Road Usage Charge Pilot Program 2013

& Per-Mile Charge Policy in Oregon

Oregon Department of Transportation

Preface

CONTENT

This document describes Oregon's development of road usage charging policy from 2007 to present, including the innovative Road Usage Charge Pilot Program (RUCPP) conducted from November 2012 to March 2013. Following the pilot, the Oregon Legislature enacted Senate Bill 810 in July 2013, directing the Oregon Department of Transportation (ODOT) to deploy the nation's first road usage charging system by 2015.

Oregon's latest approach to road usage charging—providing motorists choices for wireless mileage reporting with access to private sector services under an open system—emerged unexpectedly. A few months after the conclusion of Oregon's first per-mile charge pilot program (the Road User Fee Pilot Program) the relationship between consumers and their electronic devices changed dramatically: Apple Inc. launched the iPhone on July 29, 2007 with Google's Android open platform following a few months later and the first Android Smartphone, the HTC Dream, released on October 22, 2008.

The combination of features in a smartphone—mobile Internet access, telephony, email and most importantly an enormous range of apps—increased worldwide demand for mobile computing technology exponentially. The impact of having a handheld, powerful, mobile computing device sending and receiving data wirelessly in vast quantities suddenly gave consumers an infinite range of choices for where, when and how they connected and communicated, as well as how they paid for services.

In comparison with the development of mobile smartphone models and apps, the 2006-2007 Road User Fee Pilot Program technology design was limiting. With nascent freedom to choose from a number of handheld, mobile, wireless computers in the marketplace, why would people consent to the government selecting a GPS box for their car? When ODOT recognized the tidal shift in the public's mindset brought about by the smartphone revolution, it was clear that drivers should choose their technology from the market.

In tandem with the impact of this technological revolution, the need for a road usage charge had only increased since the time of the Road User Fee Pilot Program. Each year since 2005, fleet average fuel economy increased nearly 1 mile per gallon, while automakers began to introduce highly efficient, plug-in, hybrid models and electric vehicles that consumed little or no gasoline. Although a boon for energy and environmental policy goals, these trends began to undermine fuel tax revenues—even as the costs of roadway maintenance continued to increase. This trend, combined with the new user choice approach to road usage charging, set the stage for the RUCPP.

One envisions a time when all new cars will come equipped with mileage reporting capability. New car buyers will decide during the registration process whether to activate the mileage reporting capability already installed into the car or add an external reporting device. They will also choose a provider for account management or default to government managed account.

Motorists will then drive and periodically receive a bill by mail or email—their choice—that may be bundled with other value added services. After all, the Road Usage Charge Program is, in essence, a mobile billing system that can easily accommodate charges for other road and driver related services.

A motorist's bill will contain a charge for distance driven, an automatic fuel tax credit and a net amount to pay. Motorists may check the bill details and pay online or by mail or authorize automatic payment from their smartphone, tablet device or the connected vehicle console in the dashboard of their car. Giving motorists the ability to choose their mileage reporting and bill payment preferences will make mileage reporting and per-mile charge payment simple and comfortable—as each motorist defines it.

This vision can happen sooner than one might think. Many new vehicles already contain factory-installed telematics (sometimes called infotainment systems) that could be used to wirelessly report miles driven. A market for this type of data connectivity is already emerging. State Farm Insurance Company recently made an arrangement with Ford Motor Company for reporting miles using Ford's Sync telematics for pay-as-you-drive auto insurance policies. Other auto insurance companies are following suit. Similarly, smartphone data plan bills are already commonly bundled with telephone, cable and parking services.

Like any new venture, achieving this vision requires patience. Some may not support the progress of road usage charging. But there is no question that mileage charging technologies and systems will continue to evolve, making road usage charging ever easier. Before long, automakers and pay-as-you-drive auto insurance providers should see a business case for leveraging mileage reporting as a means for reaching an entirely new class of customers.

Oregon's second per-mile pilot program, the Road Usage Charge Pilot Program, demonstrated the essentials of future road funding options. Pilot participants—including eight state legislators—attested that the revamped road usage charge system was not only accurate, but also simple and easy to use.

Oregon state legislators trusted the pilot results enough to pass Senate Bill 810. This bill directs ODOT to create the nation's first road usage charge operational program. Though the first application will be for volunteer payers, the strength of the vote—24 to 6 in the Senate and 47 to 13 in the House —indicates that once the road usage charge program proves to be an operational success, the Oregon legislature intends to add mandated payers. After 12 years of trailblazing, Oregon has finally found the pathway to the future of road funding.

James Whitty
Salem, Oregon
February 2014

Executive Summary

The state of Oregon pioneered the "user pays principle" in 1919, charging a gas tax to drivers for road maintenance. In 2001, state legislators recognized that hybrid and all-electric vehicles would pay less or no fuel tax, and that these vehicles would see increasing adoption. Given this trend, the state accepted that a gas tax was no longer an equitable means of raising revenue for road maintenance, and that a distance-based road user fee posed a more feasible alternative. The independent Road User Fee Task Force was established that year to develop recommendations and ultimately a final design for revenue collection for Oregon's roads and highways.

In 2012-2013, ODOT embarked on the Road Usage Charge Pilot Program (RUCPP). This built on lessons learned in the state's first pilot, the 2007 Road User Fee Pilot Program—particularly the public's privacy concerns—and incorporated the most current technologies for reporting mileage and administrating payments.

A total of 88 drivers from three states participated in the second pilot program, along with two private vendors. This pilot satisfied the four major goals to achieve public acceptance that had been established: ease of use, motorist choice, open systems, and private sector administration. Drivers were charged 1.56 cents per mile; revenue exceeded fuel tax receipts by nearly 28%.

Drawing on the success of Oregon's Road Usage Charge Pilot Program, the state passed legislation (Senate Bill 810) establishing the nation's first mileage-based revenue program for light vehicles. The program, slated for launch in 2015, will engage up to 5,000 initial participants who will be charged 1.5 cents per mile driven.

Representatives from 15 U.S. states attended ODOT's 2013 Road Usage Charge Summit discussing Oregon's mileage-based revenue program, demonstrating great potential for broader adoption of such a program.

CHAPTER ONE
Introduction & History of Road Use Charging in Oregon

Oregon Road Usage Charge Program

The state of Oregon pioneered the "user pays principle" in 1919 by implementing a gas tax to fund road building and maintenance. The state recognized that hybrid and all-electric vehicles would pay less or no fuel tax, and that these vehicles would be quickly adopted. The Road User Fee Task Force was created to assess the situation, and selected a distance-based road user fee as the most feasible alternative to the fuels tax.

This report explains the policy and technical developments that led to an expansive reworking of Oregon's per-mile charge concept in 2010 and 2011. It summarizes and assesses the operations and results of the 2012-2013 Road Usage Charge Pilot Program. It also explains how new policies and the pilot's results led to passage of the first per-mile charge legislation in the United States for implementing a permanent, operational road usage charge program. It lays out the Oregon Department of Transportation's plans to implement that program and concludes with how the Oregon law addresses the most important policy issues related to distance-based charging.

The Road Usage Charge Pilot Program was Oregon's second pilot program testing per-mile charge operational concepts. The first pilot, the Road User Fee Pilot Program of 2006-2007, tested a pay-at-the-pump model for mileage charging, using devices installed in vehicles to measure distance traveled and specially-equipped gas pumps to handle transactions. While this report will not delve deeply into that effort[1], it picks up where the first pilot's final report left off in November 2007, including a summary of national and stakeholder critique of the first pilot program. This critique ultimately became the *"To Do"* list that led to a complete revision of Oregon's per-mile charge policies, creation of the Road Usage Charge Pilot Program, and passage of Oregon's Senate Bill 810 in July 2013, which authorized the operational road usage charge program under development today.

After the first pilot, a new period of development for road usage charging in Oregon (2008-2013) produced a massive quantity of technical information and analysis beyond what was produced in the first period (2001-2007). Among these reports and analyses were:

- Open System Architecture Model (2011)
- Lessons Learned from other Vehicle Road User Charging Systems (2011)
- Strategic Program Plan (2011)

[1]For an extensive explanation and evaluation of the first per-mile charge pilot program (the RUFPP), see *James M. Whitty*, Oregon's Mileage Fee Concept and Road User Fee Pilot Program Final Report, November 2007.

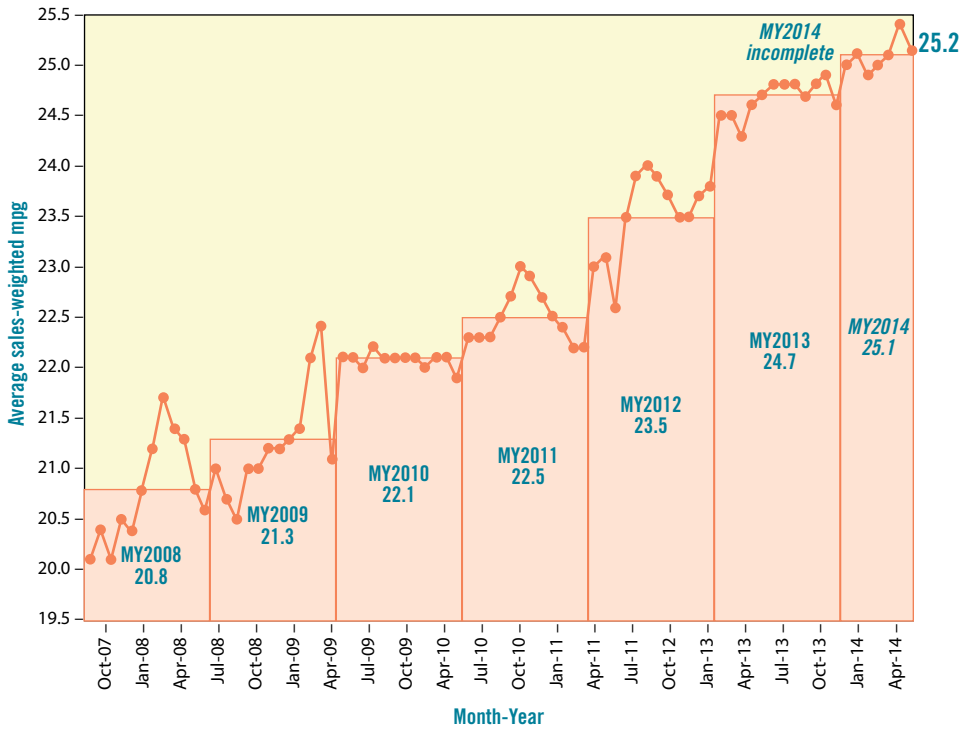
With the advent of hybrid and all-electric vehicles, Oregon's gas tax is no longer an equitable nor sustainable means of raising revenue for road building and maintenance.

- Preliminary Concept of Operations (2011)
- System Requirements Specifications (2012)
- Interface Control Document (2012)
- Fleet Forecast Report (2012)
- Road Usage Charge Pilot Project Evaluation Report (2013)
- Road Usage Charge Accounting Report (2013)
- Financial and Economic Models (2013)
- Impacts of Road Usage Charging in Rural, Urban and Mixed Counties (2013)
- Focus Group Report (2013)
- Risk Matrix (2013)
- Economic Viability of Road Usage Charging in Oregon (2013)
- Pre-Legislative Concept of Operations (2013)
- Road Usage Charge Program Implementation Plan (2013)
- Help Desk Operations Guide (2013)
- Road Usage Charge Policy and Organizational Frameworks (2011 and 2014)

This technical work attempted to answer the many questions the Oregon Legislature might ask about an operational road usage charge program. View a complete list with descriptions online at http://www.oregon.gov/ODOT/HWY/RUFPP/Pages/Road-Usage-Charge-Program-Development-Documents.aspx.[2]

CHART 1-1

Average Sales-Weighted Fuel-Economy Rating (window sticker) of Purchased New Vehicles for October 2007 through April 2014



*The average **fuel economy** (window-sticker value) of new vehicles sold in the U.S. in April was 25.2 mpg—down 0.2 mpg from the value for March. This change likely reflects the increased proportion of light trucks among newly purchased vehicles. Vehicle fuel economy is up 5.1 mpg since October 2007 (the first month of our monitoring). For a description of the calculations and the recent mpg values, please visit http://www.umich.edu/~umtriswt/EDI_sales-weighted-mpg.html.*

Source: Michael Sivak and Brando Schoettle; University of Michigan Transportation Research Institute

[2]Reports and technical documents from 2010 to 2013 can be accessed in electronic format at http://www.oregon.gov/ODOT/HWY/RUFPP/Pages/Road-Usage-Charge-Program-Development-Documents.aspx. Those interested in the history of mileage charging in Oregon may want to reference additional material and technical reports, from 2001 to 2007, related to the first pilot program (the RUFPP).

[3]House Bill 3946 (2001).

The road usage charge concept is about equity. It's a way to engage everyone in paying their fair share for Oregon's road maintenance regardless of the type of vehicle they drive.

The *User Pays Principle*

Early in the last century, the Oregon Legislature adopted the policy of paying for road costs by charging vehicle operators for road use. The legislature first applied this *user pays principle* in 1919 by passing the nation's first gas tax which was enshrined in the Oregon State Constitution, Article IX Section 3A. It extended this principle in 1925 with adoption of the ton-mile tax for heavy vehicles. When the legislature directed the state's first cost responsibility study in 1935, this *pay-for-road-use-policy* became firmly established as state policy. Since then, the Oregon Legislature has regularly accessed and reaffirmed the *user pays principle* to raise road revenue as needed.

In 2001, the Oregon legislature recognized that the policy basis for the *user pays principle*—the fuel tax on gasoline and diesel—would soon be undermined by the influx of newer types of passenger vehicles (hybrids and all-electric) into the marketplace. All-electric vehicles would not use fuel and their operators would not pay fuel tax. Hybrids would use a small amount of fuel and pay little fuel tax.

Anticipating widespread adoption of these new fuel-efficient vehicles in the future, the Legislature created the Road User Fee Task Force to design a new revenue system for measuring and charging for road use[3]. The task force chose a distance-based road user fee as the most feasible alternative to the fuel tax.

The Oregon Legislature proved prescient in 2010 when major automakers began mass marketing all-electric vehicles and in 2011 when automakers introduced plug-in hybrid vehicles. Though the number of these new vehicles on the roadway is small today, automakers have demonstrated their commitment to selling them by regularly announcing new models and reducing prices.

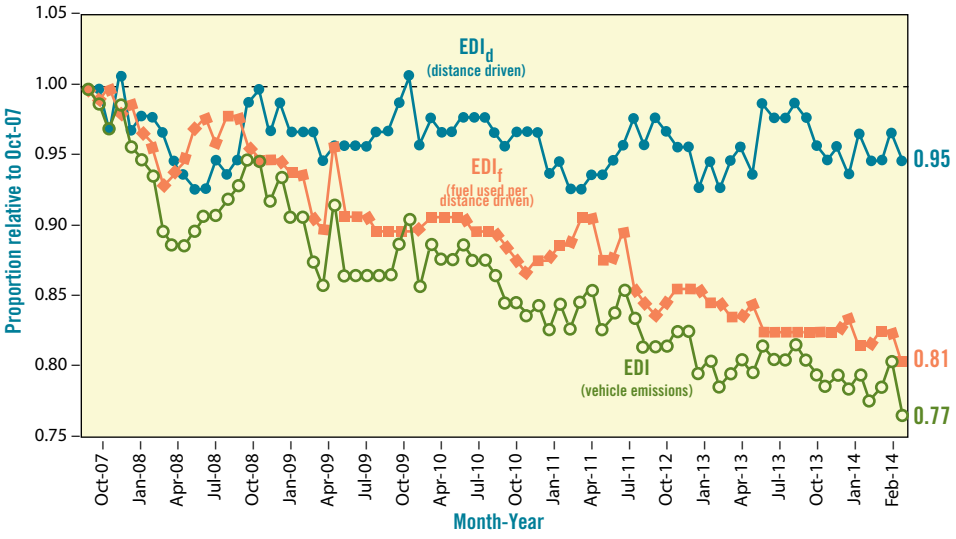
Recent technology improvements to the standard internal combustion engine fleet have also increased the overall fuel economy of the new vehicle fleet. Though stuck between 19 and 20 mpg for 20 years prior to 2007, the average fuel economy of new light vehicles has risen 25.4 percent in the past six and a half years.

Significant improvements in light vehicle fuel economy are expected to continue. Recent changes in federal policy have bolstered the nation's move to an even more fuel-efficient fleet of light vehicles. In 2012, the federal government entered into an agreement with automakers to raise fuel economy standards for new light vehicles—the Corporate Average Fuel Economy standards (CAFE)—to an average of 54.5 mpg beginning in 2025. Whether or not this goal is met, it is likely that Oregon will see more high mileage vehicles as 2025 approaches.

When highly fuel-efficient vehicles become more common on the nation's public road system, the gap between those who are paying significant

CHART 1-2

Eco-Driving Index (EDI)



The University of Michigan Eco-Driving Index (EDI)—an index that estimates the average monthly ***emissions*** *of greenhouse gases generated by an individual U.S. driver—reached a record low of 0.77 in February (the lower the value the better). This value indicates that the average new-vehicle buyer produced 23% lower emissions in December 2013 than in October 2007. The EDI takes into account both vehicle fuel economy and distance driven (the latter relying on data that are published with a two-month lag). Please visit http://www.umich.edu/~umtriswt/EDI_values.html for a brief description of what the EDI is, how it is calculated, and the current and recent values of the EDI.*

Source: Michael Sivak and Brando Schoettle; University of Michigan Transportation Research Institute

amounts for the public road system through fuel taxes and those who are not will become more obvious. One class of vehicle owners—the fuel inefficient group—pays a large amount of revenue for the road system while the highly fuel efficient group pays a much smaller amount, yet the vehicles from each of these groups consume the public infrastructure—concrete or blacktop, roadway lighting and signage—in the same amount. More fuel-efficient vehicles put an unfair burden on the fuel inefficient vehicle group while also eroding fuel tax revenues. Furthermore, since the new fuel-efficient vehicles tend to have a high price tag to recover the new technologies' developmental costs, more affluent people tend to purchase them. Less affluent people purchase vehicles in the secondary market, which tend to be less fuel-efficient. As fuel-efficient vehicles become a more substantial segment of the nation's vehicle fleet, the burden of road building and maintenance costs will fall more on the less affluent. This gap will widen if legislatures decide to recover lost fuel tax revenues by raising the fuel tax.

