Texas A&M Transportation Institute

Vehicle Miles Traveled (VMT) Fees

Preliminary Report – Tasks 1 and 2

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TRANSPORTATION
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Vehicle Miles Traveled (VMT) Fees

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Table of Contents

List of Figures

List of Tables

Executive Summary

Fuel taxes are the primary source of funding for state and federal transportation programs and have been for well over 80 years. However, the long term viability of this revenue source is in question. The development of more fuel efficient engine technologies and growth in vehicles that do not run on taxable fuels (such as gasoline and diesel) have reduced fuel consumption. While this is beneficial from an energy independence and air quality perspective, it means that less and less revenue is generated in fuel taxes to expand and maintain the nation's infrastructure.

Many states are looking at funding alternatives to the fuel tax. Among the most promising are fees directly related to use. Such "road use fees" have many different names but their defining characteristic is that they are a fee levied based on distance traveled. However, other facets of use such as vehicle weight or time-of-day could be factored into the fee rate.

This paper summarizes recent research efforts undertaken at the state level to research and, in one case, implement road user charging systems as a replacement funding mechanism for the fuel tax. This paper also presents a brief overview of recently filed federal legislation related to road user charging and discusses a few collaborative multistate initiatives.

Summary of State Efforts

This section summarizes recent state efforts in the evaluation and implementation of road user charging systems as a source of state level transportation funding. This summary does not include recent federally sponsored research efforts, as little information on those projects has been published. Nor does the discussion include older pilot studies such as:

- Oregon Mileage Fee Concept and Road User Fee Pilot Program (2005).
- Puget Sound Regional Council – Traffic Choices Study (2002).
- University of Iowa, National Evaluation of a Mileage-based Road User Fee (2005).

Some observations regarding recent pilots and their implications for Texas are presented at the conclusion of this executive summary.

Oregon Road Usage Charge Legislation

The State of Oregon recently implemented the nation's first distance-based road user charge on passenger vehicles as a replacement transportation funding mechanism to the fuel tax. Passed in 2013, Oregon's SB810 initiated a program wherein 5,000 Oregon drivers can participate in the program and pay a $0.015 per mile fee instead of the state fuel tax. Participants will receive a credit against their assessed road usage fee for fuel taxes paid as part of regular fuel purchases. Participation in the program is limited based on the fuel efficiency of the vehicle and all participating vehicles must be less than 10,000 lb in gross weight. The Oregon Department of Transportation (ODOT) is currently working to develop the technical details of the program and establish how road usage is determined and fees assessed and paid. ODOT must provide

different options for road usage assessment, one of which must not make use of global positioning system (GPS)-based data. The private sector will play a significant role in terms of recruiting program participants and administering accounts once the system is in place in 2015.

Oregon Road Usage Charge Pilot Program (RUCPP)

In 2012, ODOT concluded its second pilot test of technologies and administrative systems for the levying of road usage charges. This most recent pilot provided participants with four different road usage metering options (flat fee, basic, advanced, and smartphone) and two choices for account administration: public and private. Participants under the basic fee option used a device that counted miles driven and levied a charge on those miles without the use of location data. The advanced and smartphone plans allowed participants to be charged only for mileage accrued within the public right-of-way. The flat fee option required participants to simply write a check to cover estimated annual mileage. Participants in all plans paid the road usage fee instead of fuel taxes. To account for this the pricing system calculated an estimated amount of fuel taxes paid over the invoiced period and subtracted that amount from the assessed fee. Fuel taxes paid at the pump were thus treated as a prepayment of the road usage fee. The pilot was largely successful with very few technology or administrative issues identified in the evaluation report. The success of the pilot led Oregon to implement its current road usage charging system.

Minnesota Department of Transportation

The Minnesota Department of Transportation (MnDOT) tested a road usage charging system that relied on the use of GPS-enabled smartphones for the collection and transmission of mileage data in 2011 and 2012. Fee rates varied based on whether travel was occurring within the Minneapolis/St. Paul region, whether it was occurring during rush hour, or whether it was occurring outside Minneapolis/St. Paul but still in the state of Minnesota. Mileage accrued outside of Minnesota was not charged. Participants were paid an initial stipend that they were then expected to use to pay the assessed road usage charge. The pilot was considered a success but did have some technology issues. The smartphones used in the pilot were often unable to determine whether they were in the correct vehicle, and thus did not capture trip data. Furthermore, the smartphones did not always have a reliable GPS signal to use, meaning that not all mileage was charged correctly. Additionally, MnDOT found that the location of the phone in the vehicle could affect the accuracy of the GPS data. Participants were largely accepting of the road usage charging concept itself and felt that the rates levied were reasonable and sensible. However, they did express concerns about the reliability of the technology. There has been no additional action taken by the Minnesota legislature to advance the concept.

Washington State

Washington State is relatively new to the field of road user charging research and pilot testing. In 2012, the state legislature authorized the formation of a steering committee that was tasked with evaluating the feasibility of the road usage charging concept for implementation in Washington and to recommend potential configurations for pilot testing. The steering committee ultimately

recommended that the state explore the issue further. The steering committee received additional funding and was tasked with developing a business case for transitioning to three different road user charging options: a time-based permitting system, an odometer-based permitting system, and a technology- dependent differentiated distance charge. The steering committee will make its report on the business case for these three systems in early 2014 and is expected to make recommendations on a technology pilot scheme at that time.

Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) has conducted studies of Vehicle Miles Traveled (VMT) fees largely without the benefit of policy guidance from the state legislature or other elected officials. Its efforts have largely been funded through federal resources, with state universities providing the required matching funds. In the absence of this policy guidance the department undertook a public outreach effort to identify major issues and concerns among the public in order to guide system design. Workshops and public meetings revealed that the Nevada public had significant concerns about the potential use of location data by in-vehicle devices and tracking by governmental entities. As a result, the department chose to pilot test a VMT fee concept that did not rely on the collection of any location data whatsoever. Additionally, the public expressed concerns about the potentially high cost of administration and compliance for the new system. As a result the system that was pilot tested relied on the collection of fees in conjunction with retail-level fuel purchases, which could potentially lower the need for new administrative capabilities in a future deployment. A mini-field test with around 40 participants concluded in 2012, and a statewide pilot involving several hundred participants is expected to be underway soon. However, NDOT has not released any reports to date on either of these field tests/pilots.

Multistate Efforts

There are two significant and related efforts currently underway to coordinate state-level road usage charging research activities. The first is a pooled fund study sponsored by MnDOT through the federal Transportation Pooled Fund (TPF) Program. For a $20,000 annual payment to the TPF program, state-level transportation entities can become a member of the Mileage-based User Fee Alliance and participate in educational activities, the development of strategic research plans, and the selection of research projects funded through the TPF. As of January 2014, the pooled fund has received commitments of $100,000 from MnDOT ($20,000 per year through 2016) and $40,000 from the Washington State Department of Transportation (WSDOT) ($20,000 for 2013 and 2014). The second significant multistate effort is the formation of the Western Road User Charge Consortium (WRUCC). The WRUCC was formed by the departments of transportation in Oregon, Washington, and Nevada for the purposes of developing road user charging expertise among state-level transportation entities and facilitating resource sharing on the road user charging concept among member states. Participation is open to transportation agencies that make an annual contribution in the amount of $25,000.

Federal Legislation

On December 3, 2013, U.S. Representative Earl Blumenauer (D-OR) introduced HR 3638: Road Usage Pilot Program Act of 2013, which would direct the Secretary of the Treasury to establish a competitive grant program known as the Road Usage Fee Pilot Program. This federal program would provide grants to state and local entities to conduct road user charge pilot studies, test various road user charge system components, and implement road user charge systems. The proposed legislation identifies various aspects of road user charging systems that could be addressed by projects funded through the program and establishes a set of criteria for evaluating projects for funding. The bill also calls for the establishment of working groups that would evaluate various road user charging issues. In December 2013, the bill was assigned to the House Energy and Commerce Committee, the House Transportation and Infrastructure Committee, and the House Ways and Means Committee. The bill does not contain any language related to funding amounts for the proposed program.

Implications for Texas

Research efforts undertaken in Texas to establish a potential policy context for road user charging revealed that the public is most concerned about issues related to privacy, the equity and fairness of road user charges, administrative cost, and enforcement strategies. There are opportunities to potentially integrate road user charges into existing state fee systems and processes, such as the state's vehicle registration and inspection systems that could reduce implementation and administration costs and support enforcement. However, these previous research efforts were, at best, preliminary and served as a starting point in a potential transition to road user charging. If the State of Texas decides to pursue such funding sources, the experiences of the other states cited in this report provide useful guidance.

Legislative Support Is Desirable

Experience in other states regarding the pursuit of road user charging efforts as a mechanism for generating state transportation revenue reflect the importance of initiation and/or close coordination with the state Legislature and the Governor's Office. Officials with ODOT continually stress that political support has been crucial in their success at pursuing and ultimately implementing these charges, and that state is currently the only one in the nation set to implement a road user charging system. While ODOT has worked to include legislators in pilot efforts, much of the work done would not have been possible if support for the concept itself had not originated in the legislature. Legislative support and associated legislation can ensure that the pursuit of road charging concepts meet public policy goals; a lack of legislative support can stymie such efforts. NDOT officials are hesitant to discuss their research efforts and anticipated next steps because the department lacks legislative or executive direction. There is thus a desire to not get out in front of the legislature and be seen as driving policy. Nevada has been successful in funding and conducting research on this topic, a point that should not be understated. However, the lack of supporting legislation or public support from elected officials

reduces the ability of the NDOT to advance the issue publicly and make incremental advancements as Oregon has done.

Start with the Policy Work

When looking to develop and implement road user charging applications, technology decisions cannot be made in a vacuum. Technology requires a policy foundation if it is going to be effective in meeting its various objectives. Therefore, efforts to examine potential road user fee technology applications should not occur until a rigorous and thorough effort to identify what it is the system is supposed to do from a policy standpoint. Oregon is the state with the most success in developing and implementing road user charging, but it has taken a while to get there in terms of policy development. The state first convened a legislatively appointed task force to assess whether the idea of road user charging was worth pursuing. Once it had decided that the idea had merit, desired policy goals were developed, which in turn informed the development of high level charging concepts. These concepts were evaluated and pilot tested. The State of Washington is adopting a similar strategy.

The work undertaken by other states provides a guide in the development of road user charging systems.

1. **Acceptability of the Concept** – One of the first steps to be undertaken in this process is to decide if pursuing the road user charging concept is advisable and desirable. This process generally occurs at the legislative level with the appointment of committees, task forces, or steering committees composed of elected officials, experts in the transportation field, and transportation policy stakeholders. Assessments of future needs and anticipated future revenues from traditional funding sources may be undertaken by this entity. It is also likely that various funding sources outside of road user charging will be evaluated in terms of their ability to generate the revenue necessary to meet future needs.
2. **Policy Development** – If it is determined that road user charging systems are indeed worthy of pursuit, then it becomes necessary to identify major policy goals for the system to fulfill. This is critical because system design will ultimately be determined by policy, as policy will dictate the type of information that is ultimately collected and used by the system.
3. **Feasibility Assessment** – Once broad road user charging policies have been developed, it may be desirable to develop a variety of road user charging concepts and associated technology configurations to meet those policy goals. An assessment of each concept's feasibility and ability to attain desired policy goals can then occur. The most feasible options are likely to then be recommended for future pilot tests.
4. **Pilot Implementation** – At this point the state may choose to take the most feasible charging configurations and initiate a pilot or field test of the technologies and administrative systems that would compose the system. Successive pilots might be required in order to refine the concept.

5. **Assessment and Recommendations on Implementation** – The success of the pilot(s) will be crucial in determining whether the road usage charging system should be implemented as a permanent fee system. Should the state decide to implement, it will have to establish new legislation enabling the fee and assigning operational and administrative functions to public and/or private entities.

The Generation of Sustainable Funding in Proportion to Road Use Is the Central Policy Objective

Road user charging systems have the potential to accomplish a number of transportation policy goals. For example, they could be implemented with rates that vary by time of day in order to reduce travel during rush hours, thus achieving policy goals related to system management. However, the central focus in the public policy efforts undertaken by the states thus far is the generation of sustainable revenue in proportion to road use. This goal, although stated in slightly different wording from state-to-state, appears to be the most pertinent policy goal for future pilots and implementations. It is the primary policy objective for the two recently conducted mileage fee pilots in Oregon and Minnesota and is the primary policy consideration for the State of Washington as it moves toward potential fee development. The policy goal itself implies the central failure of the fuel tax: that funding is not generated in proportion to road use and associated costs but, rather, fuel consumption. Other transportation revenue sources, such as vehicle registration fees and vehicle sales taxes, have a similar weakness in that they are assessed at an amount that is independent of the amount of travel. Tying revenue generation to road use does enable the application of other aspects of use such as time-of-day and weight, which can be incorporated into the pricing system to achieve other policy goals. As noted earlier, a public policy on road user charging predicated on collecting revenue in proportion to use could incorporate an element that charges a higher mileage rate during rush hour, when demand for the roadway is much higher. Similarly, the policy could also accommodate weight-based variances in fee rates, as heavier vehicles impose a greater cost on roadway infrastructure.

Privacy Concerns Will Persist and Choice Is Key to Addressing Them

All of the pilots discussed in this paper illustrate the fact that privacy concerns are likely to be among the largest barriers in terms of gaining public acceptance. Oregon has continually worked to develop systems that provide choice for metering options and provide protection for those selecting technology-based applications. In an attempt to address concerns about potential government tracking, NDOT chose to test an application that explicitly does not collect location data. Minnesota tested location-based applications as a discounting tool for state-mandated odometer readings, essentially offering the technology solution as an alternative in order to alleviate potential privacy concerns. The Washington legislature, in its recent directives to the Washington State Steering Committee, identified privacy and data protection as among the most important policy factors to be examined prior to moving forward with possible pilots.

