP).

In Oregon, state law stipulates that the Oregon Transportation Commission has legal authority to establish toll roads and toll lanes, and there are no state imposed restrictions on cities or counties implementing a tolling system on locally managed roads (383.004).

Toll revenue collected in Oregon is restricted to the requirements outlined in the Oregon Constitution Article IX, section 3a, which requires the use of revenue to be used exclusively for the construction, reconstruction, improvement, repair maintenance, operation and use of public highways, roads, streets, and roadside rest areas in Oregon.[1]

[1] Oregon State Legislature. Oregon Constitution 2016 Edition.
https://www.oregonlegislature.gov/bills_laws/Pages/OrConst.aspx

Applications of Tolling

High-Occupancy Toll (HOT) Lanes

“FasTrak High Occupancy toll lanes along interstate 15” by Chevy 111, under CC BY / cropped from original

HOT lanes allow vehicles with few or no passengers to pay a toll to use HOV lanes, which have excess capacity and allow vehicles to bypass congestion. HOT lanes are typically created by converting an HOV lane to a HOT lane. The toll price can change by time of day or be set dynamically based on traffic levels. Tolls generated from HOT lanes can be used to supplement the construction, operations, enforcement, and maintenance costs of the lanes. Variable pricing keeps lanes free of congestion and helps ensure reliable travel times. There are more than 20 HOT lanes operating in a dozen states nationwide, with more poised to open.

Benefits and Drawbacks

- **Roadway Efficiency:** HOT lanes increase the traffic flow for all lanes, allowing more cars to utilize the roadway, and also have the potential to provide faster and more reliable travel times.
- **Revenue Generation:** Revenue is generated from HOT lanes, which can be used for maintenance and operations.
- **Equity Implications:** Initially, equity concerns were raised, with people assuming only high-income households would use the HOT lanes. However, rigorous research has shown that low-income drivers are not disproportionally affected.

Ease of Implementation

- Historical experience
- Help fund new lane on highway
- An existing HOV system can be helpful in establishing HOT lanes

Open-Road Tolling (ORT)

ORT is often deployed across a large network of roadways spanning large regions. Within ORT, tolls can be implemented on bridges and tunnels. Tolls are either collected with an electronic transponder (ETC) or through license plate recognition technology. This allows vehicles to drive through the toll plaza at highway speeds, decreasing congestion at these check points, while collecting the toll. ORT is found throughout the United States, from the E-ZPass network in the Midwest and Northeast, SunPass in Florida, to Good To Go! In Washington.

Benefits and Drawbacks

- **Safety:** Research shows that ORT eliminates stop-and-go traffic, improving operations and reducing exposure to crashes.
- **Speed and Roadway Capacity:** ORT, along with congestion pricing, improves speed and increases traffic flow.
- **Economic Benefits:** The travel time savings results in direct, indirect, and induced economic benefits, including lower fuel consumption, shorter commutes, and larger labor pools.
- **Toll Agency Costs:** The cost of deploying and sustaining this program can be high, though technological advances are decreasing cost.
- **User Costs:** Most systems require motorists to buy or rent transponders.

Ease of Implementation

- Several states have implemented ORT throughout the U.S.

"Electronic Road Pricing" by VK35, used under CC BY / cropped from original.

Cordon Pricing

Cordon pricing establishes a fee to enter a specified area, usually a city's downtown or business district, to mitigate intense congestion. This fee can vary by time of day, encouraging drivers to use alternative modes or travel during a less congested time, or be at a fixed price. This method has been implemented in Singapore, London, Stockholm, and Gothenburg and has yet to be employed in the United States.

Benefits and Drawbacks

- **Decreased Congestion and Improved Livability:** With fewer vehicles in a dense urban area, congestion decreases while improving livability factors such as decreased pollution, noise, and traffic collisions.
- **Revenue Generation:** Cordon pricing yields substantial and reliable revenues.
- **Local Businesses:** Some shopping trips are sensitive to cordon pricing, with some drivers opting to shop in areas outside the priced zone. However, research is still inconclusive about the overall impact.
- **Administrative Cost and Implementation:** The cost of deploying and sustaining this program can be high, ranging from 48 percent (in London) to 7 percent (in Singapore) of total annual toll revenue.

Ease of Implementation

- Not yet implemented in the U.S.
- Implemented and successful in Singapore, London, Stockholm, & Gothenburg

www.myorego.org

Mileage-Based Pricing

Mileage-based pricing involves charging vehicles a per-mile toll, essentially charging a higher fee to drivers who use the system more frequently. Revenues from this toll are an alternative to taxes on fuel consumption, removing the loss of revenue from changes in fuel economy and fuel type. Tolling may be collected by odometers or GPS transponders. One example of this toll is the OReGO Program.

Benefits and Drawbacks

- **Stable Revenue Stream:** Unlike traditional taxes on gasoline, this revenue stream is not affected by changes in fuel economy.
- **Reduced Traffic Congestion:** Traffic congestion could decrease if the per-mile charge changes based on time of day and travel locations.
- **Concern on Personal Privacy:** Mileage-based pricing tolling can trigger public concerns regarding personal privacy, such as using a GPS device to track vehicle movement. However, privacy concerns related to GPS tracking may be declining as the prevalence of smart phones rises.

Ease of Implementation

- Several pilots underway in the U.S., including OReGO
- System has not been officially launched in any U.S. city

Major Considerations and Issues

The policy implications for tolling, as with any other funding source, consider a wide range of topics and considerations. Below is a quick overview of considerations in regards to tolling, with more information and background provided in the attached white paper.

Diversion / Traffic Impacts

- For a new toll road, diversion can be significant if there is an easy, non-tolled, alternative route near the toll facility. Diversion can also be to transit or forgoing a trip altogether.
- A new toll lane could increase congestion and degrade reliability on surrounding, un-tolled facilities.

Equity

- Initial concerns that low-income drivers would be adversely affected; however, a wide range of income groups choose to use toll lanes when being on time matters to them.
- Improving transit service as tolls are added can offset the effects of the toll on lower income populations.

Congestion and GHG Reduction

- Decreased congestion can lead to lower greenhouse gas (GHG) emissions and pollution.
- Toll roads can serve a dual purpose – they generate a funding source and if they are administered using variable pricing, have the ability to manage demand.

Privacy

- Electric tolling systems require users to agree to have their location information logged.
- Agencies have methods to protect privacy and can provide alternatives, such as paying with cash.
- Younger generations are less concerned about privacy.

Exemptions

- Certain users, such as motorcycles, public transportation vehicles, and active emergency responders, are often exempt from tolls.
- Providing too many exemptions can cause the priced lanes to become congested or lead to reduced revenue generation.

Revenue Generation

- Fuel tax revenues are projected to decline in the future.
- Tolling can be seen as a more aggressive indexing to inflation.
- Tolling is frequently used to leverage private investment in public-private partnerships (PPP).

Enforcement

- States are sharing information on toll violators, including blocking a vehicle registration in an outside state.
- Enforcement can be achieved with technology, including cameras, and/or with visual inspection.

Administrative Effectiveness

- The administrative cost of tolling includes back-end accounting and enforcement. Automation of collecting tolls and the expanding number of retail outlets for obtaining transponders has decreased costs.
- Comprehensive customer service, outreach and education help ensure the success of tolling programs.

Public Acceptance

- States that have implemented variable pricing strategies show public support reaches 50-60% once motorists experience positive benefits of more reliable travel times.[1]
- Different factors affect how the public accepts tolls and road pricing, including the use of tolling revenues, and the type of tolling application.

[1] Washington State Department of Transportation. Pricing Acceptance Public Opinion Analysis. 2007. http://www.wsdot.wa.gov/sites/default/files/2011/05/24/Appendix_A_Public_Opinion_Analysis_web.pdf

1.0 Introduction

Beginning in 2007, the Oregon Transportation Commission conducted extensive research, evaluation, and public outreach focused on understanding the feasibility of tolling within the state. This work produced the following seven white papers completed in February 2009:

1. Air Quality/Greenhouse Gas Emissions White Paper (PDF) - Highlights (PDF)
2. Geographic and Situational Limits White Paper (PDF) - Highlights (PDF)
3. Travel Demand Model Sufficiency White Paper (PDF) - Highlights (PDF)
4. Economic Evaluation of Improved Reliability White Paper (PDF) - Highlights (PDF)
5. Assessing the Economic Effects of Congestion Pricing White Paper (PDF) - Highlights (PDF)
6. Economic Comparison of Alternatives White Paper (PDF) - Highlights (PDF)
7. Truck-Only Toll Lanes White Paper (PDF) - Highlights (PDF)

This white paper updates some information in these 2009 papers and is intended as a primer to inform policy makers on the most feasible types of tolling applications. It describes the technological, financial, political, and social trade-offs between tolling and current funding methods and different applications of tolling. This paper also describes how the State Legislature could use tolling on Oregon roadways and bridges to pay for additional roadway capacity in congested corridors. Following this brief introduction, the following four sections lay out what tolling options the State could deploy to generate revenues or reduce congestion, statutory authorization within Oregon, policy implications of tolling, and two case studies.

2.0 Applications of Tolling: This section defines four major tolling applications and evaluates their most significant benefits and costs. Provided are examples of where these tolling applications have been deployed and how they could be implemented in Oregon.