There is no question that fuel tax revenues are down. Chart 1-3 indicates that fuel tax revenues in Oregon dropped in 2007 when the economy went into recession and reduced economic activity resulted in less driving. When the recession ended, the fuel tax revenues began to improve, but then suddenly dropped again. No one has definitively proven the cause for this, but several factors seem to be at play:

1. Driving has been down because of the economy (though Vehicle Miles Traveled did increase slightly in 2013);
2. Younger people are not enamored with the "car culture" and are driving less as a demographic group; also, younger people are experiencing unemployment at a greater rate than the general population and thus have less need to get around; and,
3. The light vehicle fleet fuel efficiency improvements are reducing fuel consumption overall.

Whatever the reasons for the reduction in revenue, it behooves the state of Oregon and the nation to impose an alternative road usage charge on the segment of the vehicle fleet that pays little to no fuel tax per mile.

Raising the fuel tax cannot mitigate the loss of revenues without placing an even greater burden on drivers of low fuel efficiency vehicles—people who use heavier duty vehicles for work, such as farmers and construction workers, or people who lack resources to purchase a new fuel-efficient vehicle for everyday travel. Because their vehicles consume more gasoline than the average vehicle, these drivers already pay more than the average share for road use in fuel tax. If fuel taxes are increased, their burden will become ever greater until policymakers establish an alternative revenue mechanism—such as a charge on distance traveled on state roads—to rectify the inequity.

The Road User Fee Task Force

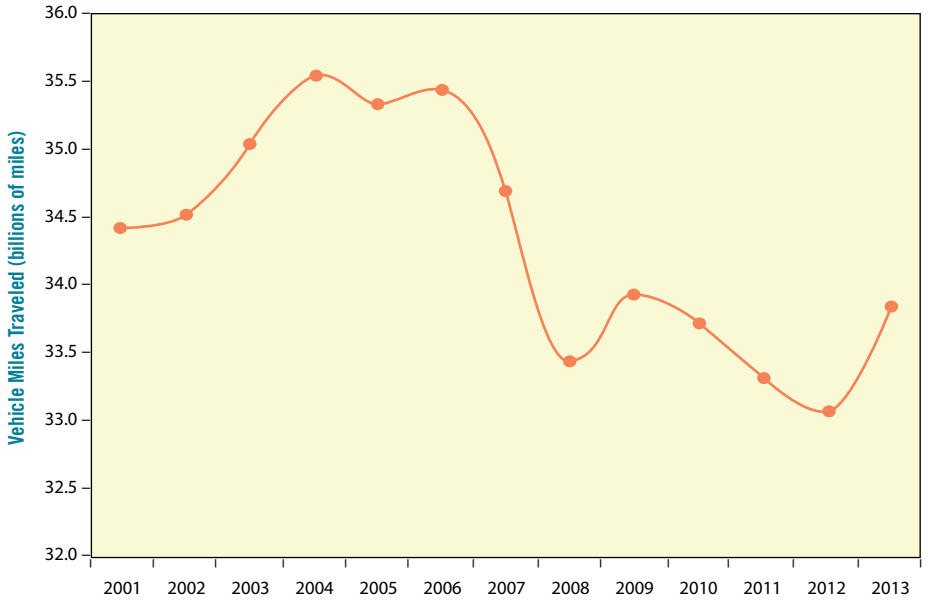
The Oregon Legislature established the Road User Fee Task Force in 2001[4]—an independent body of state legislators, transportation commissioners, local government officials and citizens—with the mandate to "develop a design for revenue collection for Oregon's roads and highways that will replace the current system for revenue collection." This meant finding a replacement for the fuel tax. The task force has provided the legislature with five policy advisory reports since its inception.

Over the past 12 years, the task force provided policy direction to ODOT on road usage charging options. The 2001 law also directed ODOT to develop and operate pilot programs to test the feasibility of a fee based on highway use that could replace the fuel tax.

In 2003, after considering 28 different funding ideas, the task force recommended a road user fee based on distance traveled as the best broad scale funding alternative to the fuel tax. ODOT completed two pilot programs, the first in 2006-07 and the second in 2012-13, employing evaluation criteria developed by the task force to measure the success of each program.

CHART 1-3

Total Oregon Statewide Vehicle Miles Traveled



Source: FHWA Highway Statistics: Vehicle miles of travel by functional system (Table VM-2)

[4]HB 3946 (2001)

CHAPTER TWO
Road Usage Charge Policy Development

Oregon Road Usage Charge Program

Although it demonstrated the viability of the concept of a Road Usage Charge, the 2007 pilot's mandate of GPS-based mileage reporting devices raised privacy concerns. In developing the second pilot, ODOT focused on aligning its program with public preferences. The Road User Fee Task Force advocated a program with open architecture; no mandate for location-based technology; motorist choice of reporting mechanism; and private sector involvement.

National and Stakeholder Critique of the First Pilot Program

During hearings in 2007, two congressionally established surface transportation commissions[5] considered the viability of a charge on vehicle miles traveled as a future road funding source. They sought to identify a model that could either augment or eventually replace the fuel tax as the fundamental revenue source for building and maintaining the nation's road system. Central to their analyses was Oregon's pay-at-the-pump mileage fee concept demonstrated in the first pilot program.

The pay-at-the-pump model relied upon a government-selected mileage reporting device installed in vehicles to wirelessly report mileage data to an electronic data reader installed in fuel pumps. The distance data, including data indicating in which region the miles were driven, was transmitted through the fueling station's point-of-sale system to a central server that processed the data and compiled an invoice presented to the motoring taxpayer as part of the gasoline purchase transaction.

Although the pay-at-the-pump system functioned as intended and met its technical objectives, negative public reaction stalled its momentum toward implementation. Citizens showed grave concerns about the potential for invasion of privacy, particularly about GPS-based mileage reporting devices; and the cost for government administration of a new revenue collection system. In addition, some raised equity concerns for the less affluent. Finally, many rural drivers regarded the system as unfair, stating that their lives require driving longer distances than their urban counterparts for the same services.

At the same time, the two national commissions that expressed support for a national mileage fee identified the following unresolved issues about system design and operations in their reports to Congress:

[5]The National Surface Transportation Policy and Revenue Study Commission, Transportation for Tomorrow, Dec. 2007, http://transportationfortomorrow.com/final_report/index.htm; and the National Surface Transportation Infrastructure Financing Commission, Paving our Way, Feb. 2009, http://financecommission.dot.gov/Documents/NSTIF_Commission_Final_Report_Mar09FNL.pdf.

The 2007 system worked, but the public was very concerned about privacy issues.

1. Protection of privacy and personally identifiable information
2. Cost of start-up and operations
3. Complexity of implementation
4. Difficulty of operations
5. Interoperability among states
6. Scalability for various levels of government
7. Flexibility for technological evolution
8. Security and seamlessness of electronic data transmission
9. Frequency of payment
10. Enforcement and evasion
11. Equity by income and geography
12. Phase-in of application

The greatest concern of both the public and the commissions was protection of privacy. It did not matter that ODOT built protections into the GPS-based mileage reporting devices used in the pilot to prevent them from tracking vehicles. The public simply did not believe that the protections could ever be guaranteed to work. Motorists' perception of the potential for government tracking their movements stopped the discussion.

A second concern of the public emerged, almost as strong as the concern for driver privacy: even those comfortable with the use of GPS technology in their daily lives objected to the government "choosing a box" for their car. The public's reaction made clear that *any* government mandate for a GPS-based mileage reporting device would make the per-mile charge unworkable. It also made clear that any specific technology mandated by the government for reporting mileage by a government entity would not achieve acceptance. The public did not want a government agency forcing any particular technology upon them. (This is not surprising; in other markets, the public has responded similarly to the notion of "smart meters" installed in their homes to measure usage of electricity.)

Rebooting the Per-Mile Charge Concept

Chastened by public reaction and informed by the thorough review of Congress's policy advisory panels, ODOT re-assessed the policies underlying the conceptual framework demonstrated in the first pilot program.

To resolve the issues raised, the department shifted from a top-down, ODOT- directed approach to providing a road usage charge, to a thorough review of the general public's objections and preferences, as revealed in the emerging wireless communications marketplace.

After receiving input from the public and technical experts, ODOT determined that public attitudes were swiftly realigning with recent developments in wireless electronics. Adjusting per-mile charge operational design to these consumer trends could potentially resolve operational concerns. For example:

- Citizens consistently showed a high sensitivity to government mandates for use of GPS in road pricing proposals, yet they routinely used mobile devices containing GPS chips with little or no concern;
- Machine-to-machine communications—called the *Internet of Things*—was growing exponentially;
- Telematics (e.g., sophisticated in-vehicle computer systems) had emerged in high-end and electric vehicles with the capability to report mileage driven directly from the vehicle;
- Pay-as-you-drive insurance demonstrated the viability of mileage reporting devices plugged into a vehicle's diagnostic port;
- Smartphones became high-capacity and saw broader market adoption;
- Communications companies were bundling data plans with cable and telephone services, at low cost; and,
- Open systems—as opposed to closed systems (as was demonstrated in the first pilot program)—had become more common in the marketplace.

Integrating these observations with per-mile charging, ODOT reconceived the per-mile charging system with four key objectives in mind:

First, the mileage reporting system should have an open architecture. This means that *government should not select* only one distance reporting technology for the vehicle. Instead, motorists should

Public reaction made clear that any government mandate for a GPS-based mileage reporting device would make the per-mile charge unworkable.

have the opportunity to use distance reporting technology built into the vehicle; or, to select a device from an assortment available in the marketplace, both now and in the future. The government's role would be to establish standards for the mileage reporting devices to ensure wireless interoperability with the computer servers of the account managers, verify that vendors are complying with these standards, ensure data security, and thwart tampering. An open road usage charging system would also allow for greater flexibility in administration and efficient technological advancement and market evolution over time. An open system would become the foundation for interoperability among states and make the system scalable from one state to multiple states, or to a regional or national system. An open system would also allow road usage charge information to be easily shared between jurisdictions to facilitate charging for multi-state driving.

Second, there should be no government mandate for GPS technology installation into vehicles, or for any other technology with the capability for location based mileage reporting. Motorists must instead have the opportunity to report mileage directly from the vehicle's existing mileage metering system (the odometer).

Third, motorists should have choices for how they report mileage and from whom they obtain mileage reporting technologies. The government must *not* choose one box for all vehicles. The public should have choices for mileage reporting and payment, just as they do for other services such as cell phones and wireless communication plans. Motorists should be able to select a mileage reporting device and service plan that works best from their perspective.

Fourth, private sector companies should have a market opportunity to provide road usage charge payers not only mileage reporting devices but also tax processing and account management services. Further, vendor companies should be allowed the opportunity to provide these services along with other value-added services that are unrelated to revenue collection. Bundling of bills for multiple services would reduce collection costs for the per-mile charge. With private sector alternatives for administration, the road usage charging system would take advantage of market efficiencies to minimize administrative costs and interface with a known commercial entity that they may already share their personal information.

Policy Changes for Distance Charging

In 2010, automakers introduced the first mass-produced fully electric vehicles to the U.S. market. Drivers of such vehicles pay no fuel tax and therefore contribute nothing for road use in Oregon[6]. This motivated Oregon's Governor, Senate President and Speaker of the House to revive the legislatively established Road User Fee Task Force. The group would consider policy adjustments to the per-mile charge recommended by ODOT and create a legislative proposal to implement a permanent, operational mileage charge program for electric vehicles.

The reconstituted Road User Fee Task Force revisited its endorsement of a per-mile charge as a road funding mechanism. After extensive discussion, it adopted the following problem statement:

"With significant numbers of highly fuel efficient vehicles entering the marketplace, the fuels tax has become a less viable revenue source to fund Oregon's road system over the long-term. Therefore, the state should transition to an alternative revenue source augmenting the fuels tax to provide the means to support the state's system of roads and highways."

[6]Operators of electric vehicles pay title fees and registration fees in Oregon but no fee, tax or charge based on amount of road use.

The task force also adopted the following solution statement,

"A charge based on measured road use to augment the fuels tax as a revenue source for funding the road system."

The task force next assessed the viability of a per-mile charge collection system under the new parameters suggested by ODOT. Over a two-year period, including a failed attempt at mandated road usage charge legislation in 2011[7], the task force adopted new policies for a road usage charging system that addressed key issues raised by the public and the two national commissions.

- **Scope.** Seeking to narrow the bill's focus and reduce complexity, the task force agreed to: (1) not enable a system for congestion pricing,[8] preferring instead to focus on revenue generation; (2) not enable a city and county option for a local distance charge[9]; and, (3) not consider application to non-resident motorists driving in Oregon.[10]
- **Nature.** The usage charge should be distance-based, not time-based. It should only apply to mileage driven on Oregon public roads and not to mileage identified as driven off Oregon public roads. Motorists paying the charge should get a rebate for fuel tax paid, under a method established by ODOT, and a refund of the road usage charge for miles driven off-road or on private property.
- **Reporting.** ODOT should have the authority to establish the methods of mileage reporting. The mileage reporting system should not rely upon manual reporting of mileage data, but should offer electronic reporting of mileage data.
- **Choices.** Mandate that road usage charge paying motorists shall have choices for mileage reporting. ODOT would allow for several device types, some reporting odometer data with no GPS technology and some with GPS, thereby eliminating any sort of requirement for location-based technology.
- **Open system.** Mileage reporting technology provided by the private sector should follow an *open system architecture* established by ODOT through standards set for the open system. Technologies and software used should neither be proprietary nor tied to a specific vendor or device.
- **Private collection services.** Require a system that allows participants to interface directly with approved private sector service providers for mileage reporting, account management, invoicing, and payment. ODOT should invite the private sector to provide these services as an alternative to ODOT-provided services.

In creating the second pilot, ODOT sought to align its program with public preferences.

- **Personally identifiable information.** Protect personally identifiable information related to mileage reporting and road usage charge payment from disclosure without the consent of the road usage charge payer.
- **Reporting/billing cycle.** Require ODOT to develop a reporting/billing cycle based on the individual circumstances of the vehicle operator subject to the road usage charge.
- **Enrollment.** Condition automobile registration on enrollment of subject vehicles in the road usage charge system.
- **Auditing authority.** ODOT should have authority to audit and impose penalties for non-payment.
- **Enforcement.** Establish penalties for non-payment, tampering and false reporting but delay recommending stronger enforcement authority until road usage charging becomes operational.
- **No escalator.** The per-mile charge should not contain an escalator for inflation. Instead, the per-mile charge would be considered every two-years in the existing bi-annual cost allocation study.[11]
- **Revenue split.** Net revenue from the per-mile charge would be split 50/30/20 to the state/counties/cities, respectively, as is the case for fuel tax revenues.
- **Tax rate.** The task force left the decision of setting the road usage charge rate to the Legislature[12].

These policies[13] formed the basis for road usage charge legislation introduced on behalf of the Road User Fee Task Force in the 2013 Oregon legislative session[14] and Senate Bill 810, which ultimately was passed into law[15].

[7]House Bill 2328 passed the House transportation and revenue committees before stalling in the Joint Ways and Means Committee.

[8]The perspective of the task force was that congestion pricing is always primarily a local decision and that application of a distance based charge in the context of congestion pricing should be revisited when local political support indicates viability.

[9]Both the city and county elected officials on the Road User Fee Task Force believed the first application of the distance based charge should be at the state level but that a local option should be reconsidered once the state system is operating efficiently.

[10]Non-resident motorists would continue to pay the fuel tax but when neighboring states join Oregon in applying a per-mile charge, applications to interstate travel of non-residents should be determined through cooperative agreements between states.

[11]Oregon Highway Cost Allocation Study 2013: http://www.oregon.gov/DAS/OEA/docs/highwaycost/2013report.pdf

[12]The Road User Fee Task Force could not reach consensus on the rate for the road usage charge. Some members supported an average rate of 1.56 cents per mile based on what operators of 20 mpg vehicles pay in Oregon fuel tax (plus an additional administrative charge). Other members supported an introductory rate of 0.6 cent per mile based on what operators of standard 50 mpg vehicles currently pay in Oregon fuel tax.

[13]The original legislation proposed by the task force (HB 2453) included a flat fee payment option but Senate Bill 810 did not include this provision. The flat fee option would allow a motorist to avoid mileage reporting by assuming a maximum amount of 35,000 miles driven annually which would be applied against the road usage charge rate to determine the amount of the flat fee. House Bill 2453 also had a provision applying the road usage charge to new vehicles rated at 55 mpg and higher on July 1, 2015 but this provision was not included in Senate Bill 810.

[14]House Bill 2453 passed through the House transportation and revenue committees and the Joint Ways and Means Committee and was on the Speaker's desk to go to the House floor for a vote when leadership determined the supermajority required for a tax vote could not be achieved in the Senate.

[15]Senate Bill 810 passed the House of Representatives on a 47 to 13 bipartisan vote and the Senate on a 24 to 6 bipartisan vote.