Significant effort can be expended to educate the public about how these systems work. Education about the technical aspects of the GPS and how GPS-based systems can be designed

to ensure anonymity may alleviate some concerns. But it is likely that the public will never have its concerns completely addressed. Education on these specific topics assumes that the public is concerned strictly with the collection of location data.

In fact, in many cases the public is not necessarily concerned about the use of location data but is concerned about the potential for governmental mandates for the use of technology. Most of the public acknowledges that the smartphones they carry are capable of collecting location data, but they also recognize that they have a choice in using this technology. Recent state efforts have recognized this dynamic and presented technology options as a choice (versus high-cost, low-tech options) or provided participants with many choices in road metering assessment technologies. These efforts have generally resulted in higher levels of satisfaction regarding the system and reduced concerns about privacy. Therefore, it is likely that future pilots and implementations will support technology (and specifically location-based technologies) as an option for users. It is unlikely that a road user charging system that mandates the use of one particular technology will generate sufficient public support to be implemented.

Flexible and Scalable Systems Require an Open Architecture

In general, recent state-level pilots of the road usage charging concept feature a greater degree of flexibility in the technology systems that support them than pilot efforts conducted before 2010. For example, Oregon's 2005 pilot, the Puget Sound Traffic Choices Study and the University of Iowa National Evaluation all featured devices that were custom built for the pilot and required some degree of assistance from the research team to install in participating vehicles. However, recent pilots have relied on off-the-shelf technologies such as smartphones or have featured several private vendors to develop flexible and innovative solutions for participants to choose from. This allows the road user pricing system to evolve along with the technologies that may support it.

The consensus of most experts in this field is that open systems, based on publicly available common standards and a common operating system, are the best approach for developing road user charging systems. Under an open system components performing the same function can be readily substituted and services can be provided by multiple providers. A closed, proprietary system locks the charging system into that particular technology for the foreseeable future, meaning that its technology components are likely to become obsolete in a relatively short time frame. Closed, proprietary systems are also difficult to expand in order to accommodate new jurisdictions, geographical areas, or additional services.

The Auto Industry Will Likely Oppose Fees Targeted to Specific Vehicle Types

Any state looking to develop and implement road user charging applications should expect opposition from several different stakeholder groups. In a recent panel convened in Portland, Oregon, State Senator Bruce Starr spoke on the challenges in getting his state's recent road user charging legislation passed. He stated that automakers, in particular, opposed initial versions of the bill by successfully making the case that it amounted to a huge increase in taxes. He went on to note that such bills require minimal opposition to pass and that the support of the automakers

is crucial. Initial versions of the bill stated that the fee would only be applied to electric vehicles, which do not currently pay fuel taxes. However, the auto industry objected to the levying of fees on specific types of vehicles, and this provision was eventually dropped, opening up the road user charging system to participation by all vehicles. While there was still opposition to the bill, it did ultimately pass, with less resistance from the auto industry because specific vehicle types were not being targeted. On the same panel State Representative Vickie Berger stated that automakers are already mandated by the federal government to do a number of things with their vehicles, and the implementation of a new fee system such as this essentially makes it even harder for them to sell vehicles. She stated that it is critical in these types of discussions to continually make the case that infrastructure needs to be funded.

Introduction

The fuel tax is the principal mechanism for funding state and federal transportation programs. In Texas, it is an excise tax, levied on the physical amount of fuel purchased and not the purchase price of the fuel. Thus, even as fuel prices decline or rise, the fuel tax remains static at a fixed rate per gallon. Since the fuel tax is paid as part of regular fuel purchases, every driver of a vehicle with an internal combustion engine prepays for road usage whenever they refuel their vehicle. Upon its initial inception the fuel tax was thought to be a true user fee because those who drove more would purchase more fuel and thus pay more taxes. However, this relationship is being undermined by various fuel efficiency improvements in vehicles.

The average fuel efficiency of the U.S. auto fleet is continually improving. Federal corporate average fuel economy (CAFE) standards require automakers to continually develop and market vehicles with higher and higher fuel efficiencies. Historically high fuel prices are driving increased demand for these vehicles. As a result, the average vehicle in the U.S. is paying less and less in fuel taxes for every mile it drives. This situation is exacerbated by two significant factors. The first is that there are new vehicle technologies coming onto the market that allow vehicles to operate on even less fossil fuels, such as plug-in electric hybrids, or on no fossil fuels at all in the case of pure electric vehicles. The second factor is inflation. State and Federal fuel taxes have, in many cases, not been raised in over two decades. This means that the fuel tax has lost over 20 years of purchasing power.

State governments have been the leaders in examining potential solutions to the unsustainable nature of the fuel tax for funding transportation investment. Many are studying fees based on actual miles traveled as a potential long-term solution. This report summarizes recent work undertaken by states in the area of road usage charges and discusses some multistate coordination activities and recent federal legislation. Complete pilots that are not discussed in this report include:

- **Oregon Mileage Fee Concept and Road User Fee Pilot Program** (2005) – Tested a mileage-based fee system that relied on a GPS enabled in-vehicle device that connected to vehicular diagnostic ports for the determination of miles traveled. Wireless equipment allowed participants to pay the assessed mileage fee in conjunction with fuel purchases.
- **Puget Sound Regional Council – Traffic Choices Study** (2002) – Evaluated driver response to network tolling in the Seattle metropolitan area. The system used a GPS enabled in-vehicle device to apply a mileage-based fee that varied based on the type of facility and time of day.
- **University of Iowa, National Evaluation of a Mileage-based Road User Fee** (2005) – Evaluated a multistate mileage-based user fee as a potential replacement system for the fuel tax. The pilot was carried out in 12 U.S. cities with devices that connected to vehicular on-board diagnostic ports and used GPS to determine location.

There is no agreement in the transportation industry on the preferred term to be used when discussing these alternative funding systems. Many in the industry believe that relying on any term that incorporates the term "mileage," such as Vehicle Miles Traveled (VMT) fees or Mileage-based User Fees (MBUF) is biased in that most countries outside the U.S. rely on the metric system. Others feel that these definitions neglect other aspects of use such as weight, location, and time. Similarly, many prefer more straightforward terms such as Road Usage Charge (RUC), with its focus simply on charging for usage regardless of whether it is defined in terms of distance, weight, location, or time. Throughout this report the preferred nomenclature of the entities being discussed is used. Thus, an RUC in one section is essentially a VMT fee in another section, keeping in mind that there may be differences in terms of the specific policies supporting each, their methods of assessment, and the vehicles and road users upon which they are levied. However, they are essentially the same in one respect: they represent a direct charge for use of the roadway network as opposed to a proxy charge on use such as fuel taxes or vehicle registration fees.

Oregon Road User Fee

In 2013, the State of Oregon became the first state in the U.S. to pass legislation establishing a road user fee on passenger vehicles as a replacement to the fuel tax. The passage of this legislation came many years after the state initially began looking at usage-based revenue mechanisms for meeting long-term transportation infrastructure needs. In 2001, the Legislative Assembly first authorized the Road User Fee Task Force (RUFTF), which provided recommendations for future road user charging pilot efforts. The ODOT conducted two road user fee pilots, the first in 2006 and the second in 2012. The 2012 pilot is discussed in the next section of this report.

The Legislation

The Oregon Legislature passed SB810 on July 7, 2013. The bill authorized up to 5,000 vehicle owners to pay a $0.015/mile road use charge in lieu of state fuel taxes. Initial participation is limited in terms of the types of vehicles that can participate in that:

- Participating vehicles must have a gross weight of less than 10,000 lb.
- No more than 1,500 participating vehicles can have a fuel efficiency rating of less than 17 miles per gallon (mpg).
- No more than 1,500 participating vehicles can have a fuel efficiency rating of between 17 mpg and less than 22 mpg.

Money collected by the system is to be deposited into the State Highway Trust Fund with 50 percent of revenue being reserved for ODOT, 30 percent for counties, and 20 percent for cities. ODOT is already the designated collector of the state's fuel tax; however, a new RUC accounting system needs to be developed.

The specifics on how miles traveled will be determined and how the fee will be paid have not been determined yet. However, SB810 stipulates that the system shall be based on an open platform, which is defined in the bill as "an integrated system based on common standards and an operating system that has been made public so that components performing the same function can be readily substituted or provided by multiple providers." While the bill steers clear of any discussion on potential technology applications, it does state that several alternative methods of assessment and payment must be developed, and that one of these methods must not rely on location data from the GPS. The bill instructs ODOT and the RUFTF to work together to define the methods for reporting and recording miles traveled under this open system. When developing technology requirements for mileage reporting technologies, the RUFTF and ODOT must consider accuracy, technological security, privacy options, ability to resist tampering, and compliance with auditing requirements.

Participants in the program will pay a fee based on the number of miles they drive and will receive a credit against the assessed fee for fuel taxes paid over the reporting period. SB810

gives ODOT the authority to develop rules for the determination of these "fuel tax credits." Decals will be developed and issued for vehicles participating in the program that show that the vehicle is exempt from the state's fuel tax.

The legislation provides a penalty at an amount not to exceed $2,000 for reporting false information or attempting to collect a fraudulent fuel tax credit. Tampering with metering equipment carries the same fine. ODOT is given the authority to determine how fees shall be collected and to determine penalties and interest on delinquent charges. The department is also given authority to determine the mileage reporting periods.

The use of private entities for fee administration that was a central element in ODOT's 2012 pilot is codified for the new road user charging system in SB810. The bill defines a Certified Service Provider (CSP) as an entity that enters into an agreement with ODOT for the reporting of road usage by participating vehicles or for administrative services related to the collection of road charges. These CSPs will be responsible for the majority of data collection and fee administration for the system.

Selected language from SB810 is located in Appendix B of this report.

Development and Passage of SB810

Development of SB810 followed two successful pilots, and over a decade of work by legislators and ODOT staff to develop the road user charging concept for deployment in Oregon. Even with the state's history of research on this topic, the drafting and passage of the bill required significant effort from interested legislators, ODOT staff, and stakeholders. The final version of the bill was carried by State Senator Bruce Starr, a Republican, and State Representative Tobias Read, a Democrat. Senator Starr is the Vice Chair of the Business and Transportation Committee, and Representative Read is the Chair of the Transportation and Economic Development Committee. Table 1 shows vote totals by branch and party for the final passage of SB810.

Table 1: Breakdown of Votes for SB810

Branch	Party	Yes	No
State Senate	Republican	8	6
	Democrat	16	0
State House of Representatives	Republican	18	8
	Democrat	29	5

As can be seen in the table, the bill enjoyed majority support from both parties in both houses. This is due in large part to the efforts undertaken by ODOT staff and the legislators involved in the 2012 pilot in working with their colleagues to provide educational information. ODOT staff also worked extensively with stakeholder groups in developing the eventual legislation. Of particular interest is the effort of ODOT staff in working with the American Civil Liberties Union (ACLU). Representatives of the ACLU had previously attended legislative hearings on

the road user fee concept and expressed opposition to the development of legislation due to privacy and data security concerns. ODOT staff had several meetings with ACLU staff to listen to their specific concerns. As a result of these meetings, language specifically addressing these concerns was ultimately included in the final bill. For example, "personally identifiable" information that may be collected by the system is exempt from Oregon public disclosure requirements. The bill lays out further requirements for CSPs in the potential release of personally identifiable information of their customers. Finally, SB810 requires ODOT and CSPs to destroy records related to the location and use of vehicles no later than 30 days following the completion of a payment processing, dispute resolution, or non-compliance investigation. In the end, the ACLU did not explicitly support the bill, but the organization also did not vocally oppose the bill once the new language was included.

ODOT staff also toured the State of Oregon holding numerous public hearings and meetings on the proposed legislation. Staff found that one of the most salient topics at these discussions was the need for good infrastructure in supporting a healthy economy. ODOT and their partners made the case that new funding sources are needed in order to maintain sufficient investment in transportation over the long term. ODOT staff observed that leaders in the small business community were the most influential in making the case that investment in transportation is needed in order to maintain a healthy economy and promote job growth.

Outstanding Policy Issues

Although the State of Oregon has done a significant amount of policy work in the lead-up to this RUC implementation, numerous issues still need to be addressed in the near term. Many of these are related to fee structure and fee rates.

Credits for Low-Fuel Efficiency Vehicles

Due to the current structure of the fee it is likely that many participants with low fuel efficiency vehicles will get a fuel tax refund that is greater than their assessed road usage charge. This will occur if the assessed road usage fee is significantly lower than total estimated fuel taxes paid. Table 2 shows the estimated difference in assessed mileage fees (at $0.015 per mile as per the legislation) versus state fuel taxes (at $0.30 per gallon) paid by Oregon drivers based on their fuel efficiency and the number of miles they travel in a year.

Table 2: Difference in Assessed RUC and Fuel Taxes Paid (RUC - Fuel Taxes Paid) for Oregon Implementation

Fuel Efficiency (miles per gallon)	Annual Miles Traveled			
	5,000	10,000	15,000	20,000
10	$ (75.00)	$ (150.00)	$ (225.00)	$ (300.00)
15	$ (25.00)	$ (50.00)	$ (75.00)	$ (100.00)
20	$ -	$ -	$ -	$ -
25	$ 15.00	$ 30.00	$ 45.00	$ 60.00
30	$ 25.00	$ 50.00	$ 75.00	$ 100.00

35	$ 32.14	$ 64.29	$ 96.43	$ 128.57
40	$ 37.50	$ 75.00	$ 112.50	$ 150.00

As can be seen in the table, drivers with a fuel efficiency of less than 20 miles per gallon (mpg) would receive a fuel tax refund in excess of the assessed mileage fee. Drivers with a fuel efficiency of 20 mpg would break even under the new system relative to the fuel tax. ODOT expects to initially pay low fuel efficiency drivers the amount that is owed, but has stated in discussions with TTI research staff that this is an issue that will have to be examined and dealt with in the future, hopefully before the 2015 implementation deadline. For now, the program is limited in terms of the number of low fuel efficiency vehicles that can participate.