3.0 Tolling Authorization: This section describes the four Federal programs the Federal Highway Administration (FHWA) has maintained to support tolling initiatives into the Fixing America's Surface Transportation Act (FAST Act) and summarizes the requirements of each program. This includes the Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP), which ODOT may apply for, and the Value Pricing Pilot Program (VPPP), in which Oregon maintains a spot. Oregon's legislative authority to toll is also summarized.

4.0 Policy Implications for Tolling: This section explains the most likely issues and trade-offs from tolling and how the various applications perform compared to current funding sources with regard to eight of the most significant policy issues: (1) revenue generation, (2) congestion reduction, (3) equity and environmental justice, (4) privacy, (5) administrative effectiveness, (6) rural versus urban impacts, (7) diversion, and (8) public acceptance.

5.0 Congestion Pricing Case Studies: This section describes two regions, Puget Sound, Washington and Dallas, Texas, which have successfully implemented tolling as a revenue generating mechanism to fund the construction of tolling facilities and other regionally significant transportation projects and improvements.

2.0 Applications of Tolling

2.1 Tolling Types

This section evaluates the menu of tolling applications as well as their benefits and costs. A toll is a fee charged by the operator of a highway, bridge, or tunnel for use of that facility. All types of tolling assess a fee on vehicles on public or private roadways and are typically implemented to help recoup the cost of road construction or maintenance. Traditional tolling applications have been deployed in 35 cities throughout the United States, including two states on the West Coast: Washington and California.[2] Open road tolling (ORT) is an electronic toll system without physical toll plazas, where motorists are charged while driving. The state of New Hampshire implemented ORT beginning in May 2010. The state of New York will implement ORT on all Metropolitan Transportation Authority (MTA) operated bridges and tunnels in the New York metropolitan region by the end of 2017.[3]

Congestion pricing, or value pricing, manages demand by applying higher charges during peak periods or more congested conditions for use of the roadway. This pricing strategy reduces congestion without adding capacity to the roadways because more price sensitive drivers shift their travel during rush hour to less congested times, routes or transportation modes. Removing a small percentage of vehicles from the congested roadways enables the system to function much more efficiently.

There are four main types of congestion pricing strategies:

- **Variable priced lanes**: tolls rates that vary by time of day on separated lanes within a highway, such as express toll lanes or high-occupancy toll (HOT) lanes
- **Variable tolls on entire roadways**: tolls that vary by time of day, both on toll roads and bridges, as well as on existing toll-free facilities during rush hours
- **Cordon charges**: either variable rate or fixed charges to drive within or into a congested area of a city
- **Vehicle miles of travel (VMT) charges**: per-mile charges that may vary by level of congestion on all roads within an area.

For the general public and most elected officials, the first and most significant distinction of these tolls involves understanding the differences of funding transportation with generic taxes versus user fees. This difference is complex because many types of fees are sometimes called taxes: gas tax, carbon tax, weight-mile tax, vehicle excise tax, studded tire tax, bicycle excise tax, etc. The most straightforward distinction classifies any charge to a transportation user as a user fee (e.g., studded tire tax), and any funding source collected from a non-transportation activity, such as a payroll tax dedicated to transportation, as a tax, regardless of how the money is eventually spent. This distinction is important when considering any applications of tolling, because all forms of tolling are user fees when the objective of user fees are to assign the burden of paying for transportation improvements and maintenance to the users of transportation.

[2] International Bridge, Tunnel and Turnpike Association (IBTTA). 2015 Report on Tolling in the United States. http://ibtta.org/sites/default/files/documents/MAF/2015_FactsInBrief_Final.pdf

[3] New York State. 2017. Governor Cuomo Announces Open Road Tolling to be completed on All MTA Bridges and Tunnels in 2017. https://www.governor.ny.gov/news/governor-cuomo-announces-open-road-tolling-be-completed-all-mta-bridges-and-tunnels-2017

This assignment means the fee sends a user a price signal, which can be weak, in the case of fuel taxes, or strong, in the case of congestion pricing.

2.1.1 High Occupancy Toll Lanes

High-occupancy toll lanes allow vehicles not meeting occupancy requirements, such as vehicles with fewer than three riders including single-occupancy vehicles (SOV), to pay a toll to use high-occupancy vehicle (HOV) lanes which have excess capacity. The toll changes price by time of day or dynamically depending on traffic levels, and funds are collected electronically. Variable pricing (i.e., congestion pricing) is a critical component to HOT lanes as it keeps the lanes free flowing and ensures reliable performance when in use. Many HOT lanes only operate during the AM and PM peak periods, when congestion is highest. There are more than 20 HOT lanes operating in a dozen states nationwide, including the cities of Seattle (SR 167 HOT Lane), San Francisco (Bay Area Express Lanes), and San Diego (I-15) with more poised to open.

The benefits of HOT lanes include:

- **Reliable and Faster Travel Times.** HOT lanes have the potential to provide faster and more reliable travel times to drivers by shifting paying drivers to underutilized and uncongested carpool lanes. If a motorist has an important meeting or appointment, he or she can pay a fee to make their trip on time and experience a more predictable trip in an uncongested carpool lane.
- **Roadway Efficiency.** HOT lanes increase a roadway's throughput (person-trips). Through variable pricing and lane management, actively managed HOT lanes divert just enough SOVs out of the mixed flow lanes to increase the capacity of the mixed flow lanes while still allowing the HOV lanes to operate at maximum efficiency.
- **Revenue Generation**. HOT lanes generate toll revenue from SOVs. Toll revenue provides revenues that may fund the operation, maintenance, enforcement of the HOT lane, and in one example generates funding which is spent on express bus service using the lane (e.g., express bus service on San Diego I-15). However, constitutional restrictions prevent revenue collected from tolling from being spent on transit improvements in the State of Oregon.[4]

The costs and disbenefits include:

- **Equity Implications.** HOT lanes users were initially expected to be primarily high income travelers. While frequent users of HOT lanes tend to have higher incomes than other commuters, more rigorous research of specific corridors has revealed a majority of vehicles are driven by contractors who must reach their job-sites at the start of their work day (e.g., SR-91 in Orange County).[5] Most HOT lanes have a cap that restricts the maximum toll regardless of congestion, but some, such as the I-10 in Los Angeles, have activated HOV-only restrictions, prohibiting SOV use when speeds in the HOT lane fall below 45 miles per hour.[6] Nevertheless, HOT lane operators are expecting over the long term that the

[4] FHWA. 2003. A Guide for HOT Lane Development. https://ntl.bts.gov/lib/jpodocs/repts_te/13668_files/chapter_1.htm

[5] RAND Corporation. 2009. Equity and Congestion Pricing. http://www.rand.org/content/dam/rand/pubs/technical_reports/2009/RAND_TR680.pdf, Los Angeles Magazine, June 11, 2015 http://www.lamag.com/driver/oc-register-find-a-new-name-for-lexus-lanes/

[6] Daily Breeze. 2016. 110, 10 Freeway Express Lanes Are Slowing Down and Officials Aren't Sure of the Fix. http://www.dailybreeze.com/general-news/20160209/110-10-freeway-expresslanes-are-slowing-down-and-officials-arent-sure-of-the-fix

increasing congestion and popularity of HOT lanes will require policy makers to increase toll subsidies for low income drives.

2.1.2 Cordon Pricing

Cordon pricing is a form of congestion pricing that is implemented in dense urban areas or congested activity centers. The fee to enter the specified area defined by a cordon can vary by time of day (i.e., congestion pricing) or be set at a flat rate. The fee charges vehicles that travel into a specified area, such as a downtown or business district. Prices to enter the area may be adjusted throughout the day, reducing congestion by encouraging motorists to use alternative modes or to travel during a less congested time. Cordon pricing usually exempts residents living inside the cordon. In the United States Cordon Pricing has not been permanently implemented. However in 2007, Mayor Bloomberg of New York City introduced a congestion pricing plan that would cordon a district in Manhattan and impose a charge on all private automobiles that traveled into the area. The plan did not receive the necessary political support from the State Legislature or the Governor due to concerns regarding adequate revenue generation from the plan as well as the impact of congestion pricing on businesses that would need to enter into the cordoned area.[7] Cordon pricing was first implemented in Singapore in 1975 and converted to electronic road pricing (ERP) in 1998. London succeeded in implementing cordon pricing in 2003, followed by the Swedish cities of Stockholm in 2006 and Gothenburg in 2013.

The benefits of cordon pricing include:

- **Decreased Congestion and Improved Livability.** Resulting in lower greenhouse gas emissions and pollution; improved livability of the cordoned area (e.g., reductions in air pollution, noise, and traffic volumes); increased transit and bicycle mode shares (London saw an increase of 28 percent of bicycle riders and 21 percent of bus ridership between 2003 and 2010)[8]; and reduced delay and improved reliability for buses in the cordoned area. Furthermore, collisions and related deaths have declined in all three cities, including in London where traffic collisions fell 40 percent between 2003 and 2010.

- **Locally Controlled Revenue Generation.** Cordon tolls yield substantial and reliable revenue generation that funds improvements to public transportation and active transportation projects in these cities. In 2008, London's cordon pricing generated net revenues of $222 million. Revenues from London's congestion charge by law must be spent on transportation improvements within the greater London area. The distribution of net revenues for transportation improvements include 82 percent used solely for bus improvements, 9 percent for roads and bridges and the remaining 9 percent for pedestrian and cycling facilities, road safety measures, neighborhood plans and environmental improvements.[9] Article IX, Section 3a of the Oregon Constitution, however, requires that highway toll revenue must be used exclusively for the construction, reconstruction, improvement, repair maintenance, operation, and use of public highways, roads, streets, and roadside rest areas in the state.