CHAPTER THREE
Developing the Road Usage Charge Pilot Program

Oregon Road Usage Charge Program

The Road User Fee Task Force adopted several policy principles for a new pilot program based on motorist choice and open systems. The task force also adopted evaluation criteria to measure the pilot's ability to demonstrate the rudiments of a market-based system focused on providing choices for mileage reporting and payment. ODOT invited private vendors to submit proposals for technologies and services required to implement the program.

Foundation for the Second Pilot Program

Not yet prepared to pass a road usage charge implementation bill in 2011, the Oregon Legislature enacted alternative legislation for distance charge development. House Bill 2138 directed the Road User Fee Task Force to consider the following factors when recommending pilot programs that test alternative approaches for road usage charging:

- Availability, adaptability, reliability, and security of methods that might be used in reporting highway use
- Protection of any personally identifiable information used in reporting highway use
- Ease and cost of reporting highway use[16]
- Ease and cost of administering the collection of taxes and fees as an alternative to the current system of taxing highway use through motor vehicle fuel taxes
- Effective methods of maintaining compliance

The legislation also directed the task force to consult with highway users and transportation stakeholders—including representatives of vehicle users, vehicle manufacturers and fuel distributors—when preparing recommendations for pilot programs.

Purpose and Design of the Second Pilot Program

The Road User Fee Task Force's principles for road usage charging legislation informed ODOT's design of the second pilot program. The Road User Fee Task Force intended the second pilot program to show key elements of a distance-based charging system based on open architecture principles and motorist choice—and to have results available in time for the Legislature to act on road usage charge legislation during the 2013 session. The task force wanted the second pilot to demonstrate to state legislators, transportation stakeholders, and others interested in roadway finance that electronic mileage reporting based on an open system was a viable, easy to use concept for drivers and for ODOT. The task

[16]Highway use is defined by ORS 801.305 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.

force also wanted the pilot to determine whether private firms had the ability and willingness to provide and implement system components for an efficient, reliable, and secure road usage charging system that could protect sensitive information and provide benchmarks for system set-up and operating costs and illuminate compliance issues.

In accordance with these principles, ODOT designed the second pilot program to operate on an open system platform. In the context of the second pilot, open system means the use of standard functional requirements and interfaces that are fully accessible to the marketplace, allowing different members of private industry to participate in the parts of the program that they are best suited to support. An open system allows system components and processes performing the same function to be readily substituted or provided by multiple providers. Motorists would have multiple choices for mileage reporting, and there would be a choice between private sector account management and government account management. Most importantly, GPS would not be mandated and thus not accessed except by motorist choice. Unlike the first pilot, the second pilot would actually charge and collect the road usage charge from motorists for miles driven in Oregon, refund state fuel taxes paid by those paying the per-mile charge, and provide opportunity to receive a credit (or simply not charge) for mileage driven on private property or out-of-state.

The task force wanted the second pilot to demonstrate a higly automated, easy-to-use and understandable tax collection system for road usage charging. The system would also prove the electronic collection process as well as a "paper trail" for auditing purposes. They developed evaluation criteria (see Appendix [A]) that reveal the Legislature's expectation that the second pilot program would address key concerns of the general public as well as issues identified by the two national surface transportation commissions established by Congress. The task force directed the new pilot begin no later than autumn of 2012.

Developing the Second Pilot Program

Preparation for the second pilot began in January 2012 when ODOT added operational objectives to the Road User Fee Task Force's requirements (see figure 3-1). ODOT developed the preliminary system design and initial standards for technology used during the pilot, specifically the *mileage message* by which mileage data flow from the mileage reporting device to the account management system.[17]

ODOT envisioned the per-mile charge system for the second pilot as consisting of three primary subsystems linked by communications: mileage data collection, road usage charge processing and road usage charge accounting.

FIGURE 3-1

Goals and Objectives for the Road Usage Charge Pilot Program

Effective demonstration of electronic distance reporting methods, meaning that the participating motorists will have the following experience:

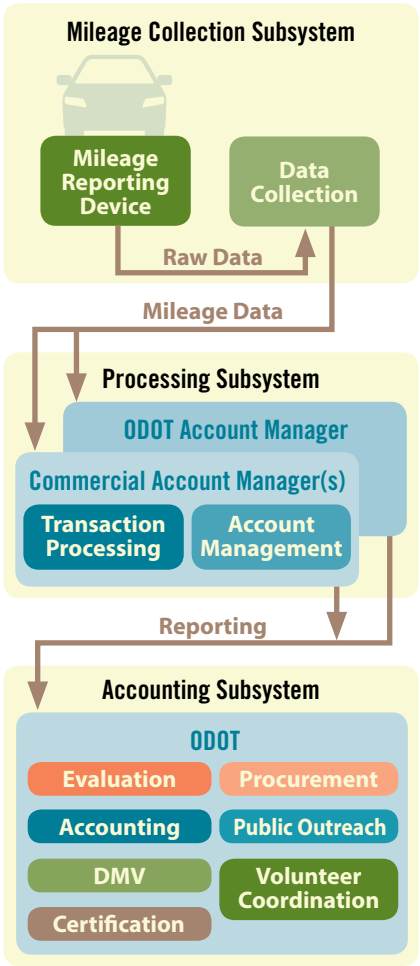
- Choice between reporting all miles driven (a basic mileage reporting device) and reporting miles driven by location (an advanced mileage reporting device)
- Technologies and system are simple and easy to use
- Technologies and system work with minimal errors and mistakes
- Motorists experience problem-free account processing
- Motorists have the opportunity for automated fuel tax credit
- Motorists experience an actual open system, including:
  - Choice of reporting and technologies
  - Choice of payment methods
  - Choice of account management provider

[17]Initial standards also included system requirement specificiations (SRS) and an interface control document (ICD).

Sanef (Société des Autoroutes du Nord et de l'Est de la France) began as a toll motorway operator in France. Now the company operates toll infrastructure—roads and bridges—and other revenue collection systems around the world.

FIGURE 3-2

Oregon Road Usage Charging Subsystems and Components



ODOT determined the marketplace had four likely categories of distance data collection technologies:

1. Undifferentiated reporting with a basic device—**basic reporting**.[18]
2. Location-based reporting with a factory installed device—**factory installed advanced reporting**.[19]
3. Location-based reporting with an after-market installed device—**after-market advanced reporting**.[20]
4. Location-based or undifferentiated reporting with a basic device electronically connected to another computing device that allows a motorist to vary mileage reporting by preference—**switchable reporting**.

Procurement Process

To better understand marketplace offerings for the four categories of mileage reporting devices—plus transaction processing and account management services—ODOT issued a Request for Information (RFI) in February 2012. This RFI included a half-day vendor workshop in Portland, Oregon, plus two and a half days of one-on-one interviews between ODOT and individual vendors. Nineteen companies participated in the interviews, and ODOT reviewed twenty-eight responses to the RFI. This level of industry participation indicated vendors were intrigued and prepared to participate in providing services for the second pilot.

Based on information gathered during the RFI, workshop and one-on-one interviews, ODOT composed and issued a Request for Proposals (RFP) in March 2012 for prospective vendors to supply, install, and demonstrate one or more of the various subsystems and components needed for the Road Usage Charge Pilot Program. ODOT received ten proposals and evaluated seven.[21]

Given constrained budgets, ODOT could not engage all prospective vendors in the short, limited duration pilot. Instead, ODOT selected vendors that provided services and reporting technologies most closely matching the qualities ODOT sought for the pilot, and engaged them in unit testing to demonstrate the functionality of their systems and components.

Based on the readiness demonstrated in unit testing, ODOT entered into contracts with two vendor teams (sanef and Raytheon) to provide subsystems and components as part of the pilot's system. Not all distance reporting categories that ODOT desired were available for the second pilot: no vendor provided a compelling proposal with factory installed advanced reporting devices. However, the pilot could demonstrate ODOT's three other desired categories of distance reporting using devices common in the pay-as-you-drive insurance industry.

Mileage reporting device, or "dongle"

[18] *Basic reporting* means an electronic device that records and reports mileage undifferentiated by location-determination electronics such as GPS. The *Basic Device* does not contain any location-determination electronics, even if such electronics are disabled, but instead computes vehicle mileage traveled from information available to the vehicle electronics. The *Basic Device* transmits mileage information without the use of an external mobile device.

[19] *Factory installed advanced reporting* means a factory installed telematics device that uses Original Equipment Manufacturer installed onboard equipment to process vehicle data and has the capability of collecting and transmitting mileage data differentiated by location. Examples include GM's *OnStar*, Ford's *SYNC*, Mercedes's *mbrace*, Toyota's *Entune.*

[20] *After-market advanced reporting* means an after-market telematics device that has the capabilities for processing mileage information from the vehicle and collecting and transmitting mileage data differentiated by location. For example, third party navigation units could provide this function.

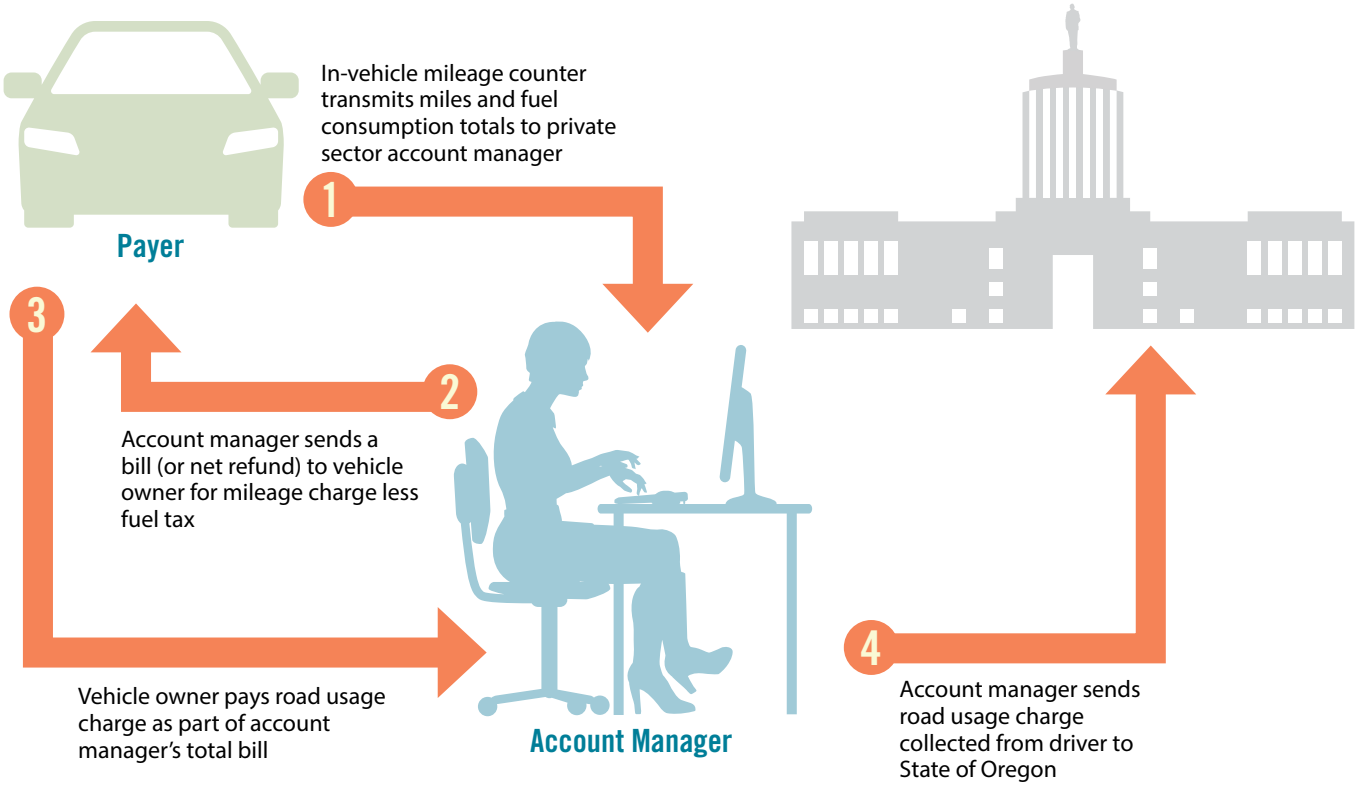
[21] Three proposals were deemed noncompliant and were thus not evaluated.

An invoice for road usage charge issued to participants

- Sanef provided invoicing and account management activities, including receiving mileage and other vehicle data from three types of mileage reporting devices;
- IMS, working as a subcontractor to sanef, provided a basic mileage reporting device and an advanced mileage reporting device
- Raytheon provided a smartphone mileage reporting device and application and mileage counting dongle that combined was similar to the *switchable* reporting capability ODOT sought; and,

Working with the contractors, ODOT tested each contractor's systems and mileage reporting technologies.[22] Pilot participant on-boarding procedures were also developed. Once the system components satisfied ODOT's requirements, the second pilot began operation on November 1, 2012.

FIGURE 3-3 **Oregon's Road Usage Charge Program**



[22]ODOT subjected each contractor's products and services to intense testing including bench testing to verify that the products worked correctly on their own as well as in-depth integration testing to verify that the product interfaces including the mileage message were implemented correctly. Finally, the products went through system testing to verify that they worked correctly as a system.

CHAPTER FOUR
Managing the Program

Oregon Road Usage Charge Program

The Road Usage Charge Pilot Program recruited 88 participants from three states. A host of private companies responded to a Request for Proposals and seven were selected (ultimately, two participated). An easy-to-use, fully supported rollout plan facilitated enrollment. Participants chose from four plans, including a flat fee option. Participants found installation of mileage reporting devices, account management, and payment very easy. Information about the pilot was widely disseminated through various media to educate Oregonians about the program.

Pilot Participants

For the second pilot, ODOT sought participants with policy interest in transportation funding rather than everyday citizens as in the first 2007 pilot test. The second pilot test was not about studying behavioral factors for distance based charging but rather to demonstrate to decision makers that the fundamentals of a future operational per-mile charging system were sound and worthy of legislative action.

ODOT requested that Oregon legislators on the House and Senate revenue and transportation committees participate in the Road Usage Charge Pilot Program. Eight legislators accepted the offer to volunteer.

Other pilot participants included locally elected officials, legislative fiscal office staff, members of the Oregon Transportation Commission, a representative of AAA and Oregon citizens. Unlike the 2007 pilot, this program was not just a paper accounting exercise—it required real payment for road usage. This second pilot was the first road usage charge system for light vehicles in the U.S. to collect funds and send them to the state treasury.

The 44 Oregon participants paid the road usage charge in lieu of the state gas tax. Participants who paid a per-mile charge received credits for any state gas tax paid (except the one participant who chose the flat fee option).

The pilot also included 21 volunteers from Washington State and 23 from Nevada. These participants did not actually pay the road usage charge; instead they received a monthly illustrative invoice instead.

Phasing

The pilot had two phases. Phase one comprised 34 participant vehicles with standard internal combustion engines, including 31 Oregon residents and three Washington State residents. Phase one ran from November 1, 2012 to January 31, 2013. The second phase comprised 54 additional participant vehicles, including hybrid-electric vehicles and one fully electric vehicle from Oregon and vehicles from Washington and Nevada. Phase two began December 1, 2012 and ended in early March 2013.

Oregon's 2013 Road Usage Charge Pilot Program was the first in the United States with actual payment: money collected from the Oregon participants was deposited in the state treasury.

Three Critical Junctures

ODOT determined that a participant's acceptance of the road usage charge system demonstrated in the second pilot would depend upon how well the system functioned at three critical junctures:

1. Participant selection of a mileage reporting plan;
2. Participant installation of the mileage reporting device; and,
3. Invoicing and payment of the road usage charge.

These junctures were the moments when the pilot functions were most visible to the Oregon participants. A pilot function performing inadequately during any of these moments would negatively impact participant acceptance of the road usage charge system and, accordingly, the prospects for action on road usage charge legislation in 2013.

Participant Selection of a Mileage Reporting Plan

The first step a prospective pilot participant needed to take was to submit an application for participation. The application included information about the individual and their vehicle (such as name, address, make, model, year, Vehicle Identification Number [VIN], license plate number, and vehicle fuel type). Vendors and ODOT used this information to determine compatibility between

FIGURE 4-1

Participants Selected Their Plan Options Online

Choosing your plan

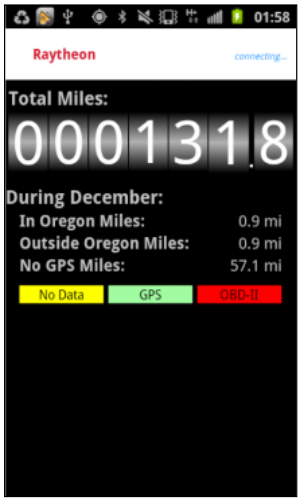
To activate your account, you must choose a charging plan. Your charging plan will include a road usage charge service provider – either ODOT or a private provider, Sanef – and a method to report the miles you drive (click on the plan title in the table below).

Need help? Call toll-free 855-797-1265 or RUCPP@odot.state.or.us

Plan Options

	Miles Reported	Invoice	Payment	Online account management	Uses GPS?
ODOT Basic Plan	All	Mailed Monthly	Check	No	No, does not report where miles are driven
ODOT Flat Rate Plan	N/A	Once, at start	Check	No	No device
Sanef Basic Plan	All	Emailed Monthly	Credit/debit card	Yes	No, does not report where miles are driven
Sanef Advanced Plan	Public roads in Oregon only	Emailed Monthly	Credit/debit card	Yes	Yes
Sanef Smartphone Plan	With application running, only roads in Oregon; without application running, all roads	Emailed Monthly	Credit/debit card	Yes	Yes, when the application is running

Participants were billed monthly at a rate of 1.56 cents per mile. This approximates the gas tax paid for a vehicle getting approximately 20 miles per gallon plus an administrative cost component.



participants' vehicles and mileage reporting devices.[23] Upon receiving ODOT approval, the participants signed an agreement to trigger state law authorizing payment of the road usage charge in lieu of the fuel tax.