Participation by High Fuel Efficiency Vehicles

Just as there is an incentive for low fuel efficiency vehicles to participate in the system, there is a disincentive for highly fuel efficient vehicles to participate. As per the legislation, the pilot must include 2,000 vehicles with a fuel efficiency of greater than 22 mpg. However, vehicles with higher fuel efficiency consume less fuel and their owners pay less in fuel taxes. As Table 2 shows, drivers of vehicles with fuel efficiency greater than 20 mpg would pay more under a $0.015 per mile road user charging system than under the state fuel tax system. It is unclear what incentive there is for drivers of these vehicles to participate in a program that will require them to pay more. ODOT officials are well aware of this disincentive and are working to develop incentives to get such drivers to participate in the program. ODOT staff has noted in interviews with TTI researchers that the emissions testing program in Oregon can be quite onerous for the driver, and they are considering allowing highly fuel efficient vehicles to opt out of the state's testing program if they participate in the road user charge deployment. However, no final decisions have been made on this issue. It is also the hope of ODOT staff that the private sector will bring the majority of these participants by providing value added services such as real time traffic information and routing assistance. This is discussed in more detail in the "systems integration section."

Future Fee Increases

ODOT is cognizant of the fact that one of the most significant factors undermining the sustainability of the fuel tax is that it simply has not been raised to keep pace with inflation. While the state's new RUC goes a long way in addressing many of the fuel tax's shortcomings, it would still need to be raised on a periodic basic in order to maintain purchasing power. The focus in Oregon right now is getting the new system up and running, but officials there recognize that effort will be needed in the future to secure required rate increases.

Leveraging of System for Other States

The State of Oregon is interested in leveraging this system, once it is up and running, so that other states may use it if they wish to develop their own road user fee systems. Oregon's vision is that other states and Canadian provinces will eventually enter into agreements with Oregon to

participate in the Oregon RUC system and use its systems. However, this process cannot be formalized until the main Oregon RUC system is operating.

Implementation

The program is expected to be deployed in 2015. Program participants will be able to select the method of assessment and payment they are most comfortable with. They will also be able to opt out of the program at any time. ODOT is currently working to implement the directives of SB810. There are three major components to the implementation: organization, systems integration, and public outreach.

Organization

In spite of its years of work on this topic, ODOT still needs to identify internal organizational gaps that need to be filled in order to administer the public elements of the system. ODOT will establish an internal RUC accounting department and establish systems for certifying private sector vendors. It also still needs to develop Standard Operating Procedures for ODOT staff.

Systems Integration

ODOT anticipates that most of the RUC system will be supported by private sector technology and in-vehicle service providers who will collect the RUC as part of subscription or other service fees. For example, a usage-based insurance provider might collect the necessary mileage data for insurance purposes and then assess and collect the RUC on ODOT's behalf. Another example would be a provider of navigation and routing assistance services collecting mileage and then assessing the RUC on invoices for the services they provide, much like how cell phone companies collect governmental taxes through cell phone invoices. However, this RUC market, where private entities collect fees for ODOT in conjunction with the provision of transportation related services, is not yet established. In the coming years ODOT will work with technology and service providers to develop this market by integrating the innovative and disparate technologies that will ultimately support the RUC system into an interoperable market. It will be necessary to ensure that the technologies deployed meet legislative mandates while still remaining flexible to changing market conditions and fostering innovation.

While system development is ongoing, ODOT has developed a basic "mileage message" that will be used for communications between the CSPs and ODOT. The mileage message is based on the JavaScript Object Notation (JSON) language, which is an open standard data-interchange format. Each mileage message will include the following information:

- Vehicle identification number.
- Reporting device identification number.
- Timestamp for installations and removals of mileage reporting device.
- Total mileage during reporting period.

- Fuel consumption during reporting period.
- Mileage by zone (for the advanced plans).

Mileage messages will be transmitted to ODOT by the CSPs responsible for collecting road usage information and handling program participant accounts. Vendors are allowed to collect such information however they want but the transmission of data to ODOT has to occur in this standardized format. By relying on this open standard language and simplified mileage message Oregon expects the new system to be adaptable to new technologies and scalable to other states.

Public Outreach

ODOT is undertaking a long-term effort to educate taxpayers in anticipation of a wider deployment of the RUC system while working to reach the mandated 5,000 participant threshold in the near term. ODOT expects that the private sector, through the development of the RUC market, will be able to obtain the necessary number of participants.

Oregon Department of Transportation Road Usage Charge Pilot Program

The State of Oregon and ODOT were the first in the nation to comprehensively explore the user fee concept as a replacement to state level fuel taxes. In 2001, the Oregon Legislative Assembly established the Road User Fee Task Force in response to warnings from transportation officials about threats to the long term viability of fuel taxes as the state's primary funding mechanism for infrastructure development. House Bill 3456 directed the RUFTF to recommend innovative funding solutions based on road use as a replacement to the fuel tax, recognizing the increasing fuel efficiency of the passenger vehicle fleet and the introduction of alternative fuel vehicles would undermine the fuel tax's primary base: fuel consumption. The RUFTF ultimately selected fees based on miles traveled as the optimal long term funding solution and recommended that Oregon initiate pilot tests of the concept to assess its feasibility. (The full text of the state statute establishing and guiding the activities of the RUFTF can be found in Appendix A.)

In 2002, ODOT deployed a pilot test of the new mileage fee concept based on the recommendations of the RUFTF. The pilot had over 285 participating vehicles equipped with on-board units (OBU) that connected to the vehicular on-board diagnostic (OBD II) port. This connection allowed each unit to determine how far the vehicle had traveled. OBUs were equipped with a GPS element to determine whether the vehicle was in a particular pricing zone, such as the State of Oregon or the Portland Metropolitan area. OBUs could not identify the specific location of the vehicle. An independent service station chain volunteered to install wireless (wi-fi) equipment on fuel pumps at two of their Portland area service stations. An independent service station owner was used because corporate franchised service stations would not grant ODOT access to their proprietary point-of-sale software. The wi-fi equipment at the fuel pumps communicated with the OBUs whenever a participant refueled their vehicle, transmitting mileage information from the unit to ODOT's administrative office, which calculated an amount owed. This amount was then added to the fuel purchase after providing a credit for any fuel taxes paid, allowing participants to pay their road usage fee in a manner similar to how they paid fuel taxes: at the fuel pump.

This first pilot showed that the mileage fee concept is indeed viable and that systems can be designed to allow drivers to pay their fees in conjunction with fuel purchases. The system tested was successfully integrated with service station point-of-sale software and communications between the service station and the ODOT administrative back-office were successful. ODOT also minimized privacy concerns by limiting the detail of location data collected to broad geographic zones. However, in spite of the success of this pilot there were numerous issues with the system tested that ODOT believed would limit its potential for implementation and long-term success. These issues included:

- **Difficult and Complex to Deploy** – The system tested in the 2006 pilot required the installation of an in-vehicle device in each participating vehicle as well as the installation

of special equipment at fuel pumps for the transmission of data. It was decided that implementing such a system statewide would be potentially complex, difficult, and expensive to deploy.

- **Closed System** – The 2006 system used a specially-designed, specified, and built hardware configuration. It was determined that relying on such a closed system would decrease system flexibility, stifle market innovation, and thus impede technology evolution over time.
- **Privacy** – The system was designed to provide the maximum level of privacy protection for participants. However, privacy concerns persisted primarily because the system would rely on a mandate by the government for the use of the in-vehicle technology.
- **Administrative Cost** – The state owned and operated all elements of the 2006 system. The public thus had concerns about the potential cost to administer a statewide system.

Pilot Initiation

With the success of the 2006 pilot, the RUFTF was reconstituted and new legislation was introduced directing the task force to further refine the RUF concept for implementation in the State of Oregon. In 2011, the Oregon legislature passed HB2138, which required the RUFTF to make additional considerations in evaluating alternative funding mechanisms for the State of Oregon. Specifically, the legislation required the RUFTF to consider:

- The availability, adaptability, reliability, and security of methods that might be used in recording and reporting highway use.
- The protection of any personally identifiable information used in reporting highway use.
- The ease and cost of recording and reporting highway use.
- The 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 new legislation also required the RUFTF to consult with "highway users and transportation stakeholders, including representatives of vehicle users, vehicle manufacturers, and fuel distributors." Through successive meetings the task force developed policy directives for subsequent road user charging in Oregon that were informed by the lessons learned from the 2006 pilot as well as a series of workshops. The policy goals ultimately adopted by the RUFTF are as follows:

- Implement a cost-effective and transparent system for collecting a vehicle RUC.
- Provide RUC payers with choices.

- Establish public-private partnerships.
- Implement government systems as alternatives.
- Protect the privacy of motorists.
- Charge Oregon residents only for in-state travel.
- Provide credits or refunds for travel on private property.
- Provide credits or refunds for fuel taxes paid.
- Ensure efficient account management operations.
- Provide a viable audit trail.
- Promote compliance.
- Base the system design on an open architecture using common standards.
- Develop a system design that does not preclude future expansion and/or collection of a variety of transportation charging.
- Provide for future connections to other states.

The new approach to the pilot testing of funding alternatives adopted by the RUFTF emphasized the following features: user choice, open systems for access to existing technology market with no mandate for particular technologies (such as GPS), and utilization of private sector for hardware, software, and services to the extent practical. Oregon's previous experience had taught it that:

- *There should be no government mandate on the use of technology* – Regardless of the outreach efforts undertaken by ODOT representatives leading up to and following the initial pilot, there were still persistent concerns among the public about the potential for a governmental mandate to use technologies in personal vehicles, particularly technologies that collect location data. As such, ODOT decided that future pilots and implementations would have to offer a range of technology options including a technology free option.
- *The road user fee system must be based on open market principles with significant private sector involvement* – ODOT recognized that the technology sector and, specifically, the industry for in-vehicle and personal data devices, is rapidly evolving. The original pilot featured a single device that was based on a closed-system configuration. ODOT decided that the technologies supporting a road user fee system needed to be flexible, and technology selection and adoption should thus be driven by market forces based on an open system philosophy.

- *Private sector options should be provided as an alternative to DOT administration* – There is the strong potential for significant cost savings to be realized by allowing the private sector to handle the assessment and collection of road user fees. Private sector administration can also reduce public concerns about government use of location and billing data.

Pilot Procurement and Operations

In 2011, ODOT began work on what would eventually become known as the Road Usage Charge Pilot Program (RUCPP). The new direction provided by the RUFTF required ODOT to develop the RUCPP such that participants have options in how their fees were assessed, assessment methods are based on open market principles, and a significant level of private sector participation in pilot administration is present. As a result the RUCPP featured a high level of private sector involvement relative to the 2006 mileage fee test pilot.

ODOT first issued a Request for Information (RFI) to obtain industry perspectives on potential operational concepts that could achieve the directives laid out by the task force. The RFI received 28 responses from a variety of domestic private sector entities including tolling technology providers, insurance providers, telecommunications services providers, and financial companies. ODOT next issued a Request for Proposals (RFP) to these 28 companies and received a total of nine responses. These nine teams where eventually narrowed down with ODOT ultimately selecting three as potential vendors for the RUCPP. These teams were interviewed by ODOT staff and submitted their proposed systems for testing. ODOT eventually contracted with two of the teams, one lead by Sanef and one led by Raytheon, to provide equipment and services for the RUCPP.

ODOT officials recognized that they needed significant involvement from policy makers if the results of the RUCPP were to influence future RUC legislation. As such, the RUCPP participant pool included eight state legislators and others with an active interest in transportation policy in addition to the general public participants. In an effort to gauge whether the RUCPP system could be leveraged to include other states, ODOT worked with officials in Nevada and Washington to get participants from both of those states. In all, there were 88 participants in the RUCPP. Participants paid the charge over a three-month period beginning in November 2012. Phase 1 began with 34 participants (31 from Oregon and 3 from Washington) while Phase 2 had 59 participants (14 from Oregon, 18 from Washington, and 27 from Nevada).

The RUCPP provided its participants with four road usage metering options as opposed to the single metering option tested in the 2006 mileage fee pilot. The four options available to participants included:

- A **Basic** Plan – Under this plan, participants used a device that recorded all miles driven. There was no GPS component in the device and no location data were collected under this plan. Participants paid for every mile they drove in their vehicles.

- An **Advanced** Plan – Participants choosing this plan used a device that recorded miles and allocated them to zones based on GPS data. Zones were set up based on state boundaries. Thus, participants paid only for mileage accrued on public roads in their state.
- A **Switchable/Smartphone**-based Plan – Under this plan, participants used a GPS enabled device that allowed them to choose whether they reported miles on a zone basis or reported all miles traveled. If the participant did not want location data to be collected for a particular trip, they could turn the device to basic mode. However, if they were to travel out of state, they could turn the device to advanced mode and not be charged for mileage accrued out of state or for non-eligible mileage (such as on private property). Participants chose whether to report and pay for mileage accrued on public roads in their state or for all mileage accrued on a per trip basis.
- A Simplified **Flat Fee** Plan – Participants opting into this plan did not use a reporting device at all and simply wrote a check that covered all mileage. Participants paid a fee based on an assumed maximum annual mileage. The amount paid was based on 35,000 miles per year at $0.0156 cents per mile, which was prorated to a monthly fee of $45 or a total of $135 for the three-month period of participation for the RUCPP.

All eligible mileage was assessed at a rate of $0.0156 per mile. Participants under the advanced and switchable/smartphone plans only paid for mileage accrued on publicly maintained roads in their home state, which included county and city maintained roads in addition to state maintained roads. By using the GPS data collected by the in-vehicle devices the pricing systems could tell whether travel was occurring within public right-of-way. Thus, a participant would cease accruing chargeable mileage when they departed the public right-of-way or left their state. ODOT found that a significant amount of non-eligible mileage was accrued in parking lots.