[7]Bruce Schaller. 2010. New York City's Congestion Pricing Experience and Implications for Road Pricing Acceptance in the United States. *Transport Policy*
http://www.nyc.gov/html/dot/downloads/pdf/schaller_paper_2010trb.pdf

[8] Jonathan Leape. 2006. The London Congestion Charge. Journal of Economic Perspectives
http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.20.4.157

[9] FHWA. Reducing Congestion and Funding Transportation Using Road Pricing in Europe and Singapore. 2010.
https://international.fhwa.dot.gov/pubs/pl10030/pl10030.pdf

The costs and disbenefits to motorists and businesses include:

- **Impacts to Local Businesses.** Discretionary shopping trips are the most sensitive to cordon pricing. The toll price to enter an area could discourage shoppers from coming into a priced zone, thereby impacting the retail businesses in the area. The full implications of this impact, however, remain a hot topic of research. Before and after studies of businesses and entertainment venues inside the London Cordon revealed low-cost restaurants and some shops lost sales, but higher-end restaurants and entertainment districts experienced higher profits and traffic.[10]

- **Administrative Costs and Implementation.** The cost of deploying and sustaining a cordon pricing program depends on the type of technology, logistics of implementation, and maintenance of the system. London's system was the most expensive because the London Transport elected to use license plate recognition technology rather than electronic tags (ETC). The system operations cost one-third of the revenue collected annually. Singapore has the most cost effective system, where annual operations cost about 10 percent of annual revenues.[11]

2.1.3 Open-Road Tolling (ORT)

Federal Highway Administration (FHWA) defines ORT as a "fully-automated electronic tolling in an open road environment, allowing vehicles to travel at highway speeds when passing through toll collection points." This system collects tolls by purely electronic means, through the installation of gantry-based electronic tolling and enforcement systems designed to enable unhindered passage of vehicles through the toll gantry at normal highway speeds. The key to ORT is that each vehicle can be uniquely identified as it passes a charging point. In most cases, vehicles are identified via an electronic transponder, which is mounted inside vehicle windshields.

Open road tolling is most often deployed across a large network of roadways spanning an entire region, nation, or multiple countries, where toll facilities cover a very wide area, making fixed toll gates impractical. The most notable of these is a truck tolling system in Germany. This system uses Global Positioning System (GPS) location information to identify when a vehicle is located on a tolled Autobahn. Other European deployments include "EasyGo", which is an interoperable tolling system deployed by Denmark, Sweden, Norway, Austria and two ferry lines in Germany, and "TOLL2GO", which uses satellite interoperability between Austria and Germany. Other European toll authorities have pushed the ORT technical and contractual interoperability to offer electronic toll services covering toll domains in France, Spain, and Portugal. Examples of ORT in the U.S. include SR 91 Express Lane in California, which opened in 1995, and the West Park Tollway in Houston Texas, which opened in 2004. As mentioned in a previous section, the state of New York is slated to implement ORT on all MTA bridges and tunnels by the end of 2017. Tolls are collected either with ETC or through license plate recognition technology and most payment is transacted directly via credit card accounts.[12]

[10] Nigel Morris. February 13, 2008. The Big Question: Has the congestion charge been effective in reducing London's traffic?. Independent.

[11] California Transportation Commission. 2012. Cordon Pricing. http://www.catc.ca.gov/reports/2012NeedsAssess/reports_submitted/cordon_pricing.pdf

[12] HNTB. 2009. Open Road Tolling Frequently Asked Questions. http://leg.wa.gov/JTC/Meetings/Documents/Agendas/2009Agendas/JTC060209/HNTB_OpenRoadTollingFAQ.pdf

The benefits of ORT include:

- **Safety.** Research shows the deployment of ORT eliminates the stop-and-go traffic and reduces interactions that occur when cars queue at variable speeds at toll plazas.[13]

- **Speed and Roadway Capacity.** Open road tolling, when applied with congestion pricing to manage demand and queuing, improves the speed of vehicles and the vehicle throughput of a roadway's fixed capacity.

- **Economic Benefits and Revenue Generation.** Improved vehicle speeds, reduced travel times, higher throughput, and time savings produce direct, indirect, and induced economic benefits.[14] Examples of direct benefits stem from lower fuel consumption and vehicular crashes. Indirect benefits emerge from shorter commuting and on-the-clock travel times, especially for goods movement. Induced benefits, which may be the largest of the three, are derived from businesses gaining access to a larger pool of labor within the same commute shed, thus improving their recruitment and retention of workers who best fit their needs.[15]

The costs of ORT include:

- **Toll Agency Costs.** The costs of implementing ORT are significantly more than traditional tolling with most other applications, but the rapidly advancing technologies used for ETC and ORT are making even recent research findings obsolete. Nevertheless, in 2007 the annual cost of operating Germany's nationwide truck tolling system consumed about 15 to 20 percent of its $5.30 billion annual revenues.[16]

- **Users Costs.** Most of the existing systems with ORT require motorists to buy or rent transponders, though some systems do have automatic license plate readers. In addition to the cost of the equipment, complying motorists are required to pay a security deposit and in some instances pay a monthly fee.[17]

2.1.4 Mileage Base Pricing or Vehicle Miles Traveled Tolling

Mileage-based pricing, which Oregon calls road usage charging, involves charging vehicles a per-mile toll for the distance the vehicle is driven.[18] Revenues from vehicle miles traveled (VMT) tolling are generated based on distance rather than fuel consumption, thus removing the erosion of revenue from changes in fuel economy and fuel type. VMT tolling may be implemented by reading odometers or through GPS transponders used for ORT systems, such as those implemented in Switzerland, Germany, France, Portugal, Spain, and Austria.

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[13] The State University of New Jersey Rutgers. 2012. Effects of the Open Road Tolling on Safety Performance of Freeway Mainline Toll Plazas. http://rits.rutgers.edu/files/trb2012-3885.pdf

[14] Dr. Khali Persad, Dr. C. Michael Walton, Shahriyar Hussain, January 2007. Toll Collection Technology and Best Practices. University of Texas Center for Transportation Research.

[15] Economies of agglomeration are used to explain the significant benefits derived from improved access to larger and more diverse pool of labor

[16] Hubert Humphrey Institute for Public Affairs University of Minnesota; Ferrol O. Robinson and SRF Consulting Group, Inc., October 1, 2008. Heavy Vehicle Tolling in Germany: Performance, Outcomes and Lessons Learned for Future Pricing Efforts in Minnesota and the U.S. http://www2.hhh.umn.edu/slpp/regionalities/Heavy%20Vehicle%20Tolling%20in%20Germany.pdf

[17] The University of Texas at Austin Center for Transportation Research. 2007. Toll Collection Technology Best Practices. https://ctr.utexas.edu/wp-content/uploads/pubs/0_5217_P1.pdf

[18] Congressional Research Service. 2016. Mileage-Based Road User Charges. https://fas.org/sgp/crs/misc/R44540.pdf

The minimum components of a mileage-fee system must be able to meet the requirements as listed in Table 1.

Table 1 Key Components of Mileage Based Pricing

Mileage-Based Pricing Components	Description
Metering Mileage	System must determine total miles traveled by each vehicle and the location of travel. Metering options could include the following: Odometer inspections, on-board unit (OBU) to transmit mileage data, OBU with cellular location to determine the jurisdiction of travel, OBU with GPS, or smartphone application.
Privacy Protection	System must protect the privacy and security of travel and billing data.
Reporting and Billing	Include mechanisms for reporting mileage and collecting payment.
Enforcement	Include strategies for preventing or detecting payment evasion of mileage fees.

Source: Mileage-Based User Fees for Transportation Funding a Primer For Transportation Funding[19]

The benefits of mileage-based pricing include:

- **Stable Revenue Stream.** Mileage-based pricing provides a stable revenue stream that is insulated from changes in fuel economy. The costs of implementing a mileage fee system are likely to be lower compared to other tolling options that require construction, maintenance, and staffing of tolling facilities. Depending on the on-board GPS technology available on the vehicle fleet, a mileage fee system would entail a low cost of collection for both agency and users.[20]

- **Reducing Traffic Congestion.** Mileage-based pricing can potentially reduce traffic congestion during peak hours by varying the per-mile charge based on time of day and travel location. In 2005, the Puget Sound Regional Council implemented a trial and found it to be effective in reducing overall traffic. [21]

The costs of mileage-based pricing include:

- **Public Concern on Personal Privacy.** The mileage based system can trigger public concerns regarding personal privacy because the most common technology involves a GPS device to issue charges based on vehicle movements. Further discussion in Section 4.4 presents more recent findings that younger generations are less concerned about their overall privacy. Authorities use vehicle GPS data from travel on tolled roadways to aid their civil or criminal investigations, and these forensic practices have not provoked significant backlash from the general public.[22]

[19] RAND Corporation. 2012. Mileage-Based User Fees For Transportation Funding A Primer for State and Local Decision Makers. http://www.rand.org/content/dam/rand/pubs/tools/TL100/TL104/RAND_TL104.pdf

[20] Ibid

[21] Ibid

[22] PBS. 2013. PBS News Hour Do License Plate Readers Prevent Crime or Create Privacy Abuses? http://www.pbs.org/newshour/bb/nation-july-dec13-plates_08-12/

3.0 Tolling Authorization

3.1 Federal Requirements

Current Federal law under Title 23 of the U.S. Code prohibits the collection of tolls on Federal-aid highways (23 U.S.C. §301). However, modifications to the code in recent years have allowed for exceptions to the prohibition through the development of special tolling programs (23 U.S.C. §129). The programs allow tolling to generate revenue to support highway construction activities as well as to facilitate road pricing strategies for congestion management. An entity that uses Federal funds to develop/construct a toll facility must qualify for toll authority under one of four Federal programs. At present, FHWA does not provide additional funding for successful applicants for any of these four programs:

Mainstream Tolling Programs

Section 129 (General Toll Program)

Public agencies may impose new tolls in the following cases, per Section 129 of Title 23:

- Initial construction of a new highway, tunnel or bridge.
- Initial construction of new lanes on highways, bridges, and tunnels (including Interstates), as long as the number of toll-free lanes is not reduced.
- Reconstruction or replacement of a bridge or tunnel.
- Reconstruction of a highway (other than an Interstate).
- Reconstruction, restoration, or rehabilitation of an Interstate highway, as long as the number of toll-free lanes is not reduced.