Once they signed the agreement, participants could sign up for their preferred mileage reporting plan on the pilot website. The website featured a matrix of mileage reporting, invoicing, and payment choices that participants could peruse, including links to more details about each choice. Most participants simply selected a mileage reporting plan by using the matrix, although some followed the links for additional information, and a few accessed the Help Desk to ask questions.[24] Having multiple ways to investigate the various plan choices enabled all 88 participants to gather information in the manner most comfortable to them and make a choice. See the matrix in Figure 4-1.

The Basic Plan

The basic plan provided mileage reporting devices with no location-determination technologies (no GPS technology). The mileage reporting devices supporting the basic plan reported only the total number of miles travelled, having no ability to determine where the miles were driven. Basic mileage reporting devices accessed the same data as the vehicle's odometer does to determine miles driven. The device reported that number wirelessly to the transaction processor to determine the road usage charge. Participants had the choice of either ODOT or sanef for administration of the basic plan.

The Advanced Plan

The advanced plan provided devices that employed location-determination technology for reporting mileage. These devices reported distance driven on public roads in Oregon separately from other mileage driven, and only distances driven on public roads in Oregon were charged. Advanced plan distance reporting devices accessed the same data as the vehicle's odometer does to determine miles driven, and used the location determination technology to determine how many miles were driven on Oregon public roads and how many miles were not. Only the private vendor sanef offered the advanced plan. No ODOT plan had an option for an advanced distance reporting device. By design, ODOT did not have access to any location information transmitted by the mileage reporting devices.

Smartphone Plan

With the smartphone plan, participants could choose between two reporting modes using an application (app) on their smartphones:

1) Record all miles
   In this mode, the smartphone app received all data from a basic reporting device plugged into the vehicle to record the total miles driven. The smartphone app reported and billed all miles driven without recording or transmitting any location information.
2) Record only Oregon miles
   In this mode, the smartphone app utilized location data from the phone's electronics in combination with data from the basic reporting device to calculate how many miles were driven in Oregon. The app reported for charging only those miles driven in Oregon. The smartphone plan could not identify when miles were driven off public roads within Oregon, but could distinguish in-state and out-of-state mileage. Participants were therefore only charged for in-state miles.

With the smartphone plan, participants could control when the location data was enabled or disabled. Only the private vendor sanef offered the smartphone reporting option. No ODOT plan offered the smartphone reporting

[23]The vendor provided mileage reporting devices were compatible with almost all vehicles produced in 2004 and later but also with some produced as early as 1996.

[24]The Help Desk was staffed by professionals Monday through Friday, 7:00 a.m. to 9:00 p.m. PDT and weekends and holidays 10:00 a.m. to 2:00 p.m. PDT.

option. By design, ODOT did not have access to any location information transmitted by the mileage reporting devices.

Flat Fee Plan

A motorist choosing the flat fee plan avoided mileage reporting altogether. In this plan, ODOT charged motorists a flat rate of $45 per month (equivalent to about 3,000 miles), or $135 for all three months of pilot participation. Under the flat fee plan, ODOT charged participants the same rate regardless of how many miles they drove. The flat fee rate was based on an assumed maximum number of miles driven per month. This provided an important alternative for drivers who drove near the assumed maximum number of miles per month or who did not want to have any form of mileage reporting technology in their vehicles. Drivers on this plan did not receive any refund for fuel tax credit. ODOT provided account management services for this plan.

Calculating and Crediting the Fuel Tax Refund

For technology-based distance reporting plans, the mileage reporting devices estimated fuel usage. Participants received a credit on their invoice for the fuel taxes that they paid based on their estimated fuel usage on miles for which they paid a road usage charge. For participants on the basic plan, fuel tax credits were based on all fuel consumed. For participants on the advanced plan, fuel tax credits were based on fuel consumed while driving on Oregon public roads. For participants on the smartphone plan, fuel tax credits were based on fuel consumed within Oregon, assuming that they chose to enable location data when driving out of state.

For some vehicles, automatic reporting of fuel consumption was not feasible. In these cases, ODOT estimated fuel consumption based on the number of miles driven and EPA fuel efficiency rating. Participants who chose the flat fee plan did not receive a fuel tax refund.

Participant Choices of Mileage Reporting Device

Based on the information provided by ODOT on each plan, participants selected the mileage reporting plan of their choice. ODOT did not encourage or discourage selection of any plan (except that participation in the smartphone plan was limited to four due to equipment constraints), but the participants' choice of plans represented a good distribution of the plans available, with one exception: only one person chose the flat rate plan. However, because this plan cost $135 for the entire period, and included no gas tax refunds, it was substantially more expensive than the other plans. Thus, this low participation was unsurprising. Participants from Washington and Nevada were only offered the sanef advanced and sanef basic plans. The following table summarizes participation by plan:

TABLE 4-1

Summary of RUCPP Participation by Plan and State

PLAN	OR	WA	NV
sanef Advanced	24	16	6
sanef Basic	8	5	17
ODOT Basic	7	0	0
Smartphone	4	0	0
Prepaid Flat Rate	1	0	0
Totals	**44**	**21**	**23**

Participant Installation of the Mileage Reporting Device

The technology used for the automatic distance reporting plans involved an in-vehicle device, frequently referred to commercially as a "dongle,"[25] plugged into the vehicle's OBD-II port under the steering wheel.[26] Each device was roughly ¾" by 2", or approximately the size of an ink jet printer cartridge. The auto insurance industry currently uses such devices to report mileage for pay-as-you-drive policies.

After a participant selected a distance reporting plan, the mileage reporting device vendor or ODOT, depending upon the plan, mailed the mileage reporting devices to participants. The package mailed to participants included the mileage reporting device, instructions for device installation, and, in the case of the smartphone plan, instructions for downloading the app.

The participants installed their own mileage reporting devices into the diagnostic port based on the instructions provided. Most participants were able to install the device easily without help and without any tools. However, a few participants called the Help Desk for information about the precise location of the diagnostic port in their vehicles.[27] For example, one participant had a decorative flap covering the port. Help Desk assistance resolved the query.

[25]A dongle is a small computing device for reporting vehichle infomation such as mileage that plugs into a vehicle's OBD-II port.

[26]OBD-II means on-board diagnostics. A standard port on nearly all vehicles manufactured since 1996. The OBD-II port is primarily used for emissions monitoring and maintenance diagnostics.

[27]The Help Desk had information on the location of the diagnostic port for every vehicle make and model in the pilot.

Network TV stories and dozens of articles in Oregon's largest circulation newspapers—including the *Oregonian* and *Eugene Register-Guard*—helped educate Oregon citizens about the pilot program.

Invoicing and Payment of the Road Usage Charge

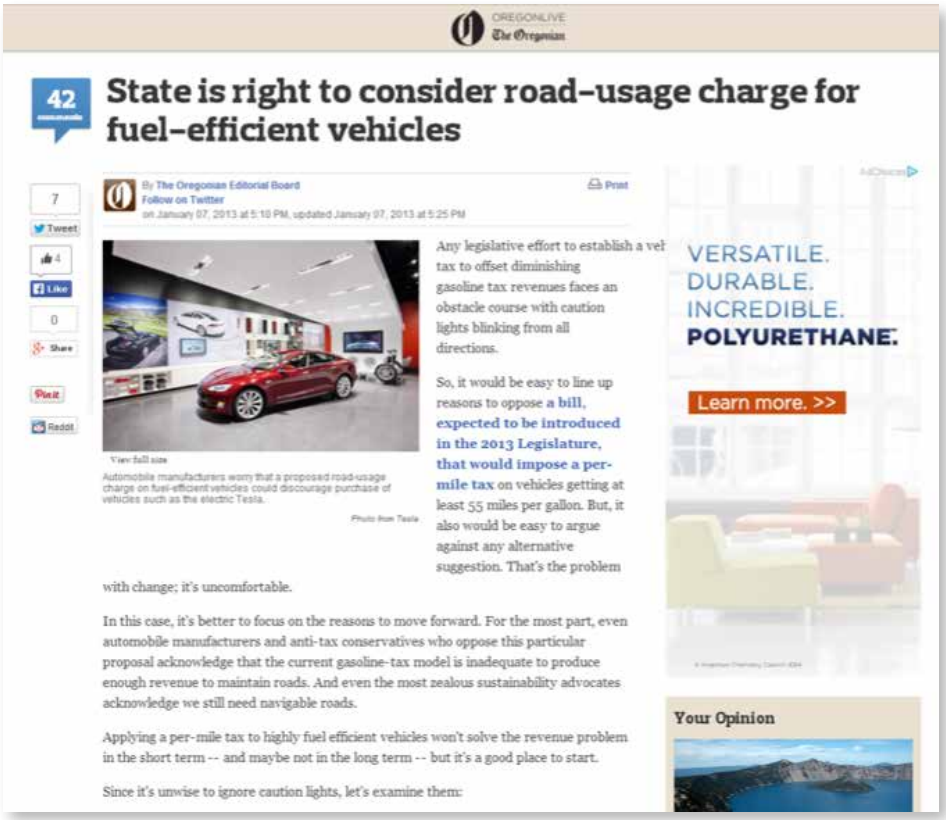
Oregon participants were billed monthly at a rate of 1.56 cents per mile. The mileage rate was the same for all Oregon participants and was set to approximate the gas tax paid by a vehicle getting approximately 20 miles per gallon plus an administrative cost component. Sanef used fuel usage information from the mileage reporting devices or, for some vehicles, EPA fuel economy ratings to estimate fuel usage during the month. Based on the reported miles and estimated fuel usage, sanef provided participants (except those with the Flat Fee Plan) with a credit on their invoice for the estimated fuel tax paid.

Basic plan participants were charged for all miles traveled. Advanced plan participants were charged only for miles travelled on Oregon public roads. Smartphone plan participants were charged for all miles travelled in Oregon, and any miles traveled outside Oregon driven when they disabled the location data use on the smartphone app.

Those participants who chose plans administered by sanef, including all Washington and Nevada participants, received an electronic copy of their invoice. Oregon participants on sanef plans paid their invoices online via credit or debit card (Washington and Nevada participants were not requested to pay the invoices). Participants enrolled in the ODOT-administered basic plan or flat fee plan received an invoice in the mail from ODOT and made payment by check.

The Help Desk

A key factor to achieving a positive participant reaction throughout the pilot program systems was deployment of a professional Help Desk to ensure that participants felt fully supported throughout the pilot plan selection, distance reporting device installation, and billing. Their questions had to be answered quickly and problems resolved rapidly. Employing professionals at the Help Desk provided the highest level of assistance. The Help Desk was open Monday through Friday, 7:00 a.m. to 9:00 p.m. PDT and weekends and holidays 10:00 a.m. to 2:00 p.m. PDT.



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State is right to consider road-usage charge for fuel-efficient vehicles

By The Oregonian Editorial Board
Follow on Twitter
on January 07, 2013 at 5:10 PM, updated January 07, 2013 at 5:25 PM

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Automobile manufacturers worry that a proposed road-usage charge on fuel-efficient vehicles could discourage purchase of vehicles such as the electric Tesla.

Photo from Tesla

Any legislative effort to establish a vel tax to offset diminishing gasoline tax revenues faces an obstacle course with caution lights blinking from all directions.

So, it would be easy to line up reasons to oppose **a bill, expected to be introduced in the 2013 Legislature, that would impose a per-mile tax** on vehicles getting at least 55 miles per gallon. But, it also would be easy to argue against any alternative suggestion. That's the problem with change; it's uncomfortable.

In this case, it's better to focus on the reasons to move forward. For the most part, even automobile manufacturers and anti-tax conservatives who oppose this particular proposal acknowledge that the current gasoline-tax model is inadequate to produce enough revenue to maintain roads. And even the most zealous sustainability advocates acknowledge we still need navigable roads.

Applying a per-mile tax to highly fuel efficient vehicles won't solve the revenue problem in the short term -- and maybe not in the long term -- but it's a good place to start.

Since it's unwise to ignore caution lights, let's examine them:

Your Opinion

Extensive Outreach to Educate the Public

During the pilot program, ODOT conducted an extensive public outreach program focusing on both the reasons for the program and how the pilot worked.

This program was intended both as a measure to draw positive attention to the pilot, and to do a trial run of an outreach program that could be executed during the rollout of a legislatively authorized road usage charging program in the future.

Any future road usage charge system would represent a major change in the way the public pays for the transportation system. Because road usage charging represents such a major shift, the success of a road usage charging system will depend in large part on public understanding of the need for the system and how the system would work.

The outreach program during the pilot included the following measures:

- A website and blog (www.roadchargeoregon.org). The blog detailed experiences of pilot participants, solicited comments and questions from blog readers, and responded to specific questions and concerns that the public raised;
- Presentations about the pilot to 23 community and civic groups;
- A short video about the program; and,
- Media outreach to help ensure that the travelling public understood the pilot and the need for a replacement for the fuel tax.

"It's been interesting to participate in the Road Usage Charge Pilot Program–at least when I get the monthly statement and actually think about it. Most of the time I don't even remember the module under the dash. Tracking the difference between gas tax and vehicles miles traveled has helped me understand why there simply isn't enough money to maintain the state highway system using gas tax revenues while many vehicles are getting increasingly better fuel mileage. I think there's great potential with this technology. My concern is whether it can be implemented in a timely manner before our highway system gets any worse."

Martin Callery, North Bend
Pilot Participant Blog Post

CHAPTER FIVE
Evaluating the Program

Oregon Road Usage Charge Program

The 2013 pilot successfully measured and reported mileage and distributed accurate invoices to 88 participants from three states. The pilot program satisfied the most important task force goals: ease of use, motorist choice, and open system and private sector administration. ODOT considers the program a success. This chapter summarizes key findings for each pilot goal based on the data collected and analyzed. The OIPP website features a Final Evaluation Report, which discusses the findings in greater detail [28].

In order to measure the performance of the pilot program, the Road User Fee Task Force directed ODOT to plan and conduct an evaluation. The task force defined goals for four key categories of interest: policy and public acceptance, technology, operations, and costs. To complete the evaluation plan, ODOT defined, and the task force approved, several metrics corresponding to each goal, as summarized in the table below, along with methods for measurement:

TABLE 5-1

RUCPP Evaluation Goals and Metrics

CATEGORY	GOAL	METRICS
Policy and public acceptance	Determine how well public will accept the per-mile charging program	1. Revenue generation capability of per-mile charge vs. fuels tax
		2. Participant acceptance of per-mile charge system
Technology	Demonstrate and measure the technical and operational viability of the proposed per-mile charging concept through demonstrations	1. Adaptability of the per-mile charge system
		2. Ease of installation of mileage reporting devices
		3. Safety and operation of mileage reporting devices
		4. Anti-tampering
		5. System performance
		6. Hardware, software and other system elements
Operations	Gain a preliminary understanding of the operational aspects of the per-mile charging program	1. Ease and cost efficiency of administering the charge
		2. Ease of use and cost of compliance with the per-mile charge system
		3. Accuracy and perception of accuracy of per-mile charge data
		4. Privacy options for per-mile charge payers
		5. Ability to audit
Costs	Gain a preliminary understanding of the costs of implementing a per-mile charging program	1. Start-up costs (capital and retrofitting)
		2. Operations and maintenance costs
		3. Costs of collection compared to fuel

[28]Reports and technical documents from 2010 to 2013 can be accessed in electronic format at http://www.oregon.gov/ODOT/HWY/RUFPP/Pages/Road-Usage-Charge-Program-Development-Documents.aspx.

Consultants uninvolved in execution and day-to-day management of the pilot performed the evaluation. Evaluation activities comprised data collection and surveys from the following:

1. Pilot participants
2. Vendors who provided mileage reporting devices (IMS and Raytheon) and the account management system (sanef)
3. ODOT pilot coordinators
4. Consultant pilot support team and Help Desk provider
5. Consultant providing accounting system

The evaluation team collected raw data from ODOT, vendors, and consultants at various points throughout the pilot. In order to capture evolving views, the evaluation team also surveyed pilot participants three times: before the pilot, at the midpoint, and after the pilot. Other groups completed surveys and interviews before and after the pilot.

POLICY

The Road User Fee Task Force directed ODOT to measure two policy and public acceptance metrics from the RUCPP: revenue generation capability of per-mile charges relative to the gas tax and participant acceptance of the system.

Revenue Generation

Per-mile charge revenues remain constant as a function of distance traveled, regardless of fleet vehicle fuel economy. In contrast, per-gallon revenues decline as fleet fuel economy increases. The Road User Fee Task Force set a per-mile rate of 1.56 cents per mile for the pilot, equivalent to 30 cents fuel tax per gallon (i.e., the Oregon state fuel tax) at 19.2 mpg, but the average fuel economy of pilot vehicles was 24.7 mpg. As a result, per-mile charges generated 28% more revenue than the fuel tax over the 121,371 miles traveled by participants in the RUCPP. The table below summarizes actual RUCPP results compared with other scenarios:

TABLE 5-2

Per-Mile Charge vs. Fuel Tax Based on RUCPP Oregon Mileage of 121,371

FLEET FUEL ECONOMY SCENARIO	GALLONS OF FUEL CONSUMED	FUEL TAXES COLLECTED	PER-MILE CHARGE COLLECTED	PER-MILE VS. PER-GALLON
19.2 mpg	6,311	$1,893	$1,893	0%
24.7 (RUCPP actual)	4,914	$1,479	$1,893	+28%
40 mpg	3,034	$910	$1,893	+108%
55 mpg	2,207	$662	$1,893	+186%
All electric vehicles	$0	$0	$1,893	N/A

Participant Acceptance

Based on data and surveys collected, participant acceptance was strong. All participants who started the pilot completed it, spending an average of 67 minutes and $0 in out-of-pocket costs over three months on all pilot-related activities. A vast majority of 92% of respondents reported that the "overall system" was either "easy" or "very easy" to use. In addition, a majority of participants found each of the following detailed aspects of the pilot easy or very easy:

- signing the participant agreement,
- registering and setting up an account,
- installing the mileage reporting device,
- viewing account and reviewing charges online, and
- paying bills.