Participants who chose a plan that used an in-vehicle device, which was almost all of them, had a choice of three different mileage reporting devices. All of the electronic plans used a “dongle,” an example of which can be seen in Figure 1. Each dongle connected to the vehicular on-board diagnostic port. Users of the basic plan received a simplified dongle that, unlike the dongles used for the advanced plan, did not have an internal GPS component. The information received through the vehicular connection was used to determine miles driven. Devices were mailed to participants, who self-installed them. ODOT found that most people did not have any trouble with the installation itself. In fact, most of the inquiries received by the ODOT helpline were from participants who had trouble finding their vehicular OBD II port, not actually installing the device.

Figure 1: Oregon RUCPP Basic Plan Dongle

Users of the switchable plan received a dongle and had to download a specialized smartphone application (app) that allowed the phone to communicate with the dongle and receive data. The app allowed the user to switch between basic and advanced mileage reporting. Users were able to disable the vehicle location reporting component of the phone at any time through the smartphone application. Figure 2 shows an example of how the RUCPP smartphone app appeared on the smartphone screen.

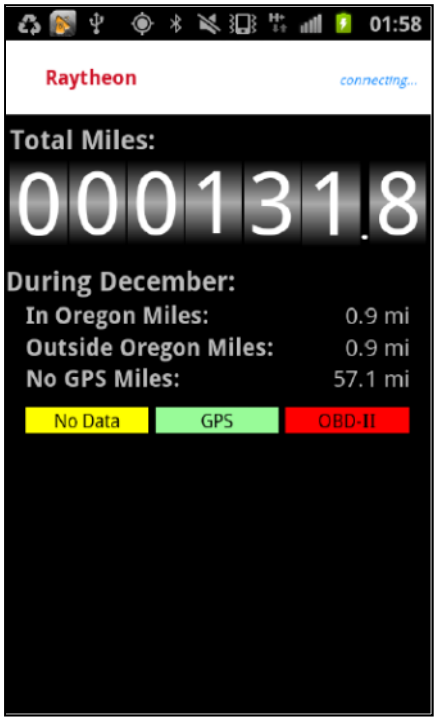

Figure 2: Screenshot of Oregon Pilot Smartphone App

All participants had to have a vehicle with a model year of 2004 or newer. This was due to the fact that the RUCPP was heavily dependent on devices connected to the vehicular OBDII port. Such ports have been standard in new model vehicles since 1996 in order to facilitate emissions testing. However, the pins that comprise the vehicular OBD II port do not necessarily provide the same information between makes and models. Through the RFI process ODOT discovered that the OBD II pins and the information they provide is consistent enough for models manufactured after 2004 that a common dongle could be used without too many data issues.

Pilot Administration

Regardless of the plan and reporting device selected, all RUCPP participants had a Road User Charge account to manage miles driven and charges owed. Under the advanced and smartphone-based plans, participants had their accounts managed by a private provider known as a Certified Service Provider (CSP). For the RUCPP the primary CSP was the technology vendor Sanef. Under the basic mileage reporting plan users could choose to have their account managed by Sanef or ODOT. Users of the advanced and smartphone plan were required to have their accounts managed by Sanef. Mileage information was reported by the in-vehicle devices to the CSP with excerpts of transmitted data also being sent to ODOT's mileage tax accounting division for use in auditing and reconciliation activities. Even though participants in the basic plan could select ODOT as their account administrator, Sanef handled most of the billing for the RUCPP. All of the mileage reporting devices transmitted mileage information to the Sanef back office billing system, which would generate bills. For the ODOT-administered basic plan, Sanef generated bills on ODOT letterhead and sent the invoices to ODOT for mailing. ODOT would then receive payment directly for those accounts. Funds collected by Sanef through its account management system where transferred to ODOT's tax collection and accounting office. It is important to note that ODOT is the designated collector of state fuel taxes in the State of Oregon, unlike Texas, which uses a state taxation entity: the Comptroller of Public Accounts. Thus, ODOT already had accounting systems in place for the collection of state revenue.

With the exception of the one participant who elected to participate in the flat fee option, all participants received an invoice at the end of each month indicating the RUC owed and gas tax credits earned. The one participant who selected the flat fee option simply wrote a check to ODOT at the start of the pilot. Options for payment varied based on the plan and account manager selected by the participant. Those who participated in the basic plan and selected ODOT as their account manager were mailed an invoice by ODOT and had to pay by mail with a check. Participants under the basic plan who selected Sanef as their account manager could either receive an invoice through the mail or e-mail. These participants paid their fees online with a credit card or debit card. Participants with advanced or smartphone plans received invoices electronically via e-mail and paid their fees online with a debit or credit card.

Participants were expected to pay the invoices as generated by the RUCPP. However because the RUCPP was being tested as a replacement for the fuel tax, and since participants were paying their fees without an initial stipend, it was necessary to credit participants for fuel taxes paid over the course of the pilot. Fuel tax credits were provided only for fuel consumed on public roadways in the State of Oregon or other participating state. Fuel tax credits were calculated by multiplying the ratio of chargeable miles (chargeable miles divided by total miles) by the estimated amount of fuel consumed and the fuel tax. If the RUCPP system was unable to determine the amount of fuel consumed based on data from the OBD II connection then an estimation technique that relied on EPA estimates of fuel efficiency for each vehicle was used to generate an estimated fuel tax credit

Evaluation Results and Conclusions

The success of the program was evaluated based on several distinct criteria, each with its own metrics. Evaluation criteria included:

1. **Policy and public acceptance** – Two primary metrics were used in determining RUCPP success for this goal. The first was that users would need to generate roughly the amount of revenue as they would have in fuel taxes. Second, participants were asked to provide feedback on their acceptance of the RUC concept in terms of the cost of the system, the ease, and convenience of the system, privacy protection, fairness, transparency, aversion/attraction, and choice.
2. **Technology** – Metrics used for the technology evaluation included adaptability of the RUC system, ease of installation of mileage reporting devices, safety of mileage reporting devices, mileage reporting device installation, and system operations for motorists, anti-tampering, and system performance. Additionally, hardware and software and other elements were evaluated based on various criteria including feasibility, accuracy, reliability, security/encryption, open system, energy consumption, and account management system experience.
3. **Operations** – Metrics used for the evaluations of the RUCPP's operational aspects included ease and cost efficiency of administering the RUC; ease of use and cost of compliance with the RUC system by RUC payers and other system users; accuracy and perception of accuracy of data transmitted to the central database and used for assessing mileage taxes; privacy options for RUC payers in protecting data; ability to audit; and usefulness for phasing and partial implementation. However, the operations portion of the evaluation report is not yet available.
4. **Cost** – The RUCPP was also evaluated in terms of its startup (capital and retrofitting), operations and maintenance costs, and collection costs relative to the fuel tax. However, the cost portion of the evaluation report is not yet available.

Evaluation activities involved surveying RUCPP participants and interviewing technology vendors, account management vendors, ODOT pilot coordinators, ODOT's pilot accounting system operator and the ODOT system integrators. Pilot participants were surveyed three times through an initial pre-pilot survey, a midpoint survey, and a closing survey at the conclusion of the testing period.

Policy and Public Acceptance

The RUCPP generated slightly more revenue from program participants than what would have been collected from them in fuel taxes. Follow-up surveys showed that the system itself was acceptable to the participants and they generally found it to be easy and convenient to use. Concerns about privacy and data protection were noticeably lower at the conclusion of the pilot. Most participants rated the system as either "fair" or "very fair." The overall attractiveness of the system also increased over the period of the pilot, and participants generally had positive views of the choices offered to them in terms of assessment and administration.

Technology

The technology components of the system worked very well. Devices were easy to install, which is important given that they relied on a connection to the vehicular diagnostic port, which provides the system with very accurate information. There were no reported safety issues with the devices. System performance metrics indicated that:

- The mileage reporting devices accurately measured distance traveled and, in the case of the advanced plan, could accurately measure distances traveled off-road and out-of-state.
- There were no mileage reporting device errors logged by the system.
- There were no errors in billing.

Nevada Department of Transportation

For many years the Nevada Department of Transportation (NDOT) has studied VMT fees as a potential alternative funding source. The department's study efforts are largely funded from Federal sources, with the department's academic partners (such as the University of Nevada at Las Vegas) providing the necessary matching funds. In order to generate policy guidance for its ongoing pilots the department relied extensively on the use of town hall meetings and public hearings.

The NDOT is also active in interstate coordination activities related to VMT research. However, the Department has not yet published reports on the field tests of VMT fee technology applications it has conducted. Much of the information contained in this section is from interviews and personal conversations with NDOT staff. The Department did publish a policy study in 2010, which is discussed in the next section.

VMT Fee Study – Phase I

The first phase of NDOT's VMT fee efforts was composed of public policy, public outreach, and economic analysis efforts without an actual field test or pilot of any particular technology configuration. This effort was completed and a report issued in 2010.

The objectives of the study were to:

- Assess and evaluate the feasibility of a VMT fee collection and payment mechanism specific to the State of Nevada.
- Conduct proactive public outreach and education efforts to educate the public, elected officials, various stakeholders, and decision makers about the critical future funding shortfalls and limitations of the current fuel tax system.
- Identify and address the significant elements associated with the concept of a VMT fee.
- Design a VMT Fee Pilot Program for Nevada.

The initial policy study consisted of a literature review of VMT studies conducted in other states, a public outreach effort to solicit input on the VMT fee concept, an assessment of potential privacy impacts, an institutional/policy/legislative analysis, and the development of economic models.

Public Outreach

As part of its public outreach NDOT conducted a series of public meetings and workshops in the Reno and Las Vegas areas in 2009. The two workshops lasted four hours and had approximately 20 attendees each. At these meetings DOT staff presented information on the VMT concept and solicited feedback in the form of breakout sessions to discuss policy, administrative, privacy, and technology related concerns. Policy and privacy related issues were rated as the most significant

at these sessions. NDOT also concluded from these sessions that the concept of equity in charging required better definition. Attendees also stressed the need for more near-term funding solutions, as VMT fees were viewed as being not feasible except in the long term. Attendees also noted that outreach was needed to educate the public on the issues facing transportation funding.

NDOT also conducted two public meetings in Reno and Clark County (in the Las Vegas Metro area) in 2010. The Reno meeting was attended by about 75 people and the Clark County meeting was attended by about 45, a lower turnout for both than what the Department had anticipated. There was, however, a media presence at both. At these meetings NDOT staff manned stations to discuss various VMT issues with the attendees, who were asked to complete an exit survey. These surveys showed that the attendees were generally satisfied with the meetings and that the information presented was useful in addressing their main concerns. Privacy and policy issues were identified as topics that require more information.

Institutional Assessment

Institutional issues examined by NDOT included administration, cost, funding, outreach, hardware and software, VMT fee structure, billing and collections, and pilot participants. Much of this work was related to identifying a structure for future pilots and identifying work that still needed to be done to facilitate pilots. NDOT suggested that future pilots address the following areas:

- Necessary user fee rates to achieve revenue neutrality (break-even revenue) with the current gas tax policy.
- The incorporation of variable fee rates that take into consideration time, space, and fuel efficiency.
- Issues related to miles driven outside of the program boundary.
- Optimal distribution of revenue among local jurisdictions.

Privacy Assessment

In its privacy assessment NDOT identified two central aspects of data security addressed in alternative funding pilots conducted to that point: technology feasibility and participant willingness to disclose information. They concluded that more work was needed to address administrative control on the use of personal information. Existing principles and practices, such as those used in connected vehicle applications, were not seen as sufficient. The Department recommended that future pilots have a strong focus on testing different policies and methodologies for privacy protection than what had been undertaken in other states. Future VMT implementation would require statutory changes in order to provide the necessary data security and privacy protections required.

Economic Models

In addition to long-term projections for state fuel consumption and vehicle miles traveled, NDOT developed economic models for six VMT fee systems including:

- **Uniform VMT fee** – Would impose a flat fee per mile traveled regardless of the type of vehicle (excluding trucks), location of travel, or time of travel.
- **Dual fee** – Would impose a flat fee per mile traveled on passenger vehicles and a separate fee on light trucks.
- **Multiple-fee** – Would impose flat fees per mile traveled that vary based on the specific make and model of the vehicle, with the general result being that fee rates would vary based on fuel efficiency.
- **Generalized variable-fee** – Would impose fees for miles traveled that vary based on the type of vehicle as well as the type of roadway being traveled on.
- **Pay-as-you-go fee** – Would levy fees on miles traveled with the rate set to generate funding levels sufficient to maintain transportation spending levels.
- **Full-cost fee systems** – Would levy fees on miles traveled with the rate being set to account for the total cost of travel in terms of road damage, emissions, accidents, and traffic delays.

For this effort NDOT simply constructed models for estimating fee rates or future revenues and identified data needs. Projections of revenues or estimates of fee rates were generally not provided. NDOT did, however, rank the models in terms of their short-term and long-term feasibility and desirability from a policy standpoint. The pay-as-you-go system received the lowest rating in both the near term and long term rankings. The multiple-fee option was seen as the best near-term option because it was economically efficient and could be implemented with relative ease. The full-cost-fee option was seen as the most viable and desirable in the long term, primarily because it was the most economically efficient. However, NDOT noted that this would be among the most difficult options to implement from a political standpoint. It ranked second lowest in terms of its near-term feasibility and desirability. Additional detail on these economic models is provided in Appendix D.

VMT Fee Study – Phase II

The Phase II field tests of Nevada's VMT fee system began in November 2010. The overall design was informed by the efforts undertaken as part of the Phase I preliminary study. For example, in response to concerns heard at the Phase I public hearings and workshops, NDOT elected to test a system that would not collect any location data at all. There were also concerns about how such a system might be enforced, and NDOT ended up testing a system with a built-in enforcement mechanism: fees would be collected as part of fuel purchases. Wireless equipment

located at participating service stations would detect "pulses" from vehicular on-board diagnostic devices such as the controller area network (CAN) bus. CAN bus components are routinely used in newer vehicle models for the facilitation of communication between various in-vehicle systems. Initial estimates for the cost of the individual units tested were in the range of $100 to $200 per unit. However, NDOT feels that these costs would be greatly reduced as part of a statewide pilot or implementation due to economies of scale.