Memorandums of Understanding (MOU) are highly encouraged and annual audits are required.[23]

Section 166 (HOV/HOT Lanes)

Under Section 166 of Title 23, public agencies have the authority to allow toll-paying vehicles that do not meet minimum occupancy requirements to use HOV lanes. Additional components of this requirement include:

- Tolling authority is available for facilities both on and off the Interstate system.
- Program requirements include enforcement of HOV restrictions, automatic collection of tolls (which must be varied to manage demand on the HOV facility), and requirements to ensure that the operational performance of the HOT lanes does not become degraded.

[23] Texas Transportation Institute. 2007. Case Study Analysis of Mid-Size Urban/Rural Area Toll Road Options – Year 2 Report. https://static.tti.tamu.edu/tti.tamu.edu/documents/5-4055-01-3.pdf

- Motorcycles and bicycles are free but the state can restrict them only after the U.S. Department of Transportation (DOT) certifies they create a safety hazard

Toll Pilot Programs

Additional tolling programs have been authorized by Congress as pilot programs. State participation in these programs is limited to a specified number of slots. All project sponsors are required to submit an application to the program and to establish an agreement with FHWA to implement tolls under these programs.[24]

Interstate System Reconstruction and Rehabilitation Pilot Program

The Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP) gives states authority for implementing tolls on the approved Interstate facility for the purpose of reconstruction and rehabilitation. Key components of the program include:

- Allows conversion of a facility on the Interstate System to a toll facility in conjunction with needed reconstruction or rehabilitation that is only financially feasible with collection of tolls.

- Three slots were created for this program, which must be used for projects in three different states. Currently, two slots are available because two states did not meet the new time requirements per the FAST Act.[25] Missouri currently occupies the third slot with provisional approval and has until December 2018 to meet the ISRRPP program criteria.

- Toll revenue may be used for debt service, to provide a reasonable return on investment to any private party financing a project, operations and maintenance (including capital improvements) of the toll facility and payments between public and private partners in a public-private partnership (PPP). Toll revenues are not allowed to be used on other facilities. Toll facilities are required to undergo annual audits to ensure compliance with the limitations on the use of toll revenues. However, this pilot has yet to be used to impose tolls; therefore, it is unclear what the parameters for success resemble.

Value Pricing Pilot Program

Key components of the Value Pricing Pilot Program (VPPP) include the following:

- Experimental program that assesses the potential of different value pricing approaches for reducing congestion.

- Tolls may be imposed on existing toll-free highways, bridges, and tunnels, however variable pricing must be used to manage demand.

[24] FHWA Office of Innovative Program Delivery. 2016. Federal Highway Tolling Programs. https://www.fhwa.dot.gov/ipd/fact_sheets/tolling_programs.aspx

[25] FHWA. Road Pricing. 2017 Tolling Programs Federal Tolling Programs Interstate System Reconstruction and Rehabilitation Pilot Program. https://www.fhwa.dot.gov/ipd/revenue/road_pricing/tolling_pricing/interstate_rr.aspx

- Fifteen slots were created for the VPPP. Twelve slots are currently occupied by states (including Oregon) and two are occupied by cities.[26] Multiple projects can be completed by states/cities once accepted into the program.

- Tolling program requirements allow toll revenues to be used to mitigate the adverse effects of tolls on low-income drivers, in addition to project-related costs and other Title 23 uses. Toll facilities are required to undergo annual audits to ensure compliance with the limitations on the use of toll revenues. Project sponsors are required to monitor a number of project performance indicators for 10 years and that data will be compiled by FHWA for reports to Congress.

The VPPP has been successful at implementing tolling and variable pricing in Washington State, Minnesota, and Texas. The State of Washington used the VPPP to convert HOV to HOT lanes on SR 167.[27] Minneapolis participated in the VPPP to implement HOT lanes on the I-394 in order to mitigate congestion and improve highway facilities.[28] The state of Texas received approval under VPPP to implement HOT lanes on the Katy Freeway (I-10) in Houston for a total of four HOT lanes, two in each direction.[29]

FAST Act Provisions

Notable provisions on mainstream tolling and tolling pilot programs under FAST Act include:

- Consultation regarding tolls: Public authorities that operate a HOT lane or low-emission and energy-efficient vehicle toll lane located on the Interstate System and within a metropolitan planning area are required to consult with the metropolitan planning organization (MPO) for the area regarding placement and the tolling amount on the HOT lane.

- Performance of HOV facilities: If performance of an HOV facility regresses (i.e. average speeds fall below specified minimums), the public authority that operates the HOV lane is required to submit to the U.S. DOT a plan delineating the actions that will be taken to bring the facility into compliance with average operating speed performance standards through changes to the operation of the facility.[30]

- Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP): New time limits for an applicant to move from a provisionally-approved application to a complete application including completing the National Environmental Policy Act process and completing a toll agreement with the U.S. DOT. The time limits include:

[26] FHWA. 2017. Value Pricing Pilot Program Projects Report October – December 2016 Project Listing. https://ops.fhwa.dot.gov/congestionpricing/value_pricing/projects/all_projects.htm

[27] Washington State Department of Transportation. 2017. Tolling. SR 167 HOT Lanes. https://www.wsdot.wa.gov/Tolling/SR167HotLanes/default.htm

[28] FHWA 2017 Minnesota: HOT Lanes I-394 in Minneapolis https://ops.fhwa.dot.gov/congestionpricing/value_pricing/projects/involving_tolls/hot_lanes/mn_hotlanes_i394minn.htm

[29] FHWA 2017 Texas: HOT Lanes on the Katy Freeway in Houston https://ops.fhwa.dot.gov/congestionpricing/value_pricing/projects/involving_tolls/express_toll_lanes/tx_hotlane_katyfwy.htm

[30] U.S. Department of Transportation Federal Highway Administration (FHWA). 2017. Tolling and High-Occupancy Vehicles. https://www.fhwa.dot.gov/fastact/factsheets/tollingandhovfs.cfm

  - One year to have provisional approvals in place prior to the enactment of the FAST Act (December 4, 2015); and
  - Three years for provisional approvals subsequent to enactment of the FAST Act
- A State Department of Transportation (DOT) can extend provisional approvals by an additional year if certain conditions are met. The State must show progress toward the implementation and advancement of the project by the following: (1) substantial progress in completing the environmental review and permitting process for the pilot project under NEPA (2) funding and financing commitments for the pilot project; (3) expressions of support for the pilot project from State and local governments, community interests, and the public; and (4) submission of a facility management plan. [31]
- Over-the-road buses
  - The FAST Act amended 23 U.S.C. 129 and 23 U.S.C. 166 to expressly address access to toll or HOV facilities for over-the-road buses.
  - On toll facilities subject to 23 U.S.C. 129, the FAST Act requires the relevant public authority to allow over-the-road buses that serve the public to access the facility under the same rates, terms, and conditions as offered to public transportation buses.

3.2 State Legislative Authority to Toll

In Oregon, Oregon Revised Statutes Chapter 383 provides the Oregon Transportation Commission (OTC) with legal authority to establish toll roads and toll lanes, and there are no state restrictions on cities' or counties' implementing a tolling system on any highway under their jurisdiction as defined by Oregon state law 801.305.[32] In 2012, two tolling related amendments were adopted into the Oregon Transportation Plan (OTP) as strategies under OTP Goal 2: "Management of the System" and "Funding the Transportation System." These strategies fell under OTP statutes that apply to tolling. Relevant Oregon statutes related to tolling are found in Table 2.

[31] Ibid

[32] According to Oregon State Law (ORS) 801.305 a Highway is defined as "every public way, road, street, thoroughfare and place, including bridges, viaducts and other structures within the boundaries of this state, open, used or intended for use of the general public for vehicles or vehicular traffic as a matter of right."