One of the principal objectives of the RUCPP was to demonstrate the concept of user choice. Table 5-3 (on the next page) summarizes several key features of the RUCPP that ODOT included as a means of ensuring adequate choices. The second column shows the proportion of participants for whom each feature was desirable. By providing all of these features and choices, even those desired by a minority, ODOT increased the satisfaction level of all participants.

TABLE 5-3

Choices Desired by RUCPP Participants at Start of Pilot Program

SERVICE PLAN FEATURE	% OF PARTICIPANTS DESIRING FEATURE
Online account setup, management, and bill pay	92%
Automated gas tax refunds	79%
Automated off road and out of state mileage refunds	75%
Pay by mail option	67%
Ability to select a technology that cannot detect location	50%
Smartphone account access	46%
Account management by private sector	33%
Ability to opt out of technology reporting	25%
Account management by government	8%

Although the majority of participants began the pilot with a positive view of per-mile charging, their experience served to improve those views. Fully 58% of respondents had a "more positive" or "much more positive" view of road usage charging afterward, compared with 42% who reported no change. All but one of those individuals reporting "no change" already had a "very positive" view of road usage charging.

TECHNOLOGY

The Road User Fee Task Force directed ODOT to measure several technology metrics from the pilot: adaptability, ease of installation, safety and operation, anti-tampering, system performance, and several hardware/software/system characteristics.

Adaptability of the per-mile charging system

All parties involved in the pilot found the per-mile charging system to be adaptable. It was capable of accepting charges and payments from a variety of sources, and was highly scalable. An account manager could easily configure the system to accept multiple types of charges, such as tolling, parking, and value-added services.

Ease of installation of mileage reporting devices

RUCPP participants found the mileage reporting devices easy and quick to install (average of 5.5 minutes to install, although most participants required less than five minutes). Vendor descriptions and ODOT pilot coordinator records confirm that the devices were quick and easy to install. The handful of participants who took longer than five minutes installing mileage reporting devices attributed their delay to difficulty locating the data port. The Help Desk assisted these individuals with locating the ports on their vehicles.

Safety and operation of mileage reporting devices

Based on several survey questions and data from the pilot coordinator, the mileage reporting devices were safe. Specifically, participants reported that the devices did not impede their driving, fall out while driving, harm the vehicle, or otherwise create unsafe conditions. Also, participants almost unanimously characterized them as easy to use—"just plug it in and go."

Anti-tampering

Both mileage reporting device vendors included a range of measures to prevent tampering. IMS, a subcontractor to sanef, used tamper-evident tape on the device and performed several error checks in their software to verify the device had not been physically tampered with, and also recorded when devices were installed and removed from the vehicle data port. Similarly, Raytheon had software measures to detect when a device was installed and removed. ODOT concluded that a combination of these measures would support tamper resistance. There were no attempts to tamper with the devices during the pilot, but since all participants were willing volunteers with a policy interest in road usage charging, tampering was not expected.

System performance

There were no identified lost transactions[29], no inaccurate billing, and no missed or misreported mileage. This was determined by evaluating several different values, including road usage charge accounting records, participant surveys, testing records, odometer values for some participants, and system error logs.

Hardware, software and other system elements

This metric showed that the system performed well across numerous dimensions:

- Feasibility: the system operated as specified.
- Reliability: the mileage reporting devices and account management system did not have failures, and were functional throughout the pilot.
- Security: authentication measures used in the software made the system secure from potential cyber attacks.
- Openness: the system was open to hardware from any vendor, as shown by the use of the same, standard message for mileage information from all mileage reporting devices; the fact that mileage reporting devices from several vendors all successfully communicated to one account management system during the pilot; and the fact that users were able to make choices about their hardware and account management service provider.
- Energy consumption: the mileage reporting devices did not drain car batteries or cause drops in fuel consumption, and the account management system operated efficiently.

[29]There were a few disconnects of the mileage reporting devices during the pilot, owing to installation demonstrations by participants to outsiders or, in a couple of cases, faulty OBD-II ports. But the mileage reporting device was able to check previous information to determine if data was missing.

- Suitability in account management experience: participant surveys showed that participants were pleased with the service provided by and ease of use of the account management system.

OPERATIONS

The Road User Fee Task Force directed ODOT to measure several metrics related to system operations during the pilot: ease and cost efficiency of administering the system, ease of use and cost of compliance with the system, accuracy and perception of accuracy of the operational system, privacy options for the system, and the ability to audit the operational system.

Ease and cost efficiency of administering the road usage charge

The RUCPP system was easy and cost-effective to administer based on interviews with the account management system vendor sanef and the consultant pilot support team. Sanef stated operating this system was "Business as Usual," because it was similar to administering the tolling systems that they typically operate. The only change that they made during system operation was a cosmetic update to invoices.

The only unexpected difficulty was achieving communications between mileage reporting devices and electric vehicles. This difficulty arose because fully electric vehicles (EVs) do not produce emissions and thus are not required by law to comply with the OBD-II data port standard. ODOT is now pursuing three solutions for EVs: custom data interfaces for electric vehicles, location-information-only mileage reporting devices that do not need a connection to the vehicle, and telematics system applications for mileage information reporting.

Administering the pilot system was cost-effective because it used hardware and software designed and made operational for other purposes.

Ease of use and cost of compliance with the per-mile charging system

The system was easy and affordable for drivers to use and comply, based on interviews with vendors and survey responses by RUCPP participants. Vendor interviews indicated that the system would be easy for participants to comply, free or inexpensive to use, and hard to evade.

Most participants who responded to surveys said they found all aspects of the system either easy or very easy to use. The only aspect of the system that more than one participant found difficult was locating the OBD-II port for installation of the mileage reporting device, which was difficult to locate on a few vehicles. The only suggestions for making the system easier to use were:

- Have clearer feedback from the mileage reporting device indicating that it is in fact operating correctly, and
- Provide clearer, more regular feedback on miles driven in a given billing period, potentially on the mileage reporting device or other electronic device such as a smartphone app (during the pilot, the information was available online, but this required users to log into their accounts through a regular web browser to access it).

Accuracy and perception of accuracy of per-mile charge data

Participants believed the mileage measurement and billing was accurate, although several reported that they could not know the accuracy of the system. Mileage reporting device accuracy was measured during acceptance testing and shown to be 97-98% accurate when compared to mileage measured by the vehicle's odometer.

Privacy options for per-mile charge payers

Vendors and participants felt that the system protected privacy well. In fact, most participants felt that the system protected privacy as well as or better than common systems such as credit cards and mobile phones.

Ability to audit

The pilot system was auditable, although lessons about mileage accounting reporting measures were learned during the pilot. ODOT is now incorporating these lessons into the operational system. The ability to audit the account management system is important because it allows ODOT to be certain the system is compliant with the requirements, interfaces, and business rules of the

The objective of the Road Usage Charge Pilot Program was to demonstrate several choices for measuring and paying a road usage charge that are easy for motorists to perform and efficient for ODOT to collect using multiple private sector providers. The RUCPP featured technology and services of three private vendors who successfully measured mileage and distributed invoices to 88 participants from three states (Oregon, Washington, and Nevada) over a four month period. Volunteers were at ease with the system, showed high levels of compliance, and received responsive customer service. By the most important measures—ease of use, motorist choice, and open, interoperable private sector administration—the RUCPP was success.

program. This in turn is vital for the public to trust the system.

The vendor sanef felt that their system was auditable, based on their experiences using a similar system for operational tolling projects that authorities have audited.

The consultant who provided the accounting/auditing system stated that the system was auditable, although improvements could be made. These improvements were incorporated into updated requirements, interface specifications, and business rules documents. The improvements included formalizing and standardizing the monthly reports from the account management system, defining the precise nature of a transaction, requiring comprehensive numbering of transactions, and allowing no missing, purged, or deleted transactions.

COSTS

The Road User Fee Task Force directed ODOT to gather and analyze as much data as possible on the cost implications of per-mile charging. Owing to its experimental nature, limited duration, and limited size, the pilot program saw higher unit costs than would a fully operational system, but ODOT learned some important cost lessons from the RUCPP.

Collection costs for the per-mile charge pilot test with 44 Oregon vehicles included the following:

- Start-up costs: cost of procuring hardware (mileage reporting devices) and costs to set up a transaction processor, billing, and account management system.
- Operating costs: monthly costs to operate the system, including device communications, data analytics, mapping, data hosting, and account management and billing.

Per-mile charge vs. per-gallon tax operating costs

The cost to collect Oregon fuels taxes averages about 0.5% of revenue, exclusive of evasion and compliance costs for taxpayers. This figure reflects a fully operational, mature program that covers taxes collected on fuels used to power over three million vehicles. This figure also excludes capital costs

associated with establishing the system (nearly a century ago) and ongoing updates and improvements (such as new system procurement currently in progress by ODOT).

The operating costs for a per-mile charge system will start out high but using private vendors to provide collection services will reduce relative system costs over time. ODOT expects private vendors would use a per-mile charge system as a platform for marketing other products and services such as pay-as-you-drive insurance, tolling, and concierge—or perhaps these other services would serve as a platform for marketing the per mile charge—and many of the costs of system implementation and operation would be borne by industry. Excluding capital costs, the evaluation team estimated an annual cost to collect per-mile charges (operating costs) between 20-50% of revenues for 10,000 vehicles.

As the size of a per-mile charge program grows, its collection costs will decline as a proportion of revenue. For example, because transactions are automated, the cost to process does not increase linearly with number of accounts. Moreover, ODOT believes that competing service providers in an open market will move toward collection of per-mile charges as a marginal additional service as part of a larger platform from which they sell value-added services to motorists. As the number of participants grows and the market for value-added services expands, the cost to government of collecting per-mile charges will decline substantially, as the majority of costs are built in to other service offerings. ODOT estimates when the number of road usage charge payers reaches one million, operating costs will drop to below five percent of gross revenues per annum[30].

[30]Other states would have to become involved with the Oregon road usage charge platform for one million vehicles to be achieved over a relatively short timeframe. The recently formed Western Road Usage Charge Consortium with ten member DOTs from the western states indicates potential for achieving a large pool of payers for a regional application of road usage charging.

CHAPTER SIX
Senate Bill 810 and the Pathway to Implementation

Oregon Road Usage Charge Program

The Oregon Senate passed Bill 810, ushering in an operational Road Usage Charge Program. Five thousand initial volunteer motorists will be charged 1.5 cents per mile. ODOT is implementing the program based on the successful approach deployed in the second pilot, creating a framework for procurement, participant recruitment and internal processes.

Taking Action: the Nation's First Road Usage Charge Legislation for Light Vehicles

Following the successful Road Usage Charge Pilot Program concluded in March 2013, the Oregon Legislature considered options for an operational road usage charging program for light vehicles. The first per-mile charge bill considered during the 2013 session was House Bill 2453 which proposed a per-mile road usage charge on light vehicles rated at 55 mpg and above.

During hearings in two House committees on House Bill 2453, legislators weighed testimony submitted by leaders of government, industry, and private citizens. The bill had overall support from a broad base of interests, including the Road User Fee Task Force, legislators from both major political parties, the League of Oregon Cities, Association of Oregon Counties, AAA Oregon/Idaho, the Metro Council and the American Council of Engineering Companies of Oregon.

At the outset, some opposed House Bill 2453. The American Civil Liberties Union opposed the bill until ODOT agreed to stronger provisions to protect personally identifiable information. The Alliance of Automobile Manufacturers and General Motors cautioned that additional, broader study be pursued before passing any legislation that mandated road usage charges because of the potential negative impact on emerging vehicle technologies such as electric vehicles. The automakers ultimately supported alternative legislation in the Senate, Senate Bill 810. That proposed legislation created a road usage charge program for up to 5,000 volunteers.

Both bills, HB 2453 and SB 810, reflected the policy evolution, lessons learned and stakeholder input painstakingly gathered over the previous decade. Both bills established a per- mile road usage charge program to begin July 1, 2015 and mandated that processes be developed to refund state fuels taxes paid for the new taxable miles. The two bills had essentially the same provisions creating an operational road usage charge program. The bills' only significant difference was the category of light vehicles that would be subject to the law.[31]

Oregon passed the nation's first mileage-based revenue program for light vehicles in 2013, just as it established America's first state fuels tax in 1919.

Each bill progressed through substantive House and Senate committees before reaching the budget writing Joint Ways and Means Committee. After extensive debate in the Joint Sub-committee for Transportation and Economic Development, the Joint Ways and Means Committee sent HB 2453 to the Speaker's desk for a vote on the House floor. When it became apparent that the necessary votes to attain the supermajority required for this bill[32] would not materialize in the Senate, the Joint Ways and Means Committee sent Senate Bill 810 to the floor of the Senate. Both chambers passed SB 810 with a vote of 24 to 6 in the Senate and 47 to 13 in the House. Governor John Kitzhaber signed the bill into law.

Just as the Oregon legislature in 1919 established the nation's first state fuels tax, 94 years later the legislature also passed the first mileage-based revenue program for light vehicles for funding the state's road system.

Senate Bill 810: Statutory Requirements

ODOT's marching orders were now clear. Senate Bill 810 clearly outlined a number of key requirements for Oregon's operational Road Usage Charge Program, to be implemented July 1, 2015. They include:

- Inclusion of up to 5,000 volunteer light vehicles registered in Oregon, with no more than 1,500 vehicles having a fuel efficiency rating of less than 17 mpg, and no more than 1,500 vehicles with a fuel efficiency rating between 17 and 22 mpg
- A road usage charge rate of 1.5 cents per mile for travel on public roads in Oregon to be paid by volunteer vehicle owners or lessees
- A refund/credit of Oregon fuels tax paid by these motorists, attributable to taxable miles charged and paid
- Refunds for travel on private roads in Oregon
- ODOT to develop methods that volunteer vehicles will utilize to measure and report mileage that includes at least one method that does not use vehicle location technology
- Choices for volunteers to select from multiple methods for how their billable mileage will be collected and reported
- The establishment of an integrated, open-systems architecture for

Oregon Rep. Tobias Read, Rep. Vicki Berger, and Sen. Bruce Starr describe their experiences participating in the 2013 Road Usage Charge Pilot Project, and subsequently passing Senate Bill 810, at the Oregon Road Usage Charge Summit, Portland, Oregon, Nov. 2013.

[31]HB 2453 had a road usage charge rate set at 1.55 cents per gallon which was determined by the House Revenue Committee upon the recommendation of the committee's economist. SB 810 had a road usage charge rate of 1.5 cents per mile set by the Senate Committee on Business and Transportation.

[32]The Oregon constitution requires revenue raising measures to attain a 60 percent supermajority vote in each chamber.

Oregon's Road Usage Charge program will become operational on July 1, 2015.

Representatives from 15 state departments of transportation attended the Road Usage Charge Summit in Portland to learn about Oregon's Road Usage Charge Program. DOT representatives from the western states attended the inaugural meeting of the Western Road Usage Charge Consortium, which now has 10 states as members.

technology components of the Road Usage Charge Program, utilizing common standards and a published operating system that will enable components provided from different sources to be readily substituted or supplied by multiple providers

- The establishment of contracted private sector partners under statutes and guidelines of the Oregon Innovative Partnerships Program to provide volunteers the option of private sector administration for their participation
- The protection of personally identifiable information from disclosure and the elimination of all location-based and daily metered use data according to strict timelines, unless the volunteer consents to retention
- Enforcement of the new law via penalties for false statements, non-payment, and tampering with the in-vehicle technology

In establishing the methods to collect and report mileage pursuant to the bill, ODOT was further instructed to consider:

- The accuracy of the data collected
- The options for privacy available for the various methods
- The security and resistance to tampering of the technology alternatives
- The ability to audit the compliance to statute and rule
- Other relevant factors that ODOT may deem important.

The bill requires the program be operational by July 1, 2015, and directs ODOT to take all actions required to meet this deadline.

The Path Forward: Implementing Senate Bill 810

Framework

With the passage of Senate Bill 810, ODOT began preparations to meet the July 1, 2015 statutory launch date. The bill approved the creation of an implementation budget that provides for an 11 person implementation team, which includes experts in the areas of: communication; project management; tax administration; organizational transition; procurement; and, information technology. To assist in the Road Usage Charge Program implementation, ODOT retained the consulting firms that proved valuable in the conceptual development of the program and pilot testing.

ODOT's Road Usage Charge Program implementation team is now working to update many program documents to reflect the requirements of Senate Bill 810's volunteer program. These include documents related to technical system requirements and interfaces, policy framework, business rules and requirements for private sector partners, and operational requirements and procedures internal to the Road Usage Charge Program.