Phase II was a limited field test with only around 40 participants. The mileage-based rates used in the field test did not vary, meaning that all vehicles, regardless of weight, type, or classification were assessed the same per-mile rate. Since there was no location data, mileage rates did not vary by location (such as in-state versus out-of-state) or the type of facility. No final reports have been issued on this phase of the project and NDOT officials have not disclosed many details on the test. NDOT officials have indicated that there were some issues with the technology systems tested but that the department learned a lot about the technology and its potential to support a VMT fee system from those glitches.

NDOT officials have stated that one of the things the department evaluated as part of the Phase II field test was linking the data generated by the VMT fee system with existing state databases such as those used by the Department of Motor Vehicles. The Phase II field test will be evaluated based on customer satisfaction, administrative costs, privacy-oriented metrics, and equity.

VMT Fee Study – Phase III

Upon completion of Phase II it was anticipated that NDOT would initiate a statewide test of the system developed for Phase II. However, the status of this Phase III effort is currently unknown. It was anticipated that the Phase III test would have 300 to 500 participants testing a basic fee collection system with expanded choices in how they would pay their fees. Options tested would include payment through a cell phone. NDOT officials expected to stay away from GPS-based systems and had expressed a greater interest in evaluating differing methods for assessment and payment.

Minnesota Department of Transportation Mileage-Based User Fee Pilot

In 2007, the Minnesota legislature set aside $5,000,000 for the Minnesota Department of Transportation (MnDOT to conduct a pilot test of technologies that would allow for the replacement of the state's fuel tax. The money was set aside as part of the 2007 MnDOT appropriations bill, with the language authorizing the pilot reading simply as follows:

> *"$5,000,000 is for a pilot project to demonstrate technologies that will allow for the future replacement of the gas tax with a fuel-neutral mileage charge."*

Prior to the implementation of the pilot a policy study was facilitated by the University of Minnesota's Humphrey School of Public Affairs. As part of that effort a task force was convened to engage transportation system stakeholders with the intent of "identifying and evaluating issues for potential implementation" of mileage-based user fees within the State of Minnesota. The 25 members of the task force were appointed by the commissioners of MnDOT and represented a broad range of public and private sector interests. The task force met several times over a six-month period to discuss and evaluate the mileage-based user fee concept and associated issues, determine the benefits and concerns related to such systems, consider potential system design options and preferences, formulate policy objectives, and issue findings and recommendations.

In its final report the task force noted that the primary objectives of a state mileage-based user fee system should be as follows:

- **Promote Equity** – The fee system should ensure that all motorists pay for their use of the roadway transportation system regardless of their vehicular energy source.
- **Generate Transportation Funds** – The fee system should generate funding for transportation programs by either supplementing or replacing the motor fuel tax.

The task force endorsed environmental protection (in terms of reducing vehicle emissions) and improved transportation system performance through efficient travel demand management as desirable ancillary goals for a future mileage fee system. However, they were not adopted as primary policy objectives for upcoming road user fee activities.

In its final report the Minnesota Task Force made the following recommendations:

- Any future transportation funding method(s) must ensure that all drivers pay their fair share for building and maintaining the roadway transportation system they use.
- Minnesota's roadway transportation funding methods must cover all vehicles using that system, regardless of the type of fuel(s) used.
- State policymakers should engage in a thoughtful discussion regarding whether to use an MBUF system to address future funding gaps between motor fuel tax revenues collected and the cost to preserve, maintain, and expand the roadway transportation system.

- The state government should conduct MBUF trials, possibly in partnership with contiguous states.
- MnDOT, in conjunction with local road authorities, should conduct a detailed technical analysis of MBUF in order to evaluate the types of issues, concerns, and design options associated with the concept and guided by clear MBUF implementation objectives.

Pilot Implementation

MnDOT initiated the Minnesota Road Fee Test (MRFT) pilot project in Minneapolis/St. Paul region with 500 participants. That region was selected due its high population density and corresponding levels of traffic congestion. MnDOT began preparatory work for the test in summer 2008, which consisted of test planning with technology development occurring over the next 3 years. Participant recruitment began in August 2011, and the actual test began in September 2011. The pilot concluded in October 2012.

In order to account for seasonal variations in travel and other external factors that could affect travel behavior, the study was implemented on a staggered basis with the 500 participant pool being deployed in three groups. Each group tested the in-vehicle components and payment system for a total of six months, with the first group beginning in September 2011 and the final group of participants ending their test in October 2012. For each of the groups there was an initial two month period during which fee baseline readings were taken using the equipment but no fees were assessed. The actual period during which data were collected, fees assessed, and charges paid lasted for four months.

Participants were required to attend an in-person orientation at the initiation of their test period. At this time an initial odometer reading was taken and participants were provided an Android smartphone (shown with mileage fee app in Figure 3) and were instructed on how to install and operate the device. A staff member from Battelle, the private entity handling operations for the system, ensured that the phone was working properly prior to concluding the odometer reading. A follow-up odometer reading was taken after the two-month baseline assessment period, and a third odometer reading was taken at the conclusion of the pilot. These readings allowed for the assessment of mileage that had not been captured by the in-vehicle device.

Figure 3: Minnesota Pilot Test Smartphone and Mileage Fee App

Technology

One of the primary goals of the MRFT was to test the accuracy of smartphone-based technologies and associated applications for the assessment of mileage-based user fees. As such, the primary in-vehicle device used was a GPS-enabled smartphone that would collect and transmit the data needed for the pilot. These Samsung Galaxy smartphones ran on the Android operating system, which was selected because the pilot's private operations team found it to be the easiest mobile operating system for developing custom apps. Phones could be mounted anywhere within the vehicle, but participants were encouraged to use dash mounting equipment provided by the operations team at the orientation.

The mileage fee app tested as part of the MRFT was developed specifically for the MRFT. All other functionality on the phones used in the test was disabled, which would prevent drivers from being distracted by the device while driving. The MRFT system also used a dongle that was attached to the vehicular on-board diagnostic (OBD II) port. The dongle communicated vehicular identification information to the smartphone app, which allowed the app to verify that it was in the correct vehicle. This prevented mileage from accruing on the device if it was removed from the vehicle while the MRFT app was still running.

Data collection by the MRFT app was initiated whenever the phone was powered on and the app activated at the beginning of a trip. Once the app was running, data were collected on a second-by-second basis and stored within the device for later reporting. The MRFT app collected three primary types of data:

- Second-by-second **trip data** – These provided time, location, and speed information to the MRFT system using the GPS capabilities of the smartphone. These data were collected on a continual basis while a trip was underway.

- Event-based **log data** – These data were recorded and time stamped whenever a system event occurred. For example, the MRFT system was continually performing status checks and conducting updates such as changes in fee categories for a particular area or entry or egress from a safety signage zone (which is discussed in the next section). When these events occurred they were recorded in conjunction with the trip data that was being accumulated by the smartphone. Log data also included error messages.
- Unique trip identification numbers or **TripId data** – A trip identification number was generated and assigned to each second-by-second trip data point on a particular trip. This allowed for the generation of summary data about trips taken by participants.

Data collected by the MRFT app were transmitted by the smartphone through its 3G mobile data channel to the pilot's back office data infrastructure. Data were transmitted immediately in real-time or stored on the smartphone until transferred by the participant. Trip data and log data were stored on the smartphone and were transmitted in real-time to the back office data infrastructure. However, for TripId data participants had the option to save (and eventually transmit) or delete the data at the end of the trip. This was done in an attempt to address privacy concerns related to perceptions about real time tracking of vehicles.

Trip data, log data, and the optional TripID data were used in the back office to construct **MBUF data**. MBUF data were what was ultimately used to determine miles driven and an amount owed by the driver. The back office allocated the second-by-second trip data to a fee category based on the time and location the individual data point was generated within. Fee categories for the travel data collected by the MRFT system used to determine an amount owed included:

- Mileage accrued outside Minnesota.
- Mileage accrued inside Minnesota.
- Mileage accrued within the Minneapolis/St. Paul region ("Metro Zone").
- Mileage accrued in the Metro Zone during peak periods of the day.

The rates assigned to these mileage categories will be discussed in a subsequent section.

In-Vehicle Signing

The Minnesota pilot also tested an in-vehicle signing application. A total of 247 participants were selected to test this particular feature, which provided visual and auditory warnings to drivers regarding sharp turns, construction zones, speed reduction zones, and school zones. These zones were identified on a map used by the smartphone such that when a vehicle entered the pre-determined zone participants would receive a warning from the device. A total of 98 zones were tested including: 46 school zones, 17 curve warning zones, 7 construction zones and 28 speed reduction zones. Figure 4 shows an example of the visual warning provided to participants.

Figure 4: Example of MRFT In-vehicle Signage Warning (Curve Warning)

Fee Structure and Payment

It was the desire of MnDOT to incorporate fee elements that would have potential for implementation while not making the fee structure so complicated as to confuse drivers. Thus, rates assigned to the mileage collected by the MRFT system varied based only on the time of day, location, and usage of the device. Rates were structured to be simple to understand and were set at an amount such that participants would pay roughly the same amount in mileage fees as they would in state fuel taxes.

A location data-based road fee system could potentially be used to levy fees that vary based on the type of facility. Thus, travel on major highways would have a different rate relative to travel on arterials. However, this was viewed as being complicated and potentially confusing to participants. Thus, MnDOT adopted the fairly simplified fee structure shown in Table 3Table 4. Mileage not captured by the device was determined at the final odometer reading and was assigned a higher relative rate.

Table 3: MRFT Rate Structure

Current Driving Location		Peak Times Monday-Friday 7AM–9AM 4PM–6PM	Off Peak Times
Outside of Minnesota		$0.00	$0.00
Inside Minnesota	Outside the Twin Cities Metro Zone	$0.01	$0.01
	Inside the Twin Cities Metro Zone	$0.03	$0.01
***Drive without device at anywhere**		$0.03	$0.03

When the smartphone and MRFT app were activated the current rate would be displayed on the smartphone screen. Participants were able to view the details of their trip through the smartphone app.

Each participant was provided an initial stipend and was expected to pay for their assessed mileage fee from that initial amount. Invoices were issued by the operations team on a monthly basis. Participants were provided several options for paying invoices including:

- Via check through the mail.
- Online via PayPal™.
- Through an online participant portal.
- In-person at the MRFT office where odometer readings were conducted.

The system collected a total of $32,000 in fees, which averaged to about $12 per month per participant. MnDOT experienced a 98 percent collection rate on invoices sent to participants.

Conclusions

MnDOT came to several conclusions based on the results of the study:

- **Smartphones are viable as an MBUF assessment and communication device** – The MRFT showed that smartphones can be outfitted with custom applications for use in the operation of a road user charging system. The phones generally need to have a GPS or some other location-based component if fees are to vary based on geography or facility type. The cellular system is capable of transferring the data necessary for fee assessment. Furthermore, because cell phone ownership is so widespread, a system leveraging these technologies would likely have a greater degree of participation by the public.
- **Smartphone-based systems do suffer from reliability issues** – Vehicle detection failures, where the smartphone did not know if it was in the correct vehicle, occurred for 35 percent of total trips and were the leading cause of lost trip data. A lack of GPS signals at any given time was the second major contributing factor leading to unrecorded trips. System diagnostic messages were used to report instances where the mileage rate was unknown because a GPS signal could not be obtained. The availability of a GPS signal was a significant system-related issue in the MRFT, and location data are critical to properly assessing road user fees. MnDOT thus concluded that, even though the system was largely successful, it may be too early to rely on smartphone technologies to achieve the required level of accuracy that is expected for such fee systems.
- **Simplicity in system design is important to participants** – Participants found the fee rates and fee categories to be sensible and appropriate. Participants understood the need to replace the fuel tax and believed that the fee system tested was reasonable but that it

was too complicated relative to the fuel tax. Many participants desired that future fee system use in-vehicle systems that are already integrated into the vehicle.

- **System administration is labor-intensive** – MnDOT concluded that a statewide deployment of the MRFT system would require significant administrative support. The MRFT required significant one-on-one interaction with participants for activities such as odometer readings, device installation, device training, and responding to general inquiries and service issues.

One of the most significant aspects of the system tested by MnDOT is that it represents a potential opt-in model for the deployment of alternative funding systems. If the system tested by MnDOT were implemented on a widescale, drivers would have the option of using the in-vehicle device to only pay for mileage accrued in-state or would have the option of simply submitting to a manual odometer reading for fee assessment. The increased rate for mileage assessed through the odometer reading would act as an incentive to adopt the technology based approach, which could facilitate the implementation of various safety and system management applications.

Next Steps

MnDOT is currently publicizing the results of the demonstration. MnDOT is also currently leading an effort to develop pooled fund research studies to further develop the MBUF topic and to examine multistate and national issues. This pooled fund effort is discussed in more detail in a subsequent section of this report.

Washington State Road Usage Charging Task Force

The 2012 Regular Session of the 62nd Legislature in Washington State passed a Supplemental Transportation Budget that directed the Washington State Transportation Commission (WSTC) to determine the feasibility of transitioning from the gas tax to a road user assessment system for funding the state's transportation programs. The bill (ESHB 2190) included funding for Washington State Department of Transportation (WSDOT) to assess the operational feasibility of road user assessment methods including assessments of, among other things, technology, agency administration, and multistate and Federal standards. These efforts were to be carried out under the direction of a steering committee that would be required to:

- Review relevant reports and data related to models of road usage assessments and methods of transitioning to a road usage assessment system.
- Analyze the research to identify issues for policy decisions in Washington.
- Make recommendations for the design of system-wide trials.
- Develop a plan to assess public perspectives and educate the public on the current transportation funding system and options for a new system.
- Assess technology, agency administration, multistate and Federal standards, and other necessary elements.