Table 2 Tolling and Toll Way References in Oregon Revised Statutes

ORS Chapter/Section	Summary of Tolling/Tollway Applicability
267.200, "Transportation Districts," general power of districts	Allows for the establishment of mass transit and transportation districts for special uses.
267.320, "User charges, fees and tolls"	Allows the transportation district board to impose and collect user charges, fees and tolls from those who use the facility (toll way) operated by that district.
291.055, "Public Financial Administration," agency fees.	Sets rules on, and allows agency fees and exemptions, including tolls assessed under Chapter 383.
Chapter 366, "State Highways and Highway Trust Fund"	Requires "consideration of tolling prior to doing modernization project," and requires ODOT to determine what portion of the project construction and maintenance costs could be recovered through tolls, and for modernization projects requires tolls to be considered (among other factors) in determining whether to include the project in the Statewide Transportation Improvement Program.
Chapter 367, "Transportation Financing, Projects"	Sets rules for funding of transportation projects. Allows use of loans from the Oregon Transportation Infrastructure Fund for projects including toll ways, but requires the loan provisions to be subordinate to the provisions of establishing the toll way under Chapter 383.
Chapter 381, "Interstate Bridges"	Allows ODOT to build and operate bridges over the Columbia River connecting to Washington State, and allows assessment of tolls on such bridges to pay for construction, maintenance, and operating costs.
Chapter 382 "Intrastate Bridges"	Allows the Board of County Commissioners of Multnomah County to establish and collect tolls for the use of any bridge across the Willamette River.
Chapter 383, "Toll Ways" (Last updated 2007)	Establishes authority of OTC to approve a tolled facility and requires the Commission to establish rules under which the toll road would operate. Allows local agencies to build and operate toll roads. Allows cities or counties to create a toll way on roads under their jurisdictions. Also establishes a State Tollway Account, a separate account within the Highway Trust Fund, which ODOT may use for toll studies and projects. Allows ODOT to take possession of a toll way under certain adverse circumstances. Requires toll way to be designed to state-approved standards and requires compatibility with technology used in the State of Washington. Allows for toll collection, enforcement (including video or photo enforcement), and penalties for not paying a toll when required.
801.305	Defines highway and what constitutes a city- or county-owned facility.

Source: Parsons Brinckerhoff and David Evans & Associates, Inc. Geographic and Situational Limits Tolling White Paper #2

4.0 Policy Implications for Tolling

The policy implications for tolling, as with any other funding source, consider a wide range of topics and considerations, extending beyond simply traveling from Point A to Point B. The eight major goals for tolling, as listed below, can help organize and categorize the full policy implications.

1. **Revenue Generation:** Measured mostly in terms of (A) total yield and (B) how reliable the revenue stream is over time, but other metrics include leveraging private investment, indexing to inflation, and generating a bondable stream of revenue.

2. **Congestion Reduction:** Tolling is a user fee that sends a direct price signal to a driver, so an optimal toll amount applied at the right time and place can ensure that scarce space on the road is allocated efficiently.

3. **Equity and Environmental Justice:** Tolling may be more regressive than fuel taxes by placing a larger burden on low-income households. Subsidies or effective transit service can provide mitigation.

4. **Privacy:** Most methods of tolling have the potential to reveal a driver's origin, destination, route, speed, and time and date of trip. Tolling programs administered by transit agencies and DOTs ensure the privacy of motorists through modern cryptography and statutory protections.

5. **Administrative Effectiveness:** The ease of collecting and enforcing tolls has been increasing, while the cost to administer tolls has been declining. Nevertheless, tolling remains more expensive to administer and enforce than fuel taxes. The goal is to expand use of electronic toll collection to reduce costs to administer, collect, enforce (minimize evasion) and maintain.

6. **Public Acceptance**: A National Cooperative Highway Research Program (NCHRP) report on public opinion and tolls defines public acceptance as the "seeking of collective consensus from members of society about a certain issue, and is premised on their support for the issue concerned." In general public acceptance is cited as a key component of program implementation.[33] Certain tolling applications, such as variable pricing, gain public support after implementation as users get to experience the benefits of managed lanes. Most drivers also accept tolling on a new bridge or new highway lanes when toll revenues are dedicated to repaying constructions costs. Evidence from states that have tolling programs show public acceptance increases once tolling programs are implemented.

7. **Diversion:** Implementing tolls on roads and/or bridges can divert drivers if alternative routes are feasible. Identifying the impacts and level of diversion to non-tolled adjacent roads is critical prior to implementing a tolling system.

The subsections below describe the positive and negative policy implications of using tolling to achieve each of these goals.

[33] National Cooperative Highway Research Program. Synthesis 377 Compilation of Public Opinion Data on Tolls and Road Pricing. 2008. https://ibtta.org/sites/default/files/National%20Cooperative%20Highway%20Research%20Program%20data%20on%20opinion%20of%20tolling.pdf

4.1 Revenue Generation

The revenue generation potential from tolling must be understood within the context of current trends of Oregon's transportation funding portfolio. The state's portfolio of transportation funding has three principal sources: Fuel taxes account for almost 50 percent, truck weight-mile fees contribute 30 percent, and vehicle license and registration fees provide the remaining 20 percent. The state's economic and population growth has increased total fuel tax revenues by 5.6 percent in 2016. Fuel tax revenues are expected to slow considerably in 2017 and begin to decline in 2020. Since 2008, the aggregate vehicle mileage across the passenger car fleet in Oregon has increased between one and two percent a year, but did not improve in 2016.

This growth in total fuel tax revenues, however, does not account for the increased demand for roadway capacity. A more informative measure divides the total state fuel tax revenues by the vehicle miles of travel (VMT). When annual fuel taxes per VMT are adjusted for inflation, the trends show in constant dollars the purchasing power of Oregon's transportation funding relative to the demand for roadway construction, operations, and maintenance expenditures.

As vehicle mileage increases and more vehicles use alternative and untaxed fuels, fuel tax revenues will be hollowed out. Furthermore, this funding squeeze is exacerbated by the absence of indexing the fuel tax rate to maintain the purchasing power and the declining state-of-good-repair as the highway infrastructure reaches the end of its useful life. These trends present the need to consider other options: to increase fuel taxes, adopt new sources of funding (including tolling), or allow infrastructure to degrade further.

Against this back drop, Oregon, Washington, and California have evaluated the feasibility of replacing some or all of their fuel tax revenue with a statewide variant of tolling: road user charges (RUC). California's RUC experiment is on-going, but in the meantime the State Legislature just passed a comprehensive transportation funding bill (SB1) that raises $5 billion annually in perpetuity and increases funding 45 percent over current state levels.[34] RUC could be set to be revenue neutral relative to fuel taxes, but unlike fuel taxes, tolling would sustain the revenue yield regardless of improving mileage of the vehicle fleet or increased use of non-taxed fuels. Nevertheless, tolling revenues depend on the volume of vehicles paying tolls, which can fluctuate significantly according to business cycles, pace of development, diversions to alternative routes, and other factors. Furthermore, policies to ensure equity and political reluctance to index tolls to inflation or increase them for capital expansion will erode revenue generation. Equity policies often provide low-income drivers with toll exemptions or rebates. Political reticence to increase congestion pricing necessary to maintain minimum speeds would not only reduce revenue, but lead to increased congestion which in turn would deter more drivers from paying tolls and diverting to untolled lanes or alternative routes.

Other policy implications of tolling are more aggressive indexing to inflation, bonding against their revenue stream, and their frequent use to leverage private investment in PPP, especially to spur implementation of large projects. Public-private partnerships help deliver, operate, maintain, and in some cases, finance highway and transit infrastructure. They also encompass a range of contractual arrangements by which public (federal, state, local government, and special authorities) and private entities collaborate in the development, operation, ownership, and financing of a transportation infrastructure project or program, including recent long-term lease arrangements. In some cases, PPPs can even attract net new investment

[34] SB 1 taps six different sources: including a 12-cent per gallon gas tax, vehicle registration surcharge, $100-per-year zero emission vehicle fee, 20-cent-per-gallon diesel excise tax; 4% increase in diesel sales tax. And General Fund loan repayments. The first four are index to inflation.

capital that otherwise might not be available. Public-private partnerships appear to be best suited for large, complex projects with strong governmental support. They can provide substantial benefits in terms of accelerating project development and construction, transferring construction and performance risk away from government, providing more efficient operation and superior service, and introducing new technologies.

4.2 Congestion Reduction

While motor fuel taxes and the other indirect user charges are technically user charges, they send very weak if any pricing signals to most motorists. The minimal linkage between the amount paid at the pump and the benefits derived from using a roadway at a particular time and place limit the economic benefits of fuel taxes to some vehicle owner's greater inclination to purchase higher mileage cars and reduce their VMT when fuel prices are high. This inclination, however, has been undermined for the past two and a half decades by car manufacturers producing vehicles with more horse power without increasing fuel consumption.

Toll roads can serve a dual purpose – they generate a new funding source and they can manage demand if the toll is varied by level of congestion (i.e., congestion pricing). Congestion pricing discourages drivers from using a congested road at peak usage times by diverting the most price sensitive drivers to transit or carpool, choosing a different route, off-peak time of day, different destination, consolidate trips, or forgoing trips entirely. The reduced congestion results in higher speeds and increased throughput for all travelers using the tolled lane or highway. Toll rates may be adjusted to maximize a lane or highway's throughput, this achieves the maximum revenue possible at the optimum level of congestion.[35] Tolls rates below this sweet spot would allow too much congestion that reduces throughput, and tolls above the sweet spot deter optimum use and reduce revenues. Table 3 shows the general likelihood of congestion reduction by tolling application.