FIGURE 6-1

Oregon Road Usage Charging Open System Concept

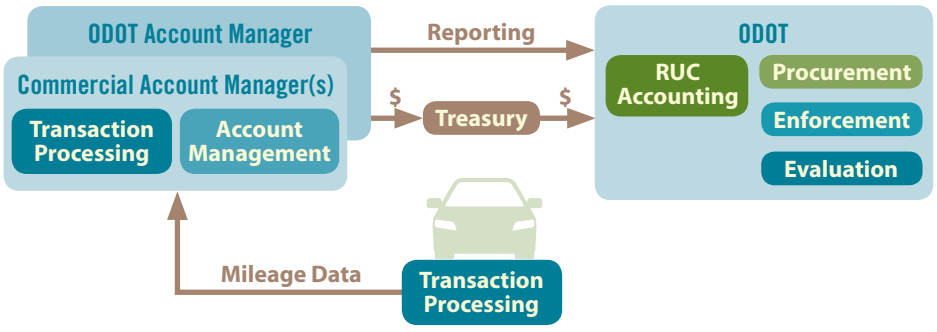


Figure 6-1 depicts a detailed target open system and organizational structure of the program that will result from the implementation of the bill.

External private companies will provide mileage measurement, data collection and processing, road usage charge assessment and collection, and individual account management services to the volunteers, as depicted on the left side of the diagram. ODOT will interface with the private sector account managers to collect the road usage charge as remitted by the account managers, and provide overall program administration, and compliance and enforcement functions. ODOT will also assure that the volunteers have the requisite choices of mileage measurement and reporting required by Senate Bill 810, and will provide an ODOT-based account management service option to assure such choices are available.

ODOT will contract with private sector entities to provide all elements of the external commercial program, and will contract separately with a single entity to provide elements of the ODOT account management service. Commercial account managers will assume responsibility for provision and compliant operation of all external elements of the Road Usage Charge Program, through a single corporate entity, joint-venture, or other arrangement with mileage reporting device and data collection providers.

Implementation

Senate Bill 810 implementation is organized around three primary, interrelated areas:

1. Procurement of private sector partners for account management services and technology.
2. Recruitment of volunteers for the program.
3. Establishment of the internal ODOT organizational systems, processes and framework necessary to work with private sector partners to administer the program and ODOT account management functions to assure the availability of the program elements required by Senate Bill 810.

Context Research

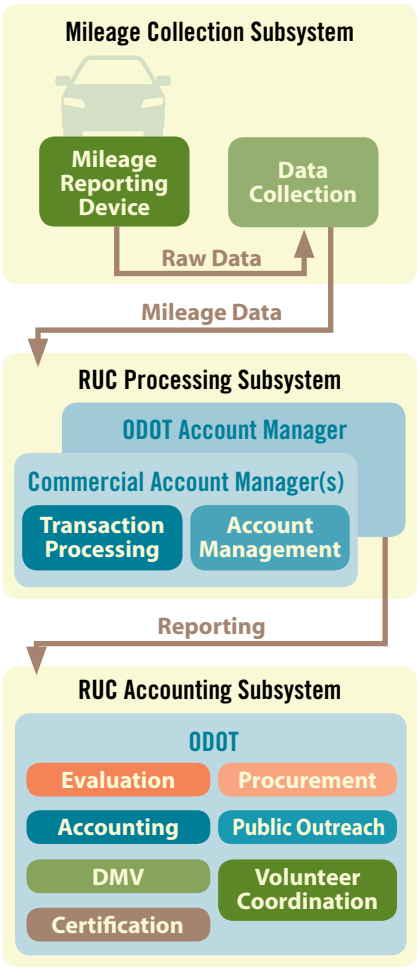
Before preparing documents to procure the operational road usage charging system, ODOT held a national Road Usage Charge Summit in November of 2013 in Portland, Oregon. Thirty-eight prospective account managers, mileage reporting device providers, and data collection providers—domestic and international—attended the Summit to learn about the opportunity provided by the new Oregon Road Usage Charge Program.

Prior to or during the summit ODOT gave these prospective private partners detailed technical system requirements, a business framework describing the relationship between ODOT and the private sector, and technical interface requirements that would establish the open-system architecture required by Senate Bill 810.

Oregon set the stage for multi-state collaboration with the first meeting of the Western Road Usage Charge Consortium at Oregon's Road Usage Charge Summit in Portland, Oregon, Nov. 2013.

FIGURE 6-2

Oregon Road Usage Charging Subsystems and Components



In addition to the private sector attendees, representatives from 15 state departments of transportation attended the Road Usage Charge Summit in Portland to learn about Oregon's Road Usage Charge Program. The attendance of nearly a third of the states in the U.S. demonstrated to the private sector there is real opportunity for market expansion of their services to millions of drivers beyond Oregon. This showed that Oregon's volunteer program is likely just the beginning of the U.S. road usage charging business.

Thirteen of the state departments of transportation at the Summit sent representatives to attend a separate meeting of the Western Road Usage Charge Consortium, a new organization comprised of western states formed to further research and develop understanding of the road usage charge concept across the western United States.

Following the summit, ODOT held one-on-one sessions with 21 potential vendors who requested meetings with ODOT. This gave vendors an opportunity to provide inputs that would further inform and refine ODOT's procurement approach. Based on the input from these potential vendors, ODOT prepared procurement documents for the Road Usage Charge Program and released them for comment on April 1, 2014.

ODOT's implementation team is now validating technical specifications and business rules to implement the program in a way that will support the volunteer program in SB810, but will also serve as an operational system for a future mandated road usage charge program, once the Oregon legislature passes such a law to expand the road usage charge program to mandated taxpayers. ODOT hopes to achieve a procurement that provides the private sector the first opportunity to enter a potentially large market in the United States for light vehicle road usage charges while allowing ODOT to preserve the public trust in administering the program.

Procurement

ODOT will issue procurement documents to establish minimum qualifications for any entity interested in being an Account Manager for the Road Usage Charge Program. Entities that meet these minimum qualifications in the procurement documents will be eligible to submit proposals for ODOT Account Management services (Request for Proposal) and Commercial Account Management services (Request for Qualification).

The Request for Proposals for ODOT Account Management services will result in ODOT selecting one firm to provide these services.

The Request for Qualifications for Commercial Account Managers will be an "open procurement" in which multiple vendors may qualify, both at the outset of the program and at any time in the future, to provide account management services. Once qualified, ODOT will negotiate contracts with the prospective Commercial Account Managers, reviewing key elements of their technology and processes for compliance with system requirements and business rules. Vendors under contract will provide the Commercial Account Management and technology services to volunteers for the program in addition to road usage charge collection services to ODOT.

The implementation team has set the following target schedule for procurement:

- May 2014: Issue Open Request for Proposals
- Summer/Fall 2014: Negotiate contracts and confirm technical / business compliance
- Winter 2014/Spring 2015: Perform all component and systemic tests
- July 1, 2015: Begin operations

Recruitment of Volunteers

Concurrent with the account management and technical procurement process, ODOT communication and public relations specialists will work to acquire a broad base of volunteers for the program. Volunteers will come from two sources:

a) Customers of the selected Account Management vendors who choose to volunteer for the program

b) Volunteers recruited by ODOT through outreach and marketing efforts

When accepting volunteers for the program, ODOT will ensure vehicle fuel efficiency restrictions specified in Senate Bill 810 are met, which specify that not all volunteers have low fuel efficiency vehicles. In addition, ODOT will strive to create a volunteer population that reflects the geographic diversity of Oregon's light vehicle on-road fleet. ODOT will engage the services of a marketing communications firm to conduct public outreach program to meet the 5,000 volunteer recruitment goal, and to further inform the public and media about the program going forward. Volunteer recruitment efforts will begin in the summer of 2014. ODOT will involve a select group of volunteers for system testing planned for the spring of 2015 prior to program commencement on July 1, 2015.

Volunteer recruitment will continue until all volunteer goals are reached, even after the July 1, 2015 commencement of the program. If the vehicle caps specified in Senate Bill 810 are met, ODOT will monitor the totals and invite more to enroll if any openings occur. Ongoing volunteer support and management will be provided by ODOT and through coordination with account management vendors for high-level customer service and program quality.

Internal ODOT Organization and Processes

Beginning in the spring of 2014, ODOT will describe, document in detail, and implement the organizational structure and specific internal governance, policy, processes, systems and procedures necessary to provide the administrative, compliance and enforcement aspects of the Road Usage Charge Program mandated by Senate Bill 810. Given the relatively small nature of the volunteer program, it likely will be staffed with a small administrative and compliance team of four FTE, supported by Information Systems, Communications, Finance, and other elements of the department via internal service level agreements.

Estimated steps in and timeframes for this effort are as follows:

Spring-Summer 2014
• ODOT will hire or retain additional subject matter experts—accounting and compliance specialists—will be hired or retained to begin development of revenue accounting, reporting, compliance and enforcement procedures, including applicable Oregon Administrative Rules
Spring-Fall 2014
• Standard operating procedures will be developed and documented; a Road Usage Charge Program administration charter, collaboratively developed with ODOT Executive Management, will establish clear management governance and organizational placement within ODOT and provide the organizational framework for the program
• ODOT will develop internal service level expectations will be developed with appropriate ODOT units to support the Road Usage Charge Program, including Information Systems, Communications, and Financial Services
• ODOT will identify required Administrative Rules and initiate the process to establish them
• ODOT will complete a "make/buy" decision on systems required for ODOT tax administration will be completed, and procurement and development will begin
Winter 2014-Spring 2015
• ODOT will procure and develop a tax administration system
• ODOT road usage charge administration and compliance personnel will participate in systemic testing of the program with private sector partners and volunteers

CHAPTER SEVEN
Issues Facing Road Usage Charging Programs

Oregon Road Usage Charge Program

As the state of Oregon proceeds with its Road Usage Charge Volunteer Program, we continue to identify issues that will potentially impact its acceptance and ultimate success. These include privacy concerns, administrative cost concerns, equity for rural drivers/drivers in different regions, treatment of out-of-state drivers and consumer interest in non-road usage charge fee models.

Making Road Usage Charge Policies Acceptable

The Oregon Legislature passed Senate Bill 810 on a strong bipartisan vote[33]. The bill contained Road User Fee Task Force recommended legislative provisions that resolved, or calmed, the policy concerns identified by the two national surface transportation commissions and eliminated or addressed strong objections raised by the general public. A list of these issues and the progress of their resolution is contained in Table 7-1.

During the many presentations ODOT made prior to the 2013 legislative session, Oregonians and others suggested numerous alternatives to road use charging as a way to bolster funding for the highway system. The latter portion of this chapter explains why the suggested alternatives cannot meet policy objectives as effectively as road usage charging.

Priority Issues for Oregonians

While Oregon's latest road usage charge platform addresses the operational and policy issues raised about the per-mile charge over the past dozen years, at least four big issues persist in the collective mind of the body politic in the United States: privacy protection, administrative costs, equity concerns related to rural driving, and non-resident driving. Oregon policymakers have taken impressive steps to protect privacy with passage of SB 810, but communicating the nature of the protections to achieve public acceptance still challenges policymakers. The Oregon road usage charge platform may resolve concerns about administrative costs as well, but proving the case may take a few years of operation and a much larger road usage charge payer pool than a few thousand volunteers. The impact of charging by distance driven upon rural motorists may also be largely a matter of adequately communicating the factual circumstances of rural drivers and how the Road Usage Charge Program would relate to their daily lives. How the per-mile charge would apply to non-resident motorists will be determined not by one state but by a number of states working together on the issue.

[33]Senate Bill 810 passed the Oregon House of Representatives, 47 to 13, and the Oregon Senate, 24 to 6, on July 7, 2013 [CONFIRM DATE]

TABLE 7-1

Key Issues Raised By Two National Surface Transportation Commissions with Resolutions by the Oregon Program Under Policies of SB 810

ISSUE	RESOLUTION
Privacy and protection of personally identifiable information (PII)	• No mandate for reporting devices containing vehicle location technology (i.e., GPS) *(Section 6(2)(c))* • Requirement for motorist choice of reporting method *(Section 6(3))* • Limits access to PII and imposes obligation to protect PII *(Section 9)* • Imposes mandate to destroy location and metered use records within 30 days after later of payment processing, dispute resolution or non-compliance investigation
Cost of start-up and operations	• ODOT estimates that implementation of SB 810 will cost $4 million • ODOT estimates that operation of the road usage charge system will cost about ten percent of revenue raised once the number of payers reaches 100,000 and under five percent with one million payers • The added cost of mileage reporting devices will be essentially nothing if already contained within the vehicle or if other vendor services are provided. Without additional services, estimates for adding an external mileage reporting device will range from $50 to $80 currently, but prices are declining and should continue to do so • By allowing private sector entities to provide technologies and systems for road usage charges that are already in the market for other purposes, start up and operational costs can be shared with other services
Complexity of implementation	• Accessing private sector services and expertise from vendors already performing similar necessary functions in the marketplace manages complexity effectively *(Section 25(2))*
Difficulty of operations	• Accessing existing private sector capability for electronic reporting and transaction processing/account management reduces difficulty *(Section 25(2))* • Government role is chiefly auditing and enforcement
Interoperability among states	• Open system requirement facilitates easy and simple interoperability if other states adopt open architecture platform *(Section 6(2)(d))*
Scalability for various levels of government	• Open system and ODOT's standard mileage message provides scalability for any level of government *(Section 6(2)(d))*
Flexibility for technological evolution	• Open system allows for easy technological evolution *(Section 6(2)(d))*
Security and seamlessness of electronic data transmission	• ODOT's standard mileage message includes security and transmission protocols and ODOT's business rules will require adherence to security requirements
Frequency of payment	• Frequency of payment will be determined according to individual circumstances *(Section 8)*
Enforcement and evasion	• Road Usage Charge Program account managers' contract requirements will impose reporting of anomalies to ODOT for enforcement
Equity by income and geography	• This issue remains unresolved pending action on rate setting policy by Oregon legislature
Phase-in of application	• Actual phase-in will be determined by Oregon legislature but the open system allows scalability to any size application

Privacy Protection

Throughout the twelve-year history of Oregon's investigation of the per-mile charge, protection of privacy proved the most prominent concern of the citizenry. They did not want to be tracked, and they did not want their travel information searched. Most importantly, many people were not willing to trust assurances of a government agency that tracking of their whereabouts would not occur and that their travel information would be secure.

Through interactions with the general public during more than 25 presentations statewide before the 2013 legislative session, ODOT learned that motorists are generally comfortable generating and reporting mileage information to an entity if they have the opportunity to choose: (1) the method of reporting; (2) from whom they acquire the mileage reporting device; and, (3) to whom they report the information. The fully operational road usage charge system the state of Oregon will implement will provide motorists these options.

Nevertheless, even when they have these choices, motorists want their personally identifiable information protected. Senate Bill 810 limits access to personally identifiable information and imposes obligation on all entities—government and private—not to disclose it except to the extent necessary to perform a particular function.[34] Motorists can expressly approve or deny access to their information by any entity.

Importantly, the bill requires that ODOT and private entities involved with road usage charging data collection destroy location and daily metered use information within 30 days after the later of payment processing, dispute resolution and non-compliance investigation. The bill makes exceptions to the mileage date destruction requirement for three cases: (1) when a private entity obtains motorist consent, (2) monthly summaries of metered use, and (3) aggregation of mileage records for traffic management and research after removal of personally identifiable information. Thus, even when a motorist surrenders anonymity, they are assured surrender will not be permanent unless they consent to data retention.

Providing motorists with choices for mileage reporting and payment and mandating protection of personally identifiable information provided a level of comfort to legislators on the privacy issue.

Administrative Costs

Typical studies of the costs associated with administration and compliance for a road usage charging system rely upon data from seemingly similar systems—primarily electronic toll collection systems. This comparison can lead to the view that collection of a road usage charge would be expensive. But there are substantive differences between them. To ensure the lowest possible operational cost, the Oregon Road Usage Charge Program structure focuses on maximizing competition, minimizing public infrastructure investments and creating an open system to minimize costs. By encouraging road usage charge payers to assess private sector administration options under an open competitive system, ODOT intends to animate market forces to foster innovation and cost efficiencies for technologies and operation of the road usage charge systems.

Through application of a financial and economic model prepared to predict road usage charge system costs and revenues under various scenarios, ODOT determined that the operational costs for Oregon's Road Usage Charge Program depend heavily on the number of road usage charge payers paying the charge. The higher the number of payers, the smaller the relative cost per transaction. ODOT estimates that critical mass for an inexpensive road usage charge system is about one million road usage charge payers. Since the Oregon road usage charge platform can be accessed by multiple states, achieving one million road usage charge payers is not unlikely.

Oregon Road Usage Charge Is Not Tolling

Oregon's Road Usage Charge Program differs in significant ways from electronic tolling systems. First, road usage charging is a broad revenue source for

Jim Whitty, Manager of ODOT's Office of Innovative Partnerships and Alternative Funding, shares details of Oregon's Road Usage Charge Program to members of the Western Road Usage Charge Consortium.

[34] See section 9 of Senate Bill 810 (2013)

the purpose of funding the entire public road system and, unlike tolling, is not related to a specific facility. While tolling systems typically have a single dedicated back office for account management services exclusive to the toll facility, Oregon's road usage charge systems will allow drivers to select who will process transactions and manage their account. These account managers may or may not be dedicated RUC providers, and they may already provide the RUC Payer with services and business activities unrelated to road usage charging. This choice of service provider, and ability for account managers to offer other services, should allow for competition that drives down costs. Further, tolling systems require significant infrastructure along the roadways. The Oregon Road Usage Charge Program does not rely upon license plate readers, gantries, or other equipment in the field to identify when an account holder uses the facility. The program's unique, system-specific infrastructure is limited to the mileage reporting device, and drivers will have multiple models from which to choose.