The Washington State Steering Committee had 20 members, composed of three members and one representative of the WSTC, two Washington State Senators, two members of the Washington State House of Representatives, a representative of the Alliance of Auto Manufacturers, a representative of the Port of Seattle, a representative of the Cascadia Law Group, a representative of a county public works office, a state university representative, a trucking industry representative, city council member, a representative of the state department of transportation, a representative of traffic data provider, a representative of AAA, and a representative of the Washington business community.

The Steering Committee was required to report to the legislature by January 2013 on whether road user charging is feasible and, if so, to propose a research and development plan for the 2013–2015 fiscal biennium for examining key issues in a more in-depth manner and proposing technology demonstrations or pilots. The Task Force ultimately concluded that road user charging is feasible and made its report and recommendations to the legislature with a request for $1.6 million in funding for new activities. In 2013, the legislature allocated $400,000 for FY 2014 activities and provided additional direction to the WSTC through ESSB 5024, Section 205(3) to develop a business case addressing the transition from fuel taxes to road usage charging for funding the state transportation system. In that bill the legislature stated that the efforts of the Committee represented an important first step in policy and conceptual

development but noted that additional clarification on governance was needed. A final report on these activities is due in 2014. Specifically, the WSTC was directed by the legislature to:

- Develop preliminary road usage charge policies and conduct the supporting research necessary to develop a business case for RUC transition.
- Develop the preferred operational concept(s) that reflect the preliminary policies developed as part of previous activities.
- Evaluate the business case and assess likely financial outcomes.
- Identify and document various policy issues deemed important to further refine the preferred operational concepts in order to gain public acceptance.

Policy Development

For the purposes of policy development the Steering Committee adopted a formal definition of a Road Usage Charge. The committee noted that there are several different forms of charging that can be implemented, but articulated that for the purposes of the effort it was undertaking that RUC would include:

- *Network wide charging* – Charges would be assessed across the entire network of facilities rather than a single facility or corridor as is the case in tolling applications.
- *24/7 charging* – Charges would be assessed during all times of day, which differs from congestion pricing applications wherein fees are only levied for travel during certain periods of the day.
- *Funding for general roadways* – Unlike tolling applications, where revenues are generally spent on a specific facility, the road usage charge would fund roads over the entire network.

The steering committee recognized that policy decisions must guide the development of technology options. This was based on previous long term funding feasibility assessments undertaken in 2007, 2009, and 2012 within the state. Thus, the steering committee first looked at policy objectives for the new transportation funding system and established feasibility criteria by which transportation funding solutions would be evaluated. The committee next looked at various road usage charging concepts, which was followed by a feasibility analysis using the criteria developed at the committee's initial meetings.

Discussion at initial meetings of the steering committee was focused on, among other things, establishing policy direction for the future road usage charging system. Committee members received information about international pricing activities and domestic mileage fee pilots, learned about technology applications for levying alternative funding systems, and participated in facilitated discussions on key issues such as privacy and equity. Following the first meeting,

committee members were surveyed to determine their preferences in terms of policy direction for the new system, with the results being that road usage charging should:

- Provide a sustainable transportation revenue source that addresses the erosion in revenues due to vehicle fuel efficiency gains.
- Demonstrate equity in terms of who uses transportation resources and who pays for those resources.
- Increase transparency with regard to roadway use costs and how funds collected for that use are spent.
- Accomplish other social objectives such as reducing the amount of driving, reducing energy usage, reducing greenhouse gas emissions; and reducing congestion through pricing.

Concept Development

Once policy direction was determined, the committee began developing pricing concepts for feasibility assessment. The committee started with a framework composed of core elements of road usage charging systems. Each of these elements would eventually need to be elaborated upon to develop an operational concept. Many of these elements would likely have to be codified in state legislation as part of a future implementation. These operational core elements included:

- **Principal** – This is the responsible party—either an individual or entity such as a corporation or other organization—that is legally responsible for paying charges and fines.
- **Vehicle** – These are the vehicles upon which the road usage charge is levied. Legislation should also identify those vehicles that are exempted from the charge.
- **Road Network** – The road network defines the roads that are subject to the road usage charge. As with the vehicular element, legislation should identify those aspects of the roadway system, such as private roads and/or toll facilities, where travel is exempted from the charge.
- **Usage** – This is the formal definition of "road usage" that will be used to levy the charge and set fee amounts. Usage, as determined by the steering committee, can be expressed in terms of both distance and/or time.
- **Charge Rates** – This is the amount charged per unit of usage.
- **Charging Policy** – This is constituted by the set of laws, regulations, and rules that define the road network, usage, rates, and approved methods of measurement.

- **Road Usage Charge Administration** – This includes system aspects such as account management, charge management, compliance and enforcement, and policy/administrative functions. The steering committee noted that road usage charge administrative functions can be carried out by a combination of governmental and private entities.

The operational concepts ultimately developed for feasibility assessment were constructed on a simpler framework. In developing road user charging concepts upon which to conduct its initial feasibility tests, the steering committee first started with the assumption that the basis of charging would be either distance, time, or both. From there, the committee identified "reporting responsibility," as in how distance or time information is reported to the assessing entity, as an additional aspect of the framework. Reporting responsibility can fall either on the user (or principal, as identified above), or the road user charging system itself. System-based reporting would essentially entail automated reporting by the vehicle itself, in-vehicle devices, or some other aspect of the overall system architecture. Based on the various combinations of charge basis and reporting responsibility, eight operational concepts were developed as shown in Table 4.

Table 4: Summary of Washington State Road Usage Charging Concepts

Basis of the Charge	Reporting Responsibility	Road Charging Concept	Description
Time	User	Time Permit	Principals would purchase unlimited road network access covering a set period of time such as a week, month, or year
	System	Engine Run Time Charge	Charging system would detect engine run time over a set period of time and report charges automatically, which would be paid by the principal
Distance	User	Mileage Permit	Principals would purchase a license to drive a certain number of miles
		Estimated Annual Mileage Permit with Reconciliation	Principals would pay to drive an estimated mileage over a set period of time and then reconcile that amount based on actual distance driven over that period
		Simple Odometer or Other Mileage Reading	Principals would report actual mileage at the end of specified reporting period and pay the corresponding amount owed
	System	Automated Mileage Reporting	Charging system would automatically detect the miles traveled over a specified period of time and report charges to be paid by the principal
		Automated Mileage and General Location Measurement	Charging system would automatically detect miles traveled within a geographic zone over a set period of time and report charges with rates varying by zone
		Automatic Mileage and Specific Location Measurement	Charging system would automatically detect miles traveled within a geographic zone and report charges with rates varying by type of road

The initial eight RUC concepts were evaluated based on their ability to satisfy various criteria. Criteria were selected and scores assigned for each of the pricing concepts based on the subjective judgment of the consultant team facilitating the meetings of the steering committee. The criteria used in the evaluation included:

- **Convenience** – The system should be convenient to road users in that it would not impose a significant compliance burden and would offer users choices.
- **Implementability** – The system must be able to overcome implementation barriers and challenges using reasonable solutions.
- **Transparency** – The system should achieve transparency in the areas of rate-setting, customer billing, and accounting.
- **Stability and Sustainability** – The system must have a high degree of confidence in terms of expected revenue. Revenue stability and sustainability should be relative to the gas tax.
- **Privacy** – Privacy concerns, regardless of whether they actually exist or are perceived, should be addressed by the system.
- **Fairness (Equity)** – The system should collect revenues from road users in a manner that is fair across all classes of users such as cars and trucks; urban and rural residents; and motorists of all income levels.
- **Flexibility** – The system should accommodate evolving revenue collection technologies and remain flexible to revenue needs, user needs, and policy changes such as rate-setting.
- **Choice** – The system should allow users to choose from numerous options in meeting their individual preferences.
- **Collect Revenue from Out-of-State Travelers** – The system should have an appropriate method for collecting revenue from out-of-state travelers.
- **Out-of-State Travel** – The system should distinguish between in-state and out-of-state travel. This criterion was deemed to be of lowest importance in selecting a preferred road usage charging system by the steering committee.

In evaluating the various operational RUC concepts the steering committee found that most were indeed feasible but that all had particular advantages and disadvantages. All of the systems would solve the issue of fuel tax revenue erosion, but each would likely have a higher administrative cost relative to the fuel tax and be less convenient for drivers. Furthermore, none of the systems effectively capture revenue from out-of-state users.

In its January 2013 report the steering committee concluded that the road user charging concept is indeed feasible and issued a multi-year, multi-phase work plan for advancing the concept. The research and development plan proposed by the committee was as follows:

- **Phase 1 (2013–2015)** – For this phase the state would focus on developing a policy framework and developing preferred operational concepts. This would include evaluating policy choices and associated implications, undertaking public outreach activities, and designing the operational concept for the road usage charging concept. These activities would enable the legislature to decide whether to initiate full pre-implementation system development activities (Phase 2). The steering committee estimated that Phase 1 activities would cost the state about $1.6 million.
- **Phase 2 (2015–2017)** – The pre-implementation system development phase would entail developing detailed system features and assessing administrative needs. At this point the state would conduct pilot tests of the preferred operational concepts developed in Phase 1. The pilot tests would be used to demonstrate the technologies and administrative systems supporting the road usage charging system and assess public acceptance of the system before committing extensive amounts of state resources to a full implementation. No budget was developed for Phase 2 activities since these activities would require specifics in terms of the operational concepts to be tested.
- **Implementation** – Based on the success of Phase 2, the state could decide at this point whether to implement the road usage charging system and transition to it as the primary mechanism for funding transportation.

Business Case Development

The state legislature ultimately directed the WSTC to continue exploring the RUC concept but only allocated $400,000 of the requested $1.6 million for Phase 1 activities. The steering committee was reconvened and charged with developing a business case for transitioning from the fuel tax to an RUC for funding state transportation funding. A final report on these activities has not been released.

In its January 2013 report to the state legislature, the steering committee noted that the RUC concept is feasible and that there are numerous operational concepts and associated configurations by which they could be implemented. However, each of these concepts has particular advantages and disadvantages. The committee noted that by combining operational concepts, and providing road users a choice in how they are assessed an RUC, many issues could potentially be mitigated. Thus, in developing operational concepts for its FY 2014 business case analysis the committee reduced and combined the operational concepts that were assessed for feasibility in its previous work as follows:

- **Time Permit** – Principals would buy permits to drive an unlimited number of miles over a given period of time (such as per quarter, per month or per year). Permits would be

purchased in conjunction with vehicle registrations and would take the form of a sticker denoting the time period for which travel has been paid. Should the state seek to collect fees from out-of-state travelers then various options (such as kiosks at border crossings, service stations or convenience stores) could be implemented.

- **Odometer Charge** – Principals would estimate the number of miles they expect to drive in a year and reconcile the amounts paid versus the actual mileage at the end of the year. "Severe under-estimation" could result in penalties. Payment could occur in conjunction with vehicle registrations, and stickers could be issued showing that the principal and their vehicle are in compliance.

- **Differentiated Distance Charge** – Principals would install devices in their vehicles that record mileage and transmit that information to a public or private billing entity that would generate invoices and collect revenue. Unlike the two other concepts, this application would allow drivers to discount mileage accrued out of state or on private roadways. Enforcement activities would occur at the level of the technology provider, who would have to submit to technical certification and likely auditing.

As with the previous feasibility assessment, the business case assessment will be guided by the overarching policy principles established in the steering committee's initial meetings in addition to several new criteria. Table 5 shows the criteria for the business case analysis..

Table 5: Washington State Business Case Evaluation Criteria

Financial Criteria	Non-Financial Criteria	Principals Related to System Design
Sustainable revenue source	Transparency	Data security
Cost-effectiveness	Complimentary policy objectives	Accountability
	Equity	System flexibility
	Simplicity	Interoperability and cooperation
	Enforcement	Phasing
	Privacy	User options

The three concepts that were evaluated could be combined, providing users with an added level of choice. In its preliminary work the committee estimated that these RUC concepts could yield between $2.1 billion and $3.1 billion more in revenue for the period between 2015 and 2040. It concluded that the time permit and odometer charging concepts would likely be the least expensive from an administrative standpoint, accounting for about 7 to 8 percent of revenues collected, respectively. The differentiated distance charge concept was estimated to have administrative costs of around 12 to 13 percent of revenue collected.

Next Steps in State Activities

The states that have completed pilots or are looking to develop pilots continue to work on this topic. Oregon is working to deploy its legislatively mandated road user charging system by 2015. Nevada is continuing with its field tests, and Washington State is continuing to conduct policy studies and establish business cases for moving to a road user charge system. However, some of the most significant developments in the future could occur as the result of two related multistate efforts: a Mileage-based User Fee pooled fund solicitation and the formation of the Western Road User Charge Consortium.

At the conclusion of its Twin Cities smartphone pilot, MnDOT issued a solicitation under the Federal Transportation Pooled Fund Program. The TPF is a federal program that allows state departments of transportation, commercial entities, and the various Federal Highway Administration (FHWA) program offices to combine resources for the achievement of common research objectives. Federal, state, regional, and local transportation agencies may all initiate pooled fund studies but the studies must ultimately be sponsored by a state DOT or FHWA. The Mileage Based User Fee pooled study is sponsored by MnDOT with FHWA's office of policy acting as a technical liaison.

The objective of the MBUF pooled fund study is to coordinate road user charging and MBUF-related research efforts across the states and FHWA. States participating in the effort will be offered membership in the Mileage-based User Fee Alliance (MBUFA), a Washington, D.C.-based non-profit aimed at promoting collaborative research and educational activities in the road user charging concept. Pooled fund participants will also solicit, select, and fund specific research projects that are of joint interest to the member states. As of January 2014, the pooled fund has received commitments of $100,000 from MnDOT ($20,000 per year through 2016) and $40,000 from the WSDOT ($20,000 for 2013 and 2014).