Table 3 Ability of Tolling to Achieve Congestion Management Objectives

Application	Reduce Recurrent Delay & Improve Travel Time Reliability
New terrain toll road New toll bridge New toll tunnel	Likely yes, at least in the short to mid term
HOV to HOT conversion	Yes, provided that toll policies are in place to minimize impacts to existing HOV users
New HOT lane	Yes, as an added lane
General purpose (GP) lane to HOT lane conversion	Yes for HOT lane users; will likely worsen travel time and delay for GP lane users; need to examine potential diversion onto other routes
New express toll lane (ETL)	Yes, as an added lane
GP lane to ETL conversion	Possibly yes on ETL, potentially no or worsen on GP; need to examine potential diversion onto other routes
Replacement bridge as toll bridge (potentially with expansion)	Likely yes, at least in the short term, due to added capacity; need to examine potential diversion onto other routes
Convert existing freeway to toll way	Likely yes, at least in the short term, due to added capacity; need to be careful about unintended consequences such as diversion onto parallel routes

Source: Geographic and Situational Limits Tolling White Paper #2 Parsons Brinckerhoff and David Evans & Associates, Inc.

[35] In economic terms, this optimal balance between toll rate and throughput is when the marginal cost (i.e. the toll the last driver is willing to pay to achieve the travel time savings from using the tolled facility) equals the marginal revenue (i.e., maximum toll revenue)

4.3 Equity and Environmental Justice

Concerns around equity and environmental justice are often raised regarding actual and perceived effects tolls have on low-income individuals' ability to access jobs, activity centers, medical care, and education. These concerns focus on the ways paying for driving will affect low-income and transportation disadvantaged groups to engage in travel required for daily activities.

The current methods of funding transportation in Oregon are regressive. Motor fuel taxes, which contribute about half of the State transportation funds, were more regressive in the past decades when lower-income households owned disproportionately more low-fuel-mileage vehicles. As the fleet of more fuel efficient vehicles has become more affordable, low-income households own more fuel efficient cars. Nevertheless, even accounting for the lower car ownership rate and higher public transit use among low-income adults, lower-income households still spend a greater share of their income on fuel taxes and registration fees than do higher-income households.

Since 1976, higher fuel economy standards were applied to new vehicles and have increased ever since.[36] Although the new, more fuel efficient cars were purchased by higher income households, these vehicles were eventually resold as used vehicles to lower-income households at lower prices. So, despite not paying the initial cost premium of purchasing a new vehicle, low-income households do not start to benefit from savings associated with greater fuel efficiency until after the vehicles are resold.

Tolling a specific roadway often forces low income drivers to divert to alternative un-tolled routes or modes. If these alternatives are not feasible, research shows that lower income drivers are adversely impacted because they are more likely to be unbanked and thus lack access to credit cards or pre-payment accounts required for ETC scanning methods, such as a transponder, or optical reader technologies. While services such as allowing cash payments and service centers can mitigate this impact to low income populations, they are more likely to endure longer waits at these manual payment centers. However, other solutions are becoming more common, such as subsidized tolling accounts through social service agencies.

Discounts, exemptions from toll programs, and improved transit service and options are common methods of mitigating equity concerns. Nevertheless, these methods, which involve reducing congestion charges paid and excluding certain persons from paying, weaken a tolling mechanism's function to generate revenue and reduce congestion, since fewer people will be paying the tolls. Once tolling programs are implemented, agencies generally extend exemptions to transit vehicles, emergency responders, carpools, and motorcycles. The success of tolling and other congestion pricing applications relies on the aggregate of motorists paying into the tolling system.[37]

[36] The Corporate Average Fuel Economy (CAFE) standards were first enacted in 1975, after the 1973-74 Arab Oil Embargo, and have improved the average fuel economy of cars and light trucks from about 18 miles/gallon in 1978 to almost 36 mpg in 2016.

[37] RAND Corporation, 2009. Equity and Congestion Pricing: A Review of the Evidence. http://www.rand.org/content/dam/rand/pubs/technical_reports/2009/RAND_TR680.pdf

4.4 Privacy Issues

All of the operating pricing projects in the United States and more than 250 other toll facilities across the country use electronic toll collection (ETC). ETC, by its nature, needs to identify a customer at a particular time and place in order to collect revenue. Virtually all electronic tolling systems operate on an opt-in concept. If an individual decides to pay electronically, he or she has to agree to have certain information logged. If the individual does not want that information recorded, some systems allow users to pay cash or open an anonymous pre-paid account.[38]

Tolling agencies have devised methods to protect the public's privacy by linking the transponder and the driver's personal information with a generic, internal account number that does not reveal the driver's identity and that is not disclosed to other organizations. Modern cryptography can deploy road tolls without creating a record of geographic location.[39] Nevertheless, the attitudes among younger generations, especially Millennials, Gen-Xers and Gen Ys, are far less concerned about privacy than older generations.

4.5 Efficiency and Administrative Costs

This criterion refers to the cost and ease of administering each fee or tax system for the agency and minimizing evasion and logistical hassle imposed on the public. Some of the most cost- and transaction-efficient collection systems are those that piggyback on other payments at the point of sale, including fuel taxes and sales taxes. Motor fuel taxes and vehicle registration fees are not widely evaded and are not cost-intensive to collect. In 2015, Oregon went to an online system and the estimated costs to the State to collect fuel taxes dropped from 0.4902 percent in fiscal year 2015 to 0.3277 percent in fiscal year 2016. This low cost is because about 90 percent of fuel taxes in Oregon are collected from 161 motor fuel dealers, who pay the tax at “first sale” at each of the state’s nine fuel terminals.[40] This concentration makes the motor fuel tax a relative easy tax to administer and enforce. The national average for fuel tax evasion is estimated to be $1 billion annually and 25 percent of total revenues.[41] The 25 jurisdictions that charge supplemental motor vehicle excise taxes report significant evasion.[42]

Until ETC became ubiquitous, road and bridge tolling required the user to make a unique payment solely for the purpose of paying a fee, but ETC and the expanding number of retail and online outlets for obtaining a toll transponder has reduced the inconvenience to users. Automation and retail strategies have made toll paying reasonably streamlined, less expensive and more efficient administratively. Nevertheless, the

[38] The German Toll Collect system fits each registered vehicle with a GPS unit that gathers data about its usage. The GPS unit can then be interrogated to generate a bill. Once the bill is paid, the usage data is erased from Toll Collect’s systems; thus, there is no central record of the vehicle's movements.

[39] Blumberg, Andrew J.; Eckersley, Peter. 2009. On Locational Privacy, and How to Avoid Losing it Forever. Electronic Frontier Foundation

[40] About 9.5% of the remaining 105 is collected from 611 use fuel sellers, which are retail stations that sell natural gas, propane, diesel and bio diesel. The 0.5 percent is collected from 1,057 special use fuel users: e.g., farms, UPS and FedEx depots, large industrial users, who self report and pay.

[41] FHWA. 2011. Preventing Fuel Tax Evasion: Developing a Real-Time Fuel Tax Evasion Detection Solution. https://www.fhwa.dot.gov/advancedresearch/pubs/12020/12020.pdf

[42] Portland has 10-cents per gallon supplemental tax, and 2 counties and 22 cities have 5-cents or less.

administrative cost of tolling also includes back-end accounting and enforcement. Many of these operations have been outsourced to private, for-profit vendors. A 2012 study estimated that all electronic tolling operations in the United States have net collection costs of about five percent for a $5.00 toll and about eight percent for a $2.00 toll.[43] A 2010 analysis of eight facilities (bridges and highways) displayed costs of collection between 12 and 20 percent of annual revenues.[44]

Evasion depends on the type of system used. A physical barrier, such as a gate arm, is highly effective but inefficient because vehicles passing through must slow to a near-stop at the toll gate, negating much of the speed and capacity benefits of electronic tolling. Automatic number plate recognition, now being used as a primary vehicle identification method in some applications (e.g., Golden Gate Bridge, London's cordon pricing) and the much more ubiquitous ETC transponder method, allow users to travel at close to full speed. A growing number of states are sharing information on toll violators, so a violator's home state motor vehicle agency can block the renewal of the vehicle's registration until the toll is paid. Toll authorities are also using collection agencies and litigation for habitual toll violators with large unpaid debts. Many toll agencies also publicize a list of habitual toll violators through media outlets and newspapers.

4.6 Rural versus Urban

In general, tolls are more likely to be implemented in urban areas, as urban roads, highways and bridges experience, on the whole, more congestion than rural regions, thus having the potential to generate enough revenue to pay for tolling operations and maintenance. For example, the use of cordon pricing, which involves either variable or fixed pricing to drive within or into a congested urban area, would have a disproportionate impact on those who drive into the tolled area (likely a central business district). Tolling a stretch of roadway or bridge will be most likely along an urban corridor and thus impact urban motorists much more than rural ones. A statewide application of a per-mile toll that would replace fuel taxes, however, may or may not increase costs for rural households compared to their out-of-pocket per-mile costs for the State's current fuel tax. While the public perception in rural areas and conventional wisdom posits that rural households drive further distances to reach certain goods and services, rural household travel behavior suggests that they make fewer trips on average than urban households. Other research shows that rural households drive less fuel-efficient vehicles on average than urban households, which could result in a per-mile savings under a per-mile toll compared to the current fuel tax.[45] A 2016 report entitled *Road Usage Charge Economic Analysis* indicates that rural users under a RUC program would not be significantly impacted and that households in urban locations may pay slightly more than their rural counterparts.[46] Nevertheless, an ODOT public opinion survey in 2013 showed that many Oregonians believe that households in rural areas would be the "losers" under a per-mile road RUC program.[47]

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[43] Daryl Fleming and Robert Poole, Reason Foundation. 2012. Dispelling the Myths: Toll and Fuel Tax Collection Costs in the 21st Century.