Second, electronic toll systems rely on specific, exclusive toll accounts held by individual motorists with the toll authority. Due to the troubled state of tolling interoperability in the U.S., this often means individual motorists must get multiple toll accounts and transponders specific to each toll system they want to use. In contrast, Oregon's road usage charge system allows for account management from any entity that successfully qualifies to provide such services. This opens the potential for road usage charge account services to be bundled with other account services and accordingly experience economies of scale. Oregon's open-system design should prevent interoperability barriers because of its adoptability by other jurisdictions and because accounts are not with a specific jurisdiction. Commercial account managers for the road usage charge system can easily support programs in multiple states by sorting mileage for each vehicle and applying the appropriate charge by state or other geographic boundary.

ODOT convened more than 20 states and 60 private sector companies representing four countries, plus several universities, advocacy groups, and the Federal Highway Administration at the Oregon Road Usage Charge Summit, Nov. 2013. It was Oregon's premier opportunity to share details of the nation's first-ever Road Usage Charge Program with a large group of potential partners, and for the Oregon team to learn more about available technology, opportunities and capabilities for successful implementation.

Both electronic tolling and the road usage charge program rely upon account management services that are paid in part or in full by the user. Toll collection costs are typically included when setting toll rates; these costs are part of the toll rate and as such are relatively invisible to the average user. Tolling account services are predominately provided by a single entity, resulting in fixed costs for contract terms with competition only occurring at the initial contract letting stage. The road usage charge program, on the other hand, seeks to minimize account management costs by creating and fostering market competition for these services, allowing as many commercial account managers that are interested and qualified to enter the market to provide services.

Taken together, these observations show that when a road usage charging program reaches a sufficient size, it can be more cost effective than an electronic tolling system.

Road Usage Charge Compliance Costs

MILEAGE REPORTING DEVICES. Oregon's open system will allow motorists to choose from a range of mileage reporting devices. Motorists' cost will depend on the features of the device, the business model of the providing company and whether the device is new to the vehicle or already installed. If a motorist already has a device and service from a provider that is collecting data from the vehicle for that service, they may incur no additional costs for mileage reporting. If not, the driver will have to purchase or lease a device (more expensive), and subscribe to an on-going service provider that collects and reports the mileage fee. In-vehicle telematics and infotainment systems now installed in many vehicles as standard equipment have the capacity to wirelessly report miles driven. Employing this equipment for mileage reporting will not require motorists to add an external device to the car but simply activate the one already installed.

If a motorist needs or prefers an external mileage reporting device, the market currently provides inexpensive mileage reporting devices in the pay-as-you-drive (PAYD) auto insurance industry that can be used for the Oregon road usage charge system as demonstrated in the second pilot. In 2013, market estimates of the price range of the PAYD insurance devices used in Oregon's second pilot ranged from $50 to $80.[35]

There are two factors at work that could dramatically reduce the costs of road usage charging over time.

1. There is a growing market for services related to the connected car. These unrelated markets are building the infrastructure needed for road usage charging. If these markets put the technology and business models in place – vehicle devices, communications links, and account management – the largest cost drivers for mileage reporting would shared or even covered entirely under other services.
2. History has shown that communications and technology costs reduce over time.

DATA COMMUNICATIONS. Daily data communications via cellular transmission can be expensive. In 2013, market estimates of daily, machine-to-machine data transmission ranged from $3 to $5 per month, an expense that would comprise a large percentage of many road usage charge billings[2]. Even though data communications costs will likely decline somewhat by July 1, 2015, this problem needed to be resolved.

ODOT's development team discovered solutions. Instead of using dedicated data plans for the device, providers can use free Wi-Fi hotspots, perhaps at the driver's home, work or other frequently visited places. Providers can also pair the device with a cell phone as the primary communications link, and use available minutes in the phone's calling plan. Unfortunately, these free communications options are not fool proof and must be augmented with other strategies. Data uploads would be dependent on the habit of the RUC Payer who remembers to pair the cell phone, or connect to a Wi-Fi hotspot. Devices must also employ a last resort method of reporting. Since the mileage reporting device is only required to report once a month, this last resort method could be a pay per use plan, which would drop communications cost to $0 in most cases or to an affordable level of closer to $1 per month, incurred only when all free options fail.

Road Usage Charge System Costs

ODOT will provide a compensation arrangement for a private sector entity to set up and operate the ODOT account management system. ODOT will negotiate this compensation arrangement with the firm selected.[36]

ODOT will take operations responsibility for the road usage charge accounting system and procurement and enforcement activities. These portions of the system should cost in the range of $420,000 annually to operate for the 5,000 volunteer road usage charge payers.

ODOT intends to negotiate compensation for providers of the commercial account management services with the marketplace. This will occur during the procurement process. Notwithstanding a compensation arrangement negotiated with ODOT, commercial account managers will have the opportunity to charge its road usage charge paying clients a fee for service that the market will bear. For the initial 5,000 volunteers in the Road Usage Charge Program beginning July 1, 2015, ODOT will cover the cost of the service fee, but would not cover such a fee when mandated payers are added to the program.

As the market for mileage charging grows in Oregon and elsewhere in the United States, the ODOT provided compensation package for commercial account managers should shrink over time so that only the payers of the road usage charge compensate the commercial account managers for providing account management services. Commercial account managers may also financially benefit from data use and sale, provided they have express approval for resale from their road usage charge customers.

[35]Report on Economic Viability of Road Usage Charging in Oregon, *June 2013, p. 20*

[2]Report on Economic Viability of Road Usage Charging in Oregon, *June 2013, p. 21*

[36]ODOT is presently engaged in procurement activities for ODOT account management functions for the Road Usage Charge Program, the compensation arrangements for which ODOT will negotiate with the entity selected to attend to the contracted account management functions. Precise set up and operations costs will be determined as part of this process.

TABLE 7-2

Fuel Tax Inequity by Vehicle Fuel Efficiency

MPG	GAS TAX	CURRENT PER MILE	SUBSIDY PER MILE
9	$0.30	$0.033	$0.0182
15	$0.30	$0.020	$0.0049
20	$0.30	$0.015	$(0.0001)
35	$0.30	$0.009	$(0.0065)
55	$0.30	$0.005	$(0.0096)

Fuel Tax Inequity by Fuel Efficiency and Distance Driven

5000 MILES PER YEAR	10000 MILES PER YEAR	15000 MILES PER YEAR	20000 MILES PER YEAR
$91.17	$182.33	$273.50	$364.67
$24.50	$49.00	$73.50	$98.00
$(0.50)	$(1.00)	$(1.50)	$(2.00)
$(32.64)	$(65.29)	$(97.93)	$(130.57)
$(48.23)	$(96.45)	$(144.68)	$(192.91)

With an initial cap of 5,000 voluntary payers for the Road Usage Charge Program, operations costs will be relatively high, and the program will operate at a loss. Once the legislature directs a segment of mandated payers to the Road Usage Charge Program, creating a larger base, relative system costs should drop significantly. ODOT estimates that when 100,000 vehicles enter the system, operating costs will be around ten percent of gross revenues per annum and will continue to decrease as more payers from Oregon and other states enter the system. When the number of road usage charge payers reaches one million, ODOT estimates that operating costs will drop to below five percent of gross revenues per annum[37].

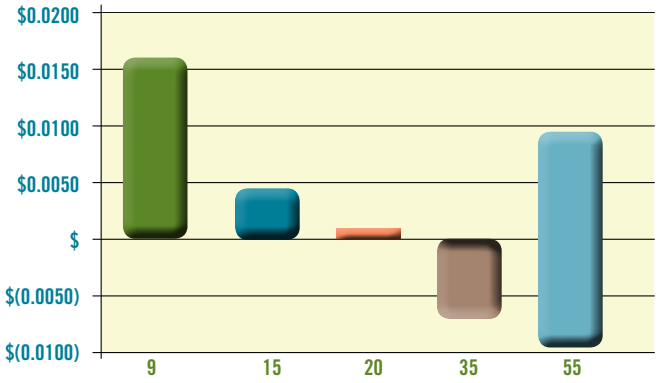
Fairness and Rural Driving

The impact of the per-mile charge upon rural driving is largely misunderstood. Some say that it would be unfair for rural drivers to pay a road usage charge because they must drive longer distances to do basic things such as go to work, school, medical appointments and the grocery store. While this may be true for some rural drivers, nearly all Oregon drivers already pay a distance-based tax—the fuel tax. Drivers pay per mile now based on how much they pay for fuel.

But the fuel tax is not a perfect proxy for road use, because it imposes a higher cost per mile on those who drive less fuel-efficient vehicles. Some drivers—for example, users of working vehicles such as pickup trucks—pay much more per mile than others. Someone driving a Ford F250 15,000 miles a year pays $410 in Oregon fuel taxes whereas someone driving a Toyota Prius pays $90 for traveling the same total distance. Operators of electric vehicles pay no road use tax at all. A per-mile road usage charge can be applied equally to all drivers or only to operators of fuel efficient vehicles to ensure they pay a fair share for their road use.

CHART 7-1

Cents per Mile Paid Above or Below Fair Share by Vehicle MPG



Source: Oregon Department of Transportation, 2013

Rural drivers tend to drive less fuel-efficient vehicles more often than their urban and mixed counterparts. Recent data indicate that the average fuel efficiency of vehicles registered in rural Oregon counties declined slightly between 2009 and 2011 while fuel efficiency has increased in urban and mixed counties. Accordingly, rural drivers are paying more per mile for road use under the fuel tax than do urban and mixed drivers.

Recent ODOT surveys of rural drivers yielded many driving patterns and no consistent theme for rural driving.[38] The surveys determined that rural drivers are quite

TABLE 7-3

Overall Average Fleet Fuel Efficiency (2011) and Change in Fuel Efficiency (2009-2011) By County Classification

COUNTY CLASSIFICATION	AVERAGE EFFICIENCY, 2011 (MPG)	CHANGE IN FUEL EFFICIENCY, 2009-2011 (MPG)
Urban	22.28	0.12
Mixed	21.26	0.06
Rural	20.71	(0.01)
Totals	21.61	0.07

Source: DMV, 2012

[37]Report on Economic Viability of Road Usage Charging in Oregon, *June 2013, p. 24*

[38]Final Report on Impacts of Road Usage Charges in Rural, Urban and Mixed Counties, *June 2013*

When comparing how far residents drive on Oregon public roads, there is not much difference—only eight percent—in the amount eastern Oregonians drive compared to western Oregonians.

diverse and have many travel behaviors. Some live in towns or close to them while others live far away on working properties. Some rural drivers drive short distances and less than urban drivers while others drive longer distances and much more than urban drivers. The surveys indicate that in western Oregon there is no significant difference in the annual amount of driving between urban and rural residents, but western rural residents reported driving fewer miles on Oregon public roads than their urban counterparts.[39]

The more significant difference in driving is between eastern and western counties. Extremely rural Oregonians drive much longer distances for medical appointments and shopping—offset by less frequent trips—than do their counterparts in the rest of Oregon.

Distances for driving to work, school or going to restaurants is not much different for any Oregonian.

Breaking down the surveys by eastern and western counties regardless of whether they are rural, urban or mixed yields a clear distinction between driving habits in the east and west of the state. Eastern Oregon residents drive 20 percent more on average than western Oregon residents. Much of the driving in eastern Oregon, however, is out of state or off public roads. When comparing driving on Oregon's public road system, there is not much difference—only eight percent—in the amount eastern Oregonians drive compared to western Oregonians.[40]

TABLE 7-4

Comparison of Urban, Rural and Mixed Driving (By Purpose)

AVERAGE MILES DRIVEN ONE WAY	STATEWIDE COUNTY SAMPLE				SUPPLEMENTAL EASTERN COUNTY SAMPLE
	URBAN	MIXED	RURAL	AVERAGE	EASTERN
Go to medical appointments	8.8	18.4	24.0	17.0	45.2
Shop for clothes and other personal items	7.9	16.4	22.5	15.5	48.4
Go to work or to school if you're a fulltime student	11.1	15.1	16.0	13.9	15.0
Shop for groceries and household items	4.0	9.1	14.8	9.3	19.3
Go to restaurants	5.3	7.9	11.6	8.1	11.6

Source: Final Report on Impacts of Road Usage Charges in Rural, Urban and Mixed Counties, June 2013, p. 30.

TABLE 7-5

Comparison of Urban, Rural and Mixed Driving (By Totals)

LOCATION OF COUNTY	AVERAGE ANNUAL MILEAGE		
	TOTAL MILEAGE	OREGON MILES	OREGON PUBLIC ROAD MILES
Eastern Oregon	14,372	12,470	11,287
Western Oregon	11,983	11,257	10,410
% Difference in Eastern Oregon	+20%	+11%	+8%

Source: Final Report on Impacts of Road Usage Charges in Rural, Urban and Mixed Counties, June 2013, p. 31.

[39]Final Report on Impacts of Road Usage Charges in Rural, Urban and Mixed Counties, *June 2013, p. 10*

[40]Final Report on Impacts of Road Usage Charges in Rural, Urban and Mixed Counties, *June 2013, p. 31*

Non-Resident Driving

Citizens often raise the question of how non-resident motorists will pay the per-mile road usage charge for driving within the state of Oregon. The Road User Fee Task Force decided not to develop and propose legislative policy for applying road usage charging to non-residents in the 2013 legislation, preferring to simplify the number of issues under debate. Until the Oregon legislature decides to resolve that issue, non-resident motorists will continue to pay the fuel tax for driving on Oregon public roads.

In Senate Bill 810, the Oregon legislature authorized ODOT to enter into multi-jurisdictional agreements to work with other states on matters of common interest for road use charging.[41] The best way to determine how road use charging will apply to interstate driving is by neighboring states working together. To this end, Oregon and Washington Departments of Transportation jointly formed the Western Road Usage Charge Consortium in the summer of 2013. All member states of the Western Association of State Highway and Transportation Officials are eligible to join the consortium and as of the date of publication, California, Texas, Nevada, Utah, Colorado, Arizona, Hawaii and Montana have also joined the consortium. While all ten states want to learn about road usage charging and having access to the research of other states, not every member state has decided whether to implement research and development programs for road usage charging within their state.

[41] Section 29 and 30 of Senate Bill 810.

[42] The State of Washington enacted a $100 annual fee for electric vehicles in 2012 but also directed the Washington State Department of Transportation to study the viability of the road usage charge to replace it. The legislatively created task force found a road usage charge to be viable in 2013. The Virginia legislature became the second to enact an annual fee for electric vehicles. It remains to be seen whether these flat fees will hold. The Oregon Legislature doubled registration fees for hybrid vehicle owners in 2001 only to repeal that law in 2003 amidst rancorous political pressure. In 2013, Virginia increased an electric vehicle annual fee and expanded it to hybrid electric and alternative fuel vehicles. Virginia's 2014 Legislature repealed of the application of this fee to hybrid vehicles. Once more people drive electric vehicles, similar pressures may ensue.

[43] While early on the fuel tax was fair when vehicles had similar fuel efficiencies, the fuel tax is no longer fair because some motorists avoid it altogether and others pay only a little for driving a lot.

Oregon Road Usage Charge Summit, Portland, Nov. 2013

Alternatives to Distance Charging

Often those uncomfortable with the per-mile charge suggest alternatives they consider more comfortable or simpler. The alternatives most often suggested are listed in table 7-6.

TABLE 7-6

Common Suggested Alternatives to the Per-Mile Charge
Flat Annual Fee (or Vehicle Registration Fee Increase)
Tax electricity for vehicle use
Tax tire purchases
Tax battery purchases
Toll interstate highways
Raise fuel tax (or index fuel tax)
General fund
BTU tax

Flat Annual Fee

Some states have enacted flat annual fees for electric vehicles to ensure that operators of those vehicles pay some kind of contribution to road funding.[42] A flat annual fee (or vehicle registration fee increase) is a simple and viable way to capture road use revenues from operators of vehicles that pay very little or nothing in fuel taxes. However, a flat annual fee is not fair; drivers who drive modest amounts would subsidize those who drive a lot. This violates the user pays principle underpinning Oregon road funding policy.

For many motorists, the flat annual fee is even less fair than the growingly inequitable fuel tax.[43] Table 7-7 illustrates that imposing an annual flat fee of $150 to both a commercial sales person driving 35,000 miles a year and a retired senior driving 3,500 miles a year results in the senior substantially subsidizing the driving of the commercial sales person. Applying the user pays principle, road usage charging is the fairest policy.

TABLE 7-7

Comparison of Annual Flat Fee to Per-Mile Charge

ANNUAL MILES DRIVEN	FLAT FEE	PER-MILE CHARGE AT 1.5 CENTS PER MILE	DIFFERENCE
35,000	$150	$525	+ $375.00
3,500	$150	$52.50	- $97.50

Tax Electricity for Vehicle Use

While taxing electricity for electric vehicle use has some intuitive appeal, practical considerations make it either impossible to implement, or more cumbersome than the per-mile charge. First, electricity use cannot be differentiated by application when it is sold. Since nearly every building has electrical outlets on external walls and hybrid and electric vehicles generate their own electricity while

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driving, the only way to charge a separate rate for vehicle electricity use is to install an electricity metering device within the vehicle. Vehicle metering is the very thing that concerns some people about the per-mile charge. Additionally, paying an additional charge for vehicle electricity use does not solve the problem of the growing fuel efficiencies of standard internal combustion vehicles.

Tax Tire Purchases

While at first glance a tire tax is associated with road use, a tax on tires has several practical concerns that make it unfeasible as a proxy for distance traveled. First, a tire tax is not a precise proxy for road use because tires wear at very different rates; furthermore, driving habits and weather affect tire wear in ways unrelated to distance traveled. More importantly, drivers can easily buy tires outside Oregon without tax. Finally, a tire tax would add significantly to the price of tires placing a hardship on less affluent purchasers and discouraging purchase of new tires, thus making road travel less safe.