In 2013, the departments of transportation in Oregon, Washington, and Nevada formed the WRUCC. It was formed for the purposes of developing road user charging expertise and facilitating resource sharing on the road user charging concept among member states. The goals of the WRUCC are to:

- Explore the technical and operational feasibility of a multi-jurisdictional system.
- Develop methods for remitting road use charges among multiple jurisdictions.
- Develop models for regional (and national) interoperability.
- Develop concepts for a multistate system.
- Engage automakers and the tech sector to offer mileage reporting capabilities.
- Identify and share public acceptance factors.
- Share policy and program experiences among members.

The organization hopes to expand its membership significantly in the coming years and could be a facilitator of multistate road user fee charging pilots. Eligibility is open to transportation agencies that make an annual contribution in the amount of $25,000. The consortium is governed by a board of directors composed of DOT directors and state level transportation secretaries. A steering committee composed of representatives from each member entity will be developing a 24-month work plan for the consortium that will be reviewed and adopted by the board. Potential areas of interest to be covered by this work plan include:

- Legal and policy issues.
- Technical research, design, and development.
- Fiscal, accounting, and economic issues.
- Standards and certifications.
- Administrative and operational issues.
- Stakeholder outreach and communications.
- Platform and operations for multiple state pilot programs.
- Potential for regional pilot programs.

Federal Activity

Most of the recent pilot studies and associated policy work on the road user charging concept have been conducted at the state level. However, there has also been activity at the federal level on this topic. On December 3, 2013, Oregon's U.S. Representative Earl Blumenauer introduced HR 3638: Road Usage Pilot Program Act of 2013. The bill directs the Secretary of the Treasury to establish a competitive grant program known as the Road Usage Fee Pilot Program. This federal program would provide grants to state and local entities to conduct road user charge pilot studies, test various road user charge system components, and implement road user charge systems. Under the legislation, systems receiving funding would explore the following issues:

- Protection of personal privacy.
- Ease of public compliance.
- Level of public acceptance.
- Geographic and income equity.
- Integration with state and local transportation revenue mechanisms.
- Administrative issues.
- Cost.
- Enforcement issues.
- Potential for fraud or evasion.
- Feasibility of implementation.

Grants awarded under the Road Usage Fee Pilot Program would be evaluated based on the following criteria:

1. Serves as a model for broad implementation of a mileage-based fee system.
2. Addresses concerns of rural and urban user equity.
3. Involves multistate projects.
4. Has a high volume of enrolled vehicles.
5. Integrates with state and local revenue systems.
6. Integrates with local demand management plans.
7. Is likely to lead to implementation of mileage-based fee systems.
8. Integrates with other intelligent transportation system (ITS) technologies.
9. Tests the proposed revenue collection system by collecting and distributing revenue.

The introduced legislation also calls for the establishment of various working groups to evaluate technology, privacy, transportation system, equity, and environmental related issues associated with potential road user charging systems. In December 2013, the bill was assigned to the House

Energy and Commerce Committee, the House Transportation and Infrastructure Committee, and the House Ways and Means Committee.

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Rephlo, Jennifer A. 2013. Connected Vehicles for Safety, Mobility and User Fees: Evaluation of the Minnesota Road Fee Test. Minnesota Department of Transportation, Roseville, MN.

Washington State Transportation Committee. 2013. Feasibility Assessment, Work Plan and Budget: Report to the Legislature. State of Washington Transportation Commission, Olympia, WA.

Appendix A: ORS 184.843 (Chapter 470, Section 7, Oregon Laws 2011)

(1) There is created the Road User Fee Task Force.

(2) The purpose of the task force is to develop a design for revenue collection for Oregon's roads and highways that will replace the current system for revenue collection. The task force shall consider all potential revenue sources.

(3) The task force shall consist of 12 members, as follows:

(a) Two members shall be members of the House of Representatives, appointed by the Speaker of the House of Representatives.

(b) Two members shall be members of the Senate, appointed by the President of the Senate.

(c) Four members shall be appointed by the Governor, the Speaker and the President acting jointly. In making appointments under this paragraph, the appointing authorities shall consider individuals who are representative of the telecommunications industry, of highway user groups, of the Oregon transportation research community and of national research and policy-making bodies such as the Transportation Research Board and the American Association of State Highway and Transportation Officials.

(d) One member shall be an elected city official, appointed by the Governor, the Speaker and the President acting jointly.

(e) One member shall be an elected county official, appointed by the Governor, the Speaker and the President acting jointly.

(f) Two members shall be members of the Oregon Transportation Commission, appointed by the chairperson of the commission.

(4)(a) The term of a legislator appointed to the task force is four years except that the legislator ceases to be a member of the task force when the legislator ceases to be a legislator. A legislator may be reappointed to the task force.

(b) The term of a member of the task force appointed under subsection (3)(c) of this section is four years and the member may be reappointed.

(c) The term of a member of the task force appointed under subsection (3)(d) or (e) of this section is four years except that the member ceases to be a member of the task force when the member ceases to be a city or county elected official. A city or county elected official may be reappointed to the task force.

(d) The term of a member of the Oregon Transportation Commission appointed to the task force is four years except that the member ceases to be a member of the task force when the member ceases to be a member of the commission. A member of the commission may be reappointed to the task force.

(5) A legislator appointed to the task force is entitled to per diem and other expense payments as authorized by ORS 171.072 from funds appropriated to the Legislative Assembly. Other members of the task force are entitled to compensation and expenses as provided in ORS 292.495.

(6) The Department of Transportation shall provide staff to the task force.

(7) The task force shall study alternatives to the current system of taxing highway use through motor vehicle fuel taxes. The task force shall gather public comment on alternative approaches and shall make recommendations to the Department of Transportation and the

Oregon Transportation Commission on the design of pilot programs to be used to test alternative approaches. The task force may also make recommendations to the department and the commission on criteria to be used to evaluate pilot programs. The task force may evaluate any pilot program implemented by the department and report the results of the evaluation to the Legislative Assembly, the department and the commission.

(8) When the task force is studying alternatives to the current system of taxing highway use through motor vehicle fuel taxes and developing recommendations on the design of pilot programs to test alternative approaches under subsection (7) of this section, the task force shall:

(a) Take into consideration the availability, adaptability, reliability and security of methods that might be used in recording and reporting highway use.

(b) Take into consideration the protection of any personally identifiable information used in reporting highway use.

(c) Take into consideration the ease and cost of recording and reporting highway use.

(d) Take into consideration the 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.

(e) Take into consideration effective methods of maintaining compliance.

(f) Consult with highway users and transportation stakeholders, including representatives of vehicle users, vehicle manufacturers and fuel distributors.

(9) The task force shall report to each odd-numbered year regular session of the Legislative Assembly on the work of the task force, the department and the commission in designing, implementing and evaluating pilot programs.

(10) Official action by the task force requires the approval of a majority of the members of the task force.

(11) Notwithstanding ORS 171.130 and 171.133, the task force by official action may recommend legislation. Legislation recommended by the task force must indicate that it is introduced at the request of the task force. Legislative measures proposed by the task force shall be prepared in time for presession filing with the Legislative Counsel by December 15 of the year preceding a regular session of the Legislative Assembly.

Appendix B: Selected Language from Senate Bill 801, 77th Oregon Legislative Assembly - 2013 Regular Session

Summary Information

This act:

Creates program whereby registered owner or lessee of motor vehicle may pay per-mile road usage charge. Requires application. Limits participation to 5,000 motor vehicles. Becomes operative July 1, 2015.

Permits person paying per-mile road usage charge to apply for refund of motor vehicle fuel tax.

Permits person paying per-mile road usage charge to apply for refund for miles driven on private property.

Directs Department of Transportation to establish methods for reporting vehicle miles traveled.

Provides penalty for making false statements related to payment and reporting of road usage charge or for collecting, attempting to collect or receiving refund to which person is not entitled.

Punishes by maximum fine of $2,000.

Creates offense of tampering with vehicle metering system. Punishes by maximum fine of $2,000.

Requires department to enter into agreements through Oregon Innovative Partnerships Program to undertake transportation projects related to operation of road usage charge system.

Authorizes department to enter into agreements with other United States and Canadian jurisdictions for research and development of similar pilot programs and sharing of costs. Provides, for biennium beginning July 1, 2013, that expenditures by department from funds received from other states, federal government, Canadian provinces or government of Canada are not limited.

Increases expenditure limit for biennium beginning July 1, 2013, from fees, moneys or other revenues, including Miscellaneous Receipts and certain federal funds, but excluding lottery funds and other federal funds, collected or received by Department of Transportation for road usage charge program established by Act.

Road Usage Charges

SECTION 3.

(1) (a) Except as provided in paragraph b) of this subsection, the registered owner of a subject vehicle shall pay a per-mile road usage charge for metered use by the subject vehicle of the highways in Oregon.

(b) During the term of a lease, the lessee of a subject vehicle shall pay the per-mile road usage charge for metered use by the subject vehicle of the highways in Oregon.

(2) The per-mile road usage charge is 1.5 cents per mile.

SECTION 4.

(1) A person wishing to pay the per-mile road usage charge imposed under section 3 of this 2013 Act must apply to the Department of Transportation on a form prescribed by the department.

(2) The department shall approve a valid and complete application submitted under this section if:

(a) The applicant is the registered owner or lessee of a motor vehicle;

(b) The motor vehicle is equipped with a method selected pursuant to section 6 of this 2013 Act for collecting and reporting the metered use by the motor vehicle of the highways in Oregon;

(c) The motor vehicle has a gross vehicle weight rating of 10,000 pounds or less; and

(d) Approval does not cause the number of subject vehicles active in the road usage charge program on the date of approval to exceed 5,000, of which no more than 1,500 may have a rating of less than 17 miles per gallon and no more than 1,500 may have a rating of at least 17 miles per gallon and less than 22 miles per gallon, such ratings to be determined pursuant to a method established by the department.

(3) Approval of an application under this section subjects the applicant to the requirements of section 10 of this 2013 Act until the person ends the person's voluntary participation in the road usage charge program in the manner required under subsection (4) of this section.

(4) A person may end the person's voluntary participation in the road usage charge program at any time by notifying the department, returning the emblem issued under section 15 of this 2013 Act to the department and paying any outstanding amount of road usage charge for metered use by the person's subject vehicle.

Revenue

SECTION 5.

Moneys collected from the road usage charges imposed under section 3 of this 2013 Act shall be deposited in the State Highway Fund and allocated for distribution as follows:

(1) 50 percent to the Department of Transportation.

(2) 30 percent to counties for distribution as provided in ORS 366.762.

(3) 20 percent to cities for distribution as provided in ORS 366.800.

Administration

SECTION 6.

(1) As used in this section, "open system" means an integrated system based on common standards and an operating system that has been made public so that components performing the same function can be readily substituted or provided by multiple providers.

(2) (a) The Department of Transportation, in consultation with the Road User Fee Task Force, shall establish the methods for recording and reporting the number of miles that subject vehicles travel on highways.

(b) When taking action under this subsection, the department shall consider:

(A) The accuracy of the data collected;

(B) Privacy options for persons liable for the per-mile road usage charge;

(C) The security of the technology;

(D) The resistance of the technology to tampering;

(E) The ability to audit compliance; and

(F) Other relevant factors that the department deems important.

(c) The department shall establish at least one method of collecting and reporting the number of miles traveled by a subject vehicle that does not use vehicle location technology.

(d) (A) The department shall adopt standards for open system technology used in methods established under this subsection.

(B) In adopting standards pursuant to this paragraph, the department shall collaborate with agencies of the executive department as defined in ORS 174.112 to integrate information systems currently in use or planned for future use.

(3) The department shall provide the persons liable for the per-mile road usage charge the opportunity to select a method from among multiple options for collecting and reporting the metered use by a subject vehicle of the highways in Oregon.

SECTION 7.

The Department of Transportation shall provide by rule for the collection of the road usage charges imposed under section 3 of this 2013 Act, including penalties and interest imposed on delinquent charges.

SECTION 8.

(1) The Department of Transportation shall establish by rule reporting periods for the road usage charges imposed under section 3 of this 2013 Act.

(2) Reporting periods established under this section may vary according to the facts and circumstances applicable to classes of registered owners, lessees and subject vehicles.

(3) In establishing reporting periods, the department shall consider:

(a) The effort required by registered owners or lessees to report metered use and to pay the per-mile road usage charge;

(b) The amount of the per-mile road usage charge owed;

(c) The cost to the registered owner or lessee of reporting metered use and of paying the per-mile road usage charge;

(d) The administrative cost to the department; and

(e) Other relevant factors that the department deems important.

SECTION 9.

(1) As used in this section:

(a) "Certified service provider" means an entity that has entered into an agreement with the Department of Transportation under ORS 367.806 for reporting metered use by a subject vehicle or for administrative services related to the collection of per-mile road usage charges and authorized employees of the entity.

(b) "Personally identifiable information" means any information that identifies or describes a person, including, but not limited to, the person's travel pattern data, per-mile road usage charge account number, address, telephone number, electronic mail address, driver license or identification card number, registration plate number, photograph, recorded images, bank account information and credit card number.

(c) "VIN summary report" means a monthly report by the department or a certified service provider that includes a summary of all vehicle identification numbers of subject vehicles and associated total metered use during the month. The report may not include location information.

(2) Except as provided in subsections (3) and (4) of this section, personally identifiable information used for reporting metered use or for administrative services related to the collection of the per-mile road usage charge imposed under section 3 of this 2013 Act is confidential within

the meaning of ORS 192.502 (9)(a) and is a public record exempt from disclosure under ORS 192.410 to 192.505.