[44] WSDOT. 2007. Comparative Analysis of Toll Facility Operational Costs.

[45] McMullen, B.S., L. Zhang, and K. Nakahara. 2010. Distributional Impacts of Changing from a Gasoline Tax to a Vehicle-Mile Tax for Light Vehicles: A Case Study of Oregon. Transport Policy, Vol. 12, No. 6, 2010, pp. 359–366.

[46] Oregon State University. 2016. Road Usage Charge Economic Analysis Final Report. http://www.oregon.gov/ODOT/TD/TP_RES/ResearchReports/SPR774_RoadUsageCharge_Final.pdf

[47] Oregon Department of Transportation (ODOT). 2013. Final Report on Impacts of Road User Charges on Rural, Urban, Mixed, and Eastern Oregon Counties. http://www.oregon.gov/ODOT/HWY/RUFPP/Road%20Usage%20Charge%20Program%20Documents/08-Impacts%20of%20Road%20Usage%20Charging%20in%20Rural,%20Urban,%20Mixed%20Counties%202013.pdf

The rural versus urban distinction, therefore, may not apply accurately to Oregon. Rather, the divide may be more east-west, where the state's sparsely populated eastern half has large distances between towns. West of the Cascades, the urban driving patterns in the major cities contrasts with the isolated communities on the Oregon coast, so the cost impacts of a per-mile charge on households may vary by region rather than a simplistic rural versus urban assessment. Furthermore, the equity of a per-mile toll depends on how the money is spent as much as how it is collected. An analysis of expenditures may reveal that households in rural, eastern, or coastal Oregon receive more spending per capita or per vehicle miles of travel than their urban or western counterparts.

4.7 Public Acceptance

Federal and state motor fuel taxes have sustained widespread public acceptance of user fees that support the construction and maintenance of highways. The best measure of this acceptance is their continued use over almost 100 years. Nevertheless, elected officials perceive opposition to increasing or indexing fuel taxes as stronger today than at any time in the past, despite rather muted public reactions to routine price fluctuations of 50 percent or more in fuel prices. Only Florida, Maryland, New York, Maine, and recently California, currently index their gas tax to the consumer price index.[48] Public acceptance has grown for tolling but remains less supportive than for fuel taxes overall. Major findings from the Washington State Department of Transportation show that variable pricing has the most public support after implementation as users get to experience the benefits of managed lanes. Additional findings suggest that the public favors choices when it comes to tolling, including tolled and "free" routes and public support increases once motorists realize the tangible benefits of less congested and more reliable lanes.[49]

The Oregon Road Usage Charge Program (ORe*GO*), included a statewide telephone survey as a baseline before deployment in 2014, and a mid-pilot online survey in June 2016.[50] These surveys provide the most extensive and recent assessment of public acceptance toward road user charges or tolling available. The results provide some simple and also nuanced findings that are difficult to summarize. The following summaries from the surveys convey two snapshots of Oregonians understanding and acceptance of tolling at the start of the program in 2014 and a mid-point in 2016:

- **There is limited understanding of how transportation is funded -** Findings in 2014 and 2016 show 60 percent versus 64 percent of respondents did not know they were paying 49 cents per gallon in fuels tax, respectively. One in 10 (11 percent) were unaware that they were paying a fuels tax.

- **Residents are not particularly supportive of any alternative funding options** – Respondents in both 2014 and 2016 were most supportive of tolls on specific highways and bridges where improvements are being made (43 percent), increasing the vehicle registration fee (36 percent), increasing the fuel tax (35 percent): implementing a vehicle sales tax (32 percent); or a road usage charge (31 percent).

- **Increased familiarity and support for RUC being a fair funding option -** From 2014 to 2016, 10 percent more respondents were somewhat familiar with the concept of a RUC, and 19 percent more (56

[48] AASHTO. 2016. Transportation Governance and Finance A 50 State Review of State Legislatures and Departments of Transportation. http://financingtransportation.org/pdf/50_state_review_nov16.pdf

[49] Washington State Department of Transportation. 2007. Pricing Acceptance Public Opinion Analysis. http://www.wsdot.wa.gov/sites/default/files/2011/05/24/Appendix_A_Public_Opinion_Analysis_web.pdf

[50] ODOT. 2016. Executive Summary: Oregon Statewide RUC Public Opinion Survey. https://www.oregon.gov/ODOT/HWY/RUFPP/Sept%202016%20Meeting%20Materials/ItemB3_June2016%20OR%20StwdeRUCPubOpSurv_ExecSumm.pdf

percent) somewhat to strongly agreed that a mileage-based system is fair, with 18 percent strongly supportive of a road usage charge program in Oregon and over 44 percent neutral to strongly supportive.

- **Concerns on unfairness for rural drivers** - Both 2014 and 2016 results show 46 percent believed that road usage charges penalize people in rural areas.

- **Undercharging out-of-state drivers** - Approximately 43 percent fear RUC would not properly charge those who cross state lines frequently, an increase of 9 percent between 2014 and 2016.

- **Raising taxes and penalizing people who buy fuel efficient vehicles** - In 2016, 27 percent of respondents regarded RUC as just another way Oregon can tax more people and 20 percent believed that it penalizes people who buy fuel efficient vehicles.

- **Concern for privacy has decreased** - Extreme concern about privacy decreased 12 percent, from 29 percent in 2014 to 17 percent in 2016. Nevertheless, 64 percent reported feeling very concerned or moderately concerned over the privacy and security of their data.

- **Fairness of road usage charge to fund transportation improvements** - In 2016, 32 percent agreed that RUC seems like a fair way to fund transportation improvements versus 33 percent regarding its as unfair, a 17 percent decrease from 2014, and 26 percent were indifferent.

4.8 Diversion

Diversion is defined as choosing an alternative to paying a toll and is inherent when tolling is implemented, as most motorists are sensitive to toll rates. Diversion is not limited to driving on adjacent un-tolled facilities. Some people divert to public transit, change destinations, or forgo a trip altogether. Studies show that if an alternate route is not available near the tolled facility, motorists will continue on with their trip. If there is an easily accessible alternative route or transit service, diversion could be significant. Tacoma Narrows Bridge in Washington, for example, has no alternative routes and the alternative modes are an expensive and much slower ferry or public transit. As a result, most people continued to use the tolled bridge to get to their destinations.[51] Diversion, however, can be significant for tolled roadways where alternative routes are feasible. The potential for diversion becomes critical for private sector tolling projects where investors seek assurances that publicly-funded future improvements to parallel roadways will not provide sufficient incentives to divert traffic off the tolled facility.

[51] Washington State Department of Transportation. 2011. Final Report: Awareness and Acceptance of Pricing Project. http://www.wsdot.wa.gov/NR/rdonlyres/FEC5D940-5B5E-4DE2-A3A3-E20B85894BDB/0/AAPReport052711.pdf

5.0 Congestion Pricing Case Studies

This section describes two regions that have successfully implemented tolling as a revenue generating mechanism to fund the construction and operation of tolling facilities and other regionally significant transportation projects and improvements. The tolling case studies in these two regions share similar toll policy objectives to Oregon and both regions used VPPP grants and authorization. The shared goals include the use of toll revenues to fund major projects, improve person throughput on congested corridors, and in the case of Dallas Ft. Worth, the application of three different types of tolling to test their effectiveness at achieving revenue generation and congestion management goals.

5.1 Puget Sound Region, Washington

The State of Washington has successfully integrated tolling to address different goals and objectives, including: serving as a funding mechanism to pay for projects, helping manage congestion, and improving mobility for its residents and visitors. Beginning in 2007, WSDOT has implemented four toll facilities in the state:

- SR 16 Tacoma Narrows Bridge
- SR 167 HOT Lanes Pilot Project
- SR 520 Bridge Floating Bridge
- I-405 Express Toll Lanes (North Half)

Tacoma Narrows Bridge

The Tacoma Narrows Bridge, located in the northern part of Tacoma, connects the city with the Kitsap Peninsula. The construction of a second span of the Tacoma Narrows Bridge was developed through a public-private partnership (PPP). Electronic tolling was implemented on the bridge in 2007 to generate enough revenue to repay the construction debt. The use of tolls on the Tacoma Narrows Bridge was the first time in Washington's history that a toll had been added to an existing toll-free corridor. Currently, the eastbound part of the bridge has fixed toll rates that only generate enough revenue to repay construction bonds. The tolls do not have a time of day pricing rate structure.[52]

SR 167 HOT Lanes

State Route (SR) 167 connects I-5 in Tacoma with I-405 in the City of Renton in King County, Washington. HOT lanes were implemented on SR 167 as a part of the VPPP, with project goals including: freeway efficiency and safety; faster express bus service (two lines); toll revenues for funding capital improvements and operations; and the impacts on all highway users. The project included conversion of an existing HOV lane to a HOT lane with dynamic pricing based on real time traffic conditions. In 2016, the SR 167 HOT lanes generated $1.4 million in revenue, which was $365,000 below the forecasted revenue. Toll revenues from the SR 167 project help fund infrastructure and maintenance of the toll facilities, toll lane vendor contracts

[52] FHWA. 2011. Congestion Pricing A Primer: Metropolitan Organization Case Studies. https://ops.fhwa.dot.gov/publications/fhwahop11030/cm_primer_cs.htm

and enforcement (Washington State Patrol).[53] The total project length was nine miles southbound and 11 miles northbound with one HOT lane in each direction.[54]

Results on the performance of the SR 167 HOT lanes, derived from an independent analysis of the Washington State Transportation Center (TRAC), indicate the following:

- Travel times in the general purpose lanes are more reliable than before the HOT lanes opened
- Since opening the HOT lanes, peak-period traffic is moving more efficiently. On average, daily general purpose lane volumes have decreased 4 to 5 percent, while speeds have increased 8 percent, and daily HOT lane volumes have increased 15 percent, while speeds have remained around the posted 60 mph speed limit.
- Preliminary data indicates that the average number of collisions is down 4 percent when compared to the five year average prior to HOT lanes opening in 2008.
- Overall public response was positive
- Transit operators experienced seamless and safer access to HOT lanes, which has helped with maintaining transit schedules

SR 520 Bridge

The SR 520 floating bridge provides a major east-west roadway crossing across Lake Washington, within King County. The Washington legislature established the 520 Tolling Implementation Committee to evaluate tolls as a method of funding a portion if the SR 520 Bridge as well as to engage the public, jurisdictions, and business interests on the impacts of tolling and other key issues including:

- Funding a portion of the SR 520 Program with tolls on the existing bridge
- Funding the SR 520 Program and improvements on the I-90 Bridge with a toll paid by drivers on both bridges
- Providing incentives and choices for transit and carpooling[55]

The SR 520 was chronically congested prior to tolling. Variable-priced, open road tolling began in 2011 and was implemented with a $154 million Federal Urban Partnership Agreement Grant and the VPPP slot.[56] The Urban Partnership Agreement Grant provided funding for technology and transit improvements. According to

[53] Washington State Department of Transportation. 2017. Statement of Revenues, Expenditures, and Changes in Funds Balance. https://www.wsdot.wa.gov/sites/default/files/2005/10/07/HOTLANESFSFY17Q3.pdf

[54] FHWA. 2010. SR 167 HOT Lanes Pilot Project SR 167, Seattle WA HOT Lanes Project. https://ops.fhwa.dot.gov/freewaymgmt/publications/documents/nrpc0610/workshop_materials/case_studies/seattle.pdf

[55] Washington State Department of Transportation. 2011. Final Report Awareness and Acceptance of Pricing Project. http://www.wsdot.wa.gov/NR/rdonlyres/FEC5D940-5B5E-4DE2-A3A3-E20B85894BDB/0/AAPReport052711.pdf

[56] The State of Washington is one of 15 states that participate in the VPPP. Once an agency holds a slot in the program, then there is no limit on the number of value pricing projects that can be implemented under the slot.

the WSDOT, "preliminary observations show that tolls help pay for the replacement of the SR 520 Bridge and variable tolls reduce congestion and improve reliability."[57]

I-405 Express Toll Lanes – Phase I

One of Washington State's more recent toll projects includes Phase I of I-405 Express toll lanes, launched in September 2015. According to the I-405/SR 167 Corridor Funding and Phasing Report, "the Washington State Legislature authorized construction of express toll lanes between Bellevue and Lynwood in 2011. One northbound and southbound lane was constructed to serve as an express toll lane." An HOV lane already in operation on the I-405 was converted to an express toll lane.[58] The first phase of the I-405 express toll lanes include 17 miles of dynamically priced toll lanes between the cities of Bellevue and Lynwood and operate on weekdays between 5 a.m. and 7 p.m. Prior to the conversion of express toll lanes, the HOV lanes were severely congested, impacting reliability for motorists.

Revenue generated by the I-405 express toll lanes covers the facility's operation and maintenance costs with the remaining revenue used for I-405 corridor improvements. According to the I-405 Express Toll Lanes One Year Update, "Over the first year of operations, the I-405 express toll lanes generated $21.6 million in revenue, including $17.5 million toll revenue, $1.8 million in Good To Go! pass revenue, $1.5 million in civil penalty revenue, and $760,000 in other revenues. Operation and maintenance costs were $8 million."[59]

As shown in Table 4, the Legislature directed the WSDOT to monitor and report on seven performance metrics on a quarterly basis. Key findings for each performance metric are included in Table 4.

[57] Connecticut Department of Transportation. 2014. Tolling in Washington State Presentation. http://www.ct-congestion-relief.com/documents/Washington%20State%20Stone%20I-95%20presentation.pdf

[58] Washington State Department of Transportation. 2014. I-405/SR 167 Corridor Funding and Phasing Report. https://www.wsdot.wa.gov/sites/default/files/2009/12/29/I405_FundingPhasing_Jan2014_Web.pdf

[59] Washington State Department of Transportation. 2015. I -405 Express Toll Lanes One Year of Operations. http://www.wsdot.com/sites/default/files/2017/01/09/I-405_ETL_12MonthUpdate_Report_010516_FINAL_WEB.PDF

Table 4 I-405 Performance Metrics

Legislative Monitoring Requirement	Key Findings
Whether the express toll lanes maintain speeds of 45 miles per hour at least 90 percent of the time during peak periods.	• From October 2015 to September 2016, express toll lanes met the target goal of 45 miles per hour for an average of 88 percent of time.
Whether the average traffic speed changed in the general purpose lanes.	• Compared to the prior year, the general purpose lanes moved vehicles an average of one mile per hour faster northbound and five miles per hour faster southbound.
Whether transit ridership changed.	• In the first year of operations, transit agencies (Community Transit and King County Metro) reported increased ridership on routes operation on the I-405.
Whether the actual use of the express toll lanes is consistent with the projected use.	• Motorists took 15 million trips in the first year compared to the 12 million trips forecasted (based on a June 2016 forecast) • The number of tolled trips were higher than forecasted by 95 percent. • The number of toll exempt carpool trips (with three or more persons) were lower than forecasted by 38 percent.
Whether the express toll lanes generated sufficient revenue to pay for all I-405 express toll lane operating costs.	• Within the first year of operations, I-405 express toll lanes generated 21.6 million in revenue. Operation and maintenance costs were $8 million.
Whether travel times and volumes have increased or decreased on adjacent local streets and state highways.	• In August 2015, traffic volumes were collected on arterial routes parallel to I-405, the same data was collected in August 2016 for comparison year-over-year. Local arterial volumes remained about the same comparing before and after express toll lanes.
Whether the actual gross revenues are consistent with projected gross revenues as identified in the fiscal note for Engrossed House Bill No. 1382 distributed by the office of financial management on March 15, 2011.	• Actual gross revenue for the first year was $21.6 million, consistent with the March 2011 estimated range.

Source: Washington State Department of Transportation. I -405 Express Toll Lanes One Year of Operations Report.

5.2 Dallas / Fort Worth, Texas

The Dallas-Fort Worth Region experiences significant congestion and has implemented tolling as a way to generate revenue to fund transportation projects and improve reliability for motorists throughout metropolitan areas.

The comprehensive highway expansion needs in the Dallas-Fort Worth region, led the North Central Texas Council of Governments (NCTCOG) to consider tolling as a means of reducing overall public expenditures related to extensive highway improvements. A forthcoming policy from NCTCOG reflected this perspective which requires that all new limited access highways be evaluated for toll potential and highway reconstructions are to include value pricing if deemed appropriate. Overall, NCTCOG frames congestion pricing as means to achieve key regional objectives including economic vitality, safety, accessibility and mobility and promoting environmental protection.[60] Three types of tolling applications were evaluated for the Dallas-Fort Worth region including: traditional toll roads, HOT lanes, and stand-alone express managed lanes. One of these involved NCTCOG and its partners applying for a VPPP grant to implement a demonstration project in the Dallas-Fort Worth Region. Based on the evaluation of the six facilities, I.H. 30 was selected as the candidate demonstration project. The managed lanes on I.H. 30 received authorization and a $416,000 VPPP award for implementation of value pricing. The plan at the time of the application was to upgrade the I.H. 30/Tom Landry Freeway corridor to five mixed lanes of traffic in each direction, with a single reversible HOV lane. The VPPP grant was used to revise the facility design to accommodate a multi-lane, managed/HOV facility in place of a single lane, HOV-only facility.

Excess revenue generated from the managed facilities is used to fund transportation projects including toll facilities, non-toll facilities and some transit projects. Additional revenues that remain once construction and maintenance/operations are funded are divided using the concept of “near neighbor, near time frame.” NCTCOG defines this policy as follows:

Near neighbor:

- Seventy-five percent of revenue stays in the county where the revenue is collected; and
- Twenty-five percent of revenue goes to the rest of the region based on the distribution of home locations of toll tag users in January of that year.

Near timeframe:

- Seventy-five percent up front; and
- Twenty-five percent over time.

In light of the NCTCOG region’s pricing policies to fund highway expansion needs, the region continues to focus on environmental justice issues in relation to their tolling policies. NCTCOG coordinates with the FHWA and the Texas Department of Transportation to ensure the tolling policies would not cause adverse equity impacts to low-income populations.

[60] Ibid