Tax Battery Purchases

A tax on car batteries is also associated with road use, but it is also infeasible as a proxy for road use. Even more than tires, batteries have variable lives depending upon type, geography, electricity use for heat and air conditioning, and luck. Drivers can also easily buy batteries outside Oregon, and thus avoid paying an Oregon tax. A battery tax collected up front would also add significantly to the price of batteries placing a hardship on less affluent purchasers who may be more likely to drive older cars with older batteries.

Toll Interstate Highways

Tolling all highway facilities with large average daily traffic (such as the Interstate Highway System) would certainly raise high levels of revenue. As a way to raise revenue for all roads, this mechanism would be fundamentally unfair because drivers near high volume roadways would pay for the entire road system while other drivers would get a free pass. Oregon's interstate highways carry less than 25% of the total vehicle miles traveled in the state.

Moreover, simply tolling high volume highway facilities would create a range of secondary problems, as many drivers would reroute to non-tolled roads to avoid the tolled highways, causing congestion and wear-and-tear on roads that were not designed to handle so many vehicles. Furthermore, there are over 600 miles of interstate highways in Oregon which amounts to more than 10% of all tolled mileage in the entire U.S. Tolling Oregon's interstate highways would be much more costly to implement and operate than other forms of road taxes.

Raise or Index Fuel Tax

While in the short term adjustments to the fuels tax make sense to ensure revenues keep pace with needs during the transition to distance charging, these suggested adjustments would make the fuel tax even more unfair than it is now. Vehicles with lower fuel efficiencies, including those of less affluent drivers which tend to be older and less fuel efficient, will bear an even greater portion of the road system costs. If, as projected, new vehicles become ever more fuel efficient, the stratification between the amounts that road revenue operators of older vehicles and newer vehicles pay should grow wider without policy justification.

General Fund

In recent years, Congress has resorted to using general fund dollars to subsidize the Federal Highway Trust Fund, but most regard this as a temporary measure. The volatile nature of general fund revenues will not yield reliable revenue for roads during economic downturns. Further, improving roads and bridges might not be a high priority under stressful economic conditions because of the intense competition for revenues with human services and education. Moreover, general revenue sources have no connection to road use.

BTU Tax

Some suggest that environmental charges such as a BTU tax are viable as a road funding source. A BTU tax, however, would have the same problem as the fuel tax in that increases in vehicle fuel efficiencies will lead to dropping road revenues.

Conclusion

There are many alternatives to funding road maintenance by charging users for the distance traveled. But very few have been attempted by state legislatures or Congress, either because they are unworkable or because they are inequitable and violate the *user pays principle* which has been formally part of road funding policy in the United States since Oregon adopted the fuel tax 95 years ago. The few times legislatures have opted for a flat fee model or to tap general funds to cover dropping road fund revenues, they tended to regard these measures as temporary until something better emerges.

It has taken the Road User Fee Task Force and ODOT 12 years of striving to finally discover the right policies and design for the per-mile charge to achieve policy success in the state legislature. The strong vote in both houses indicates that Oregon legislature believes that the policies contained in Senate Bill 810 hit the mark, but ODOT will have to prove the system operationally before mandated payers will be added.

There is much more work to do before the Road Usage Charge Program becomes operational. ODOT has processes and procedures to write, vendors to recruit, procurements to issue, contracts to negotiate, technologies and business practices to certify, field tests to run, and volunteers to attract.

On July 1, 2015, operations commence and the real learning begins. ODOT will adjust procedures, processes, and requirements as needed to meet legislative expectations and internal operational objectives.

Going operational in 2015 is not the final goal for the Road Usage Charge Program. The initial cap of 5,000 volunteers will not allow an adequate market opportunity to fully achieve the advantages of an open architecture platform. When sufficient numbers of road usage charge payers enter the program—whether by action of the Oregon legislature or when other states adopt the open system platform—the market will come alive, reducing system costs to an affordable level and providing competitive services for those in the road usage charge system.

At some point, the automakers may see a business case for incorporating the in-vehicle computer systems in mileage reporting. When that happens, motorists will be able to activate the mileage reporting capability already in their cars, approve automatic payment of their road usage charge bills, and then simply drive. Payment of one's per-mile charge could be that easy.

Acknowledgments

After 12 years of slogging through possibilities, options, policies and trials to achieve a reconceived and legislatively approved per-mile charging system, Oregon is now finally implementing an operational road usage charge program following the successful second pilot program, the Road Usage Charge Pilot Program (RUCPP). Dozens of people worked exhaustive hours to get our state to this point and they deserve recognition and our thanks.

Preparation of this report required many heads, hearts and hands. The authors thank Michelle Godfrey, RUC communications lead, for her editing and patience in shaping this report and pushing it along when everyone was busy with other essential tasks. Our gratitude also to acclaimed author Chris Santella, who provided polish for the prose to allow contributions from multiple writers flow cohesively; and, to Sharon McKee and In House Graphics, for expert design and layout that helped us communicate complex technical ideas and program history successfully.

The authors appreciate the analysis and writing of D'Artagnan Consulting to condense the evaluation report into a succinct chapter 5. ODOT's RUC implementation team and our consultants also contributed numerous facts, insights and edits necessary to the report.

ODOT launched the RUCPP less than ten months after conception. That ought to be a record in some book. Those sprinting along the RUCPP high wire with no net and an immovable deadline were ODOT's Randal Thomas (project manager), Chuck Larsen (technology adviser), Lynn Averbeck (volunteer coordinator), Jim Atkins (procurement) and ODOT's astute and responsive consulting team: CH2M Hill's Lou Neudorff (who deserves mention as MVP of the RUCPP), Dan Baxter, Rich Foote, Mike Warren and Jennie Roberts who nailed RUCPP back end operations and executed the RUCPP procurement process and D'Artagnan Consulting's Jack Opiola, Steve Morello, Matthew Dorfman, Travis Dunn and Steve Moon for preparatory work essential to pilot development, critical advice on procurement and a strong evaluation.

Credit for the successful legislative effort must begin with the gallant policy development efforts of the Road User Fee Task Force from 2010 through 2012 as they fearlessly drafted legislative proposals before the start of the RUCPP. (See Appendix [C] for a listing of the RUFTF members from 2010 through 2012).

We herald the Oregon legislature's champions of road usage charging. Terry Beyer, a former state representative and former RUFTF chair, led the efforts to lay essential groundwork in 2011. Representatives Tobias Read and Vicki Berger and Senators Bruce Starr (also former RUFTF chair) and Rod Monroe worked with tireless vigor in both the 2011 attempt and the 2013 success and continue as RUC champions going forward. The strong vote for Senate Bill 810 indicates many other legislative supporters of road usage charging in the legislature and we thank them all.

The hard, grinding work of the lobbyists who supported the bill at the Capitol kept its development and hope alive. Our lobbying team included Craig Campbell representing AAA Oregon/Idaho, Ann Hanus of the Association of Oregon Counties, Craig Honeyman of the League of Oregon Cities, Daniel Eisenbeis of the City of Portland, Randy Tucker of Metro and Marshall Coba of the American Council of Engineering Companies of Oregon. We appreciate

the practical and reasonable, but tough, style of Becky Strauss of the American Civil Liberties Union when negotiating the bill's provisions on protection of personally identifiable information.

Members of the Oregon Transportation Commission deserve special recognition for their stalwart support and advice as the road usage charge concept underwent an overhaul in recent years, including former chair Gail Achterman, Mark Frohnmayer and Alan Brown and especially former chair Pat Egan, Dave Lohman and Tammy Baney for participating in the RUCPP. Special recognition goes to Commissioner Mary Olson, also a former RUFTF chair, for valiantly stepping forward to testify before House committees. Mary's participation in the RUCPP and her courageous willingness to talk to the media about her experience led to classic clips on Seattle's King 5 television news story helping advance the concept of road usage charging in our neighboring state of Washington.

Communications support proved essential to proper presentation of the RUCPP and its results to Oregonians and the nation. ODOT communications experts Shelley Snow, Patrick Cooney (former manager) and Dave Thompson hit the mark by delivering a consistently helpful message and coaching the subject matter experts. CH2M's Kristin Hull and her staff ensured a pleasant online experience for the pilot participants and a well catalogued summary of media responses.

Over the years, the per-mile charge project has garnered strong support from within ODOT without which the pace of the recent road usage charge innovations would not have been as swift. Of particular notice is the support from key people in ODOT Government Relations, especially long time RUC confidante Betsy Imholt (manager) and also Katie Thiel, Victor Dodier, Travis Brouwer (now chief of staff) and Michelle Van Schaick, as well as ODOT budget manager Daryl Ficker and economist Jack Svadlenak.

ODOT's leadership consistently demonstrated the attentiveness, astuteness and support that proved essential to positive outcomes for all things RUC. We thank Director Matthew Garrett, former Deputy Directors Doug Tindall and Jerri Bohard and former chiefs of staff Dale Hormann and Joan Plank. We also thank our many internal advisers but especially those of DMV, Tom McClellan (manager and RUCPP participant), Lana Tribbey and Lori Bowman, Motor Carrier Division, Gregg Dal Ponte (manager), Fuels Tax Group, Doug Kleeb (manager) and IS, Kurtis Danka (manager) for their wisdom on revenue systems and internal processes.

We thank our legal advisers from the Oregon Department of Justice, Bill Nessly and Jack MacDonald. We also thank April Carpenter, Dianne Marsh and Jeff Towers, those at ODOT Human Relations for swift activation of the hiring process to form the RUC implementation team and BeckySue Williams for her graciousness when the attention of the ODOT's CEO was needed.

It is hard to give adequate thanks to the most critical key person for the program, Ms. Kathy Kleen (executive assistant), without whom the office could not operate, no staff hired, no travel booked, no appointments scheduled, no consultants or vendors paid and no wrung-out boss properly managed. She knows how every cog in ODOT works and holds it all together.

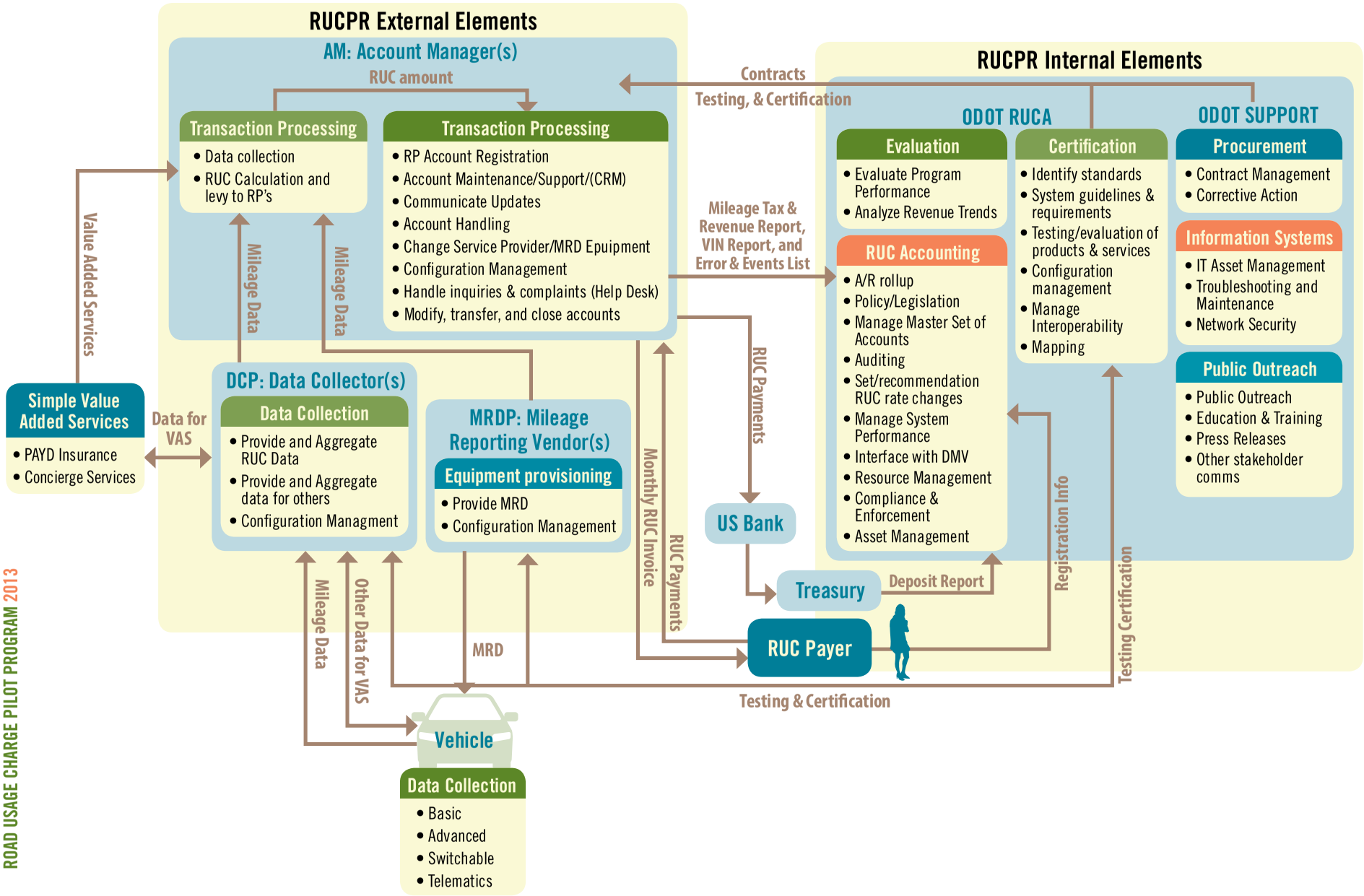
The authors will never forget the extraordinarily professional efforts of ODOT's private sector partners–sanef and IMS–for making the RUCPP a success and Raytheon for taking on the challenge of making the idea of a switchable mileage reporting device a reality.

ODOT's RUC implementation team is currently building from scratch the foundational structure for a first-of-its-kind operational road usage charge system. It's an exciting yet stressful program to build, but the team shows not only a high skill level but also a dauntless spirit and can-do attitude that will to lead to positive results. The RUC implementation team includes not only the aforementioned Messrs. Larsen and Atkins and Mss. Averbeck and Godfrey but also recent additions Carley Francis (RUC project manager), Angela Beane (RUC business analyst) and Peter Alotta (RUC compliance specialist).

Finally, the authors owe a special debt of gratitude to those special Oregonians with policy interest in the RUCPP who volunteered to become the first Americans to experience and actually pay a light vehicle road usage charge in the United States – you know who you are. Your curiosity and desire for something better reveals that the pioneer spirit lives on inside Oregonians.

Appendix A

Complete RUC System Operational Diagram



Appendix B

Road Usage Charge Pilot Program Evaluation Criteria

The Road User Fee Task Force adopted evaluation criteria for the second pilot program with the expectation that this pilot would demonstrate a per-mile charging system focused on providing choices to motorists for distance reporting and payment. The task force combined evaluation criteria derived from HB 2138 with criteria adopted from the results of the first pilot program, leading to a comprehensive set of evaluation factors for the second pilot.

EVALUATION CATEGORY *Metrics*

1. Policy and public acceptance

GOAL: Determine the level of public acceptance of the Road Usage Charge Program

a. Similar revenue contribution by road usage charge payers under the new program as under the fuel tax

b. Acceptance by payers and other system users concerning:

- Cost to road usage charge payers
- Ease and convenience
- Privacy protection
- Fairness
- Transparency
- Aversion/attraction

2. Technology

GOAL: Demonstrate and measure the technical and operational viability of the proposed program concept through demonstrations

a. Adaptability of the system

b. Ease of installation of mileage reporting devices

c. Safety of devices, installation, and system operations

d. Anti-tampering

e. Hardware, software and other system elements:

- Feasibility
- Accuracy
- Reliability
- Security/encryption
- Open system
- Energy consumption

3. Operations

GOAL: Gain a preliminary understanding of the operational aspects of the program

a. Ease and cost efficiency of administering the program

b. Ease of use and cost of compliance by road usage charge payers and other system users, including evasion potential

c. Accuracy and perception of accuracy of data used for assessing mileage taxes

d. Privacy options for payers in protecting personal, private data

e. Ability to audit

f. Usefulness for phasing and partial implementation

4. Costs

GOAL: Gain a preliminary understanding of costs associated with Road Usage Charge Program implementation

a. Start-up costs (capital and retrofitting)

b. Operations and maintenance

c. Costs of collection relative to fuel tax

Appendix C

2012 Road User Fee Task Force

Commissioner Mary Olson } Oregon Transportation Commission

Commissioner Tammy Baney } Oregon Transportation Commission

Mayor Craig Dirksen } City of Tigard

Commissioner Linda Modrell } Benton County

Susan Brody } Citizen

Tammy Dennee } Citizen

Jack Roberts } Lane Metro Partnership/Oregon Environmental Council Board of Directors

Craig Campbell } AAA Oregon / Idaho

Rep. Cliff Bentz } Oregon State House of Representatives

Rep. Terry Beyer } Oregon State House of Representatives

Sen. Bruce Starr } Oregon State Senate

Sen. Rod Monroe } Oregon State Senate

Rep. Margaret Doherty (Ex Officio) } Oregon State House of Representatives

Rep. Vicki Berger (Ex Officio) } Oregon State House of Representatives

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Oregon's Road Usage Charge Program
http://roadchargeoregon.org/
http://www.oregon.gov/ODOT/HWY/RUFPP/
Pages/index.aspx

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