(3) (a) The department, a certified service provider or a contractor for a certified service provider may not disclose personally identifiable information used or developed for reporting metered use by a subject vehicle or for administrative services related to the collection of per-mile road usage charges to any person except:

(A) The registered owner or lessee;

(B) A financial institution, for the purpose of collecting per-mile road usage charges owed;

(C) Employees of the department;

(D) A certified service provider;

(E) A contractor for a certified service provider, but only to the extent the contractor provides services directly related to the certified service provider's agreement with the department;

(F) An entity expressly approved to receive the information by the registered owner or lessee of the subject vehicle; or

(G) A police officer pursuant to a valid court order based on probable cause and issued at the request of a federal, state or local law enforcement agency in an authorized criminal investigation involving a person to whom the requested information pertains.

(b) Disclosure under paragraph (a) of this subsection is limited to personally identifiable information necessary to the respective recipient's function under sections 2 to 15 of this 2013 Act.

(4) (a) Not later than 30 days after completion of payment processing, dispute resolution for a single reporting period or a noncompliance investigation, whichever is latest, the department and certified service providers shall destroy records of the location and daily metered use of subject vehicles.

(b) Notwithstanding paragraph (a) of this subsection:

(A) For purposes of traffic management and research, the department and certified service providers may retain, aggregate and use information in the records after removing personally identifiable information.

(B) A certified service provider may retain the records if the registered owner or lessee consents to the retention. Consent under this subparagraph does not entitle the department to obtain or use the records or the information contained in the records.

(C) Monthly summaries of metered use by subject vehicles may be retained in VIN summary reports by the department and certified service providers.

(5) The department, in any agreement with a certified service provider, shall provide for penalties if the certified service provider violates this section.

SECTION 10.

(1) On a date determined by the Department of Transportation under section 8 of this 2013 Act, the registered owner or lessee of a subject vehicle shall report the metered use by the subject vehicle, rounded up to the next whole mile, and pay to the department the per-mile road usage charge due under section 3 of this 2013 Act for the reporting period.

(2) Unless a registered owner or lessee presents evidence in a manner approved by the department by rule that the subject vehicle has been driven outside this state, the department shall assume that all metered use reported represents miles driven by the subject vehicle on the highways in Oregon.

Refunds and Exemptions

SECTION 11.

(1) The Department of Transportation shall provide a refund to a registered owner or lessee that has overpaid the per-mile road usage charge imposed under section 3 of this 2013 Act.

(2) The department may provide by rule that the refund under this section be granted as a credit against future per-mile road usage charges incurred by the registered owner or lessee.

SECTION 12.

(1) A registered owner or lessee that has paid the per-mile road usage charge imposed under section 3 of this 2013 Act may apply to the Department of Transportation for a refund for metered use of a road, thoroughfare or property in private ownership.

(2) An application for a refund under this section must be submitted to the department within 15 months after the date on which the per-mile road usage charge for which a refund is claimed is paid.

(3) The application required under this section shall be in a form prescribed by the department by rule and must include a signed statement by the applicant indicating the number of miles for which the refund is claimed.

(4) The department may require the applicant for a refund under this section to furnish any information the department considers necessary for processing the application.

SECTION 13.

(1) The Department of Transportation may investigate a refund application submitted under section 12 of this 2013 Act and gather and compile such information related to the application as the department considers necessary to safeguard the state and prevent fraudulent practices in connection with tax refunds and tax evasion.

(2) The department may, in order to establish the validity of an application, examine the relevant records of the applicant for such purposes.

(3) If an applicant does not permit the department to examine the relevant records, the applicant waives all rights to the refund to which the application relates.

SECTION 14.

(1) A person may not intentionally make a false statement in a report or refund application or when supplying other information required under section 10 or 12 of this 2013 Act.

(2) A person may not intentionally apply for, receive or attempt to receive a refund under section 11 or 12 of this 2013 Act to which the person is not entitled.

(3) A person may not intentionally aid or assist another person to violate any provision of section 10, 11 or 12 of this 2013 Act.

(4) A person who violates any provision of this section commits a Class A violation.

SECTION 15.

(1) Upon application on a form prescribed by the Department of Transportation, the department shall issue an emblem to the registered owner of a subject vehicle to show that the use of fuel in the subject vehicle is exempt from taxation under ORS 319.510 to 319.880.

(2) An emblem issued under this section shall be displayed:
(a) In a conspicuous place on the subject vehicle; and
(b) Only upon the subject vehicle with respect to which it is issued.

Penalties

SECTION 21.

(1) A person commits the offense of tampering with a vehicle metering system if the person:
(a) With the intent to defraud, operates a motor vehicle that is subject to the per-mile road usage charge imposed under section 3 of this 2013 Act on a highway knowing that the vehicle metering system is disconnected or nonfunctional.
(b) Replaces, disconnects or resets the vehicle metering system of a motor vehicle that is subject to the per-mile road usage charge imposed under section 3 of this 2013 Act with the intent of reducing the metered use recorded by the vehicle metering system.

(2) This section does not apply to a person who is servicing, repairing or replacing a vehicle metering system.

(3) As used in this section, "vehicle metering system" means a system used to record the metered use by a motor vehicle for the purpose of complying with the reporting requirements under section 10 of this 2013 Act.

(4) Tampering with a vehicle metering system is a Class A traffic violation.

Partnering with Private and Governmental Entities

SECTION 25.

(1) As part of the Oregon Innovative Partnerships Program established under ORS 367.804, the Department of Transportation may:

(a) Enter into any agreement or any configuration of agreements relating to transportation projects with any private entity or unit of government or any configuration of private entities and units of government. The subject of agreements entered into under this section may include, but need not be limited to, planning, acquisition, financing, development, design, construction, reconstruction, replacement, improvement, maintenance, management, repair, leasing and operation of transportation projects.

(b) Include in any agreement entered into under this section any financing mechanisms, including but not limited to the imposition and collection of franchise fees or user fees and the development or use of other revenue sources.

(2) As part of the Oregon Innovative Partnerships Program established under ORS 367.804, the department shall enter into agreements to undertake transportation projects the subjects of which include the application of technology standards to determine whether to certify technology, the collection of metered use data, tax processing and account management, as these subjects relate to the operation of a road usage charge system pursuant to sections 2 to 15 of this 2013 Act.

(3) The agreements among the public and private sector partners entered into under this section must specify at least the following:

(a) At what point in the transportation project public and private sector partners will enter the project and which partners will assume responsibility for specific project elements;

(b) How the partners will share management of the risks of the project;

(c) How the partners will share the costs of development of the project;

(d) How the partners will allocate financial responsibility for cost overruns;

(e) The penalties for nonperformance;

(f) The incentives for performance;

(g) The accounting and auditing standards to be used to evaluate work on the project; and

(h) Whether the project is consistent with the plan developed by the Oregon Transportation Commission under ORS 184.618 and any applicable regional transportation plans or local transportation system programs and, if not consistent, how and when the project will become consistent with applicable plans and programs.

(4) The department may, either separately or in combination with any other unit of government, enter into working agreements, coordination agreements or similar implementation agreements to carry out the joint implementation of any transportation project selected under ORS 367.804.

(5) Except for ORS 383.015, 383.017 (1), (2), (3) and (5) and 383.019, the provisions of ORS 383.003 to 383.075 apply to any tollway project entered into under ORS 367.800 to 367.824.

(6) The provisions of ORS 279.835 to 279.855 and ORS chapters 279A, 279B and 279C do not apply to concepts or proposals submitted under ORS 367.804, or to agreements entered into under this section, except that if public moneys are used to pay any costs of construction of public works that is part of a project, the provisions of ORS 279C.800 to 279C.870 apply to the public works. In addition, if public moneys are used to pay any costs of construction of public works that is part of a project, the construction contract for the public works must contain provisions that require the payment of workers under the contract in accordance with ORS 279C.540 and 279C.800 to 279C.870.

(7) (a) The department may not enter into an agreement under this section until the agreement is reviewed and approved by the Oregon Transportation Commission.

(b) The department may not enter into, and the commission may not approve, an agreement under this section for the construction of a public improvement as part of a transportation project unless the agreement provides for bonding, financial guarantees, deposits or the posting of other security to secure the payment of laborers, subcontractors and suppliers who perform work or provide materials as part of the project.

(c) Before presenting an agreement to the commission for approval under this subsection, the department must consider whether to implement procedures to promote competition among subcontractors for any subcontracts to be let in connection with the transportation project. As part of its request for approval of the agreement, the department shall report in writing to the commission its conclusions regarding the appropriateness of implementing such procedures.

(8) (a) Except as provided in paragraph (b) of this subsection, documents, communications and information developed, exchanged or compiled in the course of negotiating an agreement with a private entity under this section are exempt from disclosure under ORS 192.410 to 192.505.

(b) The documents, communications or information described in paragraph (a) of this subsection are subject to disclosure under ORS 192.410 to 192.505 when the documents, communications or information are submitted to the commission in connection with its review and approval of a transportation project under subsection [*(6)*] (7) of this section.

(9) The terms of a final agreement entered into under this section and the terms of a proposed agreement presented to the commission for review and approval under subsection [*(6)*] **(7)** of this section are subject to disclosure under ORS 192.410 to 192.505.

Multijurisdictional Agreements

SECTION 29.

The Department of Transportation may enter into agreements with other state departments of transportation, the federal government and Canadian provinces for the purposes of:

(1) Conducting joint research relating to road usage charges and development programs on a multistate basis;

(2) Furthering the development and operation of single state or multistate road usage charge pilot programs;

(3) Sharing costs incurred in conducting the research described in subsection (1) of this section; and

(4) Developing a program for stakeholder outreach and communications with respect to road usage charges.

SECTION 30. For the biennium beginning July 1, 2013, expenditures by the Department of Transportation from funds received from other states, the federal government, Canadian provinces or the government of Canada for the purposes described in section 29 of this 2013 Act are not limited.

Expenditure Limitation

SECTION 31.

Notwithstanding any other law limiting expenditures, the limitation on expenditures established by section 3 (7), chapter 556, Oregon Laws 2013 (Enrolled Senate Bill 5544), for the biennium beginning July 1, 2013, as the maximum limit for payment of expenses from fees, moneys or other revenues, including Miscellaneous Receipts and federal funds received as reimbursement from the United States Department of Transportation, but excluding lottery funds and federal funds not described in this section, collected or received by the Department of Transportation, is increased by $2,828,339 for the road usage charge program established by sections 2 to 15 of this 2013 Act.

Appendix C: Summary of Oregon RUCPP Plans

Plan Type	Provider	Number of Participants*	Miles Reported	Invoice	Payment Method	Online Acct. Management	Description
Flat Rate	Public, ODOT	1	NA	Initial billing at start of pilot	Check	No	Participants who did not wish to use any technology at all had the option of paying a flat monthly fee for unlimited mileage. The rate assessed was based on an assumed 35,000 miles per year in travel at $0.0156 cents per mile, prorated to a monthly fee of $45 (or $135 for the full three month pilot).
Basic	Private, Sanef	31	All	Monthly, e-mail	Credit/ debit card	Yes	This plan used an in-vehicle device that simply counted miles driven and did not collect any location data. Technology was provided and accounts were administered by the private sector provider.
Advanced	Private, Sanef	46	Public roads in Oregon	Monthly, e-mail	Credit/ debit card	Yes	This plan used an in-vehicle device that counted miles driven but collected location data in order to determine if the vehicle had been driven out of the state or on private property. Such mileage was not counted against the participant's total RUC. Technology was provided and accounts were administered by the private sector provider.
Basic	Public, ODOT	7	All	Monthly, mail	Check	No	This plan used an in-vehicle device that simply counted miles driven and did not collect any location data. Accounts were administered by ODOT.
Smartphone	Private, Raytheon	4	**Public roads in Oregon	Monthly, e-mail	Credit/ debit card	Yes	This plan used smart phones equipped with a specialized app to assess road usage and transmit information. This application made use of GPS data in order to determine mileage subject to the RUC levy.

** Includes Phase 1 and Phase 2 participants who had selected plans as of January 24, 2013*

*** Assumes that the Road User Fee Application on the smartphone was activated. If not, all mileage was assessed the road usage charge*

Appendix D: Summary of Proposed VMT Fee Systems for Nevada

Fee Type	Description	Fee Determination	Estimated Rate (in 2010 cents per mile)	Short-Term Ranking	Long-Term Ranking
Uniform VMT Fee	Flat fee per mile traveled regardless of the type of vehicle (excluding trucks), location of travel, or time of travel.	Current fuel tax rate divided by statewide average vehicular fuel efficiency.	2.76 state average for Nevada, 2.79 for Washoe County, 2.91 for Clark County	4	5
Dual Fee	Flat fee per mile traveled on passenger vehicles and a separate fee on light trucks.	Current fuel tax rate for passenger vehicles and light trucks divided by statewide average vehicular fuel efficiency for passenger vehicles and light trucks, respectively.	2.33 for passenger vehicles, 2.90 for light trucks	2	3
Multiple-Fee	Flat fees per mile traveled that vary based on the specific make and model of the vehicle, with the general result being that fee rates would vary based on fuel efficiency.	Current fuel tax rate divided by the fuel efficiency the specific vehicle.	Example: 2.49 for 2009 Acura TL 2WD and 3.07 for 2009 Acura MDX 4WD	1	2
Generalized Variable Fee	Fees for miles traveled that vary based on the type of vehicle as well as the type of roadway being traveled on.	Fee rate would be a function of vehicle make and model, road conditions, and traffic levels. The interaction of these variables was left undetermined pending further work.	Additional analysis needed by NDOT	3	3
Pay-as-you-go Fee	Fees on miles traveled with the rate set to generate funding levels sufficient to maintain transportation spending levels.	Estimated direct transportation system costs (such as maintenance and expansion costs) divided by statewide vehicle miles traveled.	Additional analysis needed by NDOT	6	6
Full-cost Fee System	Fees on miles traveled with the rate being set to account for the total cost of travel in terms of road damage, emissions, accidents, and traffic delays.	Estimated direct transportation system costs (such as maintenance and expansion costs) and indirect transportation system costs (such as emissions, accidents, and traffic delays) divided by statewide vehicle miles traveled.	Additional analysis needed by NDOT	5